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VOL. XIV.

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PASSIFLORA, or Passion-flower; a genus of the pentandria order belonging to the gynandria class of plants; and in the natural method ranking under the 34th order, Cucurbitaceae. The calyx is pentaphyllosous: there are five petals; the stamens a crown; the berry is pedicellate. There are near 30 different species; all of them natives of warm foreign countries, only one of which is sufficiently hardy to succeed well in the open ground in England; all the others requiring the shelter of a green-house or floor, but chiefly the latter. The most remarkable are,

1. The cardinum, or blue-rayed crown; palmated passion-flower, hath long, slender, shrubby, purplish-green stalks, branchy, and ascending upon support by their claspers 30 to 40 feet high; with one large palmated leaf at each joint, and at the axillae large spreading flowers, with white-green petals, and a blue radiated stamens; succeeded by a large, oval, yellowish fruit. It flowers from July until October; the flowers are very large, conspicuous, and their composition is exceedingly curious and beautiful. The general structure of the ingress flowers of this plant is, they come out at the axillae on pedunculi about three inches long, which they terminate, each flower having just close under the calyx, a three-lobed involucrum-like appendage; a five-leaved calyx, and a five-petalous corolla, the face, figure, and colour of the calyx, &c. the petals arranging alternately with the calical lobes; the whole, including the involucrum, calyx, and corolla, make just 13 lobes and petals, all expanded flat: and within the corolla is the nektarium, composed of a multitude of thread-like fibres, of a blue and purple colour, disposed in circular rays round the column of the fructification; the outer ray is the longest, flat, and spreading on the pedals; the inner is short, erect, and narrows towards the centre: in the middle is an eel-shaped column or pillar, crowned with the someth germ, having at its base five horizontal spreading filaments, crowned with incumbent yellow anthers, that move about every way; and from the side of the germ arises three slender spreading styles, terminated by headed stigmas; the germs afterwards gradually becomes a large oval fleshy fruit, ripening to a yellowish color. These wonderful flowers are only of one day's duration, generally, opening about 11 or 12 o'clock, and frequently in hot sunny weather burst open with effusion, and continue fully expanded all that day: and the next they gradually close, assuming a decayed-like up, carcass, and never open any more; the treeing put a period to their existence; but they are succeeded by new ones daily on the same plant.—This plant and flowers are held in great veneration in some foreign Catholic countries, where the religious make the leaves, tendrils, and different parts of the flower, to represent the instruments of our blessed Saviour's passion; hence the name passiflora.

2. The incarnata, incarnated, or flesh coloured Italian passion-flower, hath a strong perennial root; slender, herbaceous stalks, rising upon support four or five feet high; leaves composed of three fleshy lobes, each leaf attended by a twining tendril; and at the axillae long slender pedunculi, terminated each by one whitish flower, having a greenish calyx, and a reddish or purple radiated stamens, surrounding the column of the fructification, which succeed to a large, round, fleshy fruit, ripening to a beautiful orange colour. The flowers of this species are also very beautiful though of short duration, opening in the morning, and night puts a period to their beauty; but they are succeeded by a daily supply of new ones. The fruit of this sort is also very ornamental, as ripening to a fine reddish orange colour; but these rarely attain perfection here, unless the plants are placed in the floor; therefore when there is such accommodation, it highly merits that indulgence, where it will exhibit both flowers and green and ripe fruit, all at the same time, in a beautiful manner.

3. The vespertilio, or bat's wing passion-flower, hath slender, striated, branchy stalks; large, bilobate, or two-lobed leaves, the base roundish and glandular, the lobes acute, widely divaricated like a bat's wing, and dotted underneath; and axillary flowers, having white petals and rays. The leaves of these species have a singular appearance, the two lobes being expanded fix or seven inches wide, resembling the wings of a bat upon flight: hence the name vespertilio.

As all the species are natives of warm climates, in this country they are mostly of a tender quality, except the first sort, which succeeds very well in the full ground, in a warm situation; only their young branches are sometimes killed in very severe winters; but plenty of new ones generally rise again in spring following: the other, denominated flower kinds, must always be retained in that repository.

PASSION, is a word of which, as Dr Reid observes, the meaning is not precisely ascertained either in common discourse or in the writings of philosophers. In its original import, it denotes every fasting of the mind occasioned by an extrinsic cause; but it is generally used to signify some antithetical of mind, opposed to that state of tranquillity in which a man is most

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The Greeks and Romans, is evident from Cicero’s rendering of the word by which the philosophers of Greece expressed it; by perturbatio in Latin. In this sense of the word, passion cannot be itself a definition and independent principle of action; but only an occasional degree of vehemence given to those dispositions, desires, and affections, which are at all times present to the mind of man; and that this is its proper sense, we need no other proof than that passion has always been conceived to bear analogy to a storm at sea or to a tempest in the air.

With respect to the number of passions of which the mind is susceptible, different opinions have been held by different authors. Le Brun, a French writer on painting, justly considering the expression of the passions as a very important as well as difficult branch of his art, has enumerated no fewer than thirty, of which the signs may be expressed by the pencil on canvas. That there are so many different states of mind producing different effects which are visible on the features and the gestures, and that those features and gestures ought to be diligently studied by the artist, are truths which cannot be denied; but it is absurd to consider all these different states of mind as passions, since tranquillity is one of them, which is the reverse of passion.

The common division of the passions into desire and affection, hope and fear, joy and grief, love and hatred, has been mentioned by every author who has treated of them, and needs no explication; but it is a question of some importance in the philosophy of the human mind, whether these different passions be each a degree of an original and innate disposition, distinct from the dispositions, which are respectively the foundations of the other passions, or only different modifications of one or two general dispositions common to the whole race.

The former opinion is held by all who build their system of metaphysics upon a number of distinct internal fancies; and the latter is the opinion of those who, with Locke and Hartley, resolve what is commonly called instinct into an early association of ideas. (See Instinct.) That without deliberation mankind instinctively feel the passion of fear up the apprehension of danger, and the passion of anger or resentment upon the reception of an injury, are truths which cannot be denied: and hence it is inferred, that the seeds of these passions are innate in the mind, and that they are not generated, but only woven to magnitude on the prospect of their respective objects. In support of this argument, it has been observed that children, without any knowledge of their danger, are instinctively afraid of being placed on the brink of a precipice; and that this passion contributes to their safety long before they acquire, in any degree equal to their necessities, the exercise of their rational powers. Deliberate anger, caused by a voluntary injury, is acknowledged to be part founded on reason and reflection; but where anger impels one suddenly to return a blow, even without thinking of doing mischief, the passion is instinctive. In proof of this, it is observed that instinctive anger is frequently roused by bodily pain, occasioned even by a tick or a stone, which infamity becomes an object of resentment, that we are violently incited to crush to atoms. Such conduct is certainly not rational, and therefore it is supposed to be necessarily instinctive.

With respect to other passions, such as the lust of power, of fame, or of knowledge, innumerable instances, says Dr Reid, occur in life, of men who sacrifice to them their ease, their pleasures, and their health. But it is absurd to suppose that men should sacrifice the end to what they desire only as means of promoting that end; and therefore he seems to think that these passions must be innate. To add strength to this reasoning, he observes, that we may perceive some degree of these principles even in brute animals of the more fagacious kind, who are not thought to desire means for the sake of ends which they have in view.

But it is in accounting for the passions which are disinterested that the advocates for innate principles seem most completely to triumph. As it is impossible not to feel the passion of pity upon the prospect of a fellow-creature in distress, they argue, that the basis of that passion must be innate; because pity, being at all times more or less painful to the person by whom it is felt, and frequently of no use to the person who is its object, it cannot in such instances be the result of deliberation, but merely the exertion of an original instinct. The same kind of reasoning is employed to prove that gratitude is the exercise of an innate principle. That good offices are, by the very constitution of our nature, apt to produce good will towards the benefactor, in good and bad men, in the savage and in the civilized, cannot surely be denied by any one in the least acquainted with human nature. We are grateful not only to the benefactors of ourselves as individuals, but also to the benefactors of our country; and that, too, when we are conscious that from our gratitude neither they nor we can reap any advantage. Nay, we are impelled to be grateful even when we have reason to believe that the objects of our gratitude know not our existence. This passion cannot be the effect of reasoning, or of association founded on reasoning; for, in such cases as those mentioned, there are no principles from which reason can infer the propriety or usefulness of the feeling. That public spirit, or the affection which we bear to our country, or to any subordinate community of which we are members, is founded on instinct, is deemed so certain, that the man destitute of this affection, if there be any such, has been pronounced as great a monster as he who has but two heads.

All the disinterested passions are founded on what philosophers have termed benevolent affection. Instead therefore of enquiring into the origin of each passion separately, which would swell this article to no purpose, let us listen to one of the finest writers as well as ablest reasoners of the age, treating of the origin of benevolent affection, "We may lay it down as a principle (says Dr Reid), that all benevolent affections are in their nature agreeable: that it is essential to them to desire the good and happiness of their objects; and that their objects must therefore be being capable of happiness. A thing may be desired either on its own account, or as the means in order to something else. That only can properly be called an object of desire which is desired upon its own account, and
and therefore I consider as benevolent those affections only which define the good of their objects, ultimately, and not as means in order to something else. To say that we define the good of others, only to procure some pleasure or good to ourselves, is to say that there is no benevolent affection in human nature. This indeed has been the opinion of some philosophers both in ancient and in later times. But it appears as unreasonable to resolve all benevolent affections into self-love, as it would be to resolve hunger and thirst into self-love. These appetites are necessary for the preservation of the individual. Benevolent affections are no less necessary for the preservation of society among men; without which men would become an easy prey to the beasts of the field. The benevolent affections planted in human nature, appear therefore no less necessary for the preservation of the human species than the appetites of hunger and thirst. In a word, pity, gratitude, friendship, love, and patriotism, are founded on different benevolent affections; which our learned author holds to be original parts of the human constitution.

This reasoning has certainly great force; and if authority could have any weight in settling a question of this nature, we know not that name to which greater deference is due than the name of him from whom it is taken. Yet it must be confessed that the philosophers, who consider the affections and passions as early and deep-rooted associations, support the opinion with very plausible arguments. On their principles we have endeavoured elsewhere to account for the passions of fear and love, (see Instinct and Love); and we may here safely deny the truth of what has been flattered respecting fear, which seems to militate against that account. We have attended with much solicitude to the actions of children; and have no reason to think that they feel terror on the brink of a precipice till they have been repeatedly warned of their danger in such situations by their parent or their keepers. Every parent knows not only that they have no original or instinctive dread of fire, which is as dangerous to them as any precipice; but that it is extremely difficult to keep them from that destructive element till they are either capable of weighing the force of arguments, or have repeatedly experienced the pain of being burnt by it. With respect to sudden repentment, we cannot help considering the argument, which is brought in proof of its being instinctive, as proving the contrary in a very foreseeable manner. Instinct is some mysterious influence of God upon the mind exciting to actions of beneficial tendency: but can any benefit arise from wrecking our infant vengeance in a flock or a fowl? or is it palpable that a being of infinite wisdom would excite us to act in extravagantly foolish? We learn from experience to defend ourselves against rational or insensible enemies by retaliating the injuries which they inflict upon us; and if we have been often injured in any particular manner, the idea of that injury becomes in time a force associated with the means by which it has been constantly repelled, so that never receive such a injury—a blow for instance—with being prompted to make the usual retaliation, without reflecting whether the object be sensible or insensible. So far from being instinctive does repentment appear to us, that we think an attentive observer may easily perceive how the seeds of it are gradually infused into the youthful mind; when the child, from being at first a timid creature trembling from every pain, learns by degrees to return blow for blow and threat for threat.

But instead of urging what appears to ourselves of most weight against the intuitive system, we shall lay before our readers a few extracts from a dissertation on the Origin of the Passions by a writer whose elegance of language and ingenuity of investigation do honour to the school of Hartley.

"When an infant is born (says Dr Sayers), there is every reason to suppose that he is born without ideas. These are rapidly communicated through the medium of the senses. The same senses are also the means of conveying to him pleasure and pain. These are the hinges on which the passions turn; and till the child is acquainted with these sensations, it would appear that no passion is formed in his mind; for till he has felt pleasure and pain, how can he direct any object, or wish for its removal? How can he either love or hate? Let us observe then the manner in which Love and hatred are formed; for the passions depend all the rest. When a child endures pain, and is able to detect the cause of it, the idea of pain is connected in his mind with that of the thing which produced it; and the object which occasioned pain be again presented to the child, the idea of pain associated with it arises also. This idea consequently urges the child to avoid or to remove the object; and thus arises the passion of dislike or hatred. In the same manner, the passion of liking or love is readily formed in the mind of a child from the association of pleasant ideas with certain objects which produced them.

"The passions of hope and fear are states of the mind depending upon the good or bad prospects of gratifying love or hatred; and joy or sorrow arising from the final success or disappointment which attends the exertions produced by love or hatred. Out of these passions, which have all a precise relation to our own good, and are universally acknowledged to be selfish, all our other passions are formed."

To account for the passions called disinterested, he observes, that in the history of the human mind we find many instances of our dropping an intermediate idea, which has been the means of our connecting two other ideas together; and that the association of these two remains after the link which originally united them has vanished. Of this truth the reader will find sufficient evidence in different articles of this work (See Instinct, n. 19, and Metaphysics, n. 101): and, to apply it to the disinterested passions, let us suppose with Dr Sayers, that any individual has done to us many offices of kindness, and has consequently much contributed to our happiness; it is natural for us to feel some anxiety for the continuance of these pleasures which he is able to communicate. But we find a different, that the surest way of obtaining the continuance of his friendly offices is to make them, as much as possible, a source of pleasure to himself. We therefore do everything he is power to promote his happiness in return for the good he has conferred upon us, that thus we may attach him to us as much as we are able. Hobbes, it is plain, selfish. We have been with reluctance, for the sake of our own future grati-
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Pain. gratification, to promote the happiness of this person: but observe the consequence. We have thus, by contemplating the advantage to be derived to ourselves from promoting the prosperity of our friend, learned to associate a lot of pleasant ideas with his happiness; but the link which has united them gradually escapes us, while the union itself remains. Continuing to associate pleasure with the well-being of our friend, we endeavour to promote it for the sake of his instantaneous gratification, without looking farther; and in this way his happiness, which was first attended to only as a means of future enjoyment, finally becomes an end. Thus then the passion which was originally selfish, is at length disinterested; its gratification being completed merely by its success in promoting the happiness of another.

In this way does our author account for the origin of gratitude; which at last becomes a habit, and flows spontaneously towards every man who has either been or intended to be our benefactor. According to him, it is easy to observe also, that from associating pleasure with the happiness of an individual when we procure ourselves, it must of course soon follow, that when the happiness is pleasure from a view of his happiness any way produced; such happiness raising at all times pleasant ideas when it is presented to our minds. This is another feature of a disinterested affection, to feel delight from the mere increase of happiness in the object whom we love.

It may be objected, perhaps, that parents seem to have an infinite disinterested love of their offspring: but surely the love of a parent (a) for a new-born infant is not usually equal to that for a child of four or five years old. When a child is first born, the prospect and hopes of future pleasure from it are sufficient to make a parent anxious for its preservation. As the child grows up, the hope of future enjoyment from it must increase; hence would pleasure be associated with the well-being of the child, the love of which would of course become in due time disinterested.

Our author does not analyze pity, and trace it to its source in selfishness; but he might easily have done it, and it has been ably done by his master. Pity or compassion is the scene of which a man feels at the misery of another. It is generated in every mind during the years of childhood; and there are many circumstances in the constitution of children, and in the mode of their education, which make them particularly susceptible of this passion. The very appearance of any kind of misery which they have experienced, or of any signs of distress which they understand, excite in their minds painful feelings from the remembrance of what they have suffered, and the apprehension of their suffering it again. We have seen a child a year old highly entertained with the noise and struggles made by its elder brother when plunged naked into a vessel filled with cold water. This continued to be the case for many days, till it was thought proper to plunge the younger as well as the elder; after which the daily entertainment was soon at an end. The little creature had not been itself plunged above twice till it ceased to find diversion in its brother's sufferings.

On the third day it cried with all the symptoms of the bitters worst anguish upon seeing its brother plunged, though no preparation was then made for plunging itself: but surely this was not disinterested sympathy, but a feeling wholly selfish, excited by the remembrance of what it had suffered itself, and was apprehensive of suffering again. In a short time, however, the painful feelings accompanying the sight of its brother's struggles, and the found of his cries, were doubtless so associated with that sight and that sound, that the appearance of the latter would have brought the former along with them, even though the child might have brooked or been under apprehension of plunging itself. This association, too, would soon be transmitted to every boy in the same circumstances, and to similar sounds and struggles, from whatever cause they might proceed.

Thus, as Dr. Hartley observes, "when several observations on Man.

(a) That this is true of the father is certain; but it may be questioned whether it be equally true of the mother. A woman is no sooner delivered of her infant, than she cares for it with the utmost possible fondness. We believe, that if she were under the necessity of making a choice between her child of four years, and her infant an hour old, she would rather be deprived of the latter than of the former; but we are not convinced that this would proceed from a less degree of affection to the infant than to the child. She knows that the child has before its fourth year escaped many dangers which the infant must encounter, and may not escape; and it is therefore probable that her choice would be the result of prudent reflection. Though we are not admirers of that philosophy which supposes the human mind a bundle of infinites, we can as little approve of the opposite scheme, which allows it no infinites at all. The affection of a mother to her new born infant is undoubtedly irrelative, as the only thing which at that moment can be associated with it in her mind is the pain she has suffered in bringing it to the world.
compassion, by coincidence with the rest. Agreeably to this method of reasoning, it may be observed, that persons whose nerves are easily irritable, and those who have experienced great trials and afflictions, are in general more disposed to compasse than others; and that we are most apt to pity others in those diseases and calamities which we either have felt or of which we apprehend ourselves to be in danger.

The origin of patriotism and public spirit is thus traced by Dr. Sayers: "The pleasures which our country affords are numerous and great. The wish to perpetuate the enjoyment of those pleasures includes, the wish to promote the safety and welfare of our country, without which many of them would be lost. All this is evidently selfish; but, as in the progress of gratitude, it finally becomes disinterested. Pleasent ideas are thus strongly connected with the welfare of our country, after the tie which first bound them together has escaped our notice. The prosperity which was at first definable as the means of future enjoyment, becomes itself an end: we feel delight in such prosperity, however produced; and we look not beyond this immediate delight. It is thus not difficult to observe in what manner a general and disinterested benevolence take place in a mind which has already received pleasure from the happiness of a few; the transition is easy towards associating it with happiness in general, with the happiness of any being, whether produced by ourselves or by any other cause whatever."

From this reasoning, our author concludes, that all our passions may be traced up to original feelings of regard for ourselves. "Thus (in the forcible language of a learned writer of the same school) does self-love, under the varying appearance of natural affection, domestic relation, and the connections of social habitues, at first work blindly on, obscure and deep, in dirt: But as it makes its way, it continues rising till it emerges into light; and then suddenly expiring, leaves behind it the fairest flower,"—benevolent affection.

Self-love forsook the path it first pursu'd, And found the private in the public good.

Thus have we stated the two opposite theories respecting the origin of passions in the mind, and given our readers a short specimen of the reasonings by which they are supported by their respective patrons. Were we called upon to decide between them, we should be tempted to say, that they have both been carried to extremes by some of their advocates, and that the truth lies in the middle between them. "It is impossible* but that creatures capable of pleasant and painful sensations, should love and choose the one, and dislike and avoid the other. No being who knows what happiness and misery are, can be supposed indifferent to them, without a plain contradiction. Pain is not a positive object of desire, nor happiness of aversion." To prefer a greater good though distant, to a less good that is present; or to choose a present evil, in order to avoid a greater future evil—is indeed wise and rational conduct; but to choose evil ultimately, is absolutely impossible. Thus far then must be admitted that every being possessed of sense and intelligence, necessarily desires his own good as soon as he knows what it is; but if this knowledge be not innate, neither can the desire. Every human being comes into the world with a capability of knowledge, and of course with a capability of affections, desires, and passions; but it seems not to be conceivable how he can actually love, or hate, or dread any thing, till he know whether it be good, or ill, or dangerous. If, therefore, we have no innate ideas, we cannot possibly have innate desires or aversions. Those who contend that we have, seem to think, that without them reason would be insufficiant, either for the preservation of the individual or the continuation of the species; and some writers have alleged, that if our affections and passions were the mere result of early associations, they would necessarily be more capricious than we ever find them. But this objection seems to arise from their not rightly understanding the theory of their antecedents. The disciples of Locke and Hartley do not suppose it possible for any man in society to prevent such associations from being formed in his mind as shall necessarily produce desires and aversions; and let us do they think it possible to form associations of ideas utterly repugnant, so as to dispose that as good which his senses and intellect have experienced to be evil. Associations are formed by the same means, and at the same time, the ideas and notions are impressed upon the mind; but as pain is never mistaken for pleasure by the senses, so an object which has given us only pain is never associated with any thing that makes it defirable. We say an object that has given us only pain because it is possible to form such an association between life and the loss of a limb, as to make us grateful to the surgeon by whom it was amputated. Associations being formed according to the same laws by which knowledge is acquired, it by no means follows that passions resulting from them should be more capricious than they are found to be; and they certainly are sufficiently capricious to make us suspect that the greater part of them has this origin, rather than that they are all infused into the mind by the immediate agency of the Creator. If man be a being formed with no innate ideas, and with no other instinctive principles of action than what are absolutely necessary to preserve his existence and perpetuate the species, it is easy to perceive why he is placed in this world as in a state of probation, where he may acquire habits of virtue to fit him for a better. It is likewise easy to perceive why some men are better than others, and why some are the slaves of the most criminal passions. But all this is unintelligible, upon the supposition that the seeds of every passion are innate, and that man is a compound of reason and of instincts so numerous and various as to suit every circumstance in which he can be placed.

*Dr. Price's Review. &c.

If passions, whatever be their origin, operate instantaneously, and if they be formed according to fixed laws, it may be thought a question of very little importance whether they be instinctive or acquired. This was long our own opinion; but we think, that upon mature reflection, we have reason to change it. If passions be the result of early associations, it is of the utmost consequence that no improper associations be formed in the minds of children, and that none of their unreasonable desires be gratified. Upon this theory it seems indeed to depend almost wholly upon education, whether a child shall become a calm, benevolent, ready, and upright man; or a passionate, capricious,

precious, foolish, illogical. By teaching him to resent every petty injury, the seeds of irritability are sown in his mind, and taken root, that before the age of manhood he becomes intolerable to all with whom he must converse. By exciting numberless defects in his youthful mind, and instantly gratifying them, you make him capricious, and impatient of disappointment; and by representing other children as in any degree inferior to him, you inspire him with the hateful passion of pride. According to the instinctive theory, education can only augment or diminish the strength of passions; according to the other theory, it is the source of by far the greater part of them. On either supposition, parents should watch with solicitude over the actions of their children; but they will freely think themselves obliged to be doubly watchful, if they believe, that through their neglect their children may acquire hateful passions, to which, if properly educated, they might have remained strangers through their whole lives. And let it be remembered, that this solicitude should begin at an early period: because the mind is susceptible of deep impressions much sooner than is sometimes imagined. Without this susceptibility no language could be learned; and therefore a child by the time he learns to speak, may have planted in his mind the seeds of passions, on the just regulation and subordination of which depends in a great measure the happiness of mankind. See Max. & Phil. Philosophy, Part 1, Chap. 1 & 2, Part III, n° 216.

P. 1034 and Emotions, difference between them. See 

e and P. 1034 and Emotions, difference between them. External Signs of Emotions and Passion. So intimately connected are the soul and body, that every agitation in the former produces a visible effect on the latter. There is, at the same time, a wonderful uniformity in that operation; each clus of emotions and passions being invariably attended with an external appearance peculiar to itself. These external appearance, or signs, may not improperly be considered as a natural language, expressing to all beholders emotions and passions as they arise in the heart. Hope, fear, joy, grief, are displayed externally: the character of a man can be read in his face; and beauty, which makes so deep an impression, is known to reflect, not so much from regular features and a fine complexion, as from good nature, good-nature, sweetness, sweetness, or other mental quality, expressed on the countenance. Though perfect skill in that language be rare, yet what is generally known is sufficient for the ordinary purposes of life. But by what means we come to understand the language, is a point of some intricacy. It cannot be by light merely; for upon the most attentive inspection of the human visage, all that can be discerned are, figure, colour, and motion, which, singly or combined, never can represent a passion nor a sentiment: the external sign is indeed visible; but to understand its meaning, we must be able to connect it with the passion that causes it; an operation far beyond the reach of eye sight. Where then is the instructor to " find that can unveil this secret connection? If we apply to experience, it is yielded, that from long and diligent observation, we may gather, in some measure, in what manner these we are acquainted with express their passions externally; but with respect to strangers, we are left in the dark; and yet are not puzzled about the meaning of these external expessions in a stranger, more than in a bosom companion. Further, had we no other means but experience for understanding the external signs of passion, we could not expect any uniformity, nor any degree of skill, in the bulk of individuals; yet matters are so much better ordered, that the external expression of passion form a language understood by all, by the young as well as the old, by the ignorant as well as the learned. We talk of the plain and legible characters of that language; for undoubtedly we are much indebted to experience, in deciphering the dark and more delicate expressions. Where then shall we apply for a solution of this intricate problem, which seems to penetrate deep into human nature? Undoubtedly if the meaning of external signs be not derived to us from sight, nor from experience, there is no remaining source whereto it can be derived but from nature.

We may then venture to pronounce, with some degree of confidence, that man is provided by nature with a sense or faculty that lays open to him every passion by means of its external expressions. And we cannot entertain any reasonable doubt of this, when we reflect, that the meaning of external signs, is not hid even from infants: an infant is remarkably affected with the passions of its nurse expressed on her countenance; a smile causes it; a frown makes it afraid; but fear cannot be without apprehending danger; and what danger can the infant apprehend, unless it be sensible that its nurse is angry? We must therefore admit, that a child can read anger in its nurse's face, of which it must be sensible intuitively, for it has no other mean of knowledge. We do not affirm, that these particulars are clearly apprehended by the child; for to produce clear and distinct perceptions, reflection and experience are requisite; but that even an infant, when afraid, must have some notion of its being in danger, is evident.

That we should be conscious intuitively of a passion from its external expressions, is conformable to the analogy of nature; the knowledge of that language is of too great importance to be left upon experience; because a foundation so uncertain and precarious, would prove a great obstacle to the formation of societies. Wisely therefore is it ordered, and agreeably to the fictions of providence, that we should have nature for our instructor.

Such is the philosophy of Lord Kames, to which objections unanswerable may be made. It is part of the intuitive system of metaphysics, which his Lordship has carried farther than all who wrote before him, and perhaps farther than all who have succeeded him in this department of science. That a child intuitively reads anger in its nurse's face, is so far from being true, that for some short time after birth it is not perceived by the most menacing gestures. It is in deed absolutely incapable of fear till it has suffered pain, (see Inst.); and could we constantly care it with that is called an angry look, it would be cheere by that look, and frightened as a lamb. It feels, however, the effects of anger, and is more capable of obeying the peculiarities of feature with which that passion is usually accompanied; and these two become in a short time so linked together in its tender mind, that
that the appearance of the one necessarily suggests to
it the reality of the other.

Should it be said that a loud and sudden noise
stirres a child immediately after birth, and that, there­fore
the infant must be instinctively afraid, the fact
may be admitted, without any necessity of admitting
the inference. The nerves of an infant are commonly
very irritable, and the strong impulse on the auditory
nerves may agitate its whole frame, without inspiring
it with the passion of fear. The loud noise is, in all
probability not the sign of approaching danger, but
the immediate cause of real pain, from which the in­fant
shrinks, as it would from the prick of a pin, or
the tearing of a candle. But we have said enough in
the article immediately preceding, and in others
which are there quoted, to show how the passions may
be formed by associations even in early infancy, and
yet operate as if they were instinctive. This being
the case, we shall through the remainder of this article
suffer his Lordship to speak his own language, with­out
making any further remarks upon it. We are
induced to do this for two reasons; of which the first
is that many of our readers will probably prefer his
theory to ours; and the second is, that his conclusions
receding the signs and language of passion hold
equally good from either theory.

We perfectly agree with him, that manifold and
admirable are the purposes to which the external signs
of passion are made subservient by the Author of our
nature.

1. The signs of internal agitation displayed exter­nally to every spectator, tend to fix the signification
of many words. The only effectual means to ascertain
the meaning of any doubtful word, is an appeal to the
thing it represents; and hence the ambiguity of words
expressive of things that are not objects of external
sense; for in that case an appeal is denied. Passion,
strictly speaking, is not an object of external sense;
but its external signs are: and by means of these signs,
passions may be appealed to with tolerable accuracy:
thus the words that denote our passions, next to those
that denote external objects, have the most distinct
meaning. Words signifying internal action and the
more delicate feelings, are least distinct. This defect,
with regard to internal action, is what chiefly occa­sions
the intricacy of logic; the terms of that science are
far from being sufficiently ascertained, even after
much care and labour bestowed by an eminent writer
* to whom, however, the world is greatly indebted, for
removing a mountain of rubbish, and moulding the
subject into a rational and correct form. The same de­fect is remarkable in criticism, which has for its ob­ject the more delicate feelings; the terms that denote
these feelings being not more distinct than those of
logic.

2. Society among individuals is greatly promoted
by that universal language. Looks and gestures give
direct access to the heart, and lead us to feel, with
tolerable accuracy, the persons who are worthy of our
confidence. It is surprising how quickly, and for the
most part how correctly, we judge of character from
external appearance.

3. After social intercourse is commenced these ex­ternal signs, which diffuse through a whole assemblage
the feelings of each individual, contribute above all
other means to improve the social affections. Lan­guage,
o doubt, is the most comprehensive vehicle for
communicating emotions; but in expedieney as well
as in power of conviction, it falls short of the signs
under consideration; the involuntary signs especi­ally,
which are incapable of deceit. Where the counte­nance,
the tones, the gestures, the actions join with
the words in communicating emotions, these united
have a force irresistible. Thus all the plentiful emo­tions of the human heart, with all the social and virtu­ous affections, are by means of these external signs,
ot only perceived but felt. By this admirable con­vivence, conversation becomes the lively and anim­ating amusement, without which life would at best
be insipid; one joyful countenance spreads cheerfulness
instantaneously through a multitude of spectators.

4. Domestic passions, being hurtful by prompting
violence and mischief, are noted by the most conspicuous
external signs, in order to put us upon our guard; thus anger and revenge, especi­ally when sudden,
display themselves on the countenance in legible char­acters. The external signs, again, of every passion
that threatens danger, raise in us the passion of
fear; which frequently operating without reason or reflection,
moves us by a sudden impulse to avoid the impending
danger.

Those external signs are remarkably subservient to
morality. A painful passion, being accompanied with disagreeable external signs, must produce in every
spectator a painful emotion; but then if the passion be
social, the emotion he produces is attractive, and con­nects the spectator with the person who suffers. Dis­fociat passions only are productive of repulsive emo­tions, involving the spectator's aversion, and frequently
his indignation. This artful contrivance makes us
cling to the virtuous, and abhor the wicked.

6. Of all the external signs of passions, those of aff­liction or distress are the most illustrious with respect
to a final cause, and deservedly merit a place of dif­inction. They are illustrious by the singularity of
their contrivance; and also by inspiring sympathy, a
passion to which human society is indebted for its
greatest blessings, that of providing relief for the dis­tressed. A subject so interesting deserves a leisur­ely and attentive examination. The conformity of the na­ture
of man to his external circumstances is in every
particular wonderful: his nature makes him prone to
society; and society is necessary to his well-being, be­cause in a solitary state he is a helpless being, de­stitute of support, and in his distresses destitute of re­lief; but mental support, the soothing attribute of
society, is of too great moment to be left depend­ent upon cool reason; it is ordered more wisely, and
with greater conformity to the analogy of nature, that
it should be enforced even intuitively by the pas­sion of sympathy. Here sympathy makes a capital
figure; and contributes more than any other means,
to make life easy and comfortable. But however es­sential the sympathy of others may be to our well­being, one beforehand would not readily conceive how
it could be raised by external signs of distress: for con­sidering the analogy of nature, if these signs be agree­able they must give birth to a pleasant emotion lead­ing every beholder to be pleased with human woes; if
disagreeable, as they undoubtedly are, ought they not naturaly

* Lock.
naturally to repel the spectator from them, in order to be relieved from pain? Such would be the reasoning beforehand; and such would be the effect were man purely a selfish being. But the benevolence of our nature gives a very different direction to the painful passion of sympathy, and to the degree involved in it; instead of avoiding diftrust, we fly to it in order to afford relief; and our sympathy cannot be otherwise gratified but by giving all the succour in our power. Thus external signs of diftrust, though disagreeable, are attractive; and the sympathy they inspire is a powerful cause, impelling us to afford relief even to a stranger, as if he were our friend or relation.

It is a noted observation, that the deepest tragedies are the most crowded: which in an overly view will be thought an accountable bias in human nature. Love of novelty, desire of occupation, beauty of action, make us fond of theatrical representations; and when once engaged, we must follow the story to the conclusion, whatever diftrust it may create. But we generally become wise by experience: and when we foresee what pain we shall suffer during the course of the representation, is it not surprizing that persons of reflection do not avoid such spectacles altogether? And yet one who has fcarcely recovered from the diftrust of a deep tragedy, resolves coolly and deliberately to go to the very next, without the slightest obstruction from felo-love. The whole mystery is explained by a single observation: That sympathy, though painful, is attractive; and attaches us to an object in diftrust, instead of prompting us to fly from it. And by this curious mechanism it is, that persons of any degree of sensibility are attracted by affliction still more than by joy.

To conclude: the external signs of passion are a strong indication, that man, by his very constitution, is framed to be open and sincere. A child, in all things obedient to the impulses of nature, hides none of its emotions: the savage and clown, who have no guide but pure nature, expose their hearts to view, by giving way to all the natural signs. And even when men learn to disguise their sentiments, and when behavious are generates into art, there still remain checks, that keep dissimulation within bounds, and prevent a great part of its mischievous effects: the total suppression of the voluntary signs during any vivid passion, begets the utmost uneasiness, which cannot be endured for any considerable time: this operation becomes indeed less painful by habit; but luckily the involuntary signs cannot, by any effort be suppressed nor even dissembled. An absolute hypocrisy, by which the character is concealed and a fictitious one assumed, is made impracticable; and nature has thereby prevented much harm to society. We may pronounce, therefore, that Nature herself, sincere and candid, intends that mankind should preserve the same character, by cultivating simplicity and truth, and banishing every sort of dissimulation that tends to mischief.

Influence of Passion with respect to our Perceptions, Opinions, and Belief. So intimately are our perceptions, passions, and actions, connected, it would be wonderful if they should have no mutual influence. That our actions are too much influenced by passion, is a well known, that passion hath also an influence upon our perceptions, opinions, and belief. For example, the opinions we form of men and things are generally directed by affection: an advice given by a man of figure hath great weight; the same advice from one in a low condition is despised or neglected; a man of courage under-rates danger; and to the indolent the slightest obstacle appears insurmountable. All this may be accounted for by the simple principle of affection.

There is no truth more universally known, than that tranquillity and sedateness are the proper state of mind for accurate perception and cool deliberation; and for that reason we never regard the opinion even of the wise man, when we discover prejudice or passion behind the curtain. Passion hath such influence over us, as to give a false light to all its objects. Agreeable passions prepare the mind in favour of their objects; and disagreeable passions, not leaves against their objects; A woman is all perfection in her lover's opinion, while in the eye of a rival beauty she is awkward and disagreeable: when the passion of love is gone, beauty vanishes with it—nothing is left of that genteel motion, that sprightly conversation, those numberless graces, which formerly, in the lover's opinion, charmed all hearts. To a zealot every one of his own sect is a saint, while the most upright of a different sect are to him children of perdition: the talent of speaking is a friend, is more regarded than prudent conduct in any other. Nor will this surprise any one acquainted with the world; our opinions, the result frequently of various and complicated views, are commonly for flight and wavering, as readily to be susceptible of a bias from passion.

With that natural bias another circumstance consurs, to give passion an undue influence on our opinions and belief: and that is a fixing tendency in our nature to justify our passions as well as our actions, not to others only, but even to ourselves. That tendency is peculiarly remarkable with respect to disagreeable passions: by its influence, objects are magnified, or softened, circumstances supplied or suppressed, every thing coloured and disguised to answer the end of justification. Hence the foundation of self-deceit, where a man imposes upon himself innocently, and even without suspicion of a bias.

We proceed to illustrate the foregoing observations by proper examples.

Gratitude, when warm, is often exerted upon the children of the benefactor; especially where he is removed out of reach by death or absence. The passion in this case being exerted for the sake of the benefactor requires no peculiar excellence in his children; but the practice of doing good to these children produces affection for them, which never fails to advance them in our esteem. By such means strong connections of affection are often formed among individuals, upon the flint foundation now mentioned.

Envy is a passion, which, being altogether unjustifiable, cannot be excused by disguising it under some plausible name. At the first sight, no passion is more eager than envy to give its object a disagreeable appearance: it magnifies every bad quality, and fixes on the most humblest circumstances.
Plaudit men was a god among many of
And entertain a cheerful disposition.

The troubled Tyber chafing with his thores,
Cæsar says to me, Dar't thou, Cæsar, now
Leap in with me into this angry flood,
And swim to yonder point.—Upon the word,
Accosted as I was, I plunged in,
And bid him follow; so indeed he did.
The torrent roar'd, and we did buffet it
With lusty finews; throwing it aside,
And fleming it with hearts of controversly.
But ere we could arrive the point propos'd,
Cæsar cry'd, Help me, Cælius, or I sink:
As Æneas, our great ancestor,
Died from the flames of Troy upon his shoulder
The old Anchises bear; so from the waves of Tyber
Did I the tired Cæsar: and this man
Is now become a god; and Cælius is
A wretched creature, and must bend his body
If Cæsar carelessly but nod on him.
He had a fever when he was in Spain;
And when the fit was on him, I did mark
How he did shake. 'Tis true, this god did shake;
His coward lips did from their colour fly;
And that fame eye whose bend did awe the world
Did lose its luster: I did hear him groan;
Ay, and that tongue of his, that bade the Romans
Mark him, and write his speeches in their books,
Alas! I it cry'd—Give me some drink, Titinius,—
As a sick girl. Ye gods, it doth amaze me,
A man of such a feeble temper should
So get the start of the majestick world,
And bear the palm alone. Julius Cæsar, &c. 1. 3.

Glo'tier, inflamed with resentment against his son
Edgar, could even force himself into a momentary
conviction that they were not related:

O strange fathers' villain!
Would he deny his letter?—I never got him.

King Lear, &c. 2. 3.

When by great sensibility of heart, or other means,
grief becomes immoderate, the mind, in order to ju-
lify itself, is prone to magnify the cause; and if the
real cause admit not of being magnified, the mind seeks
a cause for its grief in imagined future events:

Busy, Madam, your majesty is much too sad:
You promis'd, when you parted with the king,
To lay aside self-harming heaviness,
And entertain a cheerful disposition.

Queen. To please the king I did; to please myself,

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(1) We have already shown how a man may be instigated to wreck his vengeance on a flock or a fone, without ever considering, whether it be sensible or insensible; (See Passi. 

If the story of Xerxes be true, he may have considered the sea as sensible and animated without dreaming that a flock or a fone is so. The sea was a god among many of the pagans, and was considered as such by Xerxes; or he could not have ap-
plauded men not sacrificing to it.
King Richard, full of indignation against his favourite horfe for carrying Bolingbroke, is led into the conviction of his being rational:

Groom. O, how it yearn'd my heart, when I beheld
In London streets, that coronation-day,
When Bolingbroke rode on Roan Barbary,
That horfe that thou so often halft beltrid,
That horfe that I fo carefully have dressed.

K. Rich. Rode he on Barbary? tell me, gentle friend,
How went he under him?

Groom. So proudly as he had disdain'd the ground.
K. Rich. So proud that Bolingbroke was on his back!
That jade had eat bread from my royal hand.
This hand hath made him proud with clapping him.
Would he not stumble? would he not fall down,
(Since pride must have a fall), and break the neck
Of that proud man that did usurp his back!

Richard II. ad 5. fe. 11.

Hamlet, swelled with indignation at his mother's second marriage, was strongly inclined to lessen the time of her widowhood, the shortness of the time being a violent circumstance against her; and he deludes himself by degrees into the opinion of an interval shorter than the real one:

Hamlet.——That it should come to this!

But two months dead! nay, not so much; not two——
So excellent a king, that was to this,
Hyperion to a fincer: so loving to my mother,
That he permitted not the wind of heav'n
Vifit her face too roughly. Heav'n and earth!
Muft I remember—why, she would hang on him,
As if increafe of appetite had grown
By what it fed on: yet, within a month——
Let me not think—Frailty! thy name is Woman!
A little month! or ere those shoes were old,
With which she followed my poor father's body,
Like Niobe, all tears—why she, ev'n she—
(O heav'n! a beak, that wants discourse of reason,
Wou'd have mourn'd longer) married with mine uncle,
My father's brother; but no more like my father
Than I to Hercules. Within a month!——
Ere yet the fall of most unrighteous tears
Had left the fuffing in her galled eyes,
She married—Oh, most wicked speed! to poft
With such dexterity to inculcous fheets
It is not, nor is not, come to good,
But break my heart, for I muft hold my tongue.

Ad. 1. fe. 3.

The power of passion to falsify the computation of time is remarkable in this instance; because time, which hath an accurate measure, is left obsequious to our desires and wishes, than objects which have no precise standard of less or more.

Good news are greedily swallowed upon very slender evidence; our wishes magnify the probability of the event, as well as the veracity of the relater; and we believe as certain, what at first is doubtful:

Quel, che l'huom vede, amor li fa invibile
E' l'invivibile fa veder amore.

Quelto creduto fu, che 'l mifer fuole
Dar facile credenza a quel, che vuole.

Orland. Partho. cont. 1. fl. 56.

For the same reason, bad news gain also credit upon the flightest evidence; fear, if once alarmed, has the same effect with hope, to magnify every circumstance that tends to conviction. Shakespeare, who shows more knowledge of human nature than any of our philosophers, hath in his Cymbeline represented this bias of the mind; for he makes the person who alone was affected with the bad news, yield to evidence that did not convince any of his companions. And Othello is convinced of his wife's infidelity from circumstances too slight to move any person less interested.

If the news interest us in fo low a degree as to give place to reason, the effect will not be altogether the fame: judging of the probability or improbability of the story, the mind settles in a rational conviction either that it is true or not. But even in that case, the mind is not allowed to rest in that degree of conviction which is produced by rational evidence; if the news be in any degree favourable, our belief is raised by hope to an improper height; and if unfavourable, by fear.

This observation holds equally with respect to future events; if a future event be either much wished or dreaded, the mind never fails to augment the probability beyond truth.

That eafines of belief, with respect to wonders and prodigies, even the most abfur'd and ridiculous, is a strange phenomenon; because nothing can be more evident than the following proposition, That the more singular any event is, the more evidence is required to produce belief; a familiar event daily occurring, being in itself extremely probable, finds ready credit, and therefore is vouch'd by the lightest evidence; but to overcome the improbability of a strange and rare event, contrary to the course of nature, the very strongest evidence is required. It is certain, however, that wonders and prodigies are swallowed by the vulgar, upon evidence that would not be sufficient to ascertain the most familiar occurrence. It has been reckoned difficult to explain that irregular bias of mind; but we are now made acquainted with the influence of passion upon opinion and belief; a story of ghosts or fairies, told with an air of gravity and truth, rafeth an emotion of wonder, and perhaps of dread; and these emotions imposing on a weak mind, impress upon it a thorough conviction contrary to reason.

Opinion and belief are influenced by propensity as well as by passion. An innate propensity is all we have to convince us that the operations of nature are uniform; influenced by that propensity, we often rashly think that good or bad weather will never have an end; and in natural philosophy, writers, influenced by the same propensity, stretch commonly their analogical

reason.
Wisdom is the highest of all the faculties; and among great to leave me the power of weeping; but the Son be so highly concerned for a poor man, now or related to thee. Piammeticus returned the following answer: "Son of Cyrus, the calamities of my family are too great to leave me the power of weeping; but the misfortunes of a companion, reduced in his old age to want of bread, is a fit subject for lamentation."

Surprise and terror are silent passions, for a different reason: they agitate the mind so violently, as for a time to suspend the exercise of its faculties, and among others the faculty of speech. Love and revenge, when immediate, are not more loquacious than immediate grief. But when those passions become moderate, they set the tongue free, and, like moderate grief, become loquacious. Moderate love, when unsuccessful, is vented in complaints; when successful, is full of joy expressed by words and gestures.

As no passion hath any long uninterrupted existence, nor boats always with an equal pulse, the language suggested by passion is not only unequal but frequently interrupted; and even during an uninterrupted fit of passion, we only express in words the more capital sentiments. In familiar conversation, one who vents every single thought, is justly branded with the character of loquacity; because sensible people express no thoughts but what make some figure; in the same manner, we are only disposed to express the strongest impulses of passion, especially when it returns with impetuosity after interruption.

It is elsewhere observed * that the sentiments ought to be turned to the passion, and the Language to both article Sen-Elevated sentiments require elevated language; tender sentiments ought to be clothed in words that are soft and flowing; when the mind is depressed with any passion, the sentiments must be expressed in words that are humble, not low. Words being intimately connected with the ideas they represent, the greatest harmony is required between them; to express, for example, an humble sentiment in high sounding words, is disagreeable by a discordant mixture of feelings; and the discord is not less when elevated sentiments are dressed in low words:

Verfibus exponi tragicis res comici non vult.
Indignatur item privatis ac prope focco
	Dignus carminibus narrari cona Thyseste.

Horat. Ars poet. l. 89.

This, however, excludes not figurative expression, which, within moderate bounds, communicates to the sentiment an agreeable elevation. We are sensible of an effect directly opposite, where figurative expression is indulged beyond a just measure: the opposition between the expression and the sentiment makes the discord appear greater than it is in reality.

At the same time, figures are not equally the language of every passion; pleasant emotions, which elevate or swell the mind, vent themselves in strong epithets and figurative expression; but humbling and de-spiriting passions affect to speak plain:

Et tragicus plerumque dolet fermono pedestri.
Telephus et Paeus, cum pauper et exul uterque,
Proiect ampullus et fequipedialia verba,
Sic curat cor spectans tetigisse querela.

Horat. Ars poet. 95.

Figurative expression, being the work of an enlivened imagination, cannot be the language of anguish or distress. Orway, sensible of this, has painted a scene of distress in colours finely adapted to the subject: there is scarce a figure in it, except a short and natural mimic with which the speech is introduce.1 Belvidera, talking to her father of her husband:

Think you saw what past our last parting,
Think you beheld him like a raging lion,
That as he pressed the earth, and tearing up his rep,

Fix'd on my throat, while the extended other
Grasp'd a keen threatening dagger: oh, 'twas this
We last embac'd, when, trembling with revenge.
To preserve the foregoing resemblance between words and their meaning, the sentiments of active and hurry ing passions ought to be drest in words where syllables prevail that are pronounced short or faint: for these make an impression of hurry and precipitation. Emotions, on the other hand, that rest upon their objects, are best expressed by words where syllables prevail that are pronounced long or flow. A person affected with melancholy has a languid and slow train of perceptions. The expression best suited to that state of mind, is where words, not only of long but of many syllables, abound in the composition; and for that reason, nothing can be finer than the following passage:

In those deep solitudes, and awful cells,
Where heavenly-pensive Contemplation dwells,
And ever-musing Melancholy reigns.

To preserve the same resemblance, another circumstance is requisite, that the language, like the emotion, be rough or smooth, broken or uniform. Calm and sweet emotions are best expressed by words that glide softly: surprize, fear, and other turbulent passions, require an expression both rough and broken.

It cannot have escaped any diligent inquirer into nature, that, in the hurry of passion, one generally expresses that thing first which is most at heart; which is beautifully done in the following passage:

Me, me; adsum qui feci: in me converse facrum,
O Rutuli, mea frans omnis Parnass. ix. 427.

Passion has often the effect of redoubling words, the better to make them express the strong conception of the mind. This is finely imitated in the following examples:

Thou fun, said I, fair light!
And thou enlight'ned earth, so freth and gay!
Ye hills and dales, ye rivers, woods, and plains!
And ye that live, and move, fair creatures! tell,
Tell, if ye saw, how came I thus, how here. —
Paradise Lost, b. viii. 273.

Both have finned! but thou
Against God only; I, gaining God and thee:
And to the place of judgment will return;
There with my cries importune Heaven, that all
The sentence, from thy head remov'd, may light
On me, sole caufe to thee of all this wo;
Me! me! only just object of his ire.
Paradise Lost, b. x. 930.

In general, the language of violent passion ought to be broken and interrupted. Soliloquies ought to be so in a peculiar manner: language is intended by nature for society; and a man when alone, though he always clothes his thoughts in words, seldom gives his words utterance, unless when prompted by some strong emotion: and even then by starts and intervals only. Shakespeare's soliloquies may be justly esteemed as a model; for it is not easy to conceive any model more perfect. Of his many incomparable soliloquies, the following two only shall be quoted, being different in their manner.

Hamlet, Oh, that this too, too solid flesh, would
Thaw, and resolve itself into a dew! [melts.
Or that the Everlasting had not fixed
His canon 'gainst self-slaughter! O God! O God!
How weary, stale, flat, and unprofitable,
Seem to me all the uses of this world!
Fie on't! O fie! 'tis an unweeded garden,
That grows to seed; things rank and gross in nature
Posse it merely. — Thus it should come to this!
But two months dead! nay, not so much; not two—
So excellent a king, that was, to this,
Hyperion to a satyr: so loving to my mother,
That he permitted not the winds of heav'n
Visit her face too roughly. Heav'n and earth!
Muf't I remember—why, the world hung on him,
As if increafe of appetite had grown
By what it fed on; yet, within a month—
Let me not think. —Frailty, thy name is Woman!
A little month: or ere these shoes were old,
With which the follow'd my poor father's body,
Like Niobe, all tears— why, even the
(O heav'n! a beast, that wants discourse of reason,
Would have murr'd longer)— married with mine
uncle,
My father's brother; but no more like my father
Than to Hercules. Within a month—
Ere the last of most unrighteous tears
Hadj left the flushing in her gall'd eyes.
She married—Oh, most wicked speed, to post
With such dexterity to incestuous sheets!
It is not, nor it cannot come to good,
But break, my heart, for I must hold my tongue.

Hamlet, ad 1: fc. 3.

"Ford. Hum! ha! is this a vision? is this a dream?
"do I sleep? Mr Ford; awake; awake, Mr Ford;
"there's a hole made in your belt cock, Mr Ford;
"this 'tis to be married! this 'tis to have linen and
"buck-baskets? Well, I will proclaim myself what
"I am; I will now take the leacher; he is at my
"house; he cannot escape me; 'tis impossible he
"should; he cannot creep into a halfpenny purse,
"nor into a pepper-box. But let the devil that
"guides him should aid him, I will search impossible
"places; tho' what I am I cannot avoid, yet to be
"what I would not, shall not make me tame."

Merry Wives of Windsor, ad. 3. sc. left.

These soliloquies are accurate and bold copies of nature; in a passionate soliloquy one begins with thinking aloud, and the strongest feelings only are expressed; as the speaker warms, he begins to imagine one listening; and gradually slides into a connected discourse.

How far distant are soliloquies generally from these models? So far indeed as to give disgust instead of
Language ought not to be elevated above the tone of the sentiment.

Paffeon.

Paffeon.

Light and airy language is unsuitable to a severe passion.

Imagery and figurative expression are discordant in the highest degree, with the agony of a mother, who is deprived of two hopeful sons by a brutal murder. Therefore the following passage is undoubtedly in a bad taste;

Queen. Ah, my poor princes! ah, my tender babes! My unblown flowers, now appearing sweets! If yet your gentle souls fly in the air, And be not fixt in doom perpetual, Hover about me with your airy wings, And hear your mother's lamentation.

Richard III. act 4. sc. 4.

Again,

K. Philip. You are as fond of grief as of your child.

Coniurers. Grief fills the room up of my absent child, Lies in his bed, walks up and down with me, Puts on his pretty looks, repeats his words, Remembers me of all his gracious parts, Stuffs out his vacant garment with his form; Then have I reason to be fond of grief.

King John, act 3. sc. 9.

Thoughts that turn upon the expression instead of the subject, commonly called a play of words, being low and childlish, are unworthy of any commendation, whether gay or serious, that pretends to any degree of elevation.

In the Aminta of Tasso, the lover falls into a mere play of words, demanding how he who had himself, could find a mistress. And for the same reason, the
The following passage in Corneille has been generally condemned:

Chimene. Mon père est mort, Elvire, et la première épée
Dont s'est armée Rodrigue à la trame coupée.
Pleurez, pleurez, mes yeux, et fondez-vous en eaux,
La moitié de ma vie a mis l'autre au tombeau.
Et m'oblige à venger, après ce coup furelfe,
Celle que je n'ai plus, fur celle que me relè.

Cid, aii 3. fc. 3.

To die is to be banish'd from myself; And Sylvia is myself; banish'd from her, Is felt from self; a deadly banishment!

Two Gentlemen of Verona, aii 3. fc. 3.

Countess. I pray thee, Lady, have a better cheer: If thou engrodst all the griefs as thine, Thou robb'st me of a moiety.

All's well that ends well, aii 3. fc. 3.

K. Henry. O my poor kingdom sick with civil blows!

When that my care could not with-hold thy riots,
What wilt thou do when riot is thy care?
O, thou wilt be a wilderness again,
Peopled with wolves, thy old inhabitants.

Second Part of Henry IV. aii 4. fc. 11.

Cruda Amarilli, che col nome ancora
D'amai, ah laffo, amaramente insegno.

Paflor Fido, aii 1. fc. 2.

Antony, speaking of Julius Cæsar:

O world! thou wait the forest of this hart;
And this indeed, O world, the heart of thee.
How like a deer, fricken by many princes,
Doft thou here lie? "Julius Cæsar, aii 3. fc. 3.

Playing thus with the found of words, which is still worse than a pun, is the meanest of all conceits. But Shakespeare, when he descends to a play of words, is not always in the wrong; for it is done sometimes to denote a peculiar character, as in the following passage:


Lewis. I do, my Lord, and in her eye I find
A wonder, or a wondrous miracle:
The shadow of myself form'd in her eye;
Which being but the shadow of your son,
Becomes a son, and makes your son a shadow.
I do protest, I never lov'd myself
Till now infid'd I beheld myself
Drawn in the flattering table of her eye.

Fauconbridge. Drawn in the flattering table of her eye!

Hang'd in the frowning wrinkle of her brow! And quarter'd in her heart! he doth efpy
Himself Love's traitor; this is pity now,
'That hang'd, and drawn, and quarter'd should be
In such a love to vile a lout as he.

King John, aii 2. fc. 5.

A jingle of words is the lowest species of that low wit, which is scarce sufferable in any case, and least of all in an heroic poem; and yet Milton in some instances has descended to that puerility:

And brought into the world a world of woe.

Begirt th' Almighty throne
Begirt th' Almighty throne
Begirt th' Almighty throne
Begirt th' Almighty throne
Begirt th' Almighty throne
Begirt th' Almighty throne

At one flight bound high overlap'd all bound.

With a thront
Loud as from numbers without number.

One should think it unnecessary to enter a caveat against an expression that has no meaning, or no distinct meaning; and yet somewhat of that kind may be found even among good writers.

Scipio. I beg no pity for this mould'ring clay.

For if you give it burial, there it takes Possession of your earth:

If burnt and scatter'd in the air; the winds
That blow thy dust, diffuse thy royalty,
And spread me o'er your clime; for where one atom
Of mine shall light, know there Scipio reigns.

Dryden, Don Sebastian King of Portugal, aii 1.

Cleopatra. Now, what news, my Charmion?

Will he be kind? and will he not forake me?

Am I to live or die? nay, do I live?

Or am I dead? for when he gave his answer,

Fate took the word, and then I liv'd or dy'd.

Dryden, All for love, aii 2.

If she be coy, and scorn my noble fire.

If her chill heart I cannot move;

Why, I'll enjoy the very love,

And make a mistress of my own desire.

Cowley, poem inscribed "The Requête."

His whole poem inscribed My Picture is a jargon of the same kind.

"Tis he they cry, by whom

Not men, but war itself is overcome.

Indian Queen.

Such empty expressions are finely ridiculed in the Rehearsal.

Was't not unjust to ravish hence her breath,

And in lie's stead to leave us nought but death?

All 1. fc. 1.

Passions, in medicine make one of the non-naturals, and produce very sensible effects. Joy, anger, and fear, are the principal. In the two first, the spirits are hurried with too great vivacity; whereas, in fear or dread, they are as it were curbed and concentrated: whence we may conclude, that they have a very bad effect upon health: and therefore it will be best to keep them within bounds as much as possible, and to prefer an inward serenity, calmness, and tranquility.

Passions, in painting, are the external expressions of the different dispositions and affections of the mind; but particularly their different effects upon the several features of the face: for though the arms, and indeed every part of the body, serve likewise, by their quick, languid, and various motions, to express the passions of the soul; yet, in painting, this difference is 37.
P A S

is most conspicuous in the face. See Painting, p. 620.

and Drawing, § 8.

As we have given engravings of Le Brun’s drawings of the passions, we shall here subjoin the account which he has given of each of these heads. See Plates CCLXXXVIII. and CCLXXXIX.

1. The effects of attention are, to make the eye brows sink and approach the fides of the nose; to turn the eye-balls toward the object that causes it; open the mouth, and especially the upper part; to decline the head a little; and fix it without any other remarkable alteration.

2. Admiration causes but little agitation in the mind, and therefore alters but very little the parts of the face; nevertheless the eye brow rises; the eye opens a little more than ordinary; the eye-ball placed equally between the eye-lids appears fixed on the object; the mouth half opens, and makes no sensible alteration in the cheeks.

3. The motions that accompany admiration with astonishment are hardly different from those of simple admiration, only they are more lively and stronger marked; the eye-brow more lively and stronger opens the eye-ball further from the lower eye-lid, and more readily fixed: The mouth is more open, and all the parts in a much stronger emotion.

4. Admiration begets esteem, and this produces veneration, which, when it has for its object something divine or beyond our comprehension, makes the face decline, and the eye-brows bend down; the eye-balls and eye-brows rise directly up; the mouth half opens, and the two corners are also a little turned up; the other parts remain in their natural state.

5. Although rapture has the same object as veneration, only considered in a different manner, its motions are not the same; the head inclines to the left side; the eye balls and eye-brows rise directly up; the mouth half opens, and the two corners are also a little turned up; the other parts remain in their natural state.

6. The passion of desire brings the eye-brows close together and forwards toward the eyes, which are more open than ordinary; the eye-ball is inflamed, and places itself in the middle of the eye; the nostrils rise up, and are contracted towards the eyes; the mouth half opens, and the spirits being in motion give a lively glowing colour.

7. Very little alteration is remarked in the face of those that feel within themselves the sweetness of joy, or joy with tranquility. The forehead is serene; the eye-brow without motion, elevated in the middle; the eye pretty open and with a laughing air; the eye-ball lively and shining; the corners of the mouth turn up a little; the complexion is lively; the cheeks and lips are red.

8. Laughter, which is produced by joy mixed with surprise, makes the eye-brows rise towards the middle of the eye, and bend towards the sides of the nose; the eyes are almost shut, and sometimes appear wet, or shed tears, which make no alteration in the face; the mouth half open, shows the teeth; the corners of the mouth drawn back, cause a wrinkle in the cheeks, which appear so swelled as to hide the eyes in some measure; the nostrils are open, and all the face is of a red colour.

9. Acute pain makes the eye-brows approach one another and rise towards the middle; the eye-ball is hid under the eye-brows; the nostrils rise and make a wrinkle in the cheeks; the mouth half opens and draws back; all the parts of the face are agitated in proportion to the violence of the pain.

10. Simple bodily pain produces proportionally the same motions as the last, but not so strong: The eye-brows do not approach and rise so much; the eye-ball appears fixed on some object; the nostrils rise, but the wrinkles in the cheeks are less perceivable; the lips are further afunder towards the middle, and the mouth is half open.

11. The dejection that is produced by sadness makes the eye brows rise towards the middle of the forehead more than towards the cheeks; the eye-ball appears full of perturbation; the white of the eye is yellow; the eye-lids are drawn down, and a little swelled; all about the eyes is livid; the nostrils are drawn downward; the mouth is half open, and the corners are drawn down; the head carelessly leaning on one of the shoulders; the face is of a lead colour; the lips pale.

12. The alterations that weeping occasions are strongly marked: The eye brows sink down towards the middle of the forehead; the eyes are almost closed, wet, and drawn down towards the cheeks; the nostrils swelled; the muscles and veins of the forehead appear; the mouth is shut, and the sides of it are drawn down, making wrinkles on the cheeks; the under lip pushed out, presses the upper one; all the face is wrinkled and contracted; its colour is red, especially about the eye brows, the eyes, the nose, and the cheeks.

13. The lively attention to the misfortunes of another, which is called compassion, causes the eye-brows to sink towards the middle of the forehead; the eye-ball to be fixed upon the object; the sides of the nostrils next the nose to be a little elevated, making wrinkles in the cheeks; the mouth to be open; the upper lip to be lifted up and thrust forwards; the muscles and all the parts of the face sinking down and turning towards the object which excites the passion.

14. The motions of fear are lively and strong: The forehead is wrinkled; the eye-brow is knit; the eye of it next the nose sinks down, and the other side rises very much; the eye is open, and the eye-ball is in the middle; the nostrils rise, and draw towards the eyes, and make wrinkles in the cheeks; the mouth shuts, its sides finking down, and the under lip is pulled out beyond the upper one.

15. An object despised sometimes causes horror, and then the eye-brow knits, and finks a great deal more. The eye-ball, placed at the bottom of the eye, is half covered by the lower eye lid; the mouth is half open, but closer in the middle than the sides, which being drawn back, makes wrinkles in the cheeks; the face grows pale, and the eyes become livid; the muscles and the veins are marked.

16. The violence of terror or fright alters all the parts of the face; the eye-brow rises in the middle;
its muscles are marked, swelled, preffed one against the other, and sunk towards the nose, which draws up as well as the noftrils; the eyes are very open; the upper eye-lid is hid under the eye brow; the white of the eye is encompassed with red; the eye ball fixes to¬ward the lower part of the eye; the lower part of the eye lid swells and becomes livid; the muscles of the nose and cheeks swell, and these last terminate in a point toward the sides of the noftrils; the mouth is very open, and its corners very apparent; the muscles and veins of the neck stretched; the hair stands on end; the colour of the face, that is, the end of the nose, the lips, the ears, and round the eyes, is pale and livid: and all ought to be strongly marked.

17. The effects of anger show fhow its nature. The eyes become red and Infamed; the eye-ball is daring and sparkling; the eye-brows are sometimes elevated and sometimes fink down equally; the forehead is very much wrinkled, with wrinkles between the eyes; the noftrils are open and enlarged; the lips prefling against one another, the under one riding over the upper one leaves the corners of the mouth a little open, making a cruel and difdainful grin.

18. Hatred or jealousy wrinkles the forehead; the eye-brows are funk down and knit; the eye-ball is half hid under the eye-brows, which turn towards the object; it fhould appear full of fire, as well as the white of the eye and the eye-lid; the noftrils are pale, open, more marked than ordinary, and drawn backward fo as to make wrinkles in the cheeks; the mouth is fo shut as to fhew the teeth are closed: the corners of the mouth are drawn back and very much funk; the muscles of the jaw appear funk; the colour of the face is partly inflamed and partly yellowish; the lips pale or livid.

19. As defpair in extreme, its motions are fo likewife; the forehead wrinkles from the top to the bottom; the eye-brows bend down over the eyes, and pref£ one another on the fides of the nose; the eye seems to be on fire, and full of blood; the eye ball is disturbed, hid under the eye-brow, sparkling and unfixed; the eye-lid is swelled and livid; the noftrils are large, open, and lifted up; the end of the nose finks down; the muscles, tendons, and veins are swelled and fretched; the upper part of the cheeks is large, marked, and narrow towards the jaw; the mouth drawn backwards is more open at the fides than in the middle; the lower lip is large and turned out; they gnath their teeth; they foam; they bite their lips, which are pale; as is the reft of the face; the hair is ftrait and stands on end.

PASSIVE. See PASSIFLORA.

Passion-Week, the week immediately preceding the fefivial of Easter; fo called, because in that week our Saviour's passion and death happened. The Thursday of this week is called Maunday Thursday; the Friday, Good Friday; and the Saturday, the Great Saturday.

PASSIVE, in general, denotes some thing that suffers the action of another, called an agent or active power. In grammar, the verb or word that expresses this passion is termed a passive verb: which in the learned languages, has a peculiar termination; as amor doceor, &c. in Latin: that is an r is added to the actives amo doceo; and, in the Greek, the inflection is made by changing w into xwpi; 

Plate CCCLXXIX.

Compassion.

Passions.

Sleeping.

Sadness.

Terror or Fright.

Honor.

Deceit.

Despair.

Hatred or Jealousy.

Anger.

Seymour Jr.
PASSOVER, a solemn festival of the Jews, instituted in commemoration of their coming out of Egypt, because the night before their departure, the destroying angel, who put to death the first-born of the Egyptians, passed over the houses of the Hebrews without entering therein, because they were marked with the blood of the lamb which was killed the evening before, and which for this reason was called the paschal lamb. This feast was called pesach by the old Greeks and Romans: not we pronounce from ψαχνω, "I suffer," as Chrysolom, Ireneus, and Tertullian, suppose, but from the Hebrew word pesach, pesag, hep.

The following is what God ordained concerning the passover of the Jews, (Exod. xii.) The month of the coming forth from Egypt was looked upon from this time to be the first month of the sacred or ecclesiastical year, and the fourteenth day of this month, between the two vespers, that is, between the sun's decline and his setting: or rather, according to our manner of reckoning, between two o'clock in the afternoon and six o'clock in the evening, at the equinox, they were to kill the paschal lamb, and to abstain from leavened bread. The day following being the fifteenth, counting from six o'clock of the foregoing evening, which concluded the fourteenth, was the grand feast of the passover, which continued seven days. But it was only the first and the seventh day that were solemn. The lamb that was killed ought to be without any defect, a male, and yeased that year. If no lamb could be found, they might take a kid. They killed a lamb or a kid in every family: and if the number of those that lived in the house was not sufficient to eat a lamb, they might join two houses together. With the blood of the paschal lamb they sprinkled the door-posts and lintel of every house, that the destroying angel, at the flight of the blood, might pass over them, and save the Hebrew children. They were to eat the lamb the same night that followed the sacrifice; they eat it roasted, with unleavened bread, and a collation of wild lettuce. The Hebrew says literally, with bitter things, as suppofoe mustard, or any thing of this nature to give a relish. It was forbid to eat any part of it raw, or boiled in water, nor were they to break a bone, (Exod. xii. 46. Numb. ix. 12. John xix. 36.;) and if any thing remained in the house, the following day, it was thrown into the fire. They that eat it were to be in the posture of travellers, having their reins girt, their shoes on their feet, their feet in their hands, and eating in a hurry. But this last part of the ceremony was but little observed, at least it was of no obligation, but only upon that night they came forth out of Egypt. For the whole eight days of the passover no leavened bread was to be used: and whoever should eat any, was threatened to be cut off from his people. With regard to the ceremonies which are observed in relation to the bread, see the article Passover, p. 351. col. 2.

They kept the first and last day of the feast, ye to us, that it was allowed to dress victuals, which was forbidden on the Sabbath-day. The obligation of keeping the passover was so strict, that whoever should neglect to do it, was punished to death, (Numb. ix. 13.) But those who had any lawful impediment, as a journey, sickness, or any uncleanness, voluntary or involuntary; for example, those that had been present at a funeral, or by any other accident had been defiled, were to defer the celebration of the passover till the second month of the ecclesiastical year, or to the fourteenth day of the month Iyar, which answers to April and May. It was thus the Lord ordered Moses, upon the occasion of the invention of unleavened bread, who had been obliged to pay their last offices to their relations, and who being thus polluted, were not capable of partaking of the paschal sacrifice, (2 Chr. xxx. 1, 2, &c.) The modern Jews observe in general the same ceremonies that were practised by their ancestors, in the celebration of the passover. On the fourteenth of Nisan, the first-born fell in memory of God's息ting the first-born of the Egyptians. The morning prayers are the same as those paid on other festivals. They take the roll of the pentateuch out of the chancels, and read it as far as the end of the twelfth chapter of Exodus, and what is contained in the eighteenth chapter of Numbers, relating to the passover. The matrion of the family then spreads a table, and sets on it two unleavened cakes, and two pieces of the lamb, a shoulder boiled and another stewed, to put them in mind that God delivered them with a stretched out arm. To this they add some small fishes, because of the leviathan; a hard egg, because of the viz.; some meal, because of the festa of John (these three animals being appointed for the feast of the children in the other life); and peas and nuts for the children to provoke their curiosity to ask the reason of this ceremony. They likewise use a kind of mustard, which has the appearance of mortar, to represent their making bricks in Egypt. The father of the family sits down with his children and slaves, because on this day all are free. Being set down, he takes bitter herbs, and dips them in the mustard, then eats them, and distributes to the rest. Then they eat of the lamb, the history and institution of which is at that time recited by the master of the family. The whole repast is attended with hymns and prayers. They pray for the prince under whose dominion they live, according to the advice of Jeremiah (xxix. 7.), "Seek the peace of the city whither I have caused you to be carried away captives, and pray unto the Lord for it: for in the peace thereof shall ye have peace." See the article Pray., &c. The same things are put in practice the two following days; and the festival is concluded by the ceremony hadala or disfinition. This ceremony is performed at the closing of the Sabbath-day, at which time the master of the house pronounces certain benedictions, accompanied with certain formalities, requesting that every thing may succeed well the week following. After going out of the synagogue, they then eat leavened bread for the last time. (Leo of Vol. XIV. Modena,
PAS [18]

PASSOVER, PASSPORT

Modena, p. iii. c. 3, and the Rabbins.) While the temple was standing, they brought their lambs thither, and sacrificed them, offering the blood to the priest, who poured it out at the foot of the altar. The passover was typically predictive of Christ our christian passover, (1 Cor. v. 7.) As the destroying angel passed over the houses marked with the blood of the passchal lamb, so the wrath of God passes over them whose souls are sprinkled with the blood of Christ. The passchal lamb was killed before Israel was delivered, so it was necessary Christ should suffer before we could be redeemed. It was killed before Moses's law or Aaron's sacrifices were enjoined, to show that deliverance comes to mankind by none of them; but only the true passover, that lamb of God slain from the foundation of the world, (Rom. iii. 25, Heb. ix. 14.) It was killed the first month of the year, which prefigured that Christ should suffer death in this month, (John xviii. 28.) It was killed in the evening, (Exod. xix. 6.) So Christ suffered in the last days, and at this time of the year, (Matt. xxvii. 46, Heb. i. 2.) At even also the fun feits, which shows that it was the Sun of Righteousness who was to suffer and die, and that in his passion universal darkness should be upon the whole earth, (Luke xxvii. 44.) 'The passover was reclined with fire, to denote the sharp and dreadful pains which Christ should suffer, not only from men, but from God also. It was to be eaten with bitter herbs, not only to put them in remembrance of their bitter bondage in Egypt, but also to typify our mortification to sin, and readiness to undergo afflictions for Christ, (Col. i. 24.) Many erroneously imagine, that the passover was instituted in memory of the Israelites passing the Red Sea; though it is certain the feast was held, and had its name, before the Israelites took a leaf of their way out of Egypt, and consequently several days before their passing the Red Sea. Besides the passover celebrated on the fourteenth of the first month, there was a second passover held on the fourteenth of the second month after the exodus, instituted by God in favour of travellers and sick persons who could not attend at the first, nor be at Jerusalem on that day. The Greeks, and even some of the catholic doctors, from the thirteenth, eighteenth, and nineteenth chapters, of St John, take occasion to conclude, that Jesus anticipated the day marked for the passover in the law; but the authority of three evangelists seems to evince the contrary. See Whitby's Dissertation on this subject, in an appendix to the fourteenth chapter of St Mark. F. Lamy supposes, that our Lord did not attend at the passover the last year of his life; which sentiment has drawn upon him abundance of opposers. F. Hardouin afferts, that the Galileans celebrated the passover on one day, and the Jews on another.

PASSPORT, or PASS, a licence or writing obtained from a prince or governor, granting permission and a safe conduct to pass through his territories without molestation: Also a permission granted by any state to navigate in some particular sea, without hindrance or molestation from it. It contains the name of the vessel, and that of the master, together with her tonnage and the number of her crew, certifying that she belongs to the subjects of a particular state, and requiring all persons at peace with that state to suffer her to proceed on her voyage without interruption.

The violation of safe-conducts or passports expressly granted by the state or by its ambassadors to the subjects of a foreign power in time of mutual war, or committing acts of hostility against such as are in amity, league or truce with us, who are here under a general implied safe conduct, are breaches of the public faith, without which there can be no intercourse or commerce between one nation and another; and such offences may according to the writers upon the law of nations, be a proper ground of a national war. And it is enacted by the statute 51 Hen. VI. cap. 4. fill in force, that if any of the king's subjects attempt or offend upon the sea, or in any port within the king's obedience, or against any stranger in amity, league, or truce, or under safe-conduct, and especially by attacking his person, or spoiling him, or robbing him of his goods; the lord chancellor, with any of the justices of either the king's-bench or common-pleas, may cause full restitution and amendments to be made to the party injured. Paquier says, that passport was introduced for passe partout. Balzac mentions a very honourable passport given by an emperor to a philosopher in these terms: "If there be any one on land or sea hardy enough to molest Potamon, let him consider whether he be strong enough to wage war with Caesar."

PASSPORT is used likewise for a licence granted by a prince for the importing or exporting merchandizes, moveables, &c. without paying the duties. Merchants procure such passports for certain kinds of commodities; and they are always given to ambassadors and ministers for their baggage, equipage, &c.

PASSPORT is also a licence obtained for the importing or exporting of merchandizes deemed contraband, and declared such by tariffs, &c. as gold, silver, precious stones, ammunition of war, horses, horn, wool, &c. upon paying duties.

PASSUS, among the Romans, a measure of length, being about four feet ten inches, or the thousandth part of a Roman foot. The word properly signifies, the space between the feet of a man walking at an ordinary rate. See MEASURE.

PASTE, in cookery, a soft composition of flour, wrought up with proper fluids, as water, milk, or the like, to serve for puddings or pastries, therein to bake meats, fruits, &c. It is the ball or foundation of pies, tarts, patties, pâtés, and other works of pastry. It is also used in confectionary, &c. for a preparation of some fruit made by beating the pulp thereof with some fluid or other admixture, into a soft pappy consistence, spreading it into a dish, and drying it with sugar, till it becomes as pliable as an ordinary paste. It is used occasionally also for making the crusts and bottoms of pies, &c. Thus, with proper admixtures, are made almond pastes, apple pastes, apricot pastes, cherry, currant, lemon, plum, peach, and pear pastes.

Paste is likewise used for a preparation of wheat flour, boiled up and incorporated with water; used by various artificers, as upholsterers, saddlers, bookbinders, &c. instead of glue or size, to fasten or cement their cloths, leathers, papers, &c. When paste is used by bookbinders, or for paper hangings to rooms, they mix a fourth, fifth, or sixth, of the weight of the flour of powdered rye; and where it is wanted still more tenacious,
PASTEBOARD, a kind of thick paper, formed of several single sheets pasted upon one another. The chief use of pasteboard is for binding books, making letter-cases, &c. See Paper.

PASTERN, or PASTER, among painters, a kind of palete made of different colours ground up with gum-water, in order to make Crayons.

PASTIL, in pharmacy, is a dry composition of sweet-smelling resin, aromatic woods, &c. sometimes burnt to clear and scent the air of a chamber.

PASTIME, a sport, amusement, or diversion. Pastimes of some kind seem to be absolutely necessary, and to none more than to the man of study; for the most vigorous mind cannot bear to be always bent. Constant application to one pursuit, if it deeply engage the mind, and to generate madness: of which the Don Quixote of Cervantes, and the almoner of Johnson, are two admirably conceived instances. But though pastime is necessary to relieve the mind, it indicates great frivolity when made the business of life; and yet the rich and the great, who are not obliged to labour for the means of subsistence, too often rove from pastime to pastime with as constant avidity as the mechanic toils for his family, or as the philosopher devotes himself to the cultivation of science. When those pastimes tend to give relish to the mind or strength to the body, such conduct is not only allowable, but praiseworthy; but when they produce effects the reverse of these, it is both hurtful and criminal. The gaming-table, the masquerade, the midnight assembly of any fort, must of necessity enfeeble both the body and the mind; and yet such are the fashionable amusements of the present day, to which many a belle and many a beau sacrifice their beauty, their health, their quiet, and their virtue.

Far different were the pastimes of our wiser ancestors. Remote from vice and effeminacy, they were innocent, manly, and generous exercises. From the ancient records of this country, it appears that the sports, amusements, pleasures, and recreations, of our ancestors, as described by Fitz Stephen (a), added strength and agility to the wheels of state mechanism, while they had a direct tendency towards utility. For most of those ancient recreations are resolvable into the public defence of the state against the attacks of a foreign enemy. The play at ball derived from the Romans, is first introduced by this author as the common exercise of every school boy. The performance was in a field, where the refolt of the most martial and considerate citizens, to give encouragement and countenance to this sort of agility, was splendid and numerous. The intention of this amusemenit at this period of time was to make the juvenile race active, nimble, and vigorous; which qualities were requisite whenever their assistance should be wanted in the protection of their country. The next species of pastime indeed does not seem to have this tendency; but it was only, as it seems, an annual eulogium: This was cock fighting. The author tells us, that in the afternoon of Shrove-Tuesday, on which day this custom prevailed, they concluded the day in throwing the ball: which seems to intimate, that the cock fighting was merely in conformity to ancient usage, and limited only to part of the day, to make way for a more laudable performance. We may reasonably suppose, although this author is entirely silent upon this head, that while cock-fighting was going on, cock throwing was the sport of the lowest class of people, who could not afford the expense of the former (a). Another species of manly exercise was truly martial, and intended to qualify the adventures for martial discipline. It is related by Fitz-Stephen thus: "Every Friday in Lent, a company of young men comes into the field on horseback, attended and conducted by the best horsemen: then march forth the sons of the citizens, and other young men, with disarmed lances and shields; and there practise feats of war. Many courtiers likewise, when the king is near the spot, and attendants upon noblemen, do repair to these exercises; and while the hope of victory does inflame their minds, they show by good proof how serviceable they would be in martial affairs."

C 2

This

(a) Otherwise called William Stephanides, a monk of Canterbury, who lived in the reign of King Stephen, to the time of Richard I. He wrote a Latin treatise, in which he gives an account of the several pastimes which were countenanced in his time. Bale in his writings draws a pleasing portrait of him. He is likewise sketched in strong and forcible outlines of praise and commendation by Leland. Bale says thus of him: "The time which other people usually misemployed in an idle and frivolous manner, he consecrated to inquiries which tended to increase the fame and dignity of his country: in doing which he was not unworthy of being compared to Plato; for, like him, he made the study of men and heaven his constant exercise."

(b) There were places set apart for the battles of these animals, as at this day, where no one was admitted without money. These places, commonly called pits, were schools, as at this day, in which people were instructed in the doctrines of chance, lots and gains, betting and wagers, and particularly in the liberal art of laying two to one. Cock-throwing has been laudably abolished: for it was a species of cruelty towards an innocent and useful animal; and such cruelty as would have kindled compassion in the heart of the most barbarian.
This evidently is of Roman descent, and immediately brings to our recollection the *Ludus Trojus*, supposed to be the invention, as it was the common exercise, of Aulus Gallus. The common people, in this age of masculine manners, made every amusement where strength was exerted the subject matter of instruction and improvement: instructed to exert their bodily strength in the maintenance of their country's rights; and their minds improved, by such exertion, into every manly and generous principle.

In the vacant intervals of industry and labour, commonly called the holy-days, indolence and inactivity, which at this day mark this portion of time, were found only in those whose lives were distempered with age or infirmity.

The view which Fitz-Stephen gives of the Easter-holydays is animated, "In Easter-holydays they fight battles upon the water: A shield is hanged upon a pole, fixed in the middle of the stream. A boat is prepared without oars, to be borne along by the violence of the water; and in the forepart thereof standeth a young man, ready to give charge upon the shield with his lance. If so be that he break his lance against the shield, and doth not fall, he is thought to have performed a worthy deed. If without breaking his lance he runs strongly against the shield, down he falleth into the water; for the boat is violently forced with the tide; but on each side of the shield ride two boats, furnished with young men, who recover him who falleth as soon as they may. In the holydays all the summer youths are exercised in leaping, dancing, wrestling, calling the stone, and prafiding their shields; and the maidens trip with their timbrels, and dance as long as they can well fare. In winter, every holy-day before dinner, the boors prepared for brawn are set to fight, or else bulls or bears are baited."

These were the laudable pursuits to which leisure was devoted by our forefathers, so far back as the year 1150. Their immediate successors breathed the same generous spirit. In the year 1222, the 6th year of Henry III., we find, that certain masters in exercises of this kind made a public profession of their instructions and discipline, which they imparted to those who were desirous of attaining excellence and victory in these honourable achievements. At this period, the persons of better rank and family introduced the play of *Tennis* (c); and erected courts or oblong edifices for the performance of the exercise.

About the year 1253, in the 38th year of Henry III., the *Quintana* was a sport much in fashion in almost every part of the kingdom. This contrivance consisted of an upright post firmly fixed in the ground, upon the top of which was a cross piece of wood, moveable upon a spindle; one end of which was broad like the flat part of an halberd, while at the other end was hung a bag of sand. The exercitum was performed on horseback. The more lively performance was, when, upon the broad part being struck with a lance, which sometimes broke it, the assailant rode swiftly on, so as to avoid being struck on the back by the bag of sand, which turned round instantly upon the stroke given with a very swift motion. He who executed this feat in the most dexterous manner was declared victor, and the prize to which he became intitled was a peacock. But if upon the aim taken, the contender miscarried in striking at the broadside, his impotency of skill became the ridicule and contempt of the spectators.

Dr Plot, in his Natural History of Oxfordshire, tells us, that this pastime was in practice in his time at Deddington in this county. "They first (says this author) fixed a post perpendicularly in the ground, and then placed a small piece of timber upon the top of it, fastened on a spindle, with a board nailed to it on one end, and a bag of sand hanging at the other. Against this board they anciently rode with spears: now as I saw it at Deddington only with strong shaves, which violently bringing about the bag of sand, if they make not good speed away, it strikes them in the neck or shoulders, and sometimes perhaps strikes them down from their horses; the great design of the sport being to try the agility both of man and horse, and to break the board; which, whoever did, was accounted conqueror: for whom heretofore there was some reward always appointed." (d)

Matthew Paris, speaking of this manly diversion, says

(c) The word *Tennis* seems to owe its original to the French language: if so, the game is of French production. Yet the word *tennis* will hardly be found to afford incontrovertible evidence upon this subject. For the holding or keeping possession of the ball is not part of the game, but rather a circumstance casually attending it: since, during the performance of it, the ball is in continual motion, so there can be no *tennis* at this juncture. Perhaps a place in France called *Tennis* (as there is a town which differs only in a letter, called *Sennais*, in the district of Champagne) was the place where the balls were first made, and the game first introduced.

(d) This was certainly an exercise derived from a military institution of the Romans, though not instrumentally the same. Whoever considers the form and disposition of the Roman camps, which were formed into a square figure, will find there were four principal gates or passages. Near the *Quadriorium*, or *Quadror's* apartment, was the *Forum*, or what is now called a futting-house, and from being near the *Quadrior's* station called *Quadriorium forum*. At this part was a fifth gate *Quintana*, where the soldiers were instructed in the discipline of the *Paliares*, which was to aim at and strike their javelins against an upright post fixed in the ground, as a kind of *profulio* to a real engagement with an enemy. By the frequent practice of this exercise, sometimes called *exercitium ad palum* by Roman writers, the soldiers at length acquired not only a dexterity and address in the management of their arms, but a constant and regular exactness in the direction of them. *Titus Livius Patrickus*, cap. 2. *Pancratus Rumor Memoralis*. lib. ii. tit. 21. *Vitruvius in Augustian Monumentis*, lib. ii. p. 237.

Upon the irruption of the *Ifri* into the Roman camps, which they plundered, says Livius, *ad Quadriorium forum*, *quintanamque pervenerunt*. 

There are many places at this day, formerly report-ed to, for the practice of this noble art, distinguished by appellations which indicate their ancient usage: such as Brentford Butts, Newington Butts, and many others of the like denomination. It appears from 33 Hen. VIII. that by the intrusion of other pernicious games, archery had been for a long time diluted; to revive which this statute was made. It seems that the bows or the belt kind were made of yew; and that this wood might be readily obtained for this purpose, yew-trees were planted in churchyards. The sons of those only who were perfons of fortune and fashion, if under 17 years of age, were permitted to use such bows. The words of the statute are singular, and run thus: "No person under fourteen years, except he, or his father or mother, have lands or tenements to the yearly value of ten pounds, or be worth in value or movables the sum of forty marks sterling, shall shoot with any bow of yew, which shall be bought for him, after the seal of our Lady next coming, under the pain to lose and forfeit six shillings and eight-pence." Two observations arise here upon these words. One, that the yew-wood, not being so common as other wood, might probably be soon found deficient, as it was the best wood for making bows, if not restrained in the use of it to particular ages and persons, as young people wantonly destroy what is put into their hands for useful purposes. The other observation is, that the age of 17 is by this statute distinguished as the age of discretion, when young people are more attentive and con-fident in things of private concern; an age in these times which few ever arrive at, and some never. This statute makes provision of other kinds of wood for the common people in the following manner: "To the intent that every person may have bows of mean price, be it known, that every bowyer shall, for every bow that he makes of yew, make four other bows, meet to shoot with, of elm, hick, beaf, or other wood apt for the same, under pain to lose and forfeit for every such bow so lacking the sum of three shillings and fourpence." It seems there was a species of yew at this time called 6k, which wood was stronger and more plant than the common yew mentioned in this statute, and the price of it fixed. "Moreover, no bowyer shall fell or put to sale to any of the king's subjects, any bow of yew of the tax called 6k, above the price of three shillings and fourpence, under the pain to forfeit twenty shillings for every bow sold above the same price." From these several considerations which occur in this statute, we can trace three repellant qualities, courage, strength, and agility; which three united, inspired two more, generosity and magnanimity. Upon the decline of this and other polished (e) refinements, a savage deformity of manners sprung up, but.shanged.

(e) How widely different the conceptions of politeness at this day from what they were in the most refined ages of Greece and Rome! These two states agreed in fixing the standard of this accomplishment upon the fitness and propriety of things. Modern nations bend to an arbitrary imposture of language and manners which erewate the mind. To define politeness in its ancient and true sense, it is a manly exertion of conduct, founded upon every noble and virtuous principle. Much of the politeness of modern times is an effeminate impotence of demeanour, founded upon fallacy, evasion, and every insidious artifice. There can be no security, no...
Towards the beginning of James I.'s reign, military provosts seem to have founded a retreat (r). He, to gratify the importunity of the common people, and at the same time to obviate his own fears upon a refusal, published a book of sports, in which the people had been some time before usually indulged on Sunday evenings, but which had been lately prohibited. These sports consisted of dancing, fissing, wrestling, church plays, and other profane ins of that day.

Charles, his successor, wisely, in the very entrance of his reign, abolished these sports. The act of Charles states the several amusements in part; by which we may conjecture what was the remainder as stated in the book of sports by James. It is necessary to transfer that part of the act relating to this subject. "Forasmuch as there is nothing more acceptable to God, than the true and sincere worship of Him, and service according to His holy will, and that the holy keeping of the Lord's day is a principal part of the service of God, which in many places of this realm hath been, and now is, profaned and neglected by a disorderly sort of people, in exercising and frequenting bear-baiting, bull-baiting, interludes, common plays, and unlawful exercises and pastimes, neglecting divine service both in their own parishes and elsewhere: Be it enacted, that from and after forty days next after the end of this session of parliament, there shall be no meetings, assemblies, or concourse of people, out of their own parishes, on the Lord's day, within this realm of England, or any of the dominions thereof, for any sports or pastimes whatsoever: nor any bear-baiting, bull-baiting, interludes, common plays, or other unlawful exercises or pastimes, used by any person or persons within their own parishes: and that every person and persons offending in any of the said premises, shall forfeit for every offence the sum of three shillings and fourpence; the same to be employed and converted to the use of the poor of the parish where such offence shall be committed." All this was perhaps proper, and showed the distinguishing piety of this unfortunate monarch. But in this age likewise ended the manly sports of Britons, and nothing was introduced that could compensate for the loss.

All these licentious arts, considered as vehicles of pleasure, from the variety of their inventions, represent pleasure as a fleeting phantom; evincing at the same time the liability of happiness as springing from internal order. Even reflex acts, pregnant with future hopes of solace and social recreation, have more true feelings in expectancy than those which arise from the object in question. Nay, pleasure is found frequently in the imagination only: for Ixion's disappointment frequently awakens us when we advance to embrace this Juno of our desires.

Upon the whole, happiness, the only thing of intrinsic value, must aribe in the heart, and be something more solid than what mere amusements can possibly supply. Amusements or pastimes ought to be considered only as necessary relaxations from wearier and more useful employment; and in this point of view they may be safely pursued; but they become criminal when they occupy the place of the business of life.

PASTINACA, the Parner, a genus of the digynous order, belonging to the pennstata class of plants; and in the natural method ranking under the 45th order, Umbellifer. The fruit is an elliptical compressed plane; the petals are rustlated and entire. There are only two species of this genus; the principal of which is the *Pastinaca sativa*, or garden parner, which is an exhausting mealyulent root. It is to be propagated by sowing the seeds in February or March, in a rich mellow soil, which must be deep dug, that the roots may be able to run deep without hinderance.

It is a common practice to sow carrots at the same time, upon the same ground with the parners; and if the carrots are designed to be drawn young, there is no harm in it. The parners, when they are grown up a little, must be thinned to a foot distance, and carefully kept clear of weeds. They are finest tailed just at the fusion when the leaves are decayed: and such as are diiferous to eat in spring should have them taken up in autumn and preserved in kind. When the seeds are to be saved, some very strong and fine plants should be left four feet distance: and towards the end of August, or in the beginning of September, the seeds will be ripe: they must then be carefully gathered, and dried on a coarse cloth. They should always be sown the spring following, for they do not keep well.

Hints have been given and experiments made by agricultural societies respecting parners, in order to raise them for winter food to cattle. It has long been a custom in the parts of Brittany, to sow parners in the open field for the food of cattle; as we are informed by the first volume of the Transactions of a Society instituted in that province, for the encouragement of the economical and commercial interests of their country. "It is of great importance (say they) that parners should be universally cultivated; because they afford an excellent and wholesome food for all kinds of cattle during the winter, and may be used to great advantage to fatten them. Our hogs have no other food in all that season, and our bullocks and oxen thrive well upon it. Our cows fed with parners give more milk than with any other winter fodder, and that milk yields better butter than the milk of cows nourished with any other substance. Our horses fatten with this food; though some pretend that it renders them less mettle, and hurts their legs and eyes. Cattle eat these roots raw at first sliced lengthwise;

pinefs, no prosperity, awaiting those who fawn to fathions that disgrace humanity, and so manners which confit more of artificial afection than of manly freedom.

(r) It hath been confidently asserted by some historians, that James was, during his whole life, struck with terror upon the sight of a drawn sword; which was the reason of his great unwillingness in bellowing the honour of knighthood. For at this juncture, he had such a tremor upon him, that instead of laying the sword upon the shoulder of the person to be knighted, he frequently would be observed almost to thrust the point of it into the face of the party; which occasioned thes about him to assist him in the direction of his hand.
PASTORAL

In general, something that relates to shepherds: hence we lay, pastoral life, manners, poetry, &c.

Pastoral life may be considered in three different views; either such as it now actually is; when the state of shepherds is reduced to a mean, servile, and laborious state; when their employments are become disagreeable and their ideas grofs and low; or such as we may fancy it once to have been, in the more early and simple ages, when it was a life of ease and abundance; when the wealth of men consisted chiefly in flocks and herds, and the shepherd, though unreined in his manners, was respectable in his state; or, lastly, such as it never was, and never can in reality be, when, to the ease, innocence, and simplicity of the early ages, we attempt to add the polished taste, and cultivated manners, of modern times. Of these three states, the first is too grofs and mean, the last too refined and unnatural, to be made the ground-work of pastoral poetry. Either of these extremes is a rock upon which the poet will split if he approach too near it. We shall be difgusted if he give us too much of the servile employments and low ideas of actual peasants, as Theocritus is cenfured for having sometimes done; and if, like some of the French and Italian writers of pastoral, he makes his shepherds diffuse as if they were courtiers and philosophers, he then retains the name only, but wants the spirit of pastoral poetry.

PASTORAL POETRY. See POETRY, Part IV. Sect. IV.

PASTRY, that branch of cookery which is chiefly taken up in making pies, pasties, cakes, &c. See PASTRY.

Dr Cullen observes, that paife is very hard and indigestible without butter; and even with it, is apt to produce heart-burn and acidness. Perhaps this is increased by the burned butter, from a certain fehnibility in the stomach, which occasions all empyreumatic oils to be long retained, and so turn rancid and acid.

PASTURE, or PASTURE LAND, is that reffered for feeding cattle.

Pasture land is of such advantage to husbandry, that many prefer it even to corn-land, because of the small hazard and labour that attends it; and as it lays the foundation for most of the profit that is expected from the arable land, because of the manure afforded by the cattle which are fed upon it. Pasture ground is of two sorts; the one is meadow land, which is often overflowed; and the other is upland, which lies high and dry. The first of these will produce a much greater quantity of hay than the latter, and will not require manuring or dressing so often; but then the hay produced on the upland is much preferable to the other; as is also the meat which is fed in the upland more valued than that which is fattened in rich meadows; though the latter will make the fatter and larger cattle, as is seen by those which are brought from the low rich lands in Lincolnshire. But where people are nice in their meat, they will give a much larger price for such as hath been fed on the downs, or in short upland pasture, than for the other which is much larger. Besides this, dry pastures have an advantage over the meadows, that they may be fed all the winter, and are not so subject to poach in wet weather; nor will there be so many bad weeds produced; which are great advantages, and do in a great measure recom pense for the smallness of the crop.

We have already mentioned the advanges of meadow land, or such as is capable of being overflowed with water, and given directions for draining and improving low pasturage land, under the article MEADOWS; therefore shall not repeat that here, but just mention some methods for improving of upland pasture.

The first improvement of upland pasture is, by fencing it, and dividing it into small fields of four, five, six, eight, or ten, acres each, planting timber trees in the hedge-rows, which will screen the grass from the dry pinching winds of March, which will prevent the grass from growing in large open lands; so that if April proves a dry month, the land produces very little hay; whereas in the sheltered fields, the grass will begin to grow early in march, and will cover the ground, and prevent the sun from parching the roots of the grass, whereby it will keep growing, so as to afford a tolerable crop if the spring should prove dry. But in fencing of land the inclosure must not be made too small, especially when the hedge-rows are planted with trees; because, when the trees are advanced to a considerable height, they will spread over the land; and where they are close, will render the grass sour; so that instead of being of an advantage, it will greatly injure the pasture.

The next improvement of upland pasture is, to make the turf good, where, either from the badness of the soil, or for want of proper care, the grass hath been destroyed by ruthes, bushes, or mole hills. Where the surface of the land is clayey and cold, it may be improved by parching it off, and burning it; but if it is an hot sandy land, then chalk, lime, marle or clay, are very proper manures to lay upon it; but this should be laid in pretty good quantities, otherwise it will be of little service to the land.

If the ground is over run with bushes or ruthes, it will be of great advantage to the land to grub them up towards the latter part of summer, and after they are dried to burn them and spread the ashes over the ground just before the autumnal rains; at which time the surface of the land should be levelled, and tawn with grase feed, which will come up in a short time, and make good gras the following spring. See also, when the land is full of mole hills, these should be pulled off, and either burnt for the ashes, or spread immediately.
Failure of turf to thicken, where it has been thus managed, will be of great service to roll the turf in the months of February and March with an heavy wood roller; always observing to do it in moist weather, that the roller may make an impression; this will render the surface level, and make it much easier to mow the grass than when the ground lies in hills; and will also cause the turf to thicken, so as to have what the people usually term a good bottom. The grass likewise will be the sweetest for this lastardy, and it will be a great help to destroy bad weeds.

Another improvement of upland pastures is, the feeding of them; for where this is not practised, the land must be manured at least every third year; and where a farmer hath much arable land in his possession, he will not care to part with his manure to the pasture. Therefore every farmer should endeavour to proportion his manure to his arable land, especially where manure is scarce, otherwise he will soon find his error; for the pasture is the foundation of all the profit which may arise from the arable land.

Whenever the upland pastures are mended by manure, there should be a regard had to the nature of the soil, and a proper sort of manure applied: as for instance, all hot sandy land should have a cool manure; neat's dung and swine's dung are very proper for such lands; but for cold lands, horse dung, ashes, and other warm manures, are proper. And when these are applied, it should be done in autumn, before the rains have fouked the ground, and rendered it too soft to cart on; and it should be carefully spread, breaking all the clods as small as possible, and then harrowed with bushels, to let it down to the roots of the grass. When the manure is laid on at this season, the rains in winter will wash down the salts, so that the following spring the grasses will receive the advantage of it.

There should also be great care taken to destroy the weeds in the pasture every spring and autumn: for, where this is not practised, the weeds will ripen their seeds, which will spread over the ground, and thereby fill it with such a crop of weeds as will soon overbear the grass and destroy it; and it will be very difficult to root them out after they have gotten such possession, especially ragwort, and such other weeds as have down adhering to their feeds.

The grass which is sown in these upland pastures seldom degenerates, if the land is tolerably good: whereas as the low meadows, which are overflowed in winter, in a few years turn to an harsh rufhy grass, though the upland will continue a fine sweet grass for many years without renewing.

There is no part of husbandry of which the farmers are in general more ignorant than that of the pasture; most of them suppose, that when old pasture is plowed up, it can never be brought to have a good sward again; so their common method of managing their land after ploughing, is to sow with their crop of barley some grass seeds as they call them; that is, either the red clover, which they intend to stand two years after the corn is taken off the ground, or rye-grass mixed with rye; but as all these are at most but biennial plants, whole roots decay soon after their seeds are perfected, so the ground, having no crop upon it, is again ploughed for corn; and this is the constant round which the lands are employed in by the better sort of farmers.

But whatever may have been the practice of these people, it is certainly possible to lay down lands which have been in tillage with grouts, in such a manner that the sward shall be as good, if not better, than any natural sward, and of as long duration. But this is never to be expected in the common method of sowing a crop of corn with the grass seeds; for, wherever this has been practised, if the corn has succeeded well, the grass has been very poor and weak; so that if the land has not been very good, the grass has rarely been worth saving; for the following year it has produced but little hay, and the year after the crop is worth little, either to mow or feed. Nor can it be expected to be otherwise, for the ground cannot nourish two crops; and if there were no deficiency in the land, yet the corn, being the first and most vigorous of growth, will keep the grasses from making any considerable progress: so that the plants will be extremely weak, and but very thin, many of them which come up in the spring being destroyed by the corn; for whenever there are roots of corn, it cannot be expected there should be any grass. Therefore the grasses must be thin; and if the land is not in good heart to supply the grasses with nourishment, that the roots may branch out after the corn is gone, there cannot be any considerable crop of clover; and as their roots are biennial, many of the strongest plants will perish soon after they are cut; and the weak plants, which had made but little progress before, will be the principal part of the crop for the succeeding year; which is many times not worth standing.

Therefore, when ground is laid down for grass, there should be no crop of any kind sown with the feeds; or at least the crop should be sown very thin, and the land should be well ploughed and cleaned from weeds, otherwise the weeds will come up the first, and grow so strong as to overbear the grasses, and if they are not pulled up, will entirely spoil it. The best season to sow the grass seeds upon dry land, when no other crop is sown with them, is about the middle of September or sooner, if there is an appearance of rain: for the soil of the ground being then filled with frosts, there happen some good flowers of rain after the seed is sown, the grasses will soon make its appearance, and get sufficient rooting in the ground before winter; so will not be in danger of having the roots turned out of the ground by frost, especially if the ground is well rolled before the frost comes on, which will press it down and fix the earth close to the roots. Where this hath not been practised, the frost has often loosen the ground so much, as to let in the air to the roots of the grasses, and done it great damage; and this has been brought as an objection to the annual sowing of grasses; but it will be found to have no weight if the above direction is practised: nor is there any hazard of fowing the grasses at this season, but that of dry weather after the feeds are sown; for if the grasses come up well, and the ground is well rolled in the end of October, or the beginning of November, and repeated again the beginning of March, the sward will be closely joined at bottom, and a good crop of hay may be expected the
the same summer. But where the ground cannot be prepared for sowing at that season, it may be performed the middle or latter end of March, according to the season's being early or late; for, in backward springs, and in cold land, we have often sowed the grass in the middle of April with success; but there is danger, in sowing late, of dry weather, and especially if the land is light and dry; for we have seen many times the whole surface of the ground removed by brooky winds at that season; 1. so that the seeds have been driven in heaps to one side of the field. Therefore, whenever the seeds are sown late in the spring, it will be proper to roll the ground well soon after the seeds are sown, to settle the surface, and prevent its being removed.

The forts of seeds which are the best for this purpose, are, the best fort of upland hay-seeds, taken from the cleanest pastures, where there are no bad weeds; if this seed is fitted to clean it from rubbish, three bushels will be sufficient to sow an acre of land.

The other fort is the trifolium pratense album, which is commonly known by the names white Dutch clover, or white biennial grass. Eight pounds of this seed will be enough for one acre of land. The grass seed should be sown first, and then the Dutch clover-seed may be afterwards sown; but they should not be mixed together, because the clover-seeds being the heaviest will fall to the bottom, and consequently the ground will be unevenly sown.

When the seeds are come up, if the land should produce many weeds, these should be drawn out before they grow so tall as to overbear the grass; for where this has been neglected, the weeds have taken such possession of the ground as to keep down the grass, and starve it; and when these weeds have been suffered to remain until they have filled their seeds, the land has been so plentifully flocked with them as entirely to destroy the grass; therefore it is one of the principal parts of husbandry never to suffer weeds to grow on the land.

If the ground is rolled two or three times at proper distances after the grass is up, it will prefs down the grass, and cause it to make a thicker bottom: for, as the Dutch clover will put out roots from every joint of the branches which are near the ground, so, by pressing down of the flanks, the roots will mat so closely together, as to form a sward so thick as to cover the whole surface of the ground, and form a green carpet, and will better resist the drought. For if we do not examine the common pastures in summer, in most of which there are patches of this white huy-fuckel grass growing naturally, we shall find these patches to be the only verdure remaining in the fields. And this, the farmers in general acknowledge, is the sweetest feed for all sorts of cattle; yet never had any notion of propagating it by seed, nor has this been long practiced in England.

As the white clover is an abiding plant, so it is certainly the very best fort to sow, where pastures are laid down to remain; for as the hay-seeds which are taken from the best pastures will be composed of various sorts of grass, some of which may be but annual, and others biennial; so, if they go off, there will be many and large patches of ground left bare and naked, if there is not a sufficient quantity of the white clover to spread over and cover the land. Therefore a good sward can never be expected, where this is not found; for in most of the natural pastures, we find this plant makes no small share of the feed; and it is equally good for wet and dry land, growing naturally upon gravel and clay in most parts of England; which is a plain indication how easily this plant may be cultivated to great advantage in most sorts of land throughout Great Britain.

Therefore the true cause why the land which has been in tillage is not brought to a good turf again, in the usual method of husbandry, is, from the farmers not distinguishing which grasses are annual from those which are perennial: for if annual or biennial grasses are worn, these will only suffer decay; so that, unless some of their seeds may have ripened and fallen, nothing can be expected on the land but what will naturally come up. Therefore this, with the covetous method of laying down the ground with a crop of corn, has occasioned the general failure of increasing the pasture in many parts of Britain, where it is now much more valuable than any arable land.

After the ground has been sown in this manner before directed, and brought to a good sward, the way to preserve it good is, by constantly rolling the ground with a heavy roller, every spring and autumn, as hath been before directed. This piece of husbandry is rarely practiced by farmers; but those who do, find their account in it, for it is of great benefit to the grass. Another thing should also carefully be performed, which is, to cut up docks, dandelion, knapweed, and all such bad weeds, by their roots every spring and autumn, that so the quantity of good grasses may be preserved in the pastures. Dressing of these pastures every third year is also a good piece of husbandry; for otherwise it cannot be expected the ground should continue to produce good crops. Besides this, it will be necessary to change the feasons of mowing, and not to mow the same ground every year, but to mow one feasion and feed the next; for where the ground is every year mown, it must be constantly dressed, as are most of the grass grounds near London, otherwise the ground will be soon exhausted.

Patæci, in mythology, images of gods which the Phœnicians carried on the prows of their galleys. Herodotus, lib. iv. calls them πατακά. The word is Phœnician, and derived from patak, i. e. πατάκα. See Bochart's Channa,i, lib. ii. cap. 3. But Scaliger does not agree. Morin derives it from πατακας, pastoris, this animal having been an object of worship among the Egyptians, and hence might have been honoured by their neighbours. Mr Elrner has observed, that Herodotus does not call the pataci gods; but that they obtained this dignity from the liberalitd of Hsyichis and Suidas, and other ancient lexicographers, who place them at the stern of ships; whereas Herodotus placed them at the prow. Scaliger, Bochart, and Selden have taken some pains about this subject. Mr Morin has also given us a learned dissertation on this head in the Memoires de l'Acad. des Inscription & Belles Lettres, tom. i.; but Mr Elrner thinks it defective in point of evidence.

Patagonia, a country of South America, comprehending all that country extending from Chili...
Patagonia, and Paraguay to the utmost extremity of South America; that is, from 35° almost to 54° of latitude; being surrounded by the countries just mentioned, the South and North Seas, and the Straits of Magellan, which separate it from the island called Terra del Fuego, and extend about 156 leagues in length from sea to sea, but only from half a league to three or four in breadth.

This country had the name of Terra Magellan, from Ferdinand Magellan, a Portuguese officer in the service of the Catholic king, who is reported to have sailed through the straits also bear his name, from the North to the South Sea, in the year 1519.

The lofty mountains of the Andes, which are covered with snow a great part of the year, traversing the country from north to south, the air is said to be much colder than in the north under the same parallels of latitude. Towards the north, it is said to be covered with wood, and floored with an inexhaustible fund of large timber; whereas, to the southward, not so much as a single tree fit for any mechanical purpose is to be seen; yet there is good pasture, and incredible numbers of wild horned cattle and horsies, which were first brought thither by the Spaniards, and have increased amazingly. Freth water, we are told by some writers, is very scarce: but if that were really the case, it is difficult to conceive how the present inhabitants and such multitude of cattle could subsist. The east coast is monily low land, with few or no good harbours: one of the best is Port St Julian.

Patagonia is inhabited by a variety of Indian tribes; as the Patagons, from which the country takes its name; the Pampas, the Coiffars, &c. of whom we knew very little. Only it appears, from the accounts of former voyagers, lately confirmed by Commodore Byron and his crew, and the testimonies of other navigators, that some of them are of a gigantic stature, and clothed with skins; but it would seem that there are others who go almost quite naked, notwithstanding the inclemency of the climate. Some of them also, that live along the Straits, if we may credit the navigators who have passed that way into the South Sea, are perfect savages; but those with whom Commodore Byron and his people conversed, are represented as of a more gentle, humane disposition; only, like other savages, they live on fish and game, and what the earth produces spontaneously.

The Spaniards once built a fort on the Straits, and left a garrison in it, to prevent any European nation passing that way into the South Sea: but most of the men perished by famine, whence the place obtained the name of Port Famine; and no people have attempted to plant colonies here ever since.

About the middle of the Strait is a promontory called Cape Froward, which is the most foutherly on the continent of South America.

On the coasts of Patagonia lie a great number of islands, or clusters of islands. On the west coast are the islands Maider de Dios, Santa Trinidad, Santa Cruz, and the islands of Chubains and Huillas, the Sarmentos, and many others to the number of 80 in all, as some fay. Of those on the south coast, the most confiderable are Terra del Fuego, and Staten Land. See the articles.

A vallt deal has been said respecting the stature of the Patagonians, by people of different nations, and Patagonians on various occasions. We shall insert the following letter from Mr Charles Clarke, who was on board Byron's ship in 1764, and gave this account to Dr Mitty.

"We had not got above 10 or 12 leagues into the straits of Magellan, from the Atlantic Ocean, before we saw several people, some on horseback, some on foot, upon the north shore (continent), and with the help of our glasses could perceive them beckoning to us to come on shore, and at the same time observing to each other, that they seemed to be of an extraordinary size: However, we continued to stand on, and should have passed without taking the least further notice of them, could we have proceeded; but our breeze dying away, and the tide making against us, we were obliged to anchor; when the Commodore ordered his boat of 12 oars, and another of six, to be hoisted out, manned and armed. In the first went the Commodore, in the other Mr Cummins, our first lieutenant, and myself. At our first leaving the ship, their number did not exceed 40; but as we approached the shore, we perceived them pouring down from all quarters, some galloping, others running, all making use of their utmost expedition. They collected themselves into a body just at the place we steered off for. When we had got within 12 or 14 yards of the beach, we found it a disagreeable flat shore, with very large stones, which we apprehended would injure the boats; so we looked at two or three different places to find the most convenient for landing. They suppos'd we deferred coming on shore through apprehensions of danger from them; upon which they all threw open the skins which were over their shoulders, which was the only clothing they had, and consequently the only thing they could secret any kind of arms with, and many of them lay down close to the water's edge.—

The Commodore made a motion for them to go a little way from the water, that we might have room to land, which they immediately complied with, and withdrew 30 or 40 yards; we then landed, and formed each man with his musket, in case any violence should be offered. As soon as we were formed, the Commodore went from us to them, then at about 20 yards distance; they seemed vailly happy at his going among them, immediately gathered round him, and made a rude kind of动ing, as their countenances bespoke it a species of jollity. The Commodore then made a motion to them to sit down, which they did in a circle, with him in the middle, when Mr Byron took some beads and ribbons, which he had brought for that purpose, and tied about the women's necks, with which they seemed infinitely pleased. We were struck with the greatest astonishment at the sight of people of such a gigantic stature, notwithstanding our previous notice with glasses from the ship. Their body was increased, by the time we got in there, to the number of 500 men, women, and children. The men and women both rid in the same manner; the women had a kind of belt to close their skins round the waist, which the men had not, as theirs were only thrown over their shoulders, and tied with two little slips, cut from the skin, round the neck. At the time of the Commodore's motion for them to retire farther up the beach, they
Patagonia, all dismounted, and turned their horses loose, which were gentle, and herd very quiet. The Commodore having disposed of all his presents, and satisfied his curiosity, thought proper to retire; but they were vastly anxious to have him go up into the country to eat with them. That they wanted him to go with them to eat, we could very well understand by their motion, but their language was wholly unintelligible to us.—There was a very great smoke to which they pointed about a mile from us, where there must have been several fires; but some intervening hills prevented our seeing anything but the smoke. The Commodore returned the compliment, by inviting them on board the ship; but they would not favour him with their company; so we embarked, and returned to the ship. We were with them near two hours at noon-day, within a very few yards, tho' none had the honour of shaking hands but Mr Byran and Mr Cummins; however, we were near enough, and long enough with them, to convince our senses, so far as not to be cavilled out of the very existence of those fires at that time, which some of our countrymen and friends would absolutely attempt to do. They are of a copper colour, with long black hair, and some of them are certainly nine feet, if they do not exceed it. The Commodore, who is very near fix feet, could but just reach the top of one of their heads, which he attempted on tip-toes, and there were several taller than him, on whom the experiment was tried. They are prodigiously stout, and as well and as proportionably made as ever I saw people in my life. That they have some kind of arms among them, is, I think, indubitable, from their taking methods to convince us they had none as I saw people in my life. That they have some producing nothing but a coarse harsh grafs, and a few small shrubs, of which Sir John Naborough remarked, he could not find one of size enough to make the helve of an hatchet; which observation we found very just. It was some time in the winter we made this visit to our gigantic friends. I am debarr'd being so particular as I could wish, from the loss of my journals, which were demanded by their Lordships of the Admiralty immediately upon our return.

That the whole of this account is true, we cannot pretend to assert; but that the writer has been misled in some respects, and misinformed with regard to some of his facts, is at least probable; for Captain Wallis, who went out to the Straits of Magellan after Byron's return, gives a different turn to many of the observations; and with respect to the stature of the people, he differs very materially. We shall give the following epitome of his remarks on what occurred to him.—He had three ships with him, which entered the Straits on the 16th December 1766, and came to an anchor in a bay south of Cape Virjan Mary, where they were immediately accosted by a whole troop of Patagonians, who made signs for them to come on shore. The Captain, having made previous dispositions for the security of his men in case of an attack, manned all the boats belonging to the three ships, and with a party of marines landed on the beach where those giants had assembled. The commanders of the three ships, and most of their officers, were of this party. On their leaping ashore, the Indians seemed to welcome them; and being by signs desired to retreat, they all fell back, and made room for the marines to form. When they were drawn up, Captain Wallis advanced, and by signs directed the Indians to seat themselves in a semicircle, which they readily understood and obeyed. He then distributed among them knives, scissors, buttons, brasses, combs, and particularly ribbons, with which he complimented the women, who received them with a mixture of pleasure and respect. He then gave them to understand that he had filled more valuable articles to bellow, and showed them axes and bill-hooks; but, at the same time, pointed to four of those in the circle, intimating that he expected some of those in return; but they either did not, or would not, understand him; so that no traffic took place.

The whole company that were assembled on this occasion, had each a horse, with a saddle and bridle. The saddle had a foot of stirrups, and the bridle was made of thongs of leather very well put together, for the purpose of guiding the horses. The women, as well as the men, rode astride. The men, in general, wore each a wooden spur; but one of them had a large pair of Spanich spurs, brass stirrups, and a Spanish bridle. Their horses were nimble and spirited, but small in proportion to their riders, seemingly not above 14 hands high. Their dogs were of the Spanich breed. The Captain having purposely provided himself with measuring rods, found that the tallest man among them measured only fix feet seven inches high; several were within an inch or two as tall; but the ordinary size was from five feet ten inches to fix feet. It is a pity that none of our voyagers thought of measuring the whole size of one of those gigantic men. They tell us, indeed, that they are well made, that they are proportionally large, and that they are robust and bony; but they give us no criterion to judge of their bulk, nor one instance of their extraordinary strength. As they are represented not only peaceable, but remarkably tractable, some trials might have been made of the weight they could have lifted, and how much they could exceed in that respect the strongest men in the ships. This in a great measure would have determined the point, which is yet left doubtful by the different relations that are given by the different voyagers who
Patagonia, who have been these people, no two of them agreeing in the same description. All agree, however, that their hair is black, and harsh like bristles; that they are of a dark copper colour, and that their features are rather handsome than ugly; that they clothe themselves decently with the skins of guanacoos; that they paint themselves variously; and there is reason to fluff up, that by that variety they distinguish their tribes. Those seen by Commodore Byron were painted round both eyes, no two of them alike; those seen by Captain Wallis had only a red circle round the left eye; and those seen by Bougainville had no circle round the eyes, but had their cheeks painted red. This may account for the different reports of voyagers concerning their stature: it is not impossible, nay, it is very probable, that they may vary in this particular, according to their tribes; as is seen in the Highlands of Scotland, where one clan of the Campbells is remarkably tall, and another of the Frairs remarkably short. Were it not for some such natural discrimination, there could not be so wide a difference in the descriptions of gentlemen, who, having no ends to serve either in falsifying one another's reports, or in imposing upon the public, cannot be supposed to mistake willfully.

One remarkable observation made by our voyagers must not be omitted; and that is, that though our people could distinguish but one word of their language, which the English pronounce chawacu, yet the Patagonians could repeat whole sentences after our men more distinctly than almost any European foreigner of what nation soever. This appears the more singular, as among the Indians between the Tropics, it was hardly possible to make them articulate any of our words. Sydney Parkinson, in a specimen he has given us, says, that though the English remained at Oahicite three months, the nearest natives could approach the sound of Cook was fatoa; Banks, Opacu; Solander, Talano; Gore, Towara; Monkey, Mata; and so of the rest: whereas the Patagonians presently got by heart this sentence of invitation, Come offere, Englishmen! which they showed they well understood, by repeating it afterwards whenever the ships came so near the shore as to be within call.

Another very remarkable particular is, that they had none of the characters of a ferocious people; there was no offensive weapon among them, except the club already mentioned. The men, indeed, had a kind of fling, which they use in hunting, consisting of two round flints of about a pound weight each, connected together by a thong. These flints were fastened to the extremities of the thong; and, when they threw them, they held one flint in the hand, and swung the other about the head. "They are so expert in the management of this double-headed fling (says the writer of the voyage), that they will hit a mark not bigger than a flilling with both these flints at the distance of fifteen yards; but their method of availing themselves of their dexterity against the guanaco or ollinco is, to string the flints so as to entangle their legs, by which means they are retarded in their flight, and easily overtaken. Bougainville speaks of these flings as common among other Indian nations in South America; but we do not remember to have seen this allertion confirmed by any other voyager.

These people certainly dress differently as well as paint differently; for the dress described by Bougainville is very unlike the dress of those seen by the English voyagers. Captain Wallis invited some of them on board his ship; but, among all the wonders that were shown them, none seemed to attract their notice so much as the looking-glasses; they looked in the glasses and at each other; they laughed and gazed, and gazed again and laughed; in short, there was no end to their merriment when in possession of this article of curiosity. They eat whatever was given them, but would drink nothing but water. In this they differ from all the tribes of Indians in North America, who are immoderately fond of spirituous liquors. They admired the European sheep, hogs, and poultry; but did not seem over-deferous of anything they saw except clothes. When the marines were exercised to entertain them, they appeared disconcerted; an old man among them made signs, by striking his breast, and tumbling down and lying as if he had been dead upon the deck, that he knew the effective of their guns; and one of them seemed easy till the firing was over. When the Captain had satisfied his own curiosity, and, as he imagined, theirs, he gave them to understand, that he was going to sail, and that they must depart; which they were very unwilling to do. However, having given each of them a canvas bag, with some needles ready threaded, a knife, a pair of scissors, a few beads, a comb, and a looking-glass, he dismissed them, with great reluctance on their part, particularly on that of the old man's, who by very significant signs expressed his desire to stay till funet.

Patagonula, in botany; a genus of the monogynia order, and of the pentandria class of plants. The characters are these: the cup is an extremely small perianthium, divided into five segments, and remains after the flower is fallen; the flower consists of a single petal, with almost no tube, the margin of which is divided into five acute oval segments; the stamens are five filaments of the length of the flower; the anthers are entire; the stigmatic part is oval and pointed; the style is slender and slightly bifid, its ramifications are also bifid; this is of the same length with the filaments, and remains when the flower is fallen, the stigmata are simple; the fruit is an oval and pointed capsule, standing on a large cup, made up of five long segments emarginated or rimmed round their edges; the seeds of this plant are yet unknown; but the conformation of the cup, in which the capsule stands, is alone a sufficient distinction for this genus. There is but a single species.

Patan, a kingdom of Asia, in the East Indies, and in the peninsula of Malacca, and on the eastern coast between the kingdoms of Siam and Paha. The inhabitants are partly Mahometans and partly Gentoo; but they are all very volupmtious. The air is wholesome, though very hot; and they have no seasons but the winter and summer. The former is more properly the rainy season; and contains the months of November, December, and January. The woods are full of elephants and many wild animals. Some voyagers pretend that this country is governed by a queen, who never marries, but may have as many gallants as the pleases. They have some trade with the Chinese; and the principal town is of the name, which is one
of the strongest in their parts, having a well defended harbour.

Patan, a town of Asia, and capital of a province of the same name, in the dominions of the Great Mogul; it is very little known. E. Long. 109. o. N. Lat. 27. 30. 

Pataavin, among critics, denotes a peculiarity of Livy's diction, derived from Patavium or Padua, the place of his nativity; but where in this patavinity confines, they are by no means agreed.

Aelius Pollio, according to Quintilius, taxed Livy with patavinity. But what he meant by this centre we believe no man can say. Morhof believes it to be a singular turn of expression, and some phrasal peculiar to the Paduans. All we certainly know about it is, that it was a fault in the language of Livy, not in the sentiments or manners. In all probability it is one of those delicacies that are lost in a dead language. Dan. Georg. Morhof published a treatise De Patavinitate Liviana, at Kiel, 1635, where he explains, very learnedly, the urbity and peregrinity of the Latin tongue.

Pataara (Livy, Mel.) the capital of Lycia, to the east of the mouth of the river Cydnus; famous for a temple and oracle of Apollo; hence called Patarurus, three syllables only; but Patarusae (Horace). For the fix winter months, Apollo gave answers at Patara; and for the fix summer at Delos, (Virgil, S. rivus): there are the Ly iae Sortes of Virgil. The town was situated in a peninsula, called Lixnum Charionus, (Stephanus.)

Adexi. 1. St Paul in his passage from Philippi to Jerusalem, came to Miletus, hence to Coos, then to Rhodes, and from Rhodes, to Patara; where having found a ship that was bound for Phenicia, he went on board and arrived at Jerusalem, to be at the feast of Pentecost.

Pataeium (Tacitus, Strabo), a town of the Trampadar, situated on the left or north bank of the Medoacus Minor; founded by Antenor the Trojan, (Melis, Virgil, Oeneus); Patarusae, the people, (Livy); who himself was a na ve, and by Aelius Pollio charged with patavinity. Now Padua, in the territory and to the west of Venice. W. Long. 12. 15. N. Lat. 45. 30.

Patay, a town of France, in the province of Orléannois, remarkable for the defeat of the English in 1429, and where Joan of Arc did wonders. E. Long. 1. 43. N. Lat. 48. 5.

Pate, in fortification, a kind of plattform, resembling what is called an horfis fonce.

Patee, or Pattee, in heraldry, a crest, small in the centre, and widening to the extremities, which are very broad.

Pattella, or Kneefan, in anatomy. See there, no 59.

Pattell, or Limpet, a genus of invertebrate animals. The kind of the shell kind. The shells are of that clafs which is called unidens; they have no concave and are in the form of little pointed cones. They are always attached to some hard body. Their summit is sometimes acute, sometimes obtuse, flatted, turned back, or perforated. The rock or other hard body to which they are always attached adheres, serve, as a kind of second or under shell to preserve them from injury; and for this reason Alcorvandus and Rondelet have clasped them among the bivalves; but in this error they have not been followed by any other writer. Fabius Columna distinguishes four sorts of the lepas or limpets: lepas vulgaris, a sort very common at Naples, of an oval figure and ash colour. Lejas major castra, which comes from Spain, the shell is hard, thick, and ribbed in angles, and the rim is dentilate. The lepas angea, or Cyphora, is such a small shell, irregularly oval, of an ash colour, marked with radii and zones crossing each other, and perforated at the top by an aperture which serves the fish for a vent. And the patella regula, qua regi magna digerat, this is of a mother-of-pearl colour within, and is ribbed and perforated in many places: these shells have been found on the back of the sea-tortoise, or turtle, and on a large pine marina. The differing mark or characteristic of the lepas is to have but one convex shell, which abides by its rim to a rock, or some other hard substance. There are 36 species of this genus, which are principally distinguished by peculiarities in their shells. Of some of these shells we have given engravings in Plate CCLXXXI. of which we add the following description:

The limpet marked 1. has large yellow furrows and ridges from the centre to the circumference, which is indented; the eye is perfectly white, and shaped like a nipple.

That marked 2. is perfectly smooth, but radiated with brown stipples, and perforated in the summit.

Fig. 3. is ribbed, and indented at the circumference; its coat is spotted with brown, in a zig-zag form, and its eye is of a ruby colour.

Fig. 4. is a small brown shell, the ribs or frize of which are armed with small white points.

Fig. 5. is striated with radii, reaching from the eye to the circumference, which are crested by other stipples nearly parallel to the circumference; it is of the usual colour, and its eye is perforated.

Fig. 6. is white, shaped something like an hour shell, and has within a protuberance somewhat resembling a clapper.

Fig. 7. is a seven-sided limpet, divided at each angle by ridges from the summit, which form a star on a white ground, variegated with black spots.

Fig. 8. is a small ribbed shell, of a brown colour, and rough; it has a chamber, and a beak fashioned eye placed at one of its extremities.

Fig. 9. is the finest shell of this species; its size, the fine mother of pearl colour on the inside, and the beauty of its red spots without, which have the appearance of tortoise shell, give it the pre-eminence over all others. It is called the Tortoise shell buckler.

The wild limpet, or patella ferre, is a name very improperly applied by Rondllitis and Aldrovand to the aures marine, or clunca veneris, which certainly is not of the patella kind.

Patella, in the History of Insects, a name given by Linnaeus and other authors to a little huick or shell, found on the back of the cherry, plum, rose, and other trees, containing an animal within, and useful in colouring. These patellas are of the form of globes, except when they adhere to the tree, and are for the most part of a shining crimson colour. The huick itself strikes a very fine crimson colour on paper, and within it is found a white maggot which is of no value: this, in time hatches into a very small but beautiful bee. The size of this bee is about half that of an
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They have a fissing like bees; and three spots placed in a triangle on the forehead, which are supposed to be eyes. They are of a black colour, and have a large round whitish or pale yellow spot on the back. The upper pair of wings are shaded and spotted, but the under pair are clear. It may be worth while to try the shells or husks in order to discover whether the colour they yield might not be useful. It is to be remarked, that the deepcoloured husks afford the finest and deepest purple; they must be used while the animal in them is in the maggot-form; for when it is changed into the bee state the shell is dry and colourless. Lifer, who first observed these patelle, went so far on comparing them with the common kermes, as to assert that they were of the same nature with that production; but his account of their being the workmanship of a bee, to prefer her young maggot in, is not agreeable to the true history of the kermes; for that is an insect of a very peculiar kind. He has in other instances been too fully confounded for his precipitancy of judging of things, and perhaps has fallen into an error by means of it. It is very possible that these paterae may be the same for it is to some animals with the kermes, but then it produces its young within the shell or hulk, which is no other than the skin of the body of the mother animal; but as there are many flies whose worms or maggots are lodged in the bodies of other animals, it may be that this little bee may love to lay its egg in the body of the proper insect, and the maggot hatched from that egg may eat up the proper progeny; and, undergoing its own natural changes there, issue at length in form of the bee. This may have been the case in some few which Dr Lister examined; and he may have been misled by this to sup­pose it the natural change of the insect.

PATENT, in general, denotes something that stands open or expanded: thus a leaf is said to be a patent, when it stands almost at right angles with the stalk.

PATENT, or LETTER Patent. See LETTER.

PATER NOSTER, the Lord's Prayer, so called from the two first words thereof in Latin.

PATER NOBILIS, islands of Asia, in the East Indian sea, so called because of the great number of rocks, which sailors have likened to the beads with which the Papists tell their pater wotter. They abound in corn and fruits, and are very populous.

PATER PATRATUS, was the name of the first and principal person of the college of heralds called Pictia. Some say the Pater Patratus was a confant officer and per­sonal chief of that body; and others suppose him to have been a temporary minister, elected upon account of making peace or denouncing war, which were both done by him. See PICTI.

PATERA, among antiquaries, a goblet or vessel used by the Romans in their sacrifices; wherein they offered their consecrated meats to the gods, and where­with they made libations. See SACRIFICE and LIBA­TION.

The word is Latin, formed from pater, "I am open," quod pat. a, because it has a great aperture; in contradistinction to bottles, &c. which have only narrow necks, or whose aperture is less than the body of the vessel.

On medals the patera is seen in the hands of several deities; and frequently in the hands of princes, to Paterculus mark the facerdotal authority joined with the imperial, &c.

Hence F. Joubert observes, that beside the patera, there is frequently an altar upon which the patera seems to be pouring its contents.

The patera was of gold, silver, balsam, brass, glass, or earth; and they used to inclose it in urns with the ashes of the deceased, after it had served for the libations of the wine and liquors at the funeral.

The patera is an ornament in architecture, frequently seen in the Doric freeze, and the tympanums of arches; and they are sometimes used by themselves, to ornament a spandrel; and in this case it is common to hang a string of husks or drapery over them; sometimes they are much enriched with foliage, and have a mask or head in the centre.

PATERCULUS (Caius Velleius), an ancient Roman historian, who flourished in the reign of Tiberius Cesar, was born in the year of Rome 735. His ances­tors were illustrious for their merit and their offices. His grandfather espoused the party of Tiberius Nero, the emperor's father; but being old and infirm, and not able to accompany Nero when he retired from Naples, he ran himself through with his sword. His father was a officer of rank, and so was Paterculus himself. He was a military tribune when Caius Cesar, a grand son of Augustus, had an interview with the king of the Partians, in an island of the river Euphrates, in the year 753. He commanded the cavalry in Germany under Tiberius, and accompanied that prince for nine years successively in all his expeditions. He re­ceived honourable rewards from him; but we do not find that he was preferred to any higher dignity than the praetorship. The praises he bestowed upon Sejanus give some probability to the conjecture, that he was looked upon as a friend of this favourite, and conse­quently that he was involved in his ruin. His death is placed by Mr Dodwell in the year of Rome 784, when he was in his 50th year.

He wrote an Abridgement of the Roman History in two books, which is very curious. His purpose was only to deduce things from the foundation of Rome to the time wherein he lived; but he began his work with things previous to that memorable era: for, though the beginning of his first book is wanting, we yet find in what remains of it, an account of many cities more ancient than Rome. He promised a larger history, and no doubt would have executed it well; for during his military expeditions he had seen, as he tells us, the provinces of Thrace, Macedonia, Asia, Asia Minor, and other more easterly regions; especially upon the shores of the Euxine sea, which had furnished his mind with much entertaining and useful knowledge. In the Abridgement which we have, many particulars are related that are no where else to be found; and this makes it the more valuable. The style of Paterculus, though mitterably disguised through the careless­ness of transcribers, and imposible to be restored to purity for want of manuscripts, is yet manifestly worthy of his age, which was the time of pure Latinity. The greatest excellence of this historian lies in his manner of com­mending and blaming those he speaks of; which he does in the finet terms and most delicate expressions. He is, however, condemned, and indeed with the greatest
The chromatic genus, with its greater and less raisins, either ascending or descending, is very proper for the pathetic; as is also an artful management of discord, with a variety of motions, now brisk, now languishing, now swift, now slow.

Nieuwenhuyse speaks of a musician at Venice who so excelled in the pathetic, that he was able to play any of his auditors into distraction: he says also, that the great means he made use of was the variety of motions, &c.

PATHOGENOMONIC, among physicians, an appellation for a symptom, or concourse of symptoms, that are inseparable from a derangement, and are found in that only, and in no other.

PATHOLOGY, that part of medicine which explains the nature of diseases, their causes and symptoms. See Medicine.

PATHOS, a Greek term, literally signifying passion.

PATHROS, a city and capital of Egypt, of which the prophets Jeremiah and Ezekiel make mention; Jerem. xlv. 15. Ezek. xix. 14. xxx. 14. We do not very well know its situation, though Pliny and Ptolemy the geographer speak of it by the name of Pharaonis; and it appears to have been in Upper Egypt. Ifaiah (xii. 2.) calls it Pathros; and it is the country of the Pathruim, the povertv of Mizraim, of whom Moses speaks, Gen. x. 14. Ezekiel threatens them with an entire ruin. The Jews retired thither not withstanding the remonstrances of Jeremiah; and the Lord says by Isaiah, that he will bring them back from thence.

PATIENCE, that calm and unoffended temper with which a good man bears the evils of life, from a conviction that they are at least permitted, if not sent, by the hand of Being, who makes all things work together for good to those who love and fear him.

The evils by which life is embittered may be reduced to these four: 1. Natural evils, or those to which we are subject as men, and as perishing animals. The greatest of these, are the death of those whom we love, and of ourselves. 2. Those from which we might be exempted by a virtuous and prudent conduct, but which are the inevitable consequences of imprudence or vice, which we shall call punishments; as infamy proceeding from fraud, poverty from prodigality, debility and disease from intemperance. 3. Those by which the fortune of the good are exercised; such as the perfections raised against them by the wicked. To these may be added, 4. The opposition against which we must perpetually struggle, arisii from the diversity of sentiments, manners, and characters of the persons among whom we live.

Under all these evils patience is not only necessary but useful: it is necessary, because the laws of nature have made it a duty, and to murmur against natural events is to affront providence; it is useful, because it renders our sufferings lighter, shorter, and less dangerous.

Is your reputation fulfilled by invincible calumnies? rejoice that your character cannot suffer but by false imputations. You are arraigned in a court of judicature; and are unjustly condemned: passion has influenced both your prosecutor and your judge, and you cannot forbear repining that you suffer although in-
maintain the dignity of their nature. To feel for patience others, dipoese us to exercise the amiable virtue of
tunity, which our religion indisputably requires.
It constitutes that enlarged benevolence which phi-
osophy inculcates, and which is indeed com-
prehended in Christian charity. It is the privilege
and the ornament of man; and the pain which it
causes is abundantly recompensed by that sweet sen-
tion which ever accompanies the exercise of ben-
eficence.
To feel our own misery with full force is not to be
decimated. Affliction fortifies and improves the heart.
Tears, to speak in the style of figure, fertilize the soil
in which the virtue grow. And it is the remark of
one who understood human nature, that the faculties
of the mind, as well as the feelings of the heart, are
meliornated by adversity.

But in order to promote these ends, our sufferings
must not be permitted to overwhelm us. We must
oppose them with the arms of reason and religion; and
to express the idea in the language of the philosopher
as well as the poet, of Nature, every one, while he is
compelled to feel his misfortunes like a man, should
resolve also to bear them like a man.

PATIGUMO (a corruption of the words patele-
guimauve); the name of a sort of patele or cakes much
used on the continent as an agreeable and useful
remedy for catarrhal outflows, and supposed by
Dr Percival to consist of gum-arabic combined with
sugar and the whites of eggs (See the article Hunger,
p. 715, col. 1.) But we have been informed that the
powdered substance of the marjoram is the chief
ingredient of the composition.
PATTIN (Guy), professor of physic in the royal col-
lege of Paris, was born in 1602. He made his way
into the world merely by the force of his genius, being
at first corrodor of a printing-house. He was a man
of great wit and erudition: he spoke with the gravity
of a Stoic, but his expressions were very satirical.
He hated bigotry, superstition, and knavery: had an
upright soul, and a well-disposed heart. He was a mol-
tender father, courteous to every body, and polite in
the highest degree. He died in 1673, and did not
owe his reputation to any writings published in his life-
time upon physic; but his letters which appeared after
his death have rendered his name very famous. He
left a son mentioned in the ensuing article.

PATIN (Charles), who made a great figure in the
world, and excelled in the knowledge of medals. He
was born in Paris in 1633; and made so surprizing a
progres, that he maintained thieves in Greek and La-
in, on all parts of philosophy, in 1647. He studied
the law in compliance to an uncle, and was admitted
an advocate in the parliament of Paris; but could not
lay aside that of physic, for which he always had an
inclination. He therefore quitted the law, and devoted
himself to physic: in which, after taking the doctor's
degree, he applied himself to practice with great suc-
cess. He afterwards travelled into Germany, Holland,
England, Switzerland, and Italy. In 1676 he was
appointed
Augustus was soon after reduced to beg a piece of Charles at any rate; and Charles granted it upon certain conditions, one of which was, that he should deliver up Patkul. This condition reduced Augustus to a very distressful dilemma: the Czar, at this very time, exclaimed Patkul as his ambassador; and Charles demurred, with threats, that he should be put into his hands. Augustus therefore contrived an expedient by which he hoped to satisfy both: he sent some guards to deliver Patkul, who was prisoner in the castle of Konigstein, to the Swedh troops; but by secret orders, privately dispatched, he commanded the governor to let him escape. The governor, though he received this order in time, yet disappointment its intention by his villainy and his avarice. He knew Patkul to be very rich; and having it now in his power to suffer him to escape with impunity, he demanded of Patkul a large sum for the favour: Patkul refused to buy that liberty which he made no doubt would be gratuitously restored, in consequence of the Czar's requisitions and remonstrances; and, in the mean time, the Swedh guards arrived with the order for his being delivered up to them. By this party he was first carried to Charles's head quarters at Albeinfried, where he continued three months, bound to a stake with a heavy chain of iron. He was then conducted to Cufmir, where Charles ordered him to be tried; and he was by his judge found guilty. His sentence depended upon the king; and after having been kept a prisoner some months, under a guard of Mayerfield's regiment, uncertain of his fate, he was, on the 8th of September 1707, towards the evening, delivered into the custody of a regiment of dragoons, commanded by Colonel Nicholas Helm. On the next day, the 29th, the colonel took the chaplain of his regiment aside, and telling him that Patkul was to die the next day, ordered him to acquaint him with his fate, and prepare him for it. About this very time he was to have been married to a Saxon lady of great quality, virtue, and beauty; a circumstance which renders his fate the more affecting. What followed in consequence of the colonel's order to the minister (a) will be related in his own words.

"Immediately after evening service I went to his prison, where I found him lying on his bed. The first compliments over, I entered upon the melancholy duty of my profession, and turning to the officer who had him in charge, told him the colonel's orders were, that I should be alone with his prisoner. The officer having withdrawn, Patkul grabbing both my hands in his, he cried out with most affecting anxiety and distress, My dear pastor! what are you to declare? what am I to hear? I bring you, replied I, the same tidings that the prophet brought to king Hezekiah, Set time both in order, for thou must die. To morrow by this time thou shalt be no longer in the number of the living! At this terrible warning he bowed himself upon his bed, and burst into tears. I attempted to comfort him, by saying that he must, without all doubt, have often meditated on this subject: Yes, cried he, I know, this! too well, that we must all die; but the death prepared for me will be cruel and inupportable. I assured him that the manner of his death..."
death was to me totally unknown; but, believing that he would be prepared for it, I was fore his foul would be received into the number of happy spirits. Here he rose up, and folding his hands together, "Merciful Jefus! let me then die the death of the righteous! A little after, with his face inclined to the wall, where flood his bed, he broke out into this foliloquy: Augustus! O Augustus, what must be thy lot one day! Must thou not answer for all the crimes thou hast committed? He then observed that he was driven out from his country, by a sentence against his life, pronounced for doing what the king himself encouraged him to do, saying to him one day in terms of much kindness, "Patrik, maintain the rights of your country like a man of honour, and with all the spirit you are capable of." That flying into an enemy's country was also unavoidable, as the country of an ally would not have afforded him protection; but that he was in Saxony a wretched exile, not a counsellor or adviser; that before his arrival every thing was already planned, the alliance with Mufovy signed, and the measures with Denmark agreed upon. 'My inclinations (said he, after a pause) were always to serve Sweden, though the contrary opinion has prevailed. The elector of Brandenburg owed his title of king of Prussia to the services I did him; and when, in recompence, he would have given me a considerable sum of money, I thanked him, and rejected the offer; adding, that the reward I most wished for was to regain the king of Sweden's favour by his intercession. This he promised, and tried every possible method to succeed, but without success. After this I laboured so much for the interest of the late emperor in his Spanish affairs, that I brought about what scarce any other man could have effected. The emperor as an acknowledgment gave me an allowance for 50,000 crowns, which I humbly laid at his feet, and only implored his imperial majesty's recommendation of me to my king's favour: this request he immediately granted, and gave his orders accordingly, but in vain. Yet, not to lose any opportunity, I went to Moscow while he owes me; which, being liquidated, will amount to 50,000 crowns; and as my relations are here in the service of Sweden, that monarch will probably obtain it for them.'

"At this he said, let us stop here a little; I will quickly return to finish this will; but now let us address ourselves to God by prayer. Prayers being ended, 'Now (cried he) I find myself yet better, yet in a quieter frame of mind: Oh! I were my death less dreadful, with what pleasure would I expiate my guilt by embracing it!—Yes (cried he, after a pause), I have friends in different places, who will weep over my deplorable fate. What will the mother of the king of Prussia say? What will be the grief of the Countes Lévalde who attends on her? But what thoughts must arise in the bosom of her to whom my grief is plighted? Unhappy woman! the news of my death will be fatal to her peace of mind. My dear pastor, may I venture to beg one favour of you? I assured him he might command every service in my power. 'Have the goodness then (said he, pressing my hand), the moment I am no more, to write—Alas! how will you feel about it! a letter to Madam Enfeidler, the lady I am promised to.—Let her know that I die her's; inform her fully of my unhappy fate! Send her my
farther, him my hand in promise that I would faithfully grace;

live long and able; and blessed.

would not fail; but at the last moment, as he was about to


then kneeled down, and went through his confession, before the din of the people without could rise to applaud him, to the coach. He wrapped his cloak, to get his name to what was already written? 'This is my wedding-day. I looked, alas! for another, but this is the happiest; for to-day shall my foul be introduced by her heavenly bridgroom into the assembly of the blest?' He then asked me, whether I yet knew in what way he was to die? I answered, that I did not. He conjured me, by the sacred name of Jesus, not to forfike him; for that he should find in my company some consolation even in the midst of tortures. Causing his eyes on the paper that lay on the table, 'This will (said he) can never be finished.' I asked him, whether he would put his name to what was already written? 'No, (replied he, with a deep sigh), I will write that hated confession.' 

it more honour than to have been the place of the punishment of Charles XI. He incited foreign powers to attack his country when under the government of a boy, hoping, as he said himself, that it would in such circumstances become an easy conquest. He was therefore a rebel of the worst kind; and where is the absolute monarch that is ready to pardon such unnatural rebellion? Let it be remembered, too, that Charles, among whose faults no other infraction of cruelty has been numbered, certainly thought that, in ordering the execution of Patkul, he was discharging his duty. That monarch, it is known, believed in the possibility of discovering the philosopher's stone. Patkul, when under sentence of death, contrived to impose so far upon the senate at Stockholm, as to perfuade them that he had, in their presence, converted into gold a quantity of bafer metal. An account of this experiment was tramitted to the king, accompanied with a petition to his majesty for the life of so valuable a subject; but Charles, blending magnanimity with his severity, replied with indignation, that he would not grant to intercede what he had refused to the calls of humanity and the intrigues of friendship.

PATMOS (anc. geog.), one of the Sporades (Dionysius); 30 miles in compass (Pliny); concerning which we read very little in authors. It was rendered famous by the exile of St John and the Revelation showed him there. The greatest part of interpreters think that St John wrote them in the same place during the two years of his exile; but others think that he did not commit them to writing till after his return to Ephesus. The island of Patmos is between the island of Icaria and the promontory of Miletus. Nothing has done it more honour than to have been the place of the banishment of St John. It is now called Patina, or Patina, or Patnol, or Pataou. Its circuit is five and twenty or thirty miles. It has a city called Patmos, with a harbour, and some monasteries of Greek monks. It is at present in the hands of the Turks. It is considerable for its harbours; but the inhabitants derive little benefit from them, because the corsairs have obliged them to quit the town and retire to a hill on which St John's convent stands. This convent is a citadel consisting of several irregular towers, and is a

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join with me in prayer for this unhappy man. 'Yes (cried he), afflict me all of you with your supplications to heaven.' Here the executioner gave him the first stroke. His eyes were terrible: 'O Jesus! Jesu! have mercy upon me.' This cruel scene was much lengthened out, and of the utmost horror; for as the headman had no skill in his business, the unhappy victim received upwards of 15 several blows, with each of which were intermixed the most piteous groans and invocations of the name of God. At length, after two strokes given on the breast, his strength and voice failed him. In a faltering dying tone, he was just heard to say, 'Cut off my head!' and the executioner still lingering, he himself placed his head on the scaffold: After four strokes with an hatchet, the head was separated from the body, and the body quartered. Such was the end of the renowned Patkul!'

Charles XII. has been very generally and severely cenured for not pardoning him, and we are not inclined to vindicate the sovereign. Yet it must be remembered, that Patkul was guilty of a much greater crime than that which drew upon him the displeasure of Charles XI. He incited foreign powers to attack his country when under the government of a boy, hoping, as he said himself, that it would in such circumstances become an easy conquest. He was therefore a rebel of the worst kind; and where is the absolute monarch that is ready to pardon such unnatural rebellion? Let it be remembered, too, that Charles, among whose faults no other infraction of cruelty has been numbered, certainly thought that, in ordering the execution of Patkul, he was discharging his duty. That monarch, it is known, believed in the possibility of discovering the philosopher's stone. Patkul, when under sentence of death, contrived to impose so far upon the senate at Stockholm, as to persuade them that he had, in their presence, converted into gold a quantity of base metal. An account of this experiment was transmitted to the king, accompanied with a petition to his majesty for the life of so valuable a subject; but Charles, blending magnanimity with his severity, replied with indignation, that he would not grant to intercede what he had refused to the calls of humanity and the intrigues of friendship.

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PATNA, a town of Asia, in the dominions of the Great Mogul, to the north of the kingdom of Bengal, where the English have factories for f. Ipetre, borax, and raw silk. It is the capital of the province of Bahar, a dependency of Bengal, in the empire of Indostan, situated in a pleasant country, 400 miles east of Agra. It extends seven miles in length on the banks of the Gandes, and is about half a mile in breadth. — Mr Ren nel gives strong reasons for supposing it to be the ancient Pallotra. The town is large and populous, but the houses are built at a distance from each other. E. Long. 85° 40'. N. Lat. 24° 25'.

PATOMACK, a large river in Virginia, which divides that state from Maryland, rises in the mountains within a small distance of the western waters, and receives in its course several considerable rivers, and empties itself into Chesapeake Bay. It is 74 miles wide at the mouth, 42 at Nomony Bay, 1½ at Halloing point, 1½ at Alexandria; its foundations are 7 fathoms at the mouth, 5 at George's Island, 4½ at lower Machodic, 3 from Swan's point to Alexandria, and thence 10 feet water to the falls. The distance from the Capes of Virginia to the termination of the tide water in this river is above 300 miles and it is navigable for ships of large burden nearly to that distance; from thence its navigation was obstructed by several falls; but the spirited exertions of the company incorporated for opening and improving the navigation of this noble river, have surmounted many of the difficulties which obstructed its navigation; their operations still continue, intending to open the navigation to within a short portage of the Monaghela. The city of Washington, intended for the future residence of Congress, is now building on its banks nearly 300 miles from the sea. Alexandria and George Town in its vicinity, are places of considerable and increasing trade, and about nine miles below is situated Mount Vernon, the beautiful seat of General Washington. Many elegant seats, and delightful situations are on both sides of the river; and it is likely soon to become a channel of very extensive trade, the land on both sides rapidly increasing in value.

PATONCE, in heraldry, is a cross, florid at the ends; from which it differs only in this, that the ends, instead of turning down like a fleur-de-lis, are extended somewhat in the pattée form. See FLORE.

PATRÉ, a city of Achaia. This place was visited by Dr Chandler, who gives the following account of it. "It has been often attacked by enemies, taken, and pillaged. It is a considerable town, at a distance from the sea, situated on the side of a hill, which has its summit crowned with a ruinous castle. This made a brave defence in 1447 against Sultan Morat, and held out until the peace was concluded, which first rendered the Morea tributary to the Turks. A dry flat before it was once the port, which has been choked with mud. It has now, as in the time of Strabo, only an indifferent road for vessels. The house of Nicholas Paul, Esq; the English consul, stood on a part of the wall either of the theatre or the odeum. By a fountain was a fragment of a Latin inscription. We saw also a large marble birth much defaced; and the French consul showed us a collection of medals. We found nothing remarkable in the citadel. It is a palace of some trade, and inhabited by Jews as well as by Turks and Greeks. The latter have several churches. One is dedicated to St Andrew the apostle, who suffered martyrdom there, and is of great sanctity. It had been recently repaired. The site by the sea is supposed that of the temple of Ceres. By it is a fountain. The air is bad, and the country round about over-run, with the low shrub called glycyrrhiza or licorice."

Of its ancient state, the same author speaks thus: "Patra afflicted the Atheiots when invaded by the Gauls under Brennus; but afterwards was unfortunate, reduced to extreme poverty, and almost abandoned. Augustus Cæsar united the scattered citizens, and made it a Roman colony, settling a portion of the troops which obtained the victory of Actium, with other inhabitants from the adjacent places. Patra refounded and enjoyed dominion over Naupactus, Cænetha, and several cities of Achaia. In the time of Pausanias, Patra was adorned with temples and porticoes, a theatre, and an odeum which was superior to any in Greece but that of Atticus Herodes at Athens. In the lower part of the city was a temple of Bacchus Ἁίσυμμετερος, in which was an image preferred in a cist, and conveyed, it was said, from Troy by Eurypylus; who, on opening it, became disorderly in his senses. By the port were temples; and by the sea, one of Ceres, with a pleasant grove and a prophet fountain of unerring veracity in determining the event of any illness."

PATRANA, or Patrana, a town of New Castile in Spain, with the title of a duchy. It is situated between the rivers Pajo and Tajama, in W. Long. 2° 45'. N. Lat. 40° 26'.

PATRAS, an ancient and flourishing town of European Turkey, in the Morea, capital of a duchy, with a Greek archbishop's see. It is pretty large and populous; and the Jews, who are one-third part of the inhabitants, have four synagogues. There are several handsome mosques and Greek churches. The Jews carry on a great trade in silk, leather, honey, wax, and cheese. There are cypress trees of a prodigious height, and excellent pomegranates, citrons, and oranges. It has been several times taken and retaken, and is now in the hands of the Turks. It is seated in E. Long. 21° 43'. N. Lat. 38° 17'.

PATRICA, a town of Italy in the territory of the church, and in the Campagna of Rome, towards the sea coast, and eight miles east of Olbia. About a mile from this place is a hill called Monte de Liviana, which some have thought to be the ancient Lavinium founded by Æneas.
Patriarch, one of the first fathers who lived towards the beginning of the world, and who became famous by their long lines of descendants. Abraham, Isaac, and Jacob, and his twelve sons, are the patriarchs of the Old Testament; Seth, Enoch, &c. are antediluvian patriarchs.

The authority of patriarchal government existed in the fathers of families, and their first-born after them, exercising all kinds of ecclesiastical and civil authority in their respective households; and to this government, which lasted till the time of the Israelites dwelling in Egypt, some have ascribed an absolute and despotic power, extending even to the punishment by death. In proof of this, is produced the curse pronounced by Noah upon Canaan (Gen. ix. 25.); but it must be observed, that in this affair Noah seems to have acted rather as a prophet than a patriarch. Another instance of supposed despotic power is Abraham's turning Hagar and Ishmael out of his family (Gen. xxi. 9, &c.); but this can hardly be thought to be of any singular authority vested in the patriarchs, as such, and peculiar to those ages. The third instance brought forward to the same purpose is that of Jacob's denouncing a curse upon Simeon and Levi (Gen. xxxviii. 7.), which is maintained by others to be an instance of prophetic inspiration more than of patriarchal power. The fourth instance is that of Judah with regard to Tamar (Gen. xxxvii. 24.); with regard to which it is remarked, that Jacob, the father of Judah, was still living; that Tamar was not one of his own family; and that she had been guilty of adultery, the punishment of which was death by burning; and that Judah on this occasion might speak only as a prosecutor.

On the whole, however, it is difficult to say, which of these opinions are most agreeable to truth. Men who believe the origin of civil government, and the obligation to obedience, to arise from a supposed original compact, either real or implied, will be naturally led to weaken the authority of the patriarchs; and those who esteem government to be a divine institution, will be apt to raise that authority to the highest pitch that either reason or scripture will permit them. It cannot be denied, that authority existed in fathers, and descended to their first-born, in the first ages of the world; and it is neither unnatural nor improbable to imagine, that the idea of hereditary power and hereditary honours was first taken from this circumstance. But whether authority has descended through father and son in this way to our times, is a circumstance that cannot in one instance be asserted, and cannot be denied in a thousand. The real source of the dignity and of the authority of modern times seems to have been, skill in the art of war, and success in the conduct of conquests.

Jewish Patriarch, a dignity; respecting the origin of which there are a variety of opinions. The learned authors of the Universal History think, that the first appearance and institution of these patriarchs happened under Nerva the successor of Domitian. It seems probable that the patriarchs were of the Aaronic or Le-Se-Dar-Patriarch, the tribe of Judah being at that time too much depressed, and too obnoxious to the Romans to be able to assume any external power. But of whatever tribe they were, their authority came to be very considerable. Their principal business was to instruct the people; and for this purpose they instituted schools in several cities. And having gained great reputation for their extraordinary learning, zeal, and piety, they might, in time, not only bring a great concourse of other Jews from other parts, as from Egypt and other western provinces of their dispersion, but likewise prove the means of their patriarchal authority's being acknowledged there. From them they ventured at length to levy a kind of tribute, in order to defray the charges of their dignity, and of the officers (A) under them, whose business it was to carry their orders and decisions through the other provinces of their dispersion, and to see them punctually executed by all, that some shadow of union at least might be kept up among the western Jews. They likewise nominated the doctors who were to preside over their schools and academies; and these were in process of time styled chief and princes, in order to raise the credit of that dignity, or to imply the great regard which their disciples were to pay to them. These chiefs became at length rivals of the patriarchs; and some of them possest both dignities at once; an usurpation which caused not only great confusion amongst them, but oftentimes very violent and bloody contentions. However, as the Jewish Rabbis have trumped up a much older era for this patriarchal dignity, and have given us a succession of them down to the fifth century, in which it was abolished, it will not be amiss to give our readers the substance of what they have written of this and those of this order of men; and at the same time to show them the absurdity and falsehood of that pretended succession to this imaginary dignity.

According to them, the first patriarch was Hillel, surnamed the Babylonian, because he was sent for from thence to Jerusalem about 145 years before the ruin of their capital, or 30 years before the birth of Christ, to decide a dispute about the keeping of Easter, which on that year fell out on the Sabbath-day; and it was on account of his wife's decision that he was raised to that dignity, which continued in his family till the said fifth century. He was likewise looked upon as a second Moses, because he lived like him 40 years in obscurity, and more in great reputation for learning and sanctity, and 40 more in possession of this patriarchal dignity. They make him little inferior to that lawgiver in other of his excellences, as well as in the great authority he gained over the whole Jewish nation. The wonder will be, how Herod the Great, who was so jealous of his own power, could suffer a stranger to be raised to such a height of it, barely for having decided a dispute which must in all likelihood have been adjudged by others long before that time.

However, Hillel was succeeded by his son Simeon, whom many Christians pretend to have been the venerable old person of that name, who received the divine infant in his arms. The Jews give him but a very
people so regretted his death, that an order was given, Patriarch, instead of 10 bumpers of wine, which were usually drank at the funeral of a faint, to drink 15 at his, on account of his martyrdom. These bumpers were in time multiplied, they tell us, to such shameful huge, that the fanhedrim was forced to make some new regulations to prevent that abuse.

Those are the patriarchs which, the Rabbies tell us, preceded the destruction of the temple; and we need no farther confusion of this pretended dignity, than the silence of the faced historians, who not only make not the least mention of it, but affurse us all along that they were the high-priests who professed in the fanhedrim; and before whom all cases relating to the Jewish religion were brought and decided. It was the high-priest who examined and condemned our Saviour; that condemned St Stephen; that forgave the apostles to preach in Christ's name; and who far as judge on the great apostle at the head of that supreme court. The fame may be urged from Josephus, who must needs have known and mentioned this pretended dignity, if any such there had been; and yet is it far from taking the least notice of it, that, like the evang-lists, he places the point ill among at the head of all the Jewish affairs; and names the high-priest Ananas as having the care and direction of the war against the Romans, which is an evident proof that there were then no such patriarchs in being. To all this let us add, that if there had been any such remarkable succession, the Talmudists would have preferred it to future ages, whereas, neither they, nor any of the ancient authors of the Jewish church, make any mention of it; but only some of their doctors, who have written a considerable time after them, a set of writers to whom little credit can be given in points of this nature, especially as there are such unfurnishable contradictions between them, as no authors either Jewish or Christian have, with all their pains, been hitherto able to reconcile.

Their succession, according to the generality of those rabbies, stands as follows:


According to Gants Tzemach David, who hath reduced them to 10, they are,


On the whole, it cannot be doubted but that their first rise was in Nerva's time, however much Jewish pride may have prompted them to falsify, and to assert their origin to have been more ancient than it really was. Nor have the Jews been faithful in giving an account of the authority of these men. They have exaggerated their power beyond all bounds, for the purpose of repelling...
Patriarchs among Christians, are ecclesiastical dignitaries, or bishops, called from their paternal authority in the church. The power of patriarchs was not the same in all, but differed according to the different customs of countries or the pleasures of kings and councils. Thus the patriarch of Constantinople grew to be a patriarch over the patriarchs of Ephesus and Cæsarea, and was called the ecumenical and universal patriarch; and the patriarch of Alexandria had some prerogatives which no other patriarch but himself enjoyed, such as the right of consecrating and approving every single bishop under his jurisdiction.

The patriarchate has been ever esteemed the supreme church: the bishop had only under him the territory of the city of which he was bishop; the metropolitan superintended a province; and had for suffragans the bishops of his province; the primate was the chief of what was then called a diocese (a), and had several metropolitans under him; and the patriarch had under him several dioceses, composing one exarchate, and the primates themselves were under him.

Ulter, Pagi, De Marca, and Morinus, attribute the establishment of the grand patriarchates to the apostles themselves; who, in their opinion, according to the description of the world then given by geometers, pitched on the three principal cities in the three parts of the known world; viz. Rome in Europe, Constantinople in Asia, and Alexandria in Africa; and thus formed a trinity of patriarchs. Others maintain that the name patriarch was unknown at the time of the council of Nice; and that for a long time afterwards patriarchs and primates were confounded together, as being all equally chiefs of dioceses, and equally superior to metropolitans, who were only chiefs of provinces. Hence Socrates gives the title patriarch to all the chiefs of dioceses, and reckons ten of them. Indeed, it does not appear that the dignity of patriarch was appropriated to the five grand sees of Rome, Constantinople, Alexandria, Antioch, and Jerusalem, till after the council of Chalcedon in 451: for when the council of Nice regulated the limits and prerogatives of the three patriarchs of Rome, Antioch, and Alexandria, it did not give them the title of patriarchs, though it allowed them the pre-eminence and privileges thereof; thus when the council of Constantinople adjudged the second place to the bishop of Constantinople, who till then was only suffragan of Heraclea, it laid nothing of the patriarchate. Nor is the term patriarch found in the decree of the council of Chalcedon, whereby the fifth place is assigned to the bishop of Jerusalem; nor did the five patriarchs govern all the churches.

There were besides many independent chiefs of dioceses, who, from owing the jurisdiction of the grand patriarchs, called themselves patriarchs; such as that of Aquileia; nor was Carthage ever subject to the patriarch of Alexandria. Molonem * imagines that the bishops, who enjoyed a certain degree of pre-eminence over the rest of their order, were distinguished by the Jewish title of patriarchs in the fourth century. The authority of the patriarchs gradually increased, till, about the close of the fifth century, all affairs of moment within the compass of their patriarchate came before them, either at first hand or by appeals from the metropolitans. They consecrated bishops; assembled yearly in council the clergy of their respective districts; pronounced a decisive judgment in those cases where accumulations were brought against bishops; and appointed vicars or deputies, clothed with their authority, for the preservation of order and tranquillity in the remotest provinces. In short, nothing was done without consulting them; and their decrees were executed with the same regularity and respect as those of the princes.

It deserves to be remarked, however, that the authority of the patriarchs was not acknowledged through all the provinces without exception. Several dioceses, both in the eastern and western empires, were exempted from their jurisdiction. The Latin Church had no patriarchs till the sixth century; and the churches of Gaul, Britain, &c. were never subject to the authority of the patriarch of Rome, whose authority only extended to the suburban provinces. There was no primacy, no exarchate...

(a) The word diocese was then of a very different import from what it bears now. Under the article Episcopacy, it was observed, that the first founders of churches regulated their extent and the jurisdiction of their bishops by the divisions of the Roman empire into civil jurisdictions. One of these divisions was into provinces and dioceses. A province comprised the cities of a whole region subjected to the authority of one chief magistrate, who reigned in the metropolis or chief city of the province. A diocese was a still larger district, comprehending within it several provinces, subject to the control of a chief magistrate, whose residence was in the metropolis of the diocese. The jurisdiction of the bishops of the Christian church was established upon this model: the authority of a private bishop included only over the city in which he resided, together with the adjacent villages and surrounding tract of country. The diocese was called eparchia, through it comprehended many parishes in the modern sense of that word. Under Arcadius and Honorius the empire was divided into thirteen dioceses: 1. The Oriental diocese, containing fifteen provinces; 2. The diocese of Egypt, six provinces; 3. The Asiatic diocese, ten provinces; 4. The Pontic diocese, ten provinces; 5. The diocese of Thrace, six provinces; 6. The diocese of Macedonia, six provinces; 7. The diocese of Dacia, five provinces; 8. The Italian diocese, seventeen provinces; 9. The diocese of Illyricum, six provinces; 10. The diocese of Italy, six provinces; 11. The Spanish diocese, seven provinces; 12. The Gallican diocese, seventeen provinces; 13. The Britannic diocese, five provinces. Each of these provinces comprehended many parishes, and each eparchia many modern parishes. See Bingham's Origins Saec., Book ix.
PATRICK (St), the apostle of Ireland, and first bishop of that country. He was born April 9th A.D. 373, of a good family, at Kirk Patric near Dumbarton, in what is now called Scotland, but then comprehended under the general name of Britain.---His baptismal name Succatus, signifies, in the British language, "valiant in war." On some account of certain exiles from Italy he was taken prisoner, and carried into that kingdom, where he continued five years in the service of Milcho, who had bought him of three others, when Patrick acquired the new name of Cathairg, or Cathar Tige, i.e. four families. In this time he made himself master of the Irish language, and at last made his escape, and returned home on board a ship. About two years after, he formed a design of converting the Irish, either in consequence of a dream, or of reflection on what he had observed during his acquaintance with them. The better to qualify himself for this undertaking, he travelled to the continent, where he continued 35 years, pursuing his studies under the direction of his mother's uncle St Martin, bishop of Tours, who had ordained him deacon; and after his death with St German, bishop of Auxerre, who ordained him priest, and gave him his third name Mauros or Magnim.

An ancient author, Hectoricus Antifodorenfs, who wrote a book concerning the miracles of St German, considers it as the highest honour of that prelate to have been the inductor of St Patrick: "As the glory of a father shines in the government of his sons, out of the many disciples in religion who are reported to have been his sons in Christ, suffice it briefly to mention one by far the most famous, as the feries of his actions shows, Patrick the particular apostle of Ireland, who being under his holy discipline 18 years, derived no little knowledge in the inspired writings from such a source. The most godly divine pontiff, considering him alike distinguished in religion, eminent for virtue, and steadfast in doctrine; and thinking it absurd to let one of the best labourers remain inactive in the Lord's vineyard, recommended him to Celeline, Pope of Rome, by his prebyster Segetius, who was to carry to the apostolic see a testimonial of ecclesiastical merit of this excellent man. Approved by his judgment, supported by his authority, and confirmed by his blessing, he sent out for Ireland; and being peculiarly defined to that people as their apostle, instructed them at that time by his doctrine and miracles, and now does and will for ever display the wonderful power of his apostleship." Lastly, Pope Celeline consecrated him bishop, and gave him his most familiar name Patrick, expressive of his honourable defect; and to give luire and weight to the communion which he now charged him with to convert the Irish. Palladius had been here a year before him on the same design, but with little success: the saints Kieran, Alba, Declan, and Ibar, were predecessors both to Palladius and Patrick. But the great office of apostle of Ireland was conferred for our peace, who landed in the country of the Eboe, or at Wicklow, A.D. 441. His first event was S nell, eighth in descent from Cormac king of Leinster; but not meeting with encouragement, he proceeded to Dublin, and thence to Ulter, where he founded a church (afterwards the famous abbey of Saul, in the county of Down), remarkable for its position, being made out of a barn, and its greatest length reaching from north to south. After labouring seven years indefatigably in his great work, he return-
the church at Battersea in Surrey, he was preferred to the rectory of St Paul's, Covent-garden, in London, where he continued all the time of the plague in 1665 among his parishes, to their great comfort. In 1668 he published his Family debate between a Conformist and a Nonconformist. This was answered by the Dilettanti, whom he had much exasperated by it; but by his moderation and conciliatory manners towards them afterwards, they were perfectly reconciled to him, and he brough over many of them to the communion of the established church. In 1678 he was made dean of Peterborough, where he was much beloved. In 1682, Dr Lewis de Moulin, who had been a history professor at Oxford, and written many better books against the church of England, sent for Dr Patrick upon his sick-bed, and made a solemn declaration of his regret on that account, which he signed, and was published after his death. During the reign of King James, the dean's behaviour showed that he had nothing more at heart than the protestant religion; for which he ventured all that was dear to him, by preaching and writing against the errors of the church of Rome. In 1687 he published a prayer composed for that difficult time, when persecution was expected by all who stood firm to their religion. The year after the Revolution, the dean was appointed bishop of Chichester, and was employed with others of the new bishops to settle the affairs of the church in Ireland. In 1691 he was translated to the see of Ely, in the room of the deprived Bishop Turner. He died in 1709, after having published various works; among which the most distinguished are his Paraphrases and Commentaries on the Holy Scriptures, three volumes folio. These, with Louth on the Proverbs, Arnold on the Apocrypha, and Whitby on the New Testament, make a regular continued commentary in English on all the sacred books.

PATRIMONY, a right or estate inherited by a person from his ancestors.

The term patrimony has been also given to church-estates or revenues; in which some authors still lay, the patrimony of the church of Rimini, Milan, &c. The church of Rome hath patrimonies in France, Africa, Sicily, and many other countries. To create the greater respect to the estates belonging to the church, it was usual to give their patrimonies the names of the saints they held in the highest veneration; thus the estate of the church of Ravenna was called the patrimony of St Apollinaris, that of Milan, the patrimony of...

(a) At Armagh St Patrick founded, A. D. 445 or 447, a priory of Augustine canons, dedicated to St Peter and St Paul, much enriched by the archbishops; restored by Imar O Hedegun in the 12th century. It was granted, A. D. 1611, to Sir Toby Caulfield, knight. St Patrick also founded there a house of canonesses of the same order, under his abbot Lupita, called Templina ferta, or the house of miracles.

We are told, that Armagh was made a metropolitan see in honour of St Patrick; in consequence of which it was held in the highest veneration not only by bishops and priests, but also by kings and bishops, as the venerable Bede informs us.

(a) There is a cave in the county of Donegal or Tirconnel, near the source of the Liffey, which, it is pretended was dug by Ulysses, in order to hold conversations with infernals. The present inhabitants call it Elan n’ Fadatory, or the “Island of Purgatory, and Patrick’s Purgatory.” They affirm, with a pious credulity, that St Patrick the apostle of Ireland, or some abbot of that name, obtained of God by his earnest prayers, that the pains and torments which await the wicked after this life might be here set forth to view, in order the more easily to recover the Irish from their sinful state and heathenish errors.
PA T R I O T I S M 

of St. Abboy; and the eftates of the Roman church were called the patriam of St Peter in Abruzzi, the patriam of St Peter in Sicily, and the like.

What is now called St Peter's patriam is only the duchy of Castro, and the territory of Orvieto. See CASTRO, &c.

P A T R I O T I S M, a love of one's country, which is one of the noblest passions that can warm and animate the human breast. It includes all the limited and particular affections to our parents, children, friends, neighbours, fellow-citizens, and countrymen. It ought to direct and limit their more confined and partial actions within their proper and natural bounds, and never let them encroach on those sacred and first regards we owe to the great public to which we belong.

Were we solitary creatures, detached from the rest of mankind, and without any capacity of comprehending a public interest, or without affections leading us to desire and pursue it, it would not be our duty to mind it, nor criminal to neglect it. But as we are parts of the public system, and are not only capable of taking in large views of its interests, but by the strongest affections connected with it, and prompted to take a share of its concerns, we are under the most sacred ties to prosecute its security and welfare with the utmost ardour, especially in times of public trial.

"Zeal for the public good (says Mr. Addison) is the characteristic of a man of honour and a gentleman, and must take place of pleasures, profits, and all other private gratifications: that whosoever wants this motive, is an open enemy, or an inglorious nurtor to mankind, in proportion to the misapplied advantages with which nature and fortune have blessed him." This love of our country does not import an attachment to any particular soil, climate, or spot of earth, where perhaps we first drew our breath, though those natural ideas are often associated with the moral ones; and, like external signs or symbols, help to ascertain and bind them; but it imports an affection to that moral system or community, which is governed by the same laws and magistrates, and whose several parts are variably connected one with the other, and all united upon the bottom of a common interest. Wherever this love of our country prevails in its genuine vigour and extent, it swallows up all forlorn and selfish regards; it conquers the love of ease, power, pleasure, and wealth; nay, when the amiable partialities of friendship, gratitude, private affection, or regards to a family, come in competition with it, it will teach us to sacrifice all, in order to maintain the rights, and promote and defend the honour and happiness of our country. To pursue therefore our private interests in subordination to the good of our country; to be examples in it of virtue, and obedient to the laws; to choose such representatives as we apprehend to be the best friends to its constitution and liberties; and if we have the power, to promote such laws as may improve and perfect it; ready to embrace every opportunity for advancing its prosperity; cheerfully to contribute to its defence and support; and, if need be, to die for it—these are among the duties which every man, who has the happiness to be a member of our free and Protestant constitution, owes to his country.

The constitution of man is such, that the most selfish passions, if kept within their proper bounds, have a tendency to promote the public good. There is no passion of more general utility than patriotism; but its origin may unquestionably be termed selfish. The love of one's relations and friends is the most natural expansion of self-love; this affection connects itself too with local circumstances, and sometimes cannot easily be separated from them: It often varies, as relationship or place varies; but acquires new power when the whole community becomes its object. It was therefore with singular propriety that the poet said, "Self love and social are the same." Under the article CALAIRI we have already given the outlines of the transactions of its siege by Edward III. during which the inhabitants displayed a degree of patriam in a truly wonderful manner. History scarcely contains a more distinguished instance of true patriotic virtue than on this occasion. We shall therefore give a fuller account of this remarkable affair, as one of the best examples that can possibly be selected of the virtue we have been explaining. The inhabitants, under Count Vienne their gallant governor, made an admirable defence against a well disciplined and powerful army. Day after day the English effected many a breach, which they repeatedly expected to storm by morning; but, when morning appeared, they wondered to behold new ramparts raised nightly, erected out of the ruins which the day had made. France had now put her sickle into her second harvest since Edward with his victorious army had driven the town. The eyes of all Europe were intent on the issue. The English made their approaches and attacks without remission; but the citizens were as obstinate in repelling all their efforts. As lengthened families did more for Edward than arms. After the citizens had devoured the lean carcasses of their half-starved cattle, they tore up old foundations and rubbish in search of vermin; they fed on boiled leather, and the weeds of exhausted gardens; and a morse of damaged corn was accounted matter of luxury. In this extremity they resolved to attempt the enemy's camp. They boldly fell upon the English joined battle; and, after a long and desperate engagement, Count Vienne was taken prisoner; and the citizens, who survived the slaughter, retired within their gates. On the captivity of their governor, the command devolved upon Euface Saint Pierre, the mayor of the town, a man of mean birth, but of exalted virtue. Euface soon found himself under the necessity of capitulating, and offered to deliver to Edward the city, with all the possessions and wealth of the inhabitants, provided he permitted them to depart with life and liberty. As Edward had long since expected to ascend the throne of France, he was exasperated to the last degree against these people, whose sole valor had defeated his warmest hopes; he therefore determined to take an exemplary revenge, though he wished to avoid the imputation of cruelty. He answered by Sir Walter Mauny, that they all deserved capital punishment, as obstinate traitors to him, their true and notable sovereign; that, however, in his wonted clemency, he contented to pardon the bulk of the plebeians, provided they would deliver up to him fix of their principal citizens with halters about their necks, as victims of due atonement for that spirit of rebellion with which they had insulted the common people. All the remains of this deplorable city were conveyed in the great square; and like men arraigned at a tribunal from whence there was no appeal, expected...
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ed with throbbing hearts the sentence of their conquer. When Sir Walter had declared his meagre, consolation and pale disfay was impressed on every face: each looked upon death as his own inevitable lot; for how should they desire to be saved at the price proposed? Whom had they to deliver up, save parents, brothers, kindred, or valiant neighbours, who had so often exposed their lives in their defence? To a long and dead silence, deep sighs and groans succeeded, till Eulalie Saint Pierre a ceding a little eminence, thus addressed the assembly: "My friends and fellow-citizens, you see the condition to which we are reduced; we must either submit to the terms of our cruel and enflaving conqueror, or yield up our tender infants, our wives, and chaste daughters, to the bloody and brutal lufts of the violating sordidly. We well know what that tyrant intends by his sanguine offers of mercy. It does not abate his vengeance to make us merely miserable, he would also make us criminal; he would make us contemptible; he will grant us life on no condition, save that of our being unworthy of it. Look about you, my friends, and fix your eyes on the person whom you will to deliver up as the victims of your own safety. Which of these would you appoint to the rack, the ax, or the halter? Is there any here who has not watched for you, who has not fought for you, who has not bled for you? Who, through the length of this invertebrate siege, has not suffered fatigues and miseries a thousand times worse than death, that you and your might survive to days of peace and prosperity? Is it your prefers, then, whom you would define to destruction? You will not, you cannot, do it. Justice, honour, humanity, make such a treason impossible. Where then is our resource? Is there any expedient left, whereby we may avoid guilt and infamy on one hand, or the defolation and horrors of a sacked city on the other? There is, my friends, there is one expedient left; a gracious, an excellent, a god-like expedient! Is there any here to whom virtue is dearer than life? Let him offer himself an obligation for the safety of his people! he shall not fail of a blessed approbation from that power, who offered up his only Son for the salvation of mankind." He spoke—but an universal silence ensued. Each man looked round for the example of that virtue and magnanimity in others, which all wished to approve in themselves, though they wanted the resolution. At length Saint Pierre resumed: "It had been base in me, my fellow-citizens, to propose any matter of damage to others, which I myself had not been willing to undergo in my own person. But I held it ungenerous to deprive any man of that preference and elevation, which might attend a first offer on so signal an occasion: for I doubt not but there are many here as ready, nay, more zealous for this martyrdom than I can be, however modestly and the fear of imputed offense may withhold them from being foremost in exhibiting their merits. Indeed the fixation to which the captivity of Count Vienne has unhappily raised me, imports a right to be the first in giving my life for your sakes. I give it freely, I give it cheerfully. Who comes next? Your son! exclaimed a youth, not yet come to maturity. — Ah, my child! cried St Pierre; I am then twice sacrificed. — But no—I have rather begun thee a second time. — Thy years are few, but full my son; the vicissitude of virtue has reached. Patience is the utmost purpose and goal of humanity. Who next, my friends? This is the hour of heroes. — Your kinman, cried John de Aire! Your kinman, cried James Villiant! Your kinman, cried Peter Villiant! "Ah! (exclaimed Sir Walter Mauny, bursting into tears), why was I not a citizen of Calais?"

The sixth victim was still wanting, but was quickly supplied by lot, from numbers who were now envious of so ennobling an example. The lots of the city were then delivered to Sir Walter. He took the prisoners into his custody. He ordered the gates to be opened, and gave charge to his attendants to conduct the remaining citizens with their families through the camp of the English. Before they departed, however, they defined permission to take their last adieu of their deliverers.—What a parting? what a scene? they crowded with their wives and children about St Pierre and his fellow-prisoners. They embraced, they clung around, they fell prostrate before them. They groaned; they wept aloud; and the joint clamour of their mourning passed the gates of the city, and was heard throughout the camp. At length Saint Pierre and his fellow victims appeared under the conduct of Sir Walter and his guard. All the tents of the English were instantly emptied. The soldiers pored from all parts, and arranged themselves on each side to behold, to contemplate, to admire this little band of patriots as they passed. They murmured their applause of that virtue which they could not but revere even in enemies; and they regarded those ropes which they had voluntarily affixed about their necks as enigmas of greater dignity than that of Briton Mauny. As soon as they had reached the royal presence, "Many (says the king), are these the principal inhabitants of Calais?" "They are (says Mauny); they are not only the principal men of Calais, they are the principal men of France, my lord, if virtue has any share in the act of ennobling."

"Were they delivered peaceably, (says Edward)? Was there no resistance, no commotion among the people?" "Not in the least, my lord. They are self-delivered, self-devoted, and come to offer up their inestimable heads as an ample equivalent for the ransom of thousands."

The king, who was highly incensed at the length and difficulty of the siege, ordered them to be carried away to immediate execution; nor could all the remonstrances and intreaties of his couriers divert him from his cruel purpose. But what neither a regard to his own interest and honour, what neither the dictates of justice, nor the feelings of humanity, could effect, was happily accomplished by the more powerful influence of conjugal affection. The queen, who was then big with child, being informed of the particulars respecting the six victims, flew into her husband's presence, threw herself on her knees before him, and, with tears in her eyes, besought him not to stain his character with an indelible mark of infamy, by committing such a horrid and barbarous deed. Edward could refuse nothing to a wife whom he so tenderly loved, and especially in her condition; and the queen, not satisfied with having saved the lives of the sixburghers, conducted them to her tent, where she applauded their virtue, regaled them with a plentiful
PAT

ful report, and having made them a present of money and clothes, sent them back to their fellow-citizen.

The love of their country, and of the public good, seems to have been the predominant passion of the Spartans. Pedaratus having milled the honour of being chosen one of the three hundred who had a certain rank in distinction in the city, went home extremely pleased and satisfied; saying, "He was overjoyed there were three hundred in Sparta more honourable than himself."

The patriotism of the Romans is well known, and has been justly admired. We shall content ourselves at present with the following example; a zeal and patriotic devotion similar to which is perhaps scarcely equalled, and certainly is not exceeded, in history.

Rome, under the consuls Cæsio Fabius and T. Virginius, had several wars to fulfill repast, and seem to have been the admiration of all ages.

To put a stop to the incursions of the last, it would have been necessary to have established a good garrison upon their frontiers to keep them in awe. But the commonwealth, exhausted of money, and menaced by abundance of other enemies, was not in a condition to provide for so many different cares and expences. The family of the Fabii showed a generosity and love of their country that has been the admiration of all ages. They applied to the senate, and by the mouth of the consuls demanded as a favour that they would be pleased to transfer the care and expences of the garrison necessary to oppose the enterprizes of the Viets to their house, which required an industrious rather than a numerous body, promising to support with dignity the honour of the Roman name in that post. Every body was charmed with so noble and unheard-of an offer; and it was accepted with great acknowledgment. The news spread over the whole city and no hint was talked of but the Fabii. Every body praised, and extolled them to the skies. "If there were two more such families in Rome," said they, "the one might take upon them the war against the Volsci, and the other against the Équi, whilst the commonwealth remained quiet, and the forces of particulars subdivided the neighbouring states."

Early the next day the Fabii set out, with the confult at their head, robed and with his insignia. Never was there so small, and at the same time so illustrious, an army seen; for which we have the authority of Livy. Three hundred and fix foldiers, all patriots, and of the same family, of whom not one but might be judged worthy of commanding an army, marched against the Veii full of courage and alacrity, under a captain of their own name, Fabius. They were followed by a body of their friends and clients, animated by the same spirit and zeal, and actuated only by great and noble views. The whole city flocked to see the fine sight; praised those generous foldiers in the highest terms; and promised them confulsips, triumphs, and the most glorious rewards. As they passed before the capitol and the other temples, every body implored the gods to take them into their protection; to favour their departure and undertaking, and to afford them a speedy and happy return. But their prayers were not heard. When they arrived near the river Crimera, which is not far from Veii,
to prevent disorders, or any number of people from assembling together; they are to see the lights in the soldiers' barracks put out, and to take up all the soldiers they find out of their quarters. Sometimes patrols consist of an officer and 30 or 40 men, as well infantry as cavalry; but when the enemy is generally near at hand, and consequently the danger greater.

PATRON, among the Romans, was an appellation given to a master who had freed his slave. As soon as the relation of master expired, that of patron began: for the Romans, in giving their slaves their freedom, did not depose themselves of all rights and privileges in them; the law still subjected them to considerate services and duties towards their patrons, the neglect of which was very severely punished.

Patron was also a name which the people of Rome gave to some great man, under whose protection they usually put themselves; paying him all kinds of honour and respect, and denominating themselves his clients; while the patron, on his side, granted them his credit and protection. They were therefore mutually and mutually obliged to each other; and by this means, in consequence of reciprocal ties, all those petitions, jealousies, and animosities, which are sometimes the effect of a difference of rank, were prudently avoided: for it was the duty of the patron to advise his clients in points of law, to manage their suits, to take care of them as of his own children, and secure their peace and happiness. The clients were to affist their patrons with money on several occasions; to ransom them or their children when taken in war; to contribute to the portions of their daughters; and to defray, in part, the charges of their public employments. They were never to accuse each other, or take contrary sides; and if either of them was convicted of having violated this law, the crime was equal to that of treason, and any one was allowed to kill the offender with impunity. This patronage was a tie as effectual as any confanguinity or alliance, and had a wonderful effect towards maintaining union and concord among the people for the space of 600 years; during which time we find no dissensions nor jealousies between the patrons and their clients, even in the times of the republic when the populace frequently mutinied against those who were most powerful in the city.

Patron, in the church of Rome, a faint whose name a person bears, or under whose protection he is put, and whom he takes particular care to invoke; or a faint in whose name a church or order is founded.

Patron, in the canon or common law, is a person who, having the advowson of a parsonage, vicarage, or the like spiritual promotion, belonging to his manor, hath on that account the gift and disposition of the benefice, and may present to it whenever it becomes vacant. The patron's right of disposing of a benefice originally arises either from the patron or his ancestors, &c. being the founders or builders of the church; from their having given lands for the maintenance thereof; or from the church being built on their ground; and frequently from all three together.

PATRONAGE, or ADVOWSON, a sort of incorporeal hereditament, confiding in the right of presentation to a church or ecclesiastical benefice. Advowson, abbrevio, signifies in clientela recipere, the taking...
Patronage, taking into protection; and therefore is synonymous with patronage, patronatus: and he who has the right of advowson is called the patron of the church. For when lords of manors first built churches on their own demesnes, and appointed the tithe of those manors to be paid to the officiating ministers, which before were given to the clergy in common (from whence arose the division of parishes), the lord who thus built a church, and endowed it with glebe or land, had of common right a power annexed of nominating such minister as he pleased (provided he were canonically qualified) to officiate in that church, of which he was the founder, endower, maintainer, or, in one word, the patron.

Advowsons are either advowsons appendant, or advowsons in gros. Lords of manors being originally the only founders, and of course the only patrons, of churches, the right of patronage or pretension, so long as it continues annexed to the possession of the manor, as some have done from the foundation of the church, is called an advowson appendant: and it will pass, or be conveyed, together with the manor, as incident and appendant thereto, by a grant of the manor, as some have done from the foundation of the church, is called an advowson in gros; or, at large, and never can be appendant any more; but it is for the future annexed to the person of its owner, and not to his manor or lands.

Advowsons are also either pretentiae, collative, or donative. An advowson pretentiae, is where the patron hath a right of pretension to the bishop or ordinary, and moreover to demand of him to inSTITUTE, or to take the pretension of and to officiate in the church. An advowson collative, is where the bishop and patron are one and the same person: in which case the bishop cannot pretend to himself; but he does, by the act of collation, or consecrating the benefice, the whole that is done in common cases, by both pretension and institution. An advowson donative, is where the king, or any subject by his licence, doth found a church or chapel, and ordains that it shall be merely in the gift of, and to the person of, the patron; subject to his visitation only, and not to that of the ordinary; and vested absolutely in the clerk by the patron's deed of donation, without pretension, institution, or induction. This is said to have been anciently the only way of conferring ecclesiastical benefices in England; the method of institution by the bishop not being established more early than the time of Archbishops Becket in the reign of Henry II. and therefore, though pope Alexander III. in a letter to Becket, severely inveighs against the præstum confuetudo, as he calls it, of investiture conferred by the patron only, this however shews what was then the common usage. Others contend that the claim of the bishops to institution is as old as the first planting of Christianity in this island; and in proof of it they allege a letter from the English nobility to the pope in the reign of Henry the third recorded by Matthew Paris, which speaks of presentation to the bishop as a thing immemorial. The truth seems to be, that, where the benefice was to be conferred on a mere layman, he was first presented to the bishop in order to receive ordination, who was at liberty to examine and refuse him: but where the clerk was already in orders, the living was usually vested in him by the sole donation of the patron; till about the middle of the 12th century, when the pope and his bishops endeavoured to introduce a kind of feudal dominium over ecclesiastical benefices, and, in consequence of that, began to claim and exercise the right of institution universally, as a species of spiritual investiture.

However this may be, if, as the law now stands, the true patron once waxes this privilege of donation, and pretends to the bishop, and his clerk is admitted and instituted, the advowson is now become for ever pretensive, and shall never be donative any more. For these exceptions to general rules and common right are ever looked upon by the law in an unfavourable view, and continued as strictly as possible. If therefore the patron, in whom such peculiar right resides, does once give up that right, the law, which loves uniformity, will interpret it to be done with an intention of giving it up for ever; and will therefore reduce it to the standard of other ecclesiastical livings. See further, Law, Part III. Sect. i. No. cit. 9—10.

Arms of Patronage, in heraldry, are those on the top of which are some marks of subjection and dependence: thus the city of Paris lately bore the fleurs-de-lis in chief, to shew her subjection to the king; and the cardinals, on the top of their arms, bear those of the pope, who gave them the hat, to shew that they are his creatures.

Patronymic, among grammarians, is applied to such names of men or women as are derived from those of parents or ancestors.

Patronymics are derived, 1. From the father; as Pelides, i. e. Achilles the son of Peleus. 2. From the mother; as Philides, i. e. Chiron the son of Philyra. 3. From the grandfather on the father's side; as Aëacides, i. e. Achilles the grandson of Aëacus. 4. From the grandfather by the mother's side; as Atlidaides, i. e. Mercury the grandson of Atlas, And, &; From the kings and founders of nations; as Romulides, i. e. the Romans, from their founder Romulus.

The termination of Greek and Latin patronymics are chiefly four, viz. des, of which we have examples above; et, as Thaumantias, i. e. Iris the daughter of Thamus; et, as Atlantias, i. e. Electra the daughter of Atlas; and as, as Nerine, the daughter of Nereus. Of these terminations des is masculine; and et, et, and as, feminine; des and ses are of the first declension, et and is of the third.

The Russians, in their usual mode of addressing, never prefix any title or appellation of respect to their names; but periphrases of all ranks, even those of the first distinction, call each other by their Christian names, to which they add a patronymic. These patronymics are formed in some cases by adding Vitch (the same as our Fitz, as Fitzhebert, or the son of Herbert) to the Christian name of the father; in others by Of or Of; the former is applied only to periphrases of condition, the latter to those of inferior rank. Thus, Ivan Ivanovitch, Ivan Ivanof, is Ivan the son of Ivan; Peter Alexievitch, Peter Alexof, Peter the son of Alexy.

The female patronymic is Ofna or Ofma, as Sophia Alex-
PAT

Alexeufna, or Sophia the daughter of Alexey; Maria Ivanofna, or Maria the daughter of Ivan.

Great families are also in general distinguished by a surname, as those of Romanoff, Galatzin, Sieremetof, &c.

PATTROS, mentioned by Jeremiah and Ezekiel, appears from the context to be a part of Egypt. Bochart thinks he denotes the higher Egypt: the Septuagint translates it the country of Patrobas; in Pliny we have the Noma Plautores; in the Thesaurus, in Ptolemy, Patrois, probably the metropolis. From the Hbrew appellation Patro comes the gentile name Patrobas, Mosis.

PATRO (Oliver), a counsellor in Parliament, and dean of the French academy, was born at Paris in 1604. He had an excellent faculty both of speaking and writing. Upon his admission into the French academy in 1640, he made an oration of thanks, that gave rise to the custom of admittance speeches, which are still in use in that society. M. de Vaugelas owned himself much indebted to him for his assistance in composing his remarks on the French tongue, of which he was by far the greatest master in France; so that he was consulted as an oracle by all the best writers of that nation.

Pattans, or Patans, of Afganistan, a very warlike race of men, who had been subjects of the vast empire of Bochara. They revolted under their governor Abtai Tag, in the 16th century, and laid the foundation of the empire of Ghizni or Gzana. In the Differtation prefixed to Vol. III. of Dow's History, we have this account of the Pattans.

They are divided into distinct communities, each of which is governed by a prince, who is considered by his subjects as the chief of their blood, as well as their sovereign. They obey him without reluctance, as they derive credit to their family by his greatness. They attend him in his wars with the attachment which children have to a parent; and his government, though severe, partakes more of the rigid discipline of a general than the caprice of a despot. Rude, like the face of their country, and fierce and wild as the forms which cover their mountains, they are addicted to incursions and depredations, and delight in battle and plunder. United firmly to their friends in war, to their enemies faithful and cruel, they place justice in force, and conceal treachery under the name of address.

The empire, which took its rise from the revolt of the Pattans, under a succession of warlike princes rose to surprising magnitude. In the beginning of the 18th century, it extended from Iphath to Bengal, and from the mouths of the Indus to the banks of the Jaxartes, which comprehends at least half of the continent of Asia. They had fled to the mountains on the borders of Persia, that they might escape the sword, or avoid submitting to the conquerors of India; and there they formed their state, which the Moguls were never able thoroughly to subdue. Indeed they sometimes exercised depredations on the adjacent countries; nor was it possible for the Moguls either to prevent it or to extirpate them. They were sensible that the climate and soil of the delicious plains would only serve to rob them of that hardiness which they had contracted in the hills to which they were confined; they, therefore, for a long time gave no indications of a desire to exchange them for more pleasing abodes, or a more accessible situation. This enabled them to brave the victorious army of Nadir Shah, whose troops they quietly penetrated into Hindostan, and visited his return with the spoils of that country.

They then harried his army in the braits and defiles of the mountains, and proved themselves such absolute masters of the valleys, that they forced him to purchase from them his passage into Persia.

In the beginning of the present century, they had spread themselves over the adjoining province of Kandahar; and such was the imbecility of the Persian empire at that time, that many other provinces and tributary states were also induced to revolt. When the king or sultan of that time, whose name was Husein, opposed the growing power of this warlike people, he was totally defeated, and Iphath was besieged and obliged to surrender, after having suffered dreadful calamities, to an army consisting of only 30,000 men. In consequence of this, they brought about a revolution in Persia, and subjected it to themselves. This sovereignty, however, they only held for seven years and 21 days, having fallen a sacrifice to the enterprising spirit of Kouli Khan, or Nadir Shah. See Persia, and in the Appendix As換え

PAU, a town of France, in the province of Gascogne and territory of Bearn, with a parliament, a mint, and a cattle. The city of Pau (says Whateley*) is Tournay, for ever memorable in history, since it was the birthplace of Henry IV. That immortal prince was born in the castle, then the usual residence of the kings of Navarre. It stands on one of the most romantic and singular spots I have ever seen, at the west end of the town, upon the brow of a rock which terminates perpendicularly. Below runs the Gave, a river or rather a torrent which rises in the Pyrenees, and empties itself into the Adour. On the other side, about two, miles
Pau

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miles off, is a ridge of hills covered with vineyards, which produce the famous Vin de Joroncon, so much admired; and beyond all, at the distance of nine leagues appear the Pyrenees themselves, covering the horizon from east to west, and bounding the prospect. The castle, though now in a state of decay, is still habitable; and the apartments are hung with tapestry, said to be the work of Jane queen of Navarre, and mother of Henry IV. Gafnon IV. Count de Foix, who married Leonora heiress of the crown of Navarre, began the edifice in 1464; but his successor Henry d'Albret completed and enlarged it about the year 1519, when he made choice of the city of Pau for his residence, and where, during the remainder of his reign, he held his little court. In a chamber, which by its size was formerly a room of state, is a fine whole length portrait of that Jane queen of Navarre whom I have just mentioned. Her dress is very splendid, and resembles those in which Queen Elizabeth is usually painted. Her head dress is adorned with pearls; round her neck she wears a ruff; and her arms, which are likewise covered with pearls, are concealed by her habit quite down to the wrist. At her waist hangs by a chain a miniature portrait. The fingers of her right hand play on the strings of a guitar; and in her left she holds an embroidered handkerchief. The painter has drawn her as young, yet not in the first bloom of youth. Her features are regular, her countenance thin, but rather inclining to long; the eyes hazel, and the eyebrows finely arched. Her nose is well formed though large, and her mouth pretty. She was a great princess, of high spirit, and undaunted magnanimity. Her memory is not revered by the French historians, because she was the protetress of the Huguenots and the friend of Cologni; but the actions of her life evince her distinguished merit.

In one of the adjoining chambers, is another portrait of Henry IV, himself when a boy; and on the second floor is the apartment in which he was born. The particulars of his birth are in themselves so curious, and as relating to so great and good a prince are so peculiarly interesting, that I doubt not you will forgive me enumerating them, even though you should have seen them elsewhere.—His mother Jane had already lost two sons, the duke of Beaumont and the count de Marie. Henry d'Albret, her father, anxious to see an heir to his dominions, enquired her (when she accompanied her husband Antony of Bourbon to the wars of Picardy against the Spaniards), if she proved with child, to return to Pau, and to lie-in there, as he would himself superintend the education of the infant from the moment of its birth. He threatened to disinherit her if she failed to comply with this injunction. The princes, in obedience to the king's command, being in the ninth month of her pregnancy, quitted Compiègne in the end of November, traversed all France in 15 days, and arrived at Pau, where she was delivered of a son on the 15th December 1533. She had always been devout, and he her father's will, which he kept in a golden box; and he promised to show it to her, provided she admitted of his being present at her delivery, and would during the pains of her labour sing a song in the Bearnois language. Jane had courage enough to perform this unusual request; and the king being called on the first news of her illness, she immediately sung a Bearnois song, beginning, 'Notre Dame du bout du pont, aidez moi en cette heure.'—As she finished it, Henry was born. The king instantly performed his promise, by giving her the box, together with a golden chain, which he tied about her neck; and taking the infant into his own apartment, began by making him swallow some drops of wine, and rubbing his lips with a root of garlic. They still show a tortoise-shell which served him for a cradle, and is preserved on that account. Several of the ancient sovereigns of Navarre resided and died in the castle of Pau. François Thebus, who ascended the throne in 1479, died here in 1483. Pau is a handsome city, well built, and contains near 6000 inhabitants. It is a modern place, having owed its excellence entirely to the castle, and to the residence of the kings of Navarre. W. Long. o. 4. N. Lat. 43. 15.

PAVAN, or Pavé, a grave dance used among the Spaniards, and borrowed from them; wherein the performers make a kind of wheel or tail before each other, like that of pauro, "a peacock's" from whence the name is derived. The paavan was formerly in great repute; and was danced by gentlemen with cup and sword; by those of the long robe in their gowns, by princes with their mantles, and by the ladies with their gown tails trailing on the ground. It was called the grand bol, from the solemnity with which it was performed. To moderate its gravity, it was usual to introduce several flourishes, passes, and capers, &c. by way of episodes. Its tablature or score is given at large by Thoinot Arbeau in his Orchesographia.

PAVETTA, in botany; A genus of the monogynia order, belonging to the tetrandra class of plants; and in the natural method ranking under the 47th order, Stellatae. The corolla is monopetalous and funnel-shaped above; the stigma carved; the berry disperses.

Pavia, an ancient and celebrated town of Italy, in the duchy of Milan, and capital of the Pavian, with an university and bishop's see. It was formerly called Ticinum, from its situation on that river, and lies 50 miles to the southward of Milan. It was formerly the capital of the Longobardic kingdom, and is still remarkable for the breadth of its streets, the beauty and richness of some of its churches, and for its university, founded by Charlemagne, and for several other literary institutions. Here is a bishop's see, which was once the richest in Italy, but is now dependent on the pope; and upon the whole the city is gone to decay, its trade being ruined through the exactions of the government. The few objects within it worth the public attention belong to the clergy or monks; and the church and convent of the Carthusians are inexpressibly noble, the court of the convent being one of the finest in the world, and surrounded by a portico supported by pillars, the whole a mile in circumference. It is defended by strong walls, large ditches, good ramparts, excellent battlements, and a bridge over the river Tan. In the centre of the town is a strong castle, where the duke of Milan was wont to reside. There are a great number of magnificent cattles, and some colleges. It was taken by the duke of Savoy in 1706; by the French
PAVILION, in architecture, signifies a kind of turret or building, usually infilled, and contained under a single roof; sometimes square and sometimes in form of a dome: thus called from the resemblance of its roof to a tent.

Pavilions are sometimes also projecting pieces, in the front of a building, marking the middle thereof; sometimes the pavilion flanks a corner, in which case it is called an angular pavilion. The Lvivre is flanked with four pavilions; the pavilions are usually higher than the rest of the building. There are pavilions built in gardens, commonly called summer-houses, pleasure-houses, &c. Some castles or forts consist only of a single pavilion.

PAVILION, in military affairs, signifies a tent raised on poles, to lodge under in the summer-time.

PAVILION, is also sometimes applied to flags, colours, ensigns, standards, banners, &c.

PAVILION, in heraldry, denote a covering in form of a tent, which invests or wraps up the armorial devices of divers kings, and sovereigns, depending only on God and their subjects.

The pavilion consists of two parts: the top, which is the chaplain, or cornet; and the curtain, which makes the middle.

None but sovereign monarchs, according to the French heralds, may bear the pavilion entire, and in all its parts. Those who are elective, or have any dependence, may take the heralds off the head, and retain nothing but the curtains.

PAVILIONS, among jewellers, the underfides and corners of the brilliants, lying between the girdle and the corder.

PAVING, the construction of ground-flours, streets, or highways, in such a manner that they may be conveniently walked upon. In Britain, the pavement of the grand streets, &c. are usually of flint, or rubble-stone; courts, flables, kitchens, halls, churches, &c. are paved with tiles, bricks, flags, or firestone; sometimes with a kind of free-stone and rag-stone.

In some streets, &c. of Venice, the pavement is of brick: churches sometimes are paved with marble, and sometimes with mosaic work, as the church of St Mark at Venice. In France, the public roads, streets, courts, &c. are all paved with gres or grit, a kind of freestone.

In Amsterdam, and the chief cities of Holland, they call their brick pavement the burghe-masters pavement, to distinguish it from the stone or flint pavement, which usually takes up the middle of the street, and which serves for carriages; the brick which borders it being defined for the piazza of the people on foot.

Pavements of free-stone, flint, and flags, in streets, &c. are laid dry, i. e. in a bed of sand: those of courts, flables, ground-rooms, &c. are laid in a mortar of lime and sand; or in lime and cement, especially if there be vaults or cellars underneath. Some masons, after laying a floor dry, especially of brick, spread a thin mortar over it; sweeping it backwards and forwards to fill up the joints. The several kinds of pavement are as various as the materials of which they are composed and whence they derive the name by which they are distinguished; as,

1. Pebble-paving, which is done with stones collected from the sea-beach, mostly brought from the islands of Guernsey and Jersey: they are very durable, indeed the most so of any stone used for this purpose. They are used of various sizes, but those which are from six to nine inches deep, are esteemed the most serviceable. When they are about three inches deep, they are denominated builders or bowers; these are used for paving court yards, and other places not accustomed to receive carriages with heavy weights; when laid in geometrical figure, they have a very pleasing appearance.

2. Rag-paving was much used in London, but is very inferior to pebbles; it is dug in the vicinity of Maidstone in Kent, from which it has the name of Kentish rag-stone; there are squared stones of this material for paving coach-tracks and foot-ways.

3. Purbeck pitches, square stones used in foot-ways; they are brought from the island of Purbeck, and also frequently used in court yards; they are in general from six to ten inches square, and about five inches deep.

4. Squared paving, for decoration by some called Scotch paving, because the flat of this kind paved in the manner that has been and continues to be paved, came from Scotland; the first was a close close stone, called blue whinny, which is now disused, because it has been found inferior to others since introduced in the order they are hereafter placed.

5. Granite, a hard material, brought also from Scotland, of a reddish colour, very superior to the blue whinny quarry, and at present very commonly used in London.

6. Guernsey, which is the best, and very much in use; it is the same stone with the pebble before spoken of, but broken with iron hammers, and squared to any dimensions required of a prismatical figure, set with its smallest base downwards. The whole of the foregoing paving should be bedded and paved in small gravel.

7. Purbeck paving, for foot-ways, is in general got in large surfaces about 2; inches thick; the blue is the hardest and the best of this kind of paving.

8. York-stone paving, is an exceeding good material for the same purpules, and is not of almost any dimensions of the same thickness as the Purbeck. This stone will not admit the wet to pass through it, nor is it affected by the frost.

9. Ryegate, or fire-stone paving, is used for hearths, floors, ovens, and such places as are liable to great heat, which does not affect the stone if kept dry.

10. Newcastle flags, are stones about two feet square, and 1½ or two inches thick; they answer very well for paving out-offices: they are somewhat like the Yorkshire.

11. Portland paving, with stone from the island of Portland; this is sometimes ornamented with black marble dots.

12. Swadling paving, is a black slate dug in Leicestershire, and looks well for paving halls, or in party-coloured paving.

13. Marble paving, is mostly variegated with different marbles, sometimes inlaid in mosaic.

14. Flat brick paving, done with brick laid in sand, mortar

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Paving, or grotte, as when liquid lime is poured into the joints.

15. Bricks on edge paving, done with brick laid edge-wise in the same manner.
16. Bricks are also laid flat or edgewise in herring-bone.
17. Bricks are also sometimes laid endwise in sand, mortar, or grotte.
18. Paving is also performed with paving bricks.
19. With ten inch tiles.
20. With foot tiles.
21. With clinker for flables and outer offices.
22. With the bones of animals, for gardens, &c.

And, 23. We have knob-paving, with large gravel-flones, for porticoes, garden-peats, &c.

Pavements of churches, &c. frequently consist of flones of several colours; chiefly black and white, and of several forms, but chiefly squares and lozenges, artfully disposed, there being a great variety of colours to make a surprising diversity of figures and arrangements. M. Truchet, in the Memoirs of the French Academy, has shown by the rules of combination, that two square-flones, divided diagonally into two colours, may be joined together checkerwise in different ways: which appears surprising enough: since two letters or figures can only be combined in two ways.

The reason is, that letters only change their situation with regard to the first and second, the top and bottom remaining the same, but in the arrangement of these flones, each admits of four several situations, in which the order of the square may be changed six times, which gives 64 combinations.

Indeed, from a farther examination of these 64 combinations, he found there were only 32 different figures, each figure being repeated twice in the same situation, though in a different combination; so that the two only differed from each other by the transposition of the dark and light parts.

PAUL, formerly named Saul, was of the tribe of Benjamin, a native of Tarsus in Cilicia, a Pharisee by profession; first a persecutor of the church, and afterwards a disciple of Jesus Christ, and apostle of the Gentiles. It is thought he was born about two years before our Saviour, supposing that he lived 68 years, as we read in a homily which is in the fifth volume of St Chrysofom's works. He was a Roman citizen (Acts xxii. 27, 28.), because Augustus had given the freedom of the city to all the freemen of Tarsus, in consideration of their firm adherence to his interests. His parents sent him early to Jerusalem, where he studied the law at the feet of Gamaliel a famous doctor (id. xxii. 3.) He made very great progress in his studies, and his life was always blameless before men; being very zealous for the whole observance of the law of Moses (id. xxvi. 4, 5.) But his zeal carried him too far; he perverted the church, and insulted Jesus Christ in his members (1 Tim. i. 13.); and when the

protomartyr St Stephen was foned, Saul was not only confenting to his death, but he even stood by and took care of the clothes of those that foned him (Acts vii. 58, 59.) This happened in the 33d year of the common era, some time after our Saviour's death.

At the time of the perfecution that was raised against the church, after the death of St Stephen, Saul was one of those that allowed most violence in diffreting the believers (Gal. i. 13. and Acts xxvi. 11.) He entered into their houses, and drew out by force both men and women, loaded them with chains, and sent them to prison (Acts viii. 3. and xii. 4.) He even entered into the synagogues, where he caused those to be beaten with rods that believed in Jesus Christ, compelling them to blaspheme the name of the Lord.

And having got credentials from the high-priest Caiaphas, and the chief Jews of Damascus, with power to bring to Jerusalem all the Christians he should find there, he went away full of threats, and breathing nothing but blood (Acts ix. 1, 2, 3, &c.) But as he was upon the road, and now drawing near to Damascus, all on a sudden about noon, he perceived a great light to come from heaven, which encompassed him and all those that were with him. This splendor threw them on the ground; and Saul heard a voice that said to him, "Saul, Saul, why persectest thou me?" It was Jesus Christ that spoke to him. To whom Saul answered, "Who art thou, Lord?" And the Lord replied to him, "I am Jesus of Nazareth whom thou percutest; it is hard for thee to kick against the pricks." Saul, all in confusion, asked, "Lord, what is it that thou wouldst have me do?" Jesus bid him arise and go to Damascus, where the will of the Lord would be revealed to him.

Saul then rose from the ground, and felt that he was deprived of sight; but his companions led him by the hand, and brought him to Damascus, where he continued three days blind, and without taking any nourishment. He lodged at the house of a Jew named Judas. On the third day, the Lord commanded a disciple of his, named Ananias, to go to find out Saul, to lay his hands upon him, and to cure his blindness. And as Ananias made excuses, saying, that this man was one of the most violent persecutors of the church, the Lord said to him, Go and find him, because this man is an instrument that I have chosen, to carry my name before the Gentiles, before kings, and before the children of Israel; for I will shew him how many things he must suffer for my name. Ananias went therefore, and found Saul, laid his hand upon him, and restored him to his sight; then rising, he was baptized, and filled with the Holy Ghost. After this he continued some days with the disciples that were at Damascus, preaching in the synagogues, and proving that Jesus was the Messiah (a).

From Damascus he went to Arabia (Gal. i. 17.), probably

(a) The conversion of such a man, at such a time, and by such means, furnishes one of the most complete proofs that have ever been given of the divine origin of our holy religion. That Saul, from being a zealous persecutor of the disciples of Christ, became all at once a disciple himself, is a fact which cannot be controverted without overturning the credit of all history. He must therefore have been converted in the miraculou...
Paul, probably into the neighbourhood of Damascus, being then under the government of Aretas king of Arabi; and having remained there for a little while, he returned to Damascus, where he began again to preach the gospel. He could not hear to see the progress that the gospel made there; and so resolved to put him to death; and they gained to their side the governor of Damascus, who was to apprehend him, and to deliver him to them. Of this Saul had early notice; and knowing that the gates of the city were guarded night and day to prevent him from making his escape, he was let down over the wall in a basket. And coming to Jerusalem to see Peter (Gal. 1:38.), the disciples were afraid to have any correspondence with him, not believing him to be a convert. But Barnabas having brought him to the apostles, Saul related to them the manner of his conversion, and all that had followed in consequence of it. Then he began to preach both to the Jews and Gentiles; and spoke to them with such strength of argument, that not being able to withstand him in reasoning, they resolved to kill him. For this reason, the brethren brought him to Caesarea of Palestine, from whence he came, probably by sea, into his own country Tarfus in Cilicia.

There he continued about five or six years, from the year of Christ 37 to the year 43; when Barnabas coming to Antioch by the order of the apostles, and there having found many Christians, went to Tar­fus to see Saul, and brought him with him to Antioch (Acts xi. 20, 25, 26), where they continued together a whole year, preaching to and instructing the faithful. During this time, there happened a great famine in Judea (Id. ch. 27, 28, &c.), and the Christians of Antioch having made some collections to assist their brethren at Jerusalem, they made choice of Paul and Barnabas to go thither with their offering. They arrived there in the year of Christ 44; and having acquitted themselves of their commission, they returned again to Antioch. They had not been there long before God warned them by the prophets he had in this church, that he had appointed them to carry his word into other places. Then the church betook themselves to fasting and praying, and the prophets Simeon, Lucius, and Manaen, laid their hands on them,

culous manner in which he himself said he was, and of course the Christian religion be a divine revelation; or he must have been either an impostor, an enthusiast, or a dupe to the fraud of others. There is not another alternative possible.

If he was an impostor, who declared what he knew to be false, he must have been induced to act that part by some motive: (See Miracle.) But the only conceivable motives for religious imposture are, the hopes of advancing one's temporal interest, credit, or power; or the prospect of gratifying some passion or appetite under the authority of the new religion. That none of these could be St Paul's motive for professing the faith of Christ crucified, is plain from the state of Judaism and Christianity at the period of his forsaking the former and embracing the latter faith. Those whom he left were the possessors of wealth, of dignity, of power, in Judea: those to whom he went were indigent men, oppressed, and kept from all means of improving their fortunes. The certain consequence therefore of his taking the part of Christianity was the loss not only of all that he possessed, but all hopes of acquiring more; whereas, by continuing to persecute the Christians, he had hopes rising almo to a certainty of making his fortune by the favour of those who were at the head of the Jewish state, to whom nothing could so much recommend him as the zeal which he had shown in that persecution. As to credit or reputation, the scholar of Gamaliel hope to gain either by becoming a teacher in a college of fishermen? Could he flatter himself, that the doctrines which he taught would, either in or out of Judea, do him honour, when he knew that "they were to the Jews a stumbling block, and to the Greeks foolishness?" Was it then the love of power that induced him to make this great change? Power! over whom? over a flock of sheep whom he himself had afflicted to destroy, and whose very Shepherd had lately been murdered? Perhaps it was with the view of gratifying some licentious passion, under the authority of the new religion, that he commenced a teacher of that religion! This cannot be alleged; for his writings breathe nothing but the freest morality, obedience to magistrates, order, and government, with the utmost abhorrence of all licentiousness, idleness, or loose Behaviour, under the cloak of religion. We nowhere read in his works, that faults are above moral ordinances; that dominion is founded in grace; that monarchy is despotic in which ought to be abolished; that the fortunes of the rich ought to be divided among the poor; that there is no difference in moral actions; that any impulses of the mind are to direct us against the light of our reason and the laws of nature; or any of those wicked tenets by which the peace of society has been often disturbed and the rules of morality often broken, by men pretending to act under the sanction of divine revelation. He makes no distinction, like the impostor of Arabia, in favour of himself; nor does any part of his life, either before or after his conversion to Christianity, bear any mark of a licentious disposition. As among the Jews, so among the Christians, his conversations and manners were blameless. It has been sometimes objected to the other apostles, by those who were resolved not to credit their testimony, that, having been deeply engaged with Jesus during his life, they were obliged, for the support of their own credit, and from having gone too far to return, to continue the same professions after his death; but this can by no means be said of St Paul. On the contrary, whatever force there may be in that way of reasoning, it all tends to convince us, that St Paul must naturally have continued a Jew, and an enemy to Christ Jesus. If they were engaged on one side, he was as strongly engaged on the other. If shame withheld them from changing sides, much more ought it to have stopped him: who, from his superior education, must have been vastly more sensible to that kind of shame than the mean and illiterate fishermen of Galilee. The only other difference
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ineffable things, and which were above the
prehension of man (2 Cor. xii. 2, 3, 4, and Acts xiii. 4, 5, 6, &c.)

Saul and Barnabas went first into Cyprus, where
they began to preach in the synagogues of the Jews.

When they had gone over the whole island, they there
found a Jewish magician called Bar-jesus, who was with
the proconsul Sergius Paulus; and who refuted them,
and endeavoured to prevent the proconsul from
embracing Christianity: whereupon St Paul struck
him with blindness; by which miracle the proconsul, being
blind for three days, said he was ignorant, no man will allege
that he was ignorant, no man will allege

That he had very attentively; and he was
and was deceived by the fraud of others: but this inquiry needs not be long, for
matters of indifference, to "become all things to all men," with the most pliant
condescension, bending his notions and manners to theirs, as far as his duty to
God would permit; a conduct
compatible neither with the stiffness of a bigot nor with the
violence and violence of fanaticical delusion.

That he was not melancholy, is plain from his conduct in embracing every method which prudence could suggest
to escape danger and thus persecution, when he could do it without betraying the duty of his office or the
honour of his God. A melancholy enthusiast courts persecution; and when he cannot obtain it, afflicts him-
self with absurd penances: but the holiness of St Paul consisted only in the simplicity of a godly life, and in the
unnarrowed performance of his apostolical duties. That he was ignorant, no man will allege who is not
grossly ignorant himself; for he appears to have been master not only of the Jewish learning, but also of the
Greek philosophy, and to have been very conversant even with the Greek poets. That he was not credulous,
is plain from his having refuted the evidence of all the miracles performed on earth by Christ, as well as those
that were afterward worked by the apostles; to the fame of which, as he lived in Jerusalem, he could not
possibly have been a stranger. And that he was as free from vanity as any man that ever lived, may be gathered
from all that we see in his writings, or know of his

...
course again on the same subject the next sabbath-day; and several, both Jews and Gentiles, followed them, to receive particular instructions more at leisure. On the Sabbath-day following, almost all the city met together to hear the word of God: but the Jews, seeing the concourse of people, were moved with envy at it: oppressed, with blasphemies, what St Paul said; and not being able to bear the happy progress of the gospel in this country, they raised a persecution against the two apostles: whereupon Paul and Barnabas, shaking off the dust upon their feet against them, came from Antioch in Pisidia to Iconium. Being come thereto, they preached in their synagogue, and converted a great number, both of Jews and Gentiles: and God confirmed their commission by a great number of miracles (Acts xiv. 1, 2, &c.). In the mean time, the unbelieving Jews, having incensed the Gentiles against Paul and Barnabas, and threatening to stone them, they were obliged to retire to Lystra and Derbe, cities of Lycaonia, where they preached the gospel. At Lystra, there was a man who had been lame from his mother's womb. The man fixing his eyes on St Paul, the apostle bid him rise, and stand upon his feet: whereupon he presently rose up, and walked; the people, seeing this miracle, cried out, that the gods were descended among them in the shape of men. They called Barnabas Jupiter, and Paul Mercury, because of his eloquence, and being the chief speaker. The priest of Jupiter brought a bull before the gate, to offer sacrifices to them: but Paul and Barnabas tearing their clothes, and cutting themselves into the middle of the multitude, cried out to them, Friends, what do you do? we are men as well as yourselves: and we are preaching to you to turn away from these vain superstitiouns, and to worship only the true God, who has made heavens and earth. But whatever they could say, they had much ado to restrain them from offering sacrifices to them.

In the mean time, some Jews of Antioch in Pisidia and of Iconium coming to Lystra, animated the people against the apostles. They flonned Paul, and drew him out of the city, thinking him to be dead. But the disciples gathering together about him, he rose up among them, entered again into the city, and the day after left it with Barnabas to go to Derbe. And having here preached the gospel also, they returned to Lystra, to Iconium, and to Antioch in Pisidia. Paffing throughout Pisidia, they came to Pamphylia, and having preached the word of God at Perga, they went down into Attalia. From hence they set sail for Antioch in Syria, from whence they had departed a year before. Being arrived there, they assembled the church together, and told them the great things God had done by their means, and how he had opened to the Gentiles a door to salvation; and here they continued a good while with th: disciples.

St Luke does not inform us of the actions of St Paul from the 45th year of Christ to the time of the council at Jerusalem, which was held in the 50th year of Christ. There is great likelihood that it was during this interval that St Paul preached the gospel from Jerusalem to Illyricum, as he informs us in his epistle to the Romans (xv. 19.) and this without making any stay in those places where others had preached before him. He does not acquaint us with the particulars of those journeys, nor with the success of his preaching; but he says in general, that he had suffered more labours than any other, and had endured more prisons. He was often very near death itself, sometimes upon the water and sometimes among thieves. He run great dangers, sometimes from the Jews and sometimes among false brethren and perverted Christians; he was exposed to great hazards, as well in the cities as in the deserts: he suffered hunger, thirst, nakedness, cold, floggings, watchings (2 Cor. xi. 23-27.), and the fatigues inseparable from long journeys, which were undertaken without any prospect of human succour; in this very different from the good fortune of others who lived by the gospel, who received subsistence from those to whom they preached it, and who were accompanied always by religious women, who ministered to them in their necessaries occasions. He made it a point of honour to preach gratis, working with his hands that he might not be chargeable to any (1 Cor. ix. 1-5.); for he had learned a trade, as was usual among the Jews, which trade was to make tents of leather for the ufe of those that go to war (Acts xviiii. 3.)

St Paul and St Barnabas were at Antioch when some persons coming from Judea (Acts xv 1, 2, &c.) pretended to teach, that there was no salvation without circumcision, and without the observation of the other legal ceremonies. Epiphanius and Philaster say, that he that maintained this was Cerinthus and his followers. Paul and Barnabas withdofl their new doctors; and it was agreed to send a deputation to the apostles and elders at Jerusalem about this question. Paul and Barnabas were deputed; and being arrived at Jerusalem, they reported to the apostles the subject of their commission. Some of the Pharisees that had embraced the faith, adhered, that the Gentiles, that were converted ought to receive circumcision, and to observe the rest of the law. But the apostles and elders assembled to examine into this matter, it was by them decreed, that the Gentiles, who were converted to Christianity, should not be obliged to submit to the yoke of the law, but only to avoid idolatry, fornication, and the eating of things strangled, and blood.

St Paul and St Barnabas were then sent back to Antioc'h with letters from the apostles, which contained the decision of the question, and the resolution of that angelical assembly. The apostles also deputed Jude surnamed Barfaba and Silas, who were principal brethren, to go to Antioch with Paul and Barnabas to give their testimony of what had been decreed at Jerusalem. Being arrived at Antioch, they assembled the faithful, read to them the apostles' letter, and acquainted them, that it had been resolved to discharge them from the yoke of the ceremonial law. Some time after this, St Peter coming to Antioch and joining himself to the converted Gentiles, he lived with them without scruple; but some brethren happening to arrive there from Jerusalem, he separated himself from the Gentile converts, and did no longer eat with them: for which conduct St Paul publicly cenfured him (Gal. ii. 11-16.) St Paul (id. ii. 2, 3, &c.) in the same journey to Jerusalem declared openly to the faithful there the doctrine he preached among the Gentiles; and besides disowned of it in private among the chief of them in presence of Barnabas and Titus.
Paul

St Peter, St James, and St John, with whom he had these conversations, could find nothing either to be added or amended in so pure and so sound a doctrine and manner. They saw with joy the grace that God had given him; they acknowledged that he had been appointed the apostle of the Gentiles, as St Peter had been of the circumcision. They concluded that Paul and Barnabas should continue to preach among the Gentiles; and only recommended to them to take care concerning the collections for the poor; that is to say, to exhort the converted Christians among the Gentiles, to afflict the faithful brethren in Judea, who were in necessity; whether it were because they had sold and distributed their goods, or because they had been taken away from them (Heb. x. 34).

After Paul and Barnabas had continued some days at Antioch, St Paul proposed to Barnabas to return and visit the brethren through all the cities wherein they had planted the gospel, to see in what condition they were. Barnabas consented to the proposal; but infilled upon taking John Mark along with them. This was opposed by Paul, which produced a separation between them. Barnabas and John Mark went together to Cyprus; and St Paul, making choice of Silas, crossed over Syria and Cilicia, and came to Derbe, and afterwards to Lystra (Acts xv. 1, 2, &c.) Here they found a disciple called Timothy, whom St Paul took with him, and circumcised him that he might not offend the Jews of that country. When therefore they had gone over the provinces of Lycaonia, Phrygia, and Galatia, the Holy Ghost would not allow them to preach the gospel in the proconsular Asia, which contained Iconium, Aeolia, and Lydia. They therefore went on to Myra, and coming to Troas, St Paul had a vision in the night. A man, habited like a Macedonian, presented himself before him, and said, Paul and Silas went into Macedonia and came and succour us. Immediately he set out on this journey, not doubting but that God had called him into this country.

Embarking therefore at Troas, they failed towards midnight, which it immediately followed. St Paul and Silas: but the greatest part of the Jews of that country. Hence they came to Philippi, where St Paul had a great ear. Thither he came and succour us. But it shall not be so, for you yourselves shall come to fetch us out. The magistrates hearing that they were Roman citizens, came to excuse themselves; and having brought them out of prison, they desired them to depart out of their city. Paul and Silas went first to the house of Lydia, where having visited and comforted the brethren, they departed from Philippi.

Then passing through Amphipolis and Apollonia, they came to Thessalonica the capital city of Macedonia, where the Jews had a synagogue (Acts xvii. 1, &c.) Paul entered therein, according to his custom, and there preached the gospel to them for three Sabbath days successively. Some Jews and several profylytes believed in Jesus Christ, and united themselves to Paul and Silas: but the greatest part of the Jews being led away by a false zeal, raised a tumult in the city, and went to the house of Jason, where St Paul lodged. But not finding him there, they took Jason and led him before the magistrates, where they accused him of harbouring in his house people that were disobedient to the ordinances of the emperor, and who affirmed that there was another king besides him, one Jesus whom they preached up. But Jason having given security to answer for the people who were accused, he was dismissed to his own house; and the night following the brethren conducted Paul and Silas out of the city, who went to Berea, where they began to preach in the synagogue. The Jews of Berea heard them gladly, and many of them were converted; as also several of the Gentiles and many women of distinction that were not Jews.

The Jews of Thessalonica being informed that Paul and Silas were at Berea, came thither and animated the mob against them; so that St Paul was forced to withdraw, leaving Silas and Timothy at Berea to finish the work he had so happily begun. Those who conducted St Paul embarked along with him, and brought him as far as Athens (Theod. in Thek.); where he arrived in the fifty-second year of Jesus Christ. As soon as he was got thither, he sent back those that had brought him, with orders to tell Jason and Timothy, that he desired them to follow him to Athens as soon as possible. In the mean time, he went into a synagogue of the Jews, and preached to them as often as he had opportunity; and disputing with the philosophers who were frequent in that place, they...
they last brought him before the Areopagus, accusing him of introducing a new religion. St Paul being come before the judges, pleaded in his own defence, that among other marks of superflition which he had found in that city, he had observed an altar inscribed, "To the unknown God." It was therefore this God whom they confessed that they knew not, that he came to make known to them. Afterwards he spoke to them of God the creator of heaven and earth, of the superintendence of a providence, of the last judgment, and of the resurrection of the dead. But after they had heard of the resurrection, some made scorn of him, and others desired to hear him another time. However some of them embraced the Christian faith, of which number was Dionysius a senator of the Areopagus, and a woman called Damarsis, and several others with them.

St Timothy came from Berea to Athens according to the request of St Paul, and informed him of the persecution with which the Christians of Thessalonica were then afflicted. This obliged the apostle to send him into Macedonia, that he might comfort them and keep them steadfast (1 Thess. iii. 1, 2, &c.) After this St Paul left Athens and went to Corinth, where he lodged with one Aquila a Jew, and by trade a tentmaker (Acts xviii. 1, 2, &c.) With this Aquila the apostle worked, as being of the same trade himself. But, however, he did not neglect the preaching of the gospel, which he performed every day in the synagogue, showing both to the Jews and Gentiles that Jesus was the Messiah. There he made several converts; and he tells us himself (1 Cor. i. 14-17. and he was exposed to wild troubles, or delivered from the devils that were by him; though some are of opinion, that the fight here mentioned by St Paul was nothing else but the feuds he had with Demetrius the silversmith and his companions, who were disappointed in their attempt of putting the apostle to death. It was during his abode at Ephesus that the apostle wrote his epistle to the Galatians.

After this St Paul proposed, at the instigation of the Holy Ghost, to pass through Macedonia and Achaia, and afterwards to go to Jerusalem. And then after he had been there, he must also see Rome; and having sent Timothy and Eratus before to Macedonia, he tarried some time in Asia. During this time, he received intelligence that dometie troubles had rived in the church of Corinth, and that abuses had begun to creep in; which made him resolve to write his first epistle to that church.

Soon after this, taking leave of the disciples, he departed for Macedonix (Acts xx. 1, 2, &c.), He embarked at Troas, took Timothy with him, and then passed into Macedonia (2 Cor. ii. 12, and vii. 5-15). Titus came thither to him, and acquainted him with the good effects that his letter had produced among the Corinthians; and told him, that the collections that had been made by the church of Corinth, for the faithful in Palestine were now ready; which engaged Paul to write a second letter to the Corinthians. St Paul, having paused through Macedonia, came into Greece or Achaia, and there continued three months. He visited the faithful of Corinth;
and having received their alms, as he was upon the point of returning into Macedonia, he wrote his epistle to the Romans.

At last he left Greece, and came into Macedonia, in the year of Christ 58, intending to be at Jerusalem at the feast of Pentecost. He fixed some time at Philippi, and there celebrated the feast of the passover. From hence he embarked and came to Troas, where he continued a week. On the first day of the week the disciples being assembled to break bread, as St Paul was to depart the day following, he made a discourse to them which held till midnight. During this time a young man called Eutychus, happening to fall in a window and fall asleep, fell down three stories high, and was killed by the fall. St Paul came down to him, and embraced him, and restored him to life again. Then he went up again, broke bread and eat it, and continued his discourse till day-break, at which time he departed. Those of his company took ship at Troas; but as for himself he went on foot as far as Assos, otherwife called Apollonia, and then embarked along with them at Mitylene. From hence he came to Miletus, whither the elders of the church of Ephesus came to see him; for he had not time to go to them, because he was desirous of being at Jerusalem at the feast of Pentecost.

When these elders were arrived at Miletus, St Paul discoursed with them, and told them that he was going to Jerusalem without certainly knowing what should happen to him; however he did not doubt but that he had much to suffer there, since in all cities the Holy Ghost had given him to understand, that chains and afflictions waited for him at Jerusalem. Nevertheless, he declared to them, that all this did not terrify him, provided he could but fulfill his ministry. After having inquired them to patience, and having prayed along with them, he went on board, going straight to Coos, thence to Rhodes, and thence to Patara (Acts xxii. 3, 2, &c.), where finding a ship that was bound for Phœnicia, they went on board and arrived safe at Tyre. Here they made a stay for seven days, and then going on, they arrived at Ptolemais, and thence at Cæsarea, where they found Philip the evangelist, who was one of the seven deacons. While St Paul was there, the prophet Agabus came thither also from Judea; and having taken St Paul's girdle, he bound his own hands and feet with it, saying, "Thus shall the Jews of Jerusalem bind the man that owns this girdle, and shall deliver him up to the Gentiles." But St Paul's constancy was not shaken by all these predictions; and he told them, that he was ready, not only to suffer bonds, but death itself, for the name of Christ.

When he was come to Jerusalem, the brethren received him with joy; and the day following he went to see St James the less, bishop of Jerusalem, at whose house all the elders assembled. Paul gave them an account of what God had done among the Gentiles by his ministry. Then St James informed him, that the converted Jews were strangely prejudiced against him, because they were informed he taught the Jews that lived among the Gentiles and out of Palestine, that they ought to renounce the law of Moses, and no longer circumcise their children. Therefore, continued St James, we must assemble them here together, where you may speak to them yourself, and undeceive them. Moreover do this, that your acts may verify your words: join yourself to four men that are here, and who have taken upon them a vow of Nazarite ship; and that you may share in the merit of their action, contribute to the charge of their purification, and purify yourself also, that you may offer with them the offerings and sacrifices ordained for the purification of a Nazarite. See Nazarite.

St Paul exactly followed this advice of St James, and on the next day went into the temple, where he declared to the priests, that in seven days the four Nazarites would complete their vow of Nazarite ship; and that he would contribute his share of the charges. But towards the end of the seven days, the Jews of Asia having seen him in the temple, moved all the people against him, laid hold of him, and cried out, "Help, ye Israelites, this is he that teaches every where against the law, and against the temple, and has brought Gentiles into the temple, and profaned this holy place." At the same time they laid hold on him, shut the gates of the temple, and would have killed him, had not Lyfias the tribune of the Roman garrison there run to his rescue, taken him out of their hands, and brought him into the citadel. St Paul being upon the steps, defied the tribune to suffer him to speak to the people, who followed him thither in a great multitude. The tribune permitted him, and St Paul, making a sign with his hand, made a speech in Hebrew (Acts xxii.), and related them the manner of his conversion, and his mission from God to go and preach to the Gentiles. At his mentioning the Gentiles, the Jews began to cry out, "Away with this wicked fellow out of the world, for he is not worthy to live."

Immediately the tribune made him come into the stocks, and ordered that he should be examined by whipping him, in order to make him confess the matter why the Jews were so incensed against him. Being now bound, he said to the tribune, "Is it lawful for you to whip a Roman citizen before you hear him?" The tribune hearing this, caused him to be unbound, and called together the priests and the senate of the Jews, he brought Paul before them, that he might know the occasion of this tumult of the people. Then Paul began to speak to them to this purpose, (Acts xxii.): "Brethren, I have lived in all good conscience before God until this day." At which words, Ananias, son of Nebedeus, who was the chief-priest, ordered the bystanders to give him a blow in the face. At which St Paul said to him, "God shall smite thee, thou witless whit; for fittest thou to judge me after the law, and commandest me to be smitten contrary to the law?" Those that were present said to him, "Revilest thou God's high-priest?" St Paul excused himself by saying, that he did not know he was the high priest, "For it is written, thou shalt not speak evil of the ruler of thy people." Then perceiving that part of the assembly were Sadducees and part Pharisees, he cried out, "Brethren, I am a Pharisee, the son of a Pharisee; of the hope and resurrection of the dead I am called in question."

Then the assembly being divided in interests and opinions, and the clamour increasing more and more, the tribune ordered the soldiers to fetch him away out of
of the assembly, and bring him into the castle. The
following night the Lord appeared to Paul, and said
to him, "Take courage, for as you have borne testi-
mony of me at Jerusalem, so must you also at Rome." 
The day following, more than 40 Jews engaged them-
selves by an oath, not to eat or drink till they had killed Paul. They came therefore, and made known their
design to the priests and chief of the people faying to
them, "To-morrow caufe Paul to appear before you, as if you would inquire more accurately into his affair, and before he can come to you, we will lie in wait for him and kill him." But St Paul, being inforined of this conspiracy by his father's son, ac-
quainted the tribune with it; who gave orders that the
night following he should be sent to Caesarea, to felices by
Felix the Governor, who had his ordinary resi-
tence there. Felix having received letters from Lyfus and been informed that St Paul was of Cilicia, he told
him he would hear him when his accusers should ar-
rive.

Five days after, Annanias the high priest and some
of the senators came to Caesarea, bringing with them
Tertullus the orator, to plead against Paul. Tertul-
lus accused him of being a seditious person, a distur-
er of the public peace; one who had put himself at the
head of a sect of Nazarenes, and who made no scruple
even to profane the temple, (id. xxiv.) But St Paul eas-
ily refuted these calumnies, and declcied his accusers
to prove any of the articles they had alleged against
him: he ended his discourse by saying, "That for
the doctrine of the resurrection from the dead, his adver-
saries would have him condemned," Felix put off the
further hearing of this cause till another time; and,
seven days after, came himself with his wife Druf-
illa to hear Paul: and being in hopes that the apo-
file would purchase his freedom with a sum of money,
he used him well, often sent for him, and had frequent
conversations with him.

Two years having passed thus away, Felix made
way for his successor Portius Felix; but being will-
ning to oblige the Jews, he left Paul in prison. Felix
being come to Jerusalem, the chief priests defircd to
send for Paul, with a defign to fall upon him by the
way. But Felix told them, they might come to Caes-
area, where he would do them justice. Hither the
Jews came, and accused Paul of several crimes, of
which he was able to prove nothing, (id. xxv.) Felix
then proffered to the apostle to go to Jerusa-
lem, and be tried there; but he answered, "That he
was now at the emperor's tribunal, where he ought to
be tried; and that he appealed to Caesar;" whereupon
Felix, having conferred with his council, told him, that
therefore to Caesar he should go.

Some days after, King Agrippa and his wife Beren-
icia coming to Caesarea, defircd to hear Paul; who
pleaded his caufe with such ability, that Agrippa ex-
claimed, "Almoft thou persuadest me to be a Chris-
lian." See AGrippa.

As soon, therefore, as it was resolved to send Paul into
Italy, he was put on board a ship at Adramyttium, a
city of Myfia; and having paflèd over the seas of Cilicia
and Pamphylia, the arrived at Myra in Lycia, where
having found a ship that was bound for Italy, they
went on board, (id. xxvii.) But the feafon being far
advanced (for it was at least the latter end of Septem-
ber), and the wind proving contrary, they with much
difficulty arrived at the Fair Haven, a port in the isle of
Crete. St Paul advised them to winter there: how-
ever, others were of opinion they had better go to Phe-
nicia, another harbour of the fame isle; but as they
were going thither, the wind drove them upon a little
island called Cauda, where the mariners, fearing to
strike upon some bank of sand, they lowered their
maft, and surrendered themfelves to the mercy of the
waves. Three days after this, they threw overboard
the sailing of the ship. Neither fun nor fars had
appeared now for 14 days. In this extreme danger an
angel appeared to St Paul, and {aid him, that God
had given him the lives of all that were in the ship with
him; which were in all 276 fouls. St Paul told them
of his vi fion, exhorted them to take courage, and pro-
nounced them that they fhould all come alive into an
island; and that the vessel only should be loft. On
the 14th night the fear was cast out the lead, and
thought by their founding that they approached near
to fome land. They were attempting to fave themfelves
by going into the boat; but St Paul told the centurion
and the soldiers, that except the sailors continued in
the ship, their lives could not be faved. Then the
soldiers cut the ropes of the boat, and let her drive.
About day break, St Paul persuaded them to take
some nourishment; affuring them that not a hair of
their heads fhould perifh. After his example, they
took fome food, and when they had eaten, they lighten-
ed their vessel, by throwing the corn into the fea.
A fhort time after, they perceived a fhore, where they
reached, if possible, to bring the fhip to. But the ves-
fel having struck against a neck of land that ran out
into the fea, fo that the head remained fixed, and the
ftern was exposed to the mercy of the waves; the sol-
diers, fearing left any of the prisoners, fhould make
their escape by swimming, were for putting them all to
the fword. But the centurion would not suffer them,
being willing to fave Paul; and he commanded them that
could swim to throw themselves fift out of the vefel:
and the reft got planks, fo that all of them came safe
to fhore. Then they found that the isle was called
Melita or Malta; the inhabitants of which received
them with great humanity, (Acts xxvii. 1, 2, 5, &c.)
They being all very wet and cold, a great fire was
lighted to dry them; and Paul having gathered up a
handful of fticks, and put them upon the fire, a viper
leaped out of the fire, and took hold of his hand. Then
the barbarous people faid to one another, "Without
doubt this man is a murderer; and though he has been
faved from the fhipwreck, yet divine vengeance will
pursue him, and will not suffer him to live." But
Paul, flaking the viper into the fire, received no in-
jury from it. The people, feeing this, changed their
opinion of him, and took him for a god; which opin-
ion of theirs was more confirmed, by his curing
the father of Publius, the chief man of the isle, of
a fever and bloody flux. After this miracle, they all
brought out their fick to him, and they were healed.
See Malta.

At the end of three months they embarked again,
and arrived, firft at Syracuse, then at Rhegium, and
lately at Puteoli. Here St Paul found some Christians,
who detained him for seven days; then he {et out
for Rome. The brethren of this city, having been in-
formed of St Paul's arrival came out to meet him as far as Appii forum, and the Three Taverns. And when he was come to Rome, he was allowed to dwell where he pleased, having a soldier to guard him, who was joined to him with a chain. Three days afterwards, St Paul defined the chief of the Jews there to come to him. He related to them in what manner he had been seized in the temple of Jerusalem, and the necessity he was under of appealing to Caesar. The Jews told him, that as yet they had received no information about his affair; and, as for Christianity, they knew nothing of it, but only that it was spoken against everywhere; however, that they should be very willing to have some account of that doctrine from him. A day was appointed for this purpose; when St Paul preached to them concerning the kingdom of God, endeavouring to convince them from Moses and the prophets, that Jesus was the Messiah. Some of them believed what he had said to them, while others disbelieved; so that they returned from him divided among themselves.

Paul dwelt for two whole years at Rome, from the year of Christ 61 to the year 63, in a lodging that he hired, where he received all that came to him, preaching the kingdom of God, and the religion of Jesus Christ, without any interruption.

Hitherto we have had the Acts of the Apostles for our guide, in compiling the history of St Paul; what we shall add hereafter, will be mostly taken from his own Epistles. His captivity did not a little contribute to the advancement of religion; for he converted several persons even of the emperor's court, (Phil. i. 12—18. and iv. 22.) The Christians of Philippi, in Macedonia, hearing that St Paul was a prisoner at Rome, sent Epaphroditus their bishop to him, to bring him money, and otherwise to affist him in their name, (Phil. ii. 25.) Epaphroditus fell sick at Rome; and when he went back to Macedonia, the apostle sent by him his Epistle to the Philipp ans.

It is not known by what means St Paul was delivered from his prison, and discharged from the accusation of the Jews. There is great probability that they durst not appear against him before the Emperor, as not having sufficient proof of what they laid to his charge. However that may be, it is certain that he was set at liberty, after having been two years a prisoner at Rome. He wrote also, during this imprisonment, his Epistles to Philemon and the Colossians.

He was ill in the city of Rome, or at least in Italy, when he wrote his Epistle to the Hebrews. St Paul, having got out of prison, went over Italy; and, according to some of the fathers, sailed into Spain; then into Judea; went to Ephesus, and there left Timothy (Heb. vii. 24. and 1 Tim. i. 3.) preached in Crete, and fixed there Titus, to take care to cultivate the church he had planted in that place. Probably he might also visit the Philippians, according to the promise he had made them, (Phil. i. 23. 26. and ii. 24.) and it is believed, that it was from Macedonia that he wrote the First Epistle to Timothy—Some time after, he wrote to Titus, whom he had left in Crete; he defines him to come to Nicopolis, from whence probably, he sent this letter. The year following, that is, the 63rd year of the Christian era, the apostle went into Asia, and came to Troas, (2 Tim. iv. 13.) Thence he went to visit Timothy at Ephesus, and from that to Mileitus, (2 Tim. iv. 20.) Lastly he went to Rome; and St Chrysostom says, that it was reported, that having converted a cup-bearer and a concubine of Nero, this fio provoked the Emperor, that he saufed St Paul to be apprehended, and clapped into prison. It was in this last place of confinement that he wrote his Second Epistle to Timothy, which Chrysostom looks upon as the apostle's last testament. See Timothy and Titus.

This great apostle at last conformed his martyrdom, the 29th of June, in the 66th year of Jesus Christ, by having his head cut off, at a place called the Salvian aquae. He was buried on the way of Oltium, and a magnificent church was built over his tomb, which is in being to this day. Calmet's Dict. &c.

Paul (St), Cave or Grotto of, in the island of Malta, where St Paul and his company took shelter from the rains when the viper fastened on his arm. Upon this spot there is a church built by the famed Alphonse de Vignacourt, grand master of the order, in the year 1606, a very handsomely built, but a small structure. On the altar piece is a curious painting, representing the apostle shaking off the viper, surrounded with men, women, and children, in attitudes of admiration and surprise, and in the Old Maltese garb; and the whole very well executed. On the top of the painting is the following inscription:

Viperis ignis aetna calore frustra Pauli
Manum invadit; is infule benedicens
Angulbus & herbis admitt omne virus.
M. D. C. V.

Paul, first bishop of Narbonne, or Sergius Paulus the proconsul, converted and made bishop by St Paul, was defended from one of the belt families of Rome. It is said the Apostle called himself Paul, from his name. The Spaniards will have him to be their apostle, which is not improbable; and it is said he died a martyr at Narbonne.

Paul V. by birth a Roman, was first clerk of the chamber, and afterwards nuncio to Clement VIII in Spain, who honoured him with a Cardinal's hat. He was advanced to the papal chair the 16th of May 1605, after Leo XI. The ancient quarrel between the secular and ecclesiastical jurisdictions, which in former times had occasioned so much bloodshed, revived in the reign of this pontiff. The senate of Venice had condemned by two decrees, 1. The new foundations of monasteries made without their concurrence. 2. The alienation of the estates both ecclesiastical and secular. The first decree passed in 1603, and the second in 1605. About the same time a canon and abbot, accused of rapine and murder, were arrested by order of the senate, and delivered over to the secular court; a circumstance which could not fail to give offence to the court of Rome. Clement VIII. thought it proper to dissemble or take no notice of the affair; but Paul V. who had managed the Genoese upon a similar occasion, flattered himself with the hopes that the Venetians would be equally plant. However, he was disappointed for the senate maintained that they held their power to make laws of God only; and therefore they refused to revoke their decrees and deliver up the ecclesiastical
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Paul. ecclesiastical prisoners into the hands of the nuncio, as
the pope demanded. Paul, provoked at this behaviour,
excommunicated the doge and senate; and threatened
to put the whole state under an interdict, if satisfac-
tion was not given him, within the space of 24
hours. The senate did no more than protest against
this menace, and forbid the publication of it through-
out their dominions. A number of pamphlets, from
both sides, soon announced the animosity of the two
parties. The Capuchins, the Theatins, and Jesu-
tis were the only religious orders who observed the
interdict. The senate shipped them all off for Rome,
and the Jesuits were banished for ever. Meanwhile his
holiness was preparing to make the refractory republic
submit to his spiritual tyranny by force of arms. He
levied troops against the Venetians; but he soon found
his design balked, as the cause of the Venetians ap-
tered to be the common cause of all princes. He
had recourse therefore to Henry IV. to settle the
problems; and this prince had all the honour of
bringing about a reconciliation between the contending
parties. His ambassadors at Rome and Venice be-
gan the negotiation, and Cardinal de Joyeuse finished
it in 1607. It was agreed upon, that this cardinal,
should declare at his entry into the senate, that the
censures of the church were to be taken off, or that
he would remove them; and that the doge should
at the same time surrender to him the deeds of revo-
cation and protest. It was also stipulated, that all the
religious who were banished, except the Jesuits, should
be restored to their former privileges. In fine, the
Venetians promised to lend an ambassador extraordinary
throughout to Rome, in order to thank the pope for the
favour he had done them; but they would not allow
the legate to speak of his holiness granting them ab-
fuon优惠。 Paul was wise enough to overlook the whole
matter, but endeavoured to put an end to another dif-
pute, which had been long agitated in the congregations
de auxilii. He caused it to be intimidated in form to the
disputants and counsellors, that, as the congregations
were now dissolved, it was his express order that the
contending parties should no longer continue to cen-
fure one another. Some authors have affirmed that
Paul V. had drawn out a bull against the doctrine of
Molin, which only wanted to be promulgated; but
for this fact there appears to be no other evidence
than the draught of this bull, which we meet with in
the end of the history of the above-menanted congregations.
Paul was strongly solicited, but in vain, to make the immaculate conception of the holy virgin, an
article of faith. He concealed himself with barest
attachment to the contrary doctrine, to be publicly taught, that he might not offend the Dominicans, who at that
time, maintained that she was conceived, like other hu-
nan creatures, in original sin. His holiness afterwards
applied himself to the establishing of Rome, and was
at great pains to collect the works of the most eminent
painters and engravers. Rome is indebted to him for
its most beautiful fountains, especially that where the
water spouts out from an antique vase taken from the
thermae or hot-baths of Vepachi, and that which
they call agger Pauli, an ancient work of Augustus,
repaired by Paul V. He brought water into it by an
aqueduct 33 miles in length, after the example of
Sixtus V. He completed the frontispiece of St Peter,
and the magnificent palace of Mount Cavallo. He
applied himself in a particular manner to the reco-
viving and repairing ancient monuments, which he
made to advance, as much as the nature of them
would admit, the honour of Christiinity; as appears
from an elegant inscription placed upon a column
of porphyry, taken from the temple of Peace, and bear-
ing a beautiful statue of the Virgin, at the side of
the church of St Mary the elder:

“Impera fulsi templam
Quondam numinis
Jubente moelde perierebam Cæsare :
Nunc laeta veri
Perferens matrem Dei
Te, Paulæ, nulla obiecto faculæ.”

His pontificate was honoured with several illustrious
ambassadors. The kings of Japan, Congo, and other
Indian princes, sent ambassadors to him. He took
care to supply them with missionaries, and to found
bishops and in these countries newly brought over to
the faith. He showed the same attention to the Ma-
ronites and other eastern Christians. He sent legates
to different orthodox princes, both to settle his eitement
for them, and to confirm them in their zeal for reli-
gion. He died the 28th of January 1621, aged 69;
after having confirmed the French oratory, the Uni-
tines, the Order of Charity, and some other institu-
tions. Bold in his claims, but of narrow views, he
distinguished himself more by his piety and and
knowledge than by his politics. It has been remarked, that
he never paid a single day of his papedom without
celebrating masses. He enjoined all the religious in the
profession of their studies to have regular profestors for
Latin, Greek, Hebrew, and Arabic; if there were
any among themselves properly qualified; or if that
was not the case, to take the assistance of laymen for
that purpose, until there were some of their own order
who had learning enough to instruct their brethren.
It was very difficult to carry this decree into execu-
tion; and indeed it was always very imperfectly ob-
vailed.

Paul (Father), whose name, before he entered
into the monastic life, was Peter Sarpi, was born at
Venice, August 14, 1552. His father followed mer-
chandise but with so little success, that at his death
he left his family very ill provided for; but under the
care of a mother whose piety was likely to bring the
blessing of providence upon them, and whose wife con-
duct supplied the want of fortune by advantages of
greater value. Happily for young Sarpi he had a
brother, master of a celebrated school, under whose
direction he was placed by her. Here he lost no time,
but cultivated his abilities, naturally of the first rate,
with unbounded application. He was born for study,
having a natural aversion to pleasure and gaiety, and
a memory so tenacious that he could repeat 30 verses
upon once hearing them. Proprietary to his capa-
city was his progress in literature: at 15, having made
himself master of school learning, he turned his studies
to philosophy and the mathematics, and entered upon
logic under Capella of Cremona, who, through a cele-
bated master of that science, confided himself in a
very little time unable to give his pupil any farther in-
structions.

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As Capella was of the order of the Servites, his scholam was induced by his acquaintance with him to engage in the same profession, though his uncle and his mother represented to him the hardships and authority of that kind of life, and advised him with great zeal against it. But he was steady in his resolutions, and in 1566 took the habit of the order, being then only in his 14th year, a time of reflection, and not made him public professor of divinity in the cathedral, and reader of canonical divinity and canon law in that city, but honoured him with many proofs of his esteem. But father Paul finding a court life not agreeable to his temper, quitted it two years afterwards, and retired to his beloved privacy, being then not only acquainted with the Latin, Greek, Hebrew, and Chaldee languages, but with philosophy, the mathematics, cannon law, all parts of natural philosophy, and chemistry itself; for his application was uninterrupted, his head clear, his apprehension quick, and his memory retentive.

Being made a priest at 22, he was distinguished by the illustrious Cardinal Borromeo with his confidence, and employed by him on many occasions, not without the envy of persons of less merit, who were so far exasperated as to lay a charge against him before the Inquisition for denying that the Trinity could be proved from the first chapter of Genesis; but the accusation was too ridiculous to be taken notice of. After this he passed successively through the dignities of his order, of which he was chosen provincial for the province of Venice at the age of 25 years; and discharged this post with such honor, that in 1579 he was appointed, with two others, to draw up new regulations and statutes for his order. This he executed with great success; and when his office of provincial was expired, he retired for three years to the study of natural and experimental philosophy and anatomy, in which he is said to have made some useful discoveries. In the intervals of his employment he applied himself to his studies with so extensive a capacity, as left no branch of knowledge untouched. By him Acquapendente, the great anatomist, confesses that he was informed how vision is performed; and there are proofs that he was not a stranger to the circulation of the blood. He frequently converted up a attainment with mathematicians, upon anatomy with surgeons, upon medicine with physicians, and with chemists upon the analysis of metals, not as a superficial inquirer, but as a complete master. He was then chosen procurator general of his order; and during his residence at Rome was greatly esteemed by Pope Sixtus V. and contrived an intimate friendship with Cardinal Bellarmine and other eminent persons. But the hours of repose, that he employed so well, were interrupted by a new information in the Inquisition; where a former acquaintance produced a letter written by him in cyphers, in which he said, that no pretension was entertained there but by dishonest means. This accusation, however dangerous, was passed over on account of his great reputation; but made such impressions on that court, that he was afterwards denied a bishops see by Clement VIII. After these difficulties were surmounted, F. Paul again retired to his solitude; where he appears, by some writings drawn up by him at that time, to have turned his attention more to improvements in piety than learning. Such was the care with which he read the scriptures, that its being his custom to draw a line under every passage which he intended more nicely to consider, there was not a single word in his New Testament but was underlined. The same marks of attention appeared in his Old Testament, Psalter, and Breviary.

But the most active scene of his life began about the year 1615; when Pope Paul V., exasperated by some decrees of the Senate of Venice that interfered with the pretended rights of the church, laid the whole state under an interdict. The Senate, filled with indignation at this treatment, forbade the bishops to receive or publish the pope's bull; and, convening the reverend fathers of the churches, commanded them to celebrate divine service in the accustomed manner, with which most of them readily complied: but the Jesuits and some of others refusing, were by a solemn edict expelled the state. Both parties having proceeded to extremities, employed their ablest writers to defend their measures. On the pope's side, among others, Cardinal Bellarmine entered the lists, and, with his confederate authors, defended the papal claims with much severity of expression, and very sophistical reasoning; which were confuted by the Venetian apologists in much more decent language, and with much greater solidity of argument. On this occasion F. Paul was most eminently distinguished by his Defence of the Rights of the Supreme Magistrate, his Treatise of Excommunication, translated from Cerfoni, with an Apology, and other writings; for which he was cited before the Inquisition at Rome; but it may be easily imagined that he did not obey the summons.

The Venetian writers, whatever might be the abilities of their adversaries, were at least superior to them in the justice of their cause. The propositions maintained in the side of Rome were these: That the Pope is invested with all the authority of heaven and earth; that all princes are his vassals, and that he may annul their laws at pleasure; that kings may appeal to him, as he is temporal monarch of the whole earth, that he can discharge subjects from their oaths of allegiance, and make it their duty to take up arms against their sovereign, that he may depose kings without any fault committed by them, if the good of the church requires it; that the clergy are exempt from all tribute to kings, and are not accountable to them even in cases of high treason; that the pope cannot err; that his decisions are to be received and obeyed on pain of sin, though all the world should judge them to be false; that the pope is God upon earth; that his sentence and that of God are the same: and that to call his power in question is to call in question the power of God: maxims equally shocking,
weak, pernicious, and absurd; which did not require the abilities or learning of F. Paul to demonstrate their fallacious and destructive tendency. It may be easily imagined that such principles were quickly overthrown, and that no court but that of Rome thought it for its interest to favour them. The pope, therefore, finding his authors confuted and his cause abandoned, was willing to conclude the affair by treaty; which, by the mediation of Henry IV. of France, was accommodated upon terms very much to the honour of the Venetians. But the defenders of the Venetian rights were, though comprehended in the treaty, excluded by the Romans from the benefit of it: some, upon different pretences, were imprisoned; some sent to the galleys; and all debarred from preferment. But their malice was chiefly aimed against F. Paul, who soon found the effects of it; for as he was going one night to his convent, about six months after the accommodation, he was attacked by five ruffians armed with filettoes, who gave him no less than fifteen flaps, three of which wounded him in such a manner that he was left for dead. The murderers fled for refuge to the nuncio, and were afterwards received into the pope's dominions; but were purveyed by divine justice, and all, except one man who died in prison, perished by violent deaths.

This, and other attempts upon his life, obliged him to confine himself to his convent, where he engaged in writing the History of the Council of Trent; a work unequalled for the judicious disposition of the matter, and artful texture of the narration; commended by any historian, as on every other day of that affair, the men of the nation, and artists employed to relieve his has been for a time a very severe, and perhaps not unjust, censure of some other modern sects as well as of the Socinians.

PAULICANS, a branch of the ancient Manichees, so called from their founder, one Paulus, an Arminian, in the seventh century; who, with his brother John, both of Samosata, formed this sect: though others

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are of opinion, that they were thus called from another Paul, an Armenian by birth, who lived under the reign of Julian II. In the seventh century a zealot called Constandine revived this drooping sect, which had suffered much from the violence of its adversaries, and was ready to expire under the severity of the imperial edicts, and that zeal with which they were carried into execution. The Paulicians, however, by their number, and the countenance of the emperor Nicephorus, became formidable to all the East.

But the cruel rage of persecution, which had for some years been unfed, broke forth with redoubled violence under the reigns of Michael Cupropalates and Leo the Armenian, who inflicted capital punishment on such of the Paulicians as refused to return into the bosom of the church. The empress Theodora, tutors of the emperor Michael, in 843, would oblige them either to be converted or to quit the empire; upon which several of them were put to death, and more retired among the Bulgarians; many of them, either from a principle of zeal for the propagation of their religion, or from a natural desire of flying from the persecution which they suffered under the Grecian yoke, retired, about the close of the eleventh century, from Bulgaria and Thrace, and formed settlements in other countries. Their first migration was into Italy; whence, in course of time, they sent colonies into almost all the other provinces of Europe, and formed gradually a considerable number of religious assemblies, who adhered to their doctrine, and who were afterwards persecuted with the utmost vehemence by the Roman pontiffs. In Italy they were called Patarini, from a certain place called Pataria, being a part of the city of Milan, where they held their assemblies; and Gaithari or Gaziari, from Gazaria, or the Lesser Tartary. In France they were called Albigenenses, though their faith differed widely from that of the Albigenenses whom Protestant writers generally vindicate. (See Albigenenses.) The first religious assembly the Paulicians had formed in Europe is said to have been discovered at Orleans in 1017, under the reign of Robert, when many of them were condemned to be burnt alive. The ancient Paulicians, according to Photius, expressed the utmost abhorrence of Manes and his doctrine. The Greek writers compute their errors under the following particulars: 1. They denied that this inferior and visible world is the production of the Supreme Being; and they disfigured the Creator of the world and of human bodies from the most High God who dwells in the heavens: and hence some have been led to conceive that they were a branch of the Gnostics rather than of the Manichaeans. 2. They treated contemptuously the Virgin Mary; or, according to the usual manner of speaking among the Greeks, they refused to adore and worship her. 3. They refused to celebrate the institution of the Lord's supper. 4. They loaded the cross of Christ with contempt and reproach; by which we are only to understand, that they refused to follow the absurd and superstitious practice of the Greeks, who paid to the pretended wood of the cross a certain sort of religious homage. 5. They rejected, after the example of the greatest part of the Gnostics, the books of the Old Testament; and looked upon the writers of that sacred history as inspired by the Creator of this world, and not by the supreme God. 6. They excluded prebys and elders from all part in the administration of the church.

Paulina, a Roman lady, wife of Saturnus governor of Syria, in the reign of the Emperor Tiberius. Her conjugal peace was disturbed, and violence was offered to her virtue, by a young man named Mundus, who fell in love with her, and had caused her to come to the temple of Isis by means of the priests of that god, who declared that Ambitus wished to communicate to her something of moment. Saturnus complained to the emperor, which had been offered to his wife; and the temple of Isis was overturned, and Mundus banished, &c. — There was besides a Paulina, wife of the philosopher Seneca. She attempted to kill herself when Nero had ordered her husband to die. The emperor, however, prevented her; and she lived some few years after in the greatest melancholy.

Paulinia, in botany: A genus of the trignia order, belonging to the oastaria class of plants; and in the natural method ranking under the 23rd order, Triglete. Its characters are these: the flower has a permanent emplacement, composed of four small oval leaves; it has four oblong oval petals, twice the size of the emplacement; and eight short staminas with a turbinated germen, having three short slender styles, crowned by spreading ligmas; the germen turns to a large three-cornered capsule with three cells; each containing one almost oval seed. Linnaeus reckons seven, and Miller nine, species, natives of the West Indies.

Paulinus, a bishop who flourished in the early part of the 7th century. He was the apostle of Yorkshire, having been the first archbishop of York. This dignity seems to have been conferred on him about the year 626. He built a church at Almonbury, and dedicated it to St Alban, where he preached and converted the Brigantes. Camden mentions a croos at Dewborough, which had been ered to him with this inscription, Paulinus hic predixit et celebravit. York was so small about this time, that there was not so much as a small church in it in which King Edwin could be baptized. Constantius is said to have made it a bishopric. Pope Honorius made it a metropolitan see. We are told that Paulinus baptized in the river Swale, in one day, 10,000 men, besides women and children, on the first conversion of the Saxons to Christianity, besides many at Halidon. At Wallstone, in Northumberland, he baptized Segbert king of the East Saxons. Bede says, "Paulinus coming with the king and queen to the royal manor called Ad-Gibrin (now Yeverin), laid there 26 days with them, employed in the duties of catechizing and baptizing. In all this time he did nothing from morning to night but instruct the people, who flocked to him from all the villages and places, in the doctrine of Christ and salvation; and, after they were instructed, baptizing them;}
to the fame Bed; "he preached the word in the province of Lindolfi; and first converted the governor of the city of Lindocollina, whose name was Blecca, with all his family. In this city he built a fine church of exquisite workmanship, whose roof being ruined by long neglect or the violence of the enemy, only the walls are now standing." He is also said to have founded a collegiate church of prebends near Southwell in Nottinghamshire, dedicated to the Virgin Mary. This church he is said to have built when he baptized the Coritani in the Trent.

PAULO (Marco), a celebrated traveller, was son to Nicholas Paulo, a Venetian, who went with his brother Matthew, about the year 1255, to Constantinople, in the reign of Baldwin II. Nicholas, at his departure, left his wife big with child; and the brought to the world the famous Marco Paulo, the subject of this memoir. The two Venetians, having taken leave of the emperor, crossed the Black Sea, and travelled into Armenia; whence they passed over land to the court of Barka, one of the greatest lords of Tartary, who loaded them with honours. This prince having been defeated by one of his neighbours, Nicholas and Matthew made the best of their way through the deserts, and arrived at the city where Kublai, grand khan of the Tartars, reigned. Kublai was entertained with the account which they gave him of the European manners and customs; and appointed them ambassadors to the pope, in order to demand of his holiness a hundred missionaries. They came accordingly to Italy, obtained from the Roman pontiff two Dominicans, the one an Italian the other an Afaite, and carried along with them young Marco, for whom Kublai expressed a singular affection. This young man, having learned the different dialects of Tartary, was employed in embassies which gave him the opportunity of traversing Tartary, China, and other eastern countries.

At length, after a residence of seventeen years at the court of the grand khan, the three Venetians returned to their own country in the year 1295, with immense fortunes. A short time after his return, Marco served his country at sea against the Genoese, his galley, in a great naval engagement was sunk, and himself taken prisoner, and carried to Genoa. He remained there many years in confinement; and, as well to amuse his melancholy as to gratify those who desired it from him, he sent for his notes from Venice, and composed the history of his own and his father's voyages in Italy, under this title, Delle Maraviglie del mondo da lui vedute, &c.; the first edition of which appeared at Venice, in 8vo, 1496. His work was translated into different languages, and inserted in various collections. The editions most esteemed are the Latin one published by Andrew Muller at Cologne, in 4to, 1671; and that in French, to be found in the collection of voyages published by Bergeron, at the Hague, 1735, in 2 vols. 4to. In the writings of Marco Paulo, there are some things true and others highly incredible. It is indeed difficult to believe, that as soon as the great khan was informed of the arrival of two Venetian merchants who were come to sell theriac (or treacle) at his court, he sent before them an escort of 40,000 men, and afterwards dispatched these Venetian ambassadors to the Pope, to beseech his holiness to send him a hundred missionaries. It is equally difficult to believe that the pope, who doubtless had an ardent zeal for the propagation of the faith, instead of a hundred, should have sent him only two missionaries. There are therefore some errors and exaggerations in Marco Paulo's narrative; but many other things which were afterwards verified, and which have been of service to succeeding travellers, prove that in several respects his relation is valuable. He not only gave better accounts of China than had been before received; but likewise furnished a description of Japan, of many of the islands of the East Indies, of Madagascar, and the coasts of Africa; so that from his work it might be easily collected, that a direct passage by sea to the Indies was not only possible but practicable. It may be worth while to add, that, in the opinion of the authors of the Universal History, what he wrote from his own knowledge is both curious and true, so that where he has erred his father and uncle must have deceived him.

PAULUS AEMLILUS. See AEMLUS vs Paulus.

PAVO, the peacock, in ornithology; a genus belonging to the order of gallinae. The head is covered with feathers which bend backwards; the feathers of the tail are very long, and beautifully variegated with eyes of different colours. Latham enumerates eight species:

1. The cristatus, or common peacock of England, is rather less than the male. The female has rather less than the male. The train is very short, being much shorter than the tail, and fearfully longer than its coverters; neither are the feathers furnished with eyes. The crest on the head is similar to that on the head of the male; the sides of the head have a greater portion of white: the throat and neck,
where they are black: the instructions for collecting their
infections. Lots come male, matrons, of fritters, common
in wheat.

care the cry is loud and inharmonious; a
for his land than

fot this

fame luxury, and fold

in St Helena, at

cold

lines, but growing yellowish towards
the ends where they are black: the upper tail covers
are fewer than those of the common peacock, but
much longer than the tail; they are of a cheetah brown,
with white shafts, and have at the end of each a large
spot gilded in the middle, then blue, and surrounded
with green: the legs are ash-coloured, and not
furrihied with spurs, or have they been overlooked
by those who have seen them.
The female is smaller than the male; and differs in
having the belly quite black, and the upper tail
covers much shorter: the tail is green, edged with
blue, and white shafts. It inhabits Japan, and is only
known to Europe by means of a painting, sent by
the emperor of Japan to the pope.

So beautiful a species of birds as the peacock could
not long remain a stranger in the more distant parts
in which they were produced; for so early as the days
of Solomon, we find, among the articles imported
in his Tarshish navies, apes, and peacocks. A
monarch so convenient in all branches of natural
history, "who spoke of trees from the cedar of Leba-
non, even unto the hyppoc that springeth out of the
wall; who spoke of beasts and of fowl," would
certainly not neglect furnishing his officers with
instructions for collecting every curiosity in the
countries they voyaged to, which gave him a knowledge
that distinguished him from all the princes of his time.

Heliian relates, that they were brought into Greece
from some barbarous country; and that they were held
in such high esteem, that a male and female were val-
ued at Athens at 1000 drachms, or 32l. 5s. 1od.
Their next step might be to Samos; where they were
preferred about the temple of Juno, being the birds fi-
cred to that goddess; and Celsus, in his Noct. Attic.,
c. 16. commends the excellency of the Samian pe-
cocks. It is therefore probable, that they were
brought there originally for the purposes of superflu-
itv, and afterwards cultivated for the uses of luxury.
We are also told, when Alexander was in India, he

(a) Taversier's Travels, vol. iii. p. 57. The inhabitants of the mountains on both sides of the Ganges
catch them with a birdlime, prepared from the milky
juice of two sorts of trees ficus religiosa & indica.—
Lam., boiled with oils into a confection; which proves sufficiently tenacious to entangle them, or the largest

(b) They must have been in plenty notwithstanding; or the emperor Vitellius could not have got sufficient
for his large dish, called the Bucale of Misserus, which, history says, was filled with the livers of stari, tongues
of flamingoes, and brains of pheasants and peacocks.
found vast numbers of wild ones on the banks of the
Hydoritis; and was so struck with their beauty, as to
at a point a severe punishment on any person that killed
them.

Peacocks crests, in ancient times, were among the
ornaments of the kings of England. Ernald de Ac-
lent was fined to king John in 140 falaries, with fack-
butts, lorains, gift spurs, and peacock crests, such as
would be for his credit. See plate CCCX. X.

5. The pavo bicoloratus, is larger than the common
pheasant. The bill is black, but from the nostrils to
the tip of the upper mandible red. The irides are yel-
low. The feathers on the crown of the head are suf-
ficiently long to form a crest, of a dull brown colour.
The space between the bill and eyes is naked, with a
few fatted hairs: the fides of the head are white:
the neck is bright brown, interated with dusky
brown: the upper parts of the back, scapulars, and
wing coverts, are dull brown, d-ted with paler brown
and yellowish; besides which, each feather near the end
with a roundish large spot of a gilded purple colour,
changing into blue and green in different lights: the lower
part of the back and rump are dotted with white: all the under parts are brown, flari-
ated transversely with black: the quills are dusky, the
secondaries are marked with the same spot at the root
of the wings; the upper tail coverts are longer than the
tail, and each marked at the end with a spot like
the wing feathers, each of which is surrounded first
with a circle of black, and ultimately with an orange
one: the legs and claws are brown, and on the back
part of each leg are two spurs, one above the other.

The female is a third smaller than the male. The head,
neck, and under parts are brown; the head smooth:
the upper parts are also brown, and the feathers mark-
ed with a dull blue spot, surrounded with dirty orange:
the feathers which cover the tail are similar; but
marked at the end with an obscure dull oval spot of
blue: the legs have no spurs.

This species is of Chinese origin, and some of them
have been brought from China to England alive, and
have been in some time in the possession of Mr James
Monro. The male is now in the Leverian Museum,
in the finest preservation.

Someone observes, that the bird from whence his
description was taken had two spurs on one leg, and
three on the other. This must surely be a supxis na-
ture; especially as he says, it is the same as that in
Eden, pl. 67.

6. The pavo tibetanus, is about the size of a pinta-
do, being about two feet and nearly two inches long.
The bill is above an inch and a half long, and cinere-
ous: the irides are yellow: the head neck and under
parts are ash coloured, marked with blackish lines:
the wing coverts, back and rump, are grey, with small
white dots; besides which, on the wing coverts and
back are large round spots of a fine blue, changing in
different lights to violet and green gold: the quills and
upar tail coverts are also grey, marked with black-
ishes; the quills have two round blue spots on each,
like those of the coverts; on the outer webs, and on
each tail feather, there are four of the same, two on
each side of the web; the middle coverts are the longest,
the others shorten by degrees: the legs are grey, fur-
nished with two spurs behind, like the tail species:
the claws are blackish. This species inhabits the
kingdom of Thibet. The Chinese give it the name of
Chin tibet. Khi.

Pavo, in ichthyology. See Persever. See.

Pavo, in astronomy, a constellation in the souther-
hemisphere, unknown to the ancients, and not visible
in our latitude. It consists of 14 stars, of which the
names and situations are as follow:

<table>
<thead>
<tr>
<th>Star</th>
<th>Longitude</th>
<th>Latitude</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

The eye of the peacock
In the breast
In the right wing
In the middle
In the root of the tail, first
second
third
fourth
fifth
sixth
seventh
In the right foot
In the left foot

See Astronomy, n° 406.

PAVOR, a Roman deity, whose worship was intro-
duced by Tullius Hostilius, who, in a panic, vowed a
shrine to him, and one to Pallor, Palens; and there-
fore they are found on the coins of that family.

PAUREDASTYLE, in natural history, the
name of a genus of perfect crystals with double py-
ramids, and no intermediate column, composed of
12 planes, or two hexagonal pyramids joined base to
base.

PAUSANIA, in Grecian antiquity, a festival in
which were solemn games, wherein nobody contend-
but free-born Spartans; in honour of Pausanias
the Spartan general, under whom the Greeks over-
came the Persians in the famous battle of Plataea.

PAUSANISUS, a Spartan king and general, who
signalled himself at the battle of Plataea against the
Persians. The Greeks, very sensible of his services,
rewarded his merit with a tenth of the spoils taken
from the Persians. He was afterwards appointed to
command the Spartan armies, and he extended his
conquests in Asia: but the haughtiness of his behavi-
our created him many enemies; and the Athenians
soon obtained a superiority in the affairs of Greece —
Pausanias, dissatisfied with his countrymen, offered to
betray Greece to the Persians, if he received in mar-
riage as the reward of his perfidy the daughter of
their king. His intrigues were discovered by means
of a young man who was intrusted with his letters to
Peri, and who refused to go, on recoiling that such
as had been employed in that office before had never
returned. The letters were given to the Ephori of
Sparta, and the perfidy of Pausanias was thus dis-
covered. He fled for safety to a temple of Minerva; and as the
fandity of the place screened him from the violence
VOL. XIV.
PAUSANIAS, a learned Greek historian and orator in the second century, under the reign of Antonius the philosopher, was the disciple of Herodotus Atticus. He lived for a long time in Greece; and afterwards went to Rome, where he died at a great age. He wrote an excellent description of Greece, in ten books; in which we find not only the situation of places, but the antiquities of Greece, and every thing most curious and worthy of knowledge. Abbé Gedoin has given a French translation of it, in 2 vols 4to.

PAUSE, a stop or cessation in speaking, finging, playing, or the like. One use of pointing in grammar is to make proper pauses, in certain places.——There is a pause in the middle of each verse; in an hemistich, it is called a ref or repeat. See POETRY, and READING.

PAW, in the manage. A horse is said to paw the ground, when, his leg being either tired or painful, it does not rest it upon the ground, and seems to hurt himself as he walks.

PAWN, a pledge or gage for security of payment of mony lent. It is said to be derived a pugno, quia res que pignori dantur, pugno vel manu traduntur. The party that pawns goods hath a general property in them; they cannot be forfeited by the party that hath them in pawn for any offence of his, nor be taken in execution for his debt; neither may they otherwise be put in execution till the debt for which they are pawned is satisfied.

If the pawn is laid up, and the pawnee robbed, he is not answerable; though if the pawnee use the thing, as a jewel, watch, &c. that will not be the worse for wearing, which he may do, it is at his peril; and if he is robbed, he is answerable to the owner, as the using occasioned the loss, &c.

If the pawn is of such a nature that the keeping is a charge to the pawnee, as a cow or a horse, &c. he may milk the one and ride the other, and this shall go in recompense for his keeping.

Things which will grow the worse by using, as apparel, &c. he may not use.

PEA, in botany. See PISUM.

PEACE (Temple of), a celebrated temple at Rome, which was consumed by fire A. D. 191; produced, as some writers suppose, by a flight earthquake, for no thunder was heard at the time. Dio Cassius, however, supposes that it began in the adjoining houses. Be that as it will, the temple, with all the surrounding buildings, were reduced to ashes. That magnificent structure had been raised by Vespasian after the destruction of Jerusalem, and enriched with the spoils and ornaments of the temple of the Jews. The ancients speak of it as one of the most lofty buildings in Rome. There men of learning used to hold their assemblies, and lodge their writings, as many others deposited their jewels, and whatever else they esteemed of great value. It was likewise made use of as a kind of magazine for the spices that were bought by the Roman merchants out of Egypt and Arabia; so that many rich persons were reduced to beggary, all their valuable effects and treasures being consumed in one night, with the temple.

PEACH, in botany. See AMYGDALUS.

PEACOCK, in ornithology See PAVO.

Peacock Fili. Pinna ani ruddis 55 caudalí falcata. The body of this fih is of various colours; the fin of the anus has 55 streaks, and its tail is in the form of a crenet. The head is without scales; it is brown upon the upper part, yellow above the eyes, and of a silver colour on the sides. The back is round, and adorned with beautiful blue streaks in a serpentine form; and the belly bright as silver. The fins of the breast are round, and, like those of the belly, have a yellow ground with a grey border; that of the back is of a violet colour; that of the anus is straw coloured; and, lastly, that of the tail is yellow on the sides, red towards the middle, and bordered with a deep blue.

There is a variety of this fish found only in the Indian seas, and therefore called the Indian peacock fih; which is thus described in the language of Linnaeus: Pavo pinna caudalí forcipata; pinna dorfa út 14: acela carcel ò pone oncele. It has the fin of its tail forked: 14 sharp points or prickles on the back, with around blue fire break behind the eyes.

The body of this fish is of an elliptical form; the head is covered with scales to the tip of the fin. The two jaws are armed with long and sharp teeth; the ball of the eye is black, and the iris of a white colour, with a mixture of green. At the infection of the fins of the belly is found a bony substance. The head, back, and sides, are of a yellow colour, more or less deep, and covered with lines or streaks of sky blue. These colours are so agreeably mixed, that they resemble the elegance of the peacock's tail.

PEAK OF DERBYSHIRE, a chain of very high mountains in the county of Derby in England, famous for the mines they contain, and for their remarkable caverns. The most remarkable of these are Pool's barn and Elen: the former is a cave at the foot of a high hill called Cottring, so narrow at the entrance that passengers are obliged to crawl on all fours; but it soon opens to a considerable height, extending to above a quarter of a mile, with a roof somewhat resembling that of an ancient cathedral. By the petrifying water continually dropping in many parts of the cave are formed a variety of curious figures and representations of the works both of nature and art. There is a column here as clear as alabaster, which is called The Queen of Scots Pillar, because Queen Mary is said to have proceeded thus far when she visited the cavern. It seems the curiosity of that princess had led her thus far into this dark abode; and indeed there are few travellers who care to venture farther; but others determined to see the end of all, have gone beyond it. After sliding down the rock a little way, is found the dreary cavity turned upwards; following its course, and climbing from crag to crag, the traveller arrives at a great height, till the rock, closing over his head.
on all sides, puts an end to any farther subterraneous journey. Just at turning to descend, the attention is caught by a chasm, in which is seen a candle glimmering at a vast depth underneath. The guides say, that the light is at a place near Mary Queen of Scots pillar, and no less than 80 yards below. It appears frightfully deep indeed to look down; but perhaps does not measure any thing like what it is said to do. It is pitch'd fire by the Queen of Scots pillar, it will make a report as loud as a cannon. Near the extremity, there is a hollow in the roof, called the Needle's Eye; in which if a candle is placed, it will represent a star in the firmament to those who are below. At a little distance from this cave is a small clear stream consisting of hot and cold water, so near each other, that the finger and thumb of the same hand may be put, the one into the hot water and the other into the cold.

Elden-hole is a dreadful chasm in the side of a mountain; which, before the latter part of the last century, was thought to be altogether unfathomable. In the time of Queen Elizabeth, a poor man was let down into it for 200 yards; but he was drawn up in a frenzy, and soon after died. In 1682, it was examined by Captain Collins, and in 1699 by Captain Sturmy, who published their accounts in the Philosophical Transactions. The latter defended by ropes fixed at the top of an old lead-ore pit, four fathoms perpendicular. At 200 yards, he found a rich mine; but immediately after came a violent head-ach, which after continuing four days abated a little; however, will probably never be accounted on account of its vast use.

Pearce, in heraldry, is when the field of a coat of arms is fable, and the powderings or. PEARCE, in botany. See Pyrus. pear- Glovis. See vitensis Lactuca. PEARCE (Dr.), lord bishop of Rochester, was the son of a distiller in High Holborn. He married Miss Adams, the daughter of a distiller in the same neighbourhood, with a considerable fortune, who lived with him 52 years in the highest degree of conjugal happiness. He had his education in Westminster school, where he was distinguished by his merit, and elected one of the king's scholars. In 1716, when he was 20 years old, he was elected to Trinity College, Cambridge. During the first years of residence at the university, he sometimes amused himself with lighter compositions, some of which are inserted in the Guardian and Spectator.

In 1716, he published his edition of Cicero De Oratione, and, at the desire of a friend, luckily dedicated it to Lord Chief Justice Parker (afterwards Earl of Macclesfield), to whom he was a stranger. This incident laid the foundation of his future fortune: for Lord Parker soon recommended him to Dr Bentley, Maller of Trinity, to be made one of the fellows; and the doctor consented to it on this condition, that his lordship would promise to unmake him again as soon as it lay in his power to give him a living. In 1717 Mr Pearce was ordained at the age of 27; having taken time enough, as he thought, to attain a sufficient knowledge of the sacred office. In 1718, Lord Parker was appointed chancellor, and invited Mr Pearce to live with him in his house as chaplain. In 1719, he was inducted into the rectory of Stapleford Abbot, in Essex; and in 1720 into that of St Bartholomew, behind the Royal Exchange, worth 400 l. per annum. In 1724, the lord chancellor presented him to St Martin's in the Fields. His Majesty, who was then at Hanover, was applied to in favour of St Claget who was then along with him, and the doctor actually kissed hands upon the occasion: but the chancellor, upon the king's return, disputed the point and was permitted to present Mr Pearce. Mr Pearce soon attracted the notice and esteem of persons in the highest stations and of the greatest abilities. Befide Lord Parker, he could reckon among his patrons or friends, Lord Macclesfield, Mr Pulteney (afterwards Earl of Bath), archbishop Potter, Lord Hardwicke, Sir Isaac Newton, and other illustrious personages. In 1724, the degree of doctor of divinity was conferred on him by archbishop Wake. The same year he dedicated to his patron, the earl of Macclesfield, his edition of Longinus on the Sublime, with a new Latin version and notes.

When the church of St Martin's was rebuilt, Dr Pearce preached a sermon at the consecration, which he afterwards printed, and accompanied with an Essay on the origin and progress of temples, traced from the rude flones of which were first used for altars to the noble structure of Solomon, which he considers as the first temple completely covered. His observations on that building which is called the Temple of Dagon removes part of the difficulty which prevents itself in the narration of the manner in which Solomon destroyed it.

The deanery of Winchester becoming vacant, Dr
Pearce was appointed dean in 1739; and in the year 1744 he was elected prolocutor of the lower house of convocation for the bishop of Canterbury. His friends now began to think of him for the episcopal dignity; but Mr Dean's language rather declined it. However, after several difficulties had been flourished and removed, he consented to accept the bishopric of Bangor, and promised Lord Hardwicke to do it with a good grace. He accordingly made proper acknowledgments of the royal goodnefs, and was consecrated Feb. 12, 1748.

Upon the declining state of health of Dr Wilcocks, bishop of Rochester, the bishop of Bangor was several times applied to by archbishop Herring to accept of Rochester, and the deanship of Welfminton, in exchange for Bangor; but the bishop then first signified his desire to obtain leave to resign and retire to a private life. His lordship, however, upon being pressed, suffered himself to be prevailed upon.—"My Lord (said he to the Duke of Newcastle), your grace offers these dignities to me in so generous and friendly a manner, that I promise you to accept them." Upon the death of Bishop Wilcocks he was accordingly promoted to the see of Rochester and deanery of Welfmite, on Feb. 1756. Bishop Sherlock died 1761, and Lord Bath offered his interest for getting the Bishop of Rochester appointed to succeed him in the diocese of London; but the bishop told his lordship, that he had determined never to be bishop of London or archbishop of Canterbury.

In the year 1763, his lordship being 73 years old, and finding himself left fit for the business of his stations as bishop and dean, informed his friend Lord Bath of his intention to resign both, and live in a retired manner upon his private fortune. Lord Bath undertook to acquaint his majesty; who named a day and hour, when the bishop was admitted alone into the closet. He told the king, that he wished to have some interval between the Engagements of business and eternity; and desired his majesty to consult proper persons about the propriety and legality of his resignation. In about two months the king informed him, that Lord Mansfield faw no objection; and that Lord Northington, who had been doubtful, on further consideration thought that the sequel might be complied with. Unfortunately for the bishop, Lord Bath applied for Bishop Newton to succeed. This alarmed the ministry, who thought that no dignities should be obtained but through their hands. They therefore opposed the resignation; and his majesty was informed that the bishop disliked the design. His majesty sent to him again; and at a third audience told him, that he must think no more of resigning. The bishop replied, "Sir, I am all duty and submission," and then retired.

In 1768 he obtained leave to resign the deanship; in 1773, he left his lady; and after some months of lingering decay, he died at Little Ealing, June 29, 1774. This eminent prelate distinguished himself in every part of his life by the virtues proper to his station. His literary abilities, and application to sacred and philological learning, appeared by his works; the principal of which are, A letter to the clergy of the church of England, on occasion of the bishop of Rochester's commitment to the Tower, 3d edit. 1722. Miracles of Jesus vindicated, 1727 and 1728. A review of the text of Milton, 1733. Two letters against Dr Middle-
The perch is very abominable in winter, and will seldom bite in this season of the year; if he does at all, it is in the middle of the day: at which time indeed all fish bite best at that season.

If the bait be a minnow, which is the bait that affords most diversion to the angler, it must be fastened to the hook alive, by putting the hook through the upper lip or back-fin; it must be kept at about mid-water, and the float must be a quill and a cork, that the minnow alone may be able to work. The float must be of flax, and strong; and the hook armed with a small and fine wire, that if a pike should take the bait, as is not unfrequently the case, he may be taken. The way to carry the minows or small gudgeons alive for baits is this: All of them in a quarter of an hour by the holes, with regular belay, and pearches.

As for the use of flax, and flax; and the hook armed with a small and fine wire, that if a pike should take the bait, as is not unfrequently the case, he may be taken. The way to carry the minows or small gudgeons alive for baits is this: All of them in a quarter of an hour by the holes, with regular belay, and pearches.

The perch, in natural history, a hard, white, shining body, usually roundish, found in a teataceous fish resembling an oyster.

Pearls, though esteemed of the number of gems by our jewellers, and highly valued not only at this time but in all ages, proceed only from a distemper in the creature that produces them, analogues to the bauxsas and other leprous concretions in several animals of other kinds.

The fish in which these are usually produced is the East Indian pearl oyster, as it is commonly called. Besides this shell there are many others that are found to produce pearls; as the common oyster, the mussel, and several others; the pearls of which are often very good, but those of the true Indian barbiet, or pearl-oyster, are in general superior to all. The small or seed pearls, also called, cooke pearls, from being fold by the ounce and not by tale, are vastly the most numerous and common: but, as in diamonds, among the multitudes of small ones, there are smaller numbers and larger found, so in pearls there are larger and larger kinds; but as they increase in size, they are proportionably less frequent; and this is one reason of their great price. We have Stotch pearls frequently as big as a little tare, some as big as a large pea, and some few of the size of a horse-bean; but these are usually of a bad shape, and of little value in proportion to their weight. Philip II. of Spain had a pearl perfect in its shape and colour, and of the size of a pigeon's egg. The first, and what is called the true shape of the pearl, is a perfect round; but if pearls of a considerable size are of the shape of a pear, as is not unfrequently the case, they are not less valued, as they serve for ear-rings and other ornaments. Their colour ought to be a pure white; and that not a dead and lifeless, but a clear and brilliant one: they must be perfectly free from any foulines, spot, or flaw; and their surfaces must be naturally smooth and glossy, for they bring their natural polish with them, which art is not able to improve.

All pearls are formed of the matter of the shell, and consist of a number of coats spread with perfect regularity one over another, in the manner of the several coats of an onion; or like the several strata of the stones found in the bladders or stomachs of animals, only much thinner.

Manner of Fishing for Pearls in the East Indies.—There are two seasons for pearl-fishing: the first is in March and April, and the last in August and September: and the more rain there falls in the year, the more plentiful are these fisheries. At the beginning of the season there are sometimes 250 barks on the banks; the larger barks have two divers, and the smaller one. As soon as the barks arrive at the place where the fish lies, and have cast anchor, each diver binds a stone, six inches thick and a foot long, under his body; which serves him as a ballast, prevents his being driven away by the motion of the water, and enables him to walk more steadily under the waves. They also tie another very heavy stone to one foot, by which they are very speedily sent to the bottom of the sea; and as the oysters are usually firmly fixed to the rocks, they arm their hands with leather mittens, to prevent their being wounded in pulling them violently off; but this task some perform with an iron rake.

In the last place, each diver carries down with him a large net in the manner of a sack, tied to his neck by a long cord, the other end of which is fastened to the side of the bark. This net is to hold the oysters gathered from the rock, and the cord is to pull up the diver when his bag is full, or when he wants air.

In this equipment he sometimes precipitates himself fifty feet under water, and as he has no time to lose, he no sooner arrives at the bottom than he begins to run from side to side, tearing up all the oysters he meets with, and cramming them into his bag.

At whatever depth the divers are, the light is so great, that they easily see whatever passes in the sea; and, to their great consternation, sometimes perceive monstrous fishes, from which all their address in muddying the water &c. will not always save them, but they unhappily become their prey; and of all the dangers of the fishery, this is one of the greatest and most usual. The best divers will keep under water near half an hour, and the rest do not stay less than a quarter. During this time they held their breath without the use of oils or any other liquors; only acquiring the habit by long practice. When they find themselves straitened, they pull the rope to which the bag is fastened, and hall fall by it with both hands: when these in the bark, taking the signal, hoist them up into the air, and unload them of
their fish; which is sometimes 500 oysters, and sometimes not above 50. Some of the divers need a moment's respite to recover breath; others jump in again instantly, continuing this violent exercise without intermission for several hours.

On the middle of the night, the boats being ready in the fand, or in five feet square, raising heaps of sand over them to the height of a man; and in this condition they are left till the rain, wind, and sun, have obliged them to open, which soon kills them: upon this the flesh rots and dries, and the pearls, thus diffiged, fall into the pit on their taking out the shells. After clearing the pits of the greater fish, they sift the sand several times in order to find the pearl; but whatever care they take they always lose a great many. After cleaning and drying the pearls they are passed through a kind of sieve, according to their sizes; the smallest are then sold as feed-pearls, and the rest put up to auction, and sold to the highest bidder.

Though those ornaments are met with in all quarters of the globe, the most esteemed have always been those of Asia, and the coast of Africa. In the kingdom of Madura, which lies on the coast of Malabar, there are many pearl fisheries. Tutukurin or Tutucorin is the principal, if not the only city, on the coast of Madura. At the time the Portuguese were masters of these parts, the taking of oysters in the straits between the island of Ceylon and the continent, was styled by way of excellence, the fishery, and very deservedly; for though some prefer the pearls taken near the island of Baharen in the Persian gulf, and others likewise found on the coast of China at Hainan, yet it might be very easily proved, from the comparison of the annual amount of those fisheries within this period, that they were very seldom superior to this of which we are speaking. It was one of the wise points in the Portuguese policy, that, though they were really in possession of this beneficial commerce, yet they chose to dissemble it, and took all imaginable precautions in order to make the natives believe that they were perfectly free, and that their interposition was not so much the effect of authority as of goodwill; it was for this reason that they never pretended to erect any fort either at Tutucorin or at Calicutnam, two towns upon the continent, from whence most of the fishers and their barks came, and that they suffered the ancient customs to take place.

The season of the fishery was the latter end of April or beginning of May, sometimes sooner, sometimes later, according to the weather. The direction of it was left entirely to the sovereign of the country, called the naik, and the Portuguese, in quality of the protectors of the sea, sent two frigates to defend the fishing-vessels from the Malabar and Maldive pirates. The time which this pearl-fishing lasted was about a fortnight, of the beginning of which the naik gave public notice; and, the day being come, there repaired to the place assigned several thousands of people of all ages, and an indefinite number of fishing vessels, and divers from five or six hundred to a thousand or more. Upon a signal given the boats put to sea; and, having chosen their proper stations, the divers plunged and brought up the oysters in little baskets upon their heads; with which the boats being sufficiently laden, they were carried on shore, where the people who remained there for that purpose bought them in the sand, till, by the heat of the sun, the fish was corrupted and congealed, and the pearls easily taken out. The whole produce of the first day's fishery belonged to the naik; and after that deduction, what was caught every day was separated, and particularly distinguished, but went to the common profit. The whole number of the people employed at sea and at shore amounted frequently to 50,000 or 60,000 souls; and the pavilions and tents set up for their accommodation made a fine appearance at a distance. When the pearls were extracted, cleaned, and dried, they passed them through a kind of sieves, by which their sizes were distinguished. When all was over, the naik appointed a time and place for the public market; in consequence of which there was a kind of fair, that lasted commonly from the close of June till the beginning of September. The smallest, which are what we call sifted pearls, they sold by weight, and all the rest according to their respective sizes and beauty, from a few shillings up to ten or twenty pounds, but there were few buyers, except the Portuguese merchants, who, bringing ready money, had got bargains, and thus all parties were pleased. The Portuguese assumed the protection of this fishery very soon after they settled in the Indies, and held it till the year 1658, when, in consequence of their losses in Ceylon and elsewhere, it fell into the hands of the Dutch, who have remained in possession of it ever since.

The Dutch have changed this method, as we are informed by a person very well acquainted with their affairs. The course into which they have put it is, in a few words, this: the camp is sometimes held on the coast of Madura, upon the continent; sometimes on the island of Manar, which is in the hands of the Dutch, who, notwithstanding, follow the example of the Portuguese, and lay claim to that of protectors of the fishery, in which quality their commissary is ever in the camp, as well as the naik or sovereign of the country, who is also the rajah of Tanjore. The oysters caught every day are put up in tons or barrels, of which, when a certain number are full, they put them up to sale by way of auction; and the merchants bid according as they have an opinion of the oysters for the season; but the middle price is between 30 and 40 shillings sterling per cask. When a merchant has bought such a lot as this, he carries it to his quarters; and after a certain number of days he proceeds to opening the oysters, but always in the air, for the French is to great as to be almost insupportable. They open them over tubs, into which they pour what comes out of the oyster, as also that muddy water that remains in the cask; next they draw it out into cullenders of several sizes, and at length perhaps they find four or five shillings worth of pearls, sometimes to the value of ten or twelve pounds; so that it is a perfect lottery, by which some few becoming rich, it betrays numbers into beggary. This pearl-fishery, we are told, brings the Dutch company an annual tribute of 20,000 l.

There are a variety of rivers great and small in Eastern Tartary considerable for pearl-fishery; but these
these pearls, though much esteemed by the Tartars, would be little valued by Europeans, on account of their defects in shape and in colour. The Emperor Kang-hi had several chaplets or strings of these pearls, each containing 100, which were very large, and exactly matched. There are many rivulets in Livonia which produce pearls almost equal in size and clearness to the Oriental ones. There are several fisheries both on the eastern and western coasts of Africa; the most considerable of which lie round some small islands, over against the kingdom of Sofala; but the people thus employed, instead of expelling the oysters to the water's edge, as in the East, would induce them to open, lay them upon the embers; by which absurd method, these pearls which they catch contract a dull kind of redness, which robs them of their natural lustre as well as of their value. Pearl fishing is performed by the women as well as the men; both being equally expert. In the sea of California also there are very rich pearl fisheries. In Japan likewise there are found pearls of great price. Pearls are met with in all parts of the Red Sea in the Indian Ocean, on the low part of the coast of Arabia Felix named Balsam, adjoining to the Persian Gulf. They are likewise found on the low coast about Gumbroon to the eastward of the Persian Gulf; and many of the finest kind are met with on the coasts of Ceylon. They are most plentiful in the Baharene, between the coast of Arabia Felix and Ormus, whence they are transported to Aleppo, then sent to Leghorn, and then circulated through Europe.

It has been very commonly supposed, that pearls are found in the sand of oysters; and such the pearl fishes are called in part of the above account extracted from the Universal History; but Mr Bruce absolutely denies this, and informs us that there is no such fish as an oyster to be met with in the Red Sea in particular. They are indeed found in bivalve shells, of which there are three kinds commonly sought after by the pearl-fishers. One of these is a kind of murex now very rare; but whether more plentiful former than at present is not known; they are principally found on the north end of the Red Sea and on the Egyptian side, and Mr Bruce informs us, that the only place in which he ever met with them was about Coiffair, and to the northward of it, where there was an ancient port called Mus Hermes, "which (says Mr Bruce) commentators have called the port of the Muse, when they should have translated it the harbour of the Muses."

The second fort of shell is called Plu-a. It is broad and lenticular at the top, decreasing gradually until it turns sharp at the lower end, where the hinge is. The outside is rough and figured, of a beautiful red colour, and sometimes three feet long, and extremely brittle; the inside lined with that beautiful substance called mother-of-pearl.

The third kind of shell is the only one which can be said to bear any resemblance to the oyster; though even this is evidently of a different genus. In a general view of the writings of Linnaeus by Richard Pulteney, M. D. p. 42, it is said that Linnaeus made a remarkable discovery relating to the generation of pearls, in the river pearl-muscle (Mya margaritifera) a shell shell found in several rivers of Great Britain and Ireland; that this shell will bear removal remarkably well; and that in some places they form reservoirs for the purpose of keeping it, and taking out the pearl, which in a certain period will be renewed again. The discovery was a method which Linnaeus found of putting these muscles into a state of producing pearls at his pleasure, though the final effect did not take place for several years; but that in five or six years after the operation, the pearl would have acquired the size of a vert. Dr Pulteney regrets that we are unacquainted with the means by which Linnaeus accomplished this extraordinary operation, which was considered as important, since it is certain the author was rewarded with a munificent premium from the states of the kingdom on that account.

The colours of pearls are different according to the shells in which they are found. The first kind often produces those of a fine shape and excellent lustre, but seldom of that very fine colour which enhances their price. The second kind produces pearls having the reddish cast of the inner shell of the pinnas, called mother of pearl, which seems to confirm the opinion of Reaumur, that the pearls are formed from the glutinous fluid which makes the first rudiments of the shell; and this kind of pearl is found to be more red as it is formed nearer the broad part of the shell, which is redder than the other end. Mr Bruce is of opinion, that the pearl found in this shell is the pinnas of Scripture; and that this name is derived from its redness. "On the contrary (says he), the word pinnas has been idly imagined to be derived from penna, a feather; as being broad and round at the top, and ending at a point, like a quill below. The English translation of the Sacred text is not accurate in many things more material, translates this pinnas by rubies, without any foundation or authority but because they were both red, as are bricks or tiles, and many other things of base materials. The Greeks have translated it literally pina or pinnas, and the shell they call pinnas; and many places occur in Strabo, Theophrastus, Elian, and Ptolemy, which are mentioned as famous or this kind of pearl. I should imagine also, that by Solomon saying it is the most precious of all productions, he means that this species of pearl was the most valued or the best known in Judea; for though we learn from Pliny that the excellency of pearls was their whiteness, yet we know that the pearls of a yellowish cast are those esteemed in India to this day, as the pinnas pearls, or reddish pearl, was in Judea in the days of Solomon. In Job, where all the variety of precious stones are mentioned, the translator is forced, as it were unwillingly, to render pinnas pearls, as he thought indeed to have done in many other places where it occurs."

The third kind of shell produces pearls of extreme whiteness, which, though sayso that Bochart says are called diva or dora in Arabic; which seems to be a general term for all kinds of pearls in Scripture, whereas pinnas is only in particular. The pinnas is the magnet; "wisdom is better (a better guide) than the polar stone." But though the character of this pearl be extreme whiteness, we are told by Pliny that there are shades or differences of it. The chlorine, he says, are those of the Red Sea; but the pearls of India have the colour of the flakes or divisions of the lapis specularis. The most excellent are those like a solution of
of alum, limpid, milky-like, and even with a certain almost imperceptible cast of a fiery colour. Theophrastus tells us, that these pearls are transparent, as the description of Pliny would lead us to imagine; but it is not so; and if there were, it is apprehended they would lose all their beauty and value, and approach too much to glass. The value of these commodities depends upon their size, regularity of form, whether round or not, weight, smoothness, colour, and the different shades of that colour. The pearl fishers say, that when the shell is smooth and perfect, they never expect to find any pearls, but always do so when it has begun to be deformed and distorted. Hence it would seem, that as the fish turned older the vessels containing the juice for forming the shell, and keeping it in its vigour, grew weak and ruptured; and thence, from this juice accumulating in the fish, the pearl was formed, and the shell brought to decay, as supposed by Mr. Reaumur. If this be the case, it ought to be known by the form of the shell whether the pearl is large or small: and thus the smaller ones being thrown back into the sea, a constant crop of large pearls might be obtained.

Pliny says that pearls are the most valuable and excellent of all precious stones; and from our Saviour’s comparing the kingdom of heaven to a pearl, it would seem that they really were held in such high estimation at that time. Mr. Bruce, however, is of opinion, that this extraordinary value was put only upon the very large kinds of which we are told, that Servilia, the Mother of Marcus Brutus, presented one to Caesar of the value of 50,000 l. of our money; and Cleopatra dissolved one worth 250,000 l. in vinegar, which she drank at a supper with Mark Antony.

It is generally said that the pearl shell grows on rocks, which, together with the method of catching them, we have already mentioned. Some say they are taken with nets; from whence Mr. Bruce converts the idea of their growing on rocks; for nobody, he says, would employ nets to gather fish from among rocks. He tells us, that all kinds of them are found in the deep, and shallow, and very shallow bottom; the parts of most of them being too fine to bear the agitation of the sea among the rocks. It is observed that they produce the most beautiful pearls in those places of the sea where a quantity of fresh water falls. Thus (says Mr. Bruce), in the Red Sea, they are very much esteemed that were fished from Suakim southward, that is, in those parts corresponding to the country anciently called Berberis and Asa-ritis on the Arabian Coast near the island Camaron, where there is abundance of fresh water; and in the island of Poofht. As it is a fish that delights in repose, I imagine it avoids this part of the Gulf, as lying open to the Indian Ocean, and agitated by variable winds.

Mr. Bruce mentions a muscle found in the salt springs of the Nubian desert; in many of which he found those excreta which might be called pearls, but all of them ill formed, foul, and of a bad colour, though of the same consistence, and lodged in the same part of the body as those in the sea. “The muscle, too (says our author), is in every respect similar, I think larger. The outer skin or covering of it is of a vivid green. Upon removing this, which is the epidermis, what next appears is a beautiful pink, without glos, and seemingly of a calcareous nature. Below this, the mother-of-pearl, which is undermoll, is a white without lustre, partaking much of the blue and very little of the red; and this is all the difference I observed between it and the pearl-bearing muscle of the Red Sea.”

“In Scotland, especially to the northward (A), in all rivers running from lakes, there are found muscles that have pearls of more than ordinary merit, though seldom of large size. They were formerly tolerably cheap, but lately the wearing of real pearls into fashion, those of Scotland have increased in price greatly beyond their value, and superior often to the price of oriental ones when bought in the East. The reason of this is, a demand from London, where they are actually employed in work, and fold as oriental. But the excellence of all glass or plate manufactories, it is likely, will keep the price of this article, and the demand for it, within bounds; when every lady has it in her power to wear in her ears, for the price of existence, a pearl as beautiful in colour, more elegant in form, lighter and easier to carry, and as much bigger as the pieces, than the famous ones of Cleopatra and Servilia. In Scotland, as well as in the east, the smooth and perfect shell rarely produces a pearl; the crooked and distorted shell seldom wants one.

The mother-of-pearl manufactory is brought to the greatest perfection at Jerusalem. The most beautiful shell of this kind is that of the peninnium already mentioned; but it is too brittle to be employed in any large pieces of workmanship; whence that kind named dora, is most usually employed; and great quantities of this are daily brought from the Red Sea to Jerusalem. Of these, all the fine works, the crucifixes, the wafer-boxes, and the beads, are made which are sent to the Spanish dominions in the New World, and produce a return incomparably greater than the staple of the greatest manufactory in the Old.

Very little is known of the natural history of the pearl fish. Mr. Bruce says, that, as far as he has observed, they are all very upright in the mud by an extremity: the muscle by one end, the pinna by the small sharp point, and the third by the hinge or square part which projects from the round. “In shallow and clear streams (says Mr. Bruce), I have seen small furrows or tracks upon the sandy bottom, by which you could trace the muscle from its last fixation; and these not straight, but deviating into traverses and triangles, like the course of a ship in a contrary wind laid down upon a map, probably in pursuit of food. The general belief is, that the muscle is constantly stationary in a state of repose, and cannot transfer itself from place to place.”
to place. This is a vulgar prejudice, and one of those false ideas that are mistaken for want of sufficient pains or opportunity to make more critical observations. Others, finding the first opinion a false one, and that they are endowed with power of changing place like other animals, have, upon the same foundation, gone into the contrary extreme, so far as to attribute swiftness to them, a property purely inconsistent with their being fixed to rocks. Pliny and Solinus say that the molecules have leaders, and go in flocks; and that their leader is endowed with great cunning to travel; and that, when he is taken, the others fall an easy prey. This, however, we may justly look upon to be a fable; some of the most accurate observers having discovered the motion of the molecule, which indeed is wonderful, and that they lie in beds, which is not at all so, have added the rite, to make their history complete." Our author informs us, that the molecules found in the salt springs of Nubia likewise travel far from home, and are sometimes surprised, by the leaking of the rains, at a greater distance from their beds than they have strength and moisture to carry them. He assures us, that none of the pearl-fish are edible; and that they are the only fish he saw in the Red Sea that cannot be eaten.

Artificial Pearls. Attempts have been made to take out flains from pearls, and to render the foul opaque-coloured one equal in lustre to the orient. Abundance of processes are given for this purpose in books of secrets and travels; but they are very far from answerring what is expected from them. Pearls may be cleaned indeed from any external foulneffes by washing and rubbing them with a little Venice soap and warm water, or with ground rice and salts, with starch and powder blue, plaster of vitriol; and the like substances; but a flain that reaches deep into the substance of pearls is impossible to be taken out. Nor can a number of small pearls be united into a mass similar to an entire natural one, as some pretend.

There are, however, methods of making artificial pearls, in such manner as to be with difficulty distinguished from the best orient. The ingredient used for this purpose was long kept a secret; but it is now discovered to be a fine silver-like substance found upon the under side of the scales of the blay or bleak fish. The scales, taken off in the usual manner, are washed and rubbed with fresh parcels of fair water, and the several liquors suffered to fettle; the water being then poured off, the pearly matter remains at the bottom, of the confluence of oil, called by the French eau d'orient. A little of this is dropped into a hollow head of bluish-glaafs, and shaken about fo as to line the internal surface; after which the cavity is filled up with wax, to give solidity and weight. Pearls made in this manner are distinguishable from the natural only by their having fewer blemishes.

Mother-of-Pearl, the shell, not of the pearl oyster but of the mytilis margaritifera. See Mytilus.

Pearl-ashes, a kind of fixed alkaline salt, prepared chiefly in Germany, Russia, and Poland, and America, by melting the salts out of the ashes of burnt wood; and having reduced them again to dryness, evaporating the moisture, and calcining them for a considerable time in a furnace moderately hot. The goodness of pearl-ashes must be distinguished by the uniform and white appearance of them: they are nevertheless subject to a common adulteration, not easily to be distinguished by the mere appearance, which is done by the addition of common salt. In order to find out this fraud, take a small quantity of the suspected salt; and after it has been softened by lying in the air, put it over the fire in a flovel: if it contains any common salt, a cracking and kind of light explosion will take place as the salt grows hot.

Pearl-ashes are much used in the manufacture of glafs, and require no preparation, except where very great transparency is required, as in the case of looking-glaafs, and the kind of window-glaafs. For this purpose dissolve them in four times their weight of boiling water: when they are dissolved, let the solution be put into a clean tub, and suffered to remain there 24 hours or more. Let the clear part of the fluid be then decanted off from the sediment, and put back into the iron pot in which the solution was made; in a few let the water be evaporated till the salts be left perfectly dry. Keep those that are not designed for immediate use in stone jars, well stuffed with moisture and air.

Mr Kirwan, who has tried a course of experiments on the alkaline substances used in bleaching, &c. (seetrijf Trains: for 1789), tells us, that in 100 parts of the Danzicz pearl ash, the vegetable alkali amounted to somewhat above 63. His pearl-ashes he prepares by calcining a ley of vegetable ashes dried into a salt to whiteness. In this operation, he says, "particular care should be taken that it should not melt, as the extractive matter would not be thoroughly consumed, and the alkali would form such an union with the earthy parts as could not be easily dissolved." He has "added this caution, as Dr Lewis and Mr Doffie have inadvertently directed the contrary." We apprehend, however, that here is a little inaccuracy; and that it was not for pearl-ashes, but for the unrefined pot-ash, that these gentlemen directed evaporation. The fact is, that the American pot-ash, examined by them, had unquestionably suffered fusion; which was effected in the fame iron pot in which the evaporation was finished, by rather increasing the fire at the end of the process: by this management, one of the most troublesome operations in the whole manufacture, the separation of the hard salt from the ashes with hammers and chisels, was avoided; and though the extractive matter was not consumed, it was burnt to an indissoluble coal: so that the salt, though black itself, produced a pale or colourless solution, and was uncommonly strong. Mr Kirwan has also given tables of the quantities of ashes and salt obtained from different vegetables; and he concludes from them, 1. "That in general weeds yield much more ashes, and their ashes much more salt, than woods; and that, consequently, as to salts of the vegetable alkali kind, neither America, Triend, nor the northern countries, produfs any advantage over England. 2. That of all weeds, sumintry produces most salt, and next to it wormwood; but if we attend only to the quantity of salt in a given weight of ashes, the ashes of wormwood contain most. Trileum fliruum also produces more ashes and salt than fern." See Potash.

PEARSON (John), a very learned English bishop.
in the 17th century, was born at Saoring in 1613. After his education at Eton and Cambridge, he entered into holy orders in 1639, and was the same year collated to the prebend of Netherhaven in the church of Sarum. In 1640 he was appointed chaplain to the lord keeper Finch, and by him presented to the living of Torrington in Suffolk. In 1650 he was made minifter of St Clement's, Eastcheap, in London. In 1652, he and Mr Gunning had a dispute with two Roman Catholics upon the subject of schisms; a very unfair account of which was printed at Paris in 1658. Some time after, he published at London, An Exposition of the Creed, in folio, dedicated to his parishioners of St Clement's, Eastcheap, to whom the substance of that excellent work had been preached several years before, and by whom he had been forced to make it public. The same year he likewise published The Golden Remains of the ever memorable Mr John Hales of Eton; to which he prefixed a preface, containing, of that great man, with whom he had been acquainted for many years, a character drawn with great elegance and force. Soon after the Restoration, he was prefixed by Juxton, then bishop of London, to the rectory of St Christopher's in that city; created doctor of divinity at Cambridge, in purtuance of the king's letters mandatory; installed prebendary of Ely; archdeacon of Surry; and made master of Jesus college in Cambridge: all before the end of the year 1660. March 25th, 1661, he was appointed Margaret professor of divinity in that university; and, the first day of the ensuing year, was nominated one of the commissioners for the review of the liturgy in the conference at the Savoy. April 14th, 1662, he was admitted master of Trinity college in Cambridge; and, in August, resigned his rectory of St Christopher's and prebend of Sarum. In 1667 he was admitted a Fellow of the Royal Society. In 1672 he published at Cambridge, in 4to, Vindiciæ Epistolæorum S. Ignatii, in answer to Mons. Dailié, to which is subjoined, Epistolæ duæ ad deum Davidum Blondellum. Upon the death of the celebrated Wilkins, Pearson was appointed his successor in the see of Chester, to which he was consecrated February 9th 1672-3. In 1682, his Annales Cypriani, sive tresdecem annorum, quibus S. Cyprian, inter Christophanos veris simplicem historia chronologica, was publishèd at Oxford, with Pell's edition of that Father's works. Pearson was disabled from all public service by ill health a considerable time before his death, which happened at Chester, July 16th 1686.

PEASANT, a kind, one whose business is in rural labour.

It is amongst this order of men that a philosopher would look for innocent and ingenuous manners. The situation of the peasantry is such as excludes them from the devalitations of luxury and licentiousness; for when the contagion has once reached the cottages of rural retirement, and corrupted the minds of habitual innocence, that nation has reached the summit of vice, and is hastening to that decay which has always been the effect of vicious indulgence. The peasantry of Britain still in a great measure retain that simplicity of manner and rustic innocence which ought to be the characteristic of this order of society; and, in many parts, their condition is such as, were all its advantages sufficiently known, would create envy in the minds of those who have toiled through life, amidst the bustle of the world, in quest of that happiness which it could not confer.

O fortunatus nimium, tua si bona noster, 
Agricolae.——
Virgil.

In other countries the peasants do not enjoy the same liberty as they do in our own, and are consequently not so happy. In all feudal governments they are abject slaves, entirely at the disposal of some petty despots. This was the case in Poland, where the native peasants were subject to the most horrid slavery, though those descended of the Germans, who settled in Poland during the reign of Bolshaus the Chaste and Calumni the Great, enjoyed very distinguished privileges. Among the native slaves, too, those of the crown were in a better condition than those of individuals. See Poland.

The peasants of Russia (Mr Coxe tells us) are a hardy race of men, and of great bodily strength. Their cottages are constructed with tolerable propriety, after the manner of those in Lithuania; but they are very poorly furnished. The peasants are greedy of money, and, as the same author informs us, somewhat inclined to thieving. They afford horses to travellers, and act the part of coachmen and pottilioners. "In their Travels in to Poland, Russia, Sweden, and Denmark, in their intercourse with each other; they take off their cap at meeting; bow ceremoniously and frequently, and usually exchange a salutation. They accompany their ordinary discourse with much action, and innumerable gestures; and are exceedingly servile in their expressions of deference to their superiors: in acknowledging a person of consequence, they prostrate themselves, and even touch the ground with their heads. We were often struck at receiving this kind of eastern homage, not only from beggars, but frequently from children, and occasionally from some of the peasants themselves."

"The peasants are well clothed, comfortably lodged, and seem to enjoy plenty of wholesome food. Their rye-bread, whose blackness at first disgusts the eye, and whose flour is the paste, of a delicate traveller, agrees very well with the appetite: as I became reconciled to it from use, I found it at all times no unpleasant relish, and when seasoned with hunger, it was quite delicious: they render this bread more palatable, by stuffing it with onions and groats, carrots or green corn, and seasoning it with sweet oil. The rye-bread is sometimes white, and their other articles of food are eggs, salt fish, bacon, and mustrooms; their favourite dish is a kind of hodge-podge, made of fat, or sometimes fresh meat, groats, flour, highly seasoned with onions and garlic, which latter ingredients are much used by the Russians. Besides, mushrooms are so exceedingly common in these regions, as to form a very essential part of their provisions. I seldom entered a cottage without finding great abundance of them; and in passing through the markets, I was often astonished at the prodigious quantity exposed for sale; their variety was no less remarkable than their number; they were of many colours, among which I particularly noticed white, black, brown, yellow, green, and pink. The common drink of the peasants is kvass, a fermented liquor, somewhat like sweet-wort, made by pouring warm water on rye.
They are extremely fond of whisky, a spirituous liquor distilled from malt, which the peasants can occasionally command, and which their inclination often leads them to use to great excesses."

These people are extremely backward in the mechanic arts, though, where they have much intercourse with other nations, this does not appear, and therefore does not proceed from natural inability; indeed we have already given an instance of one peasant of Russia, who seems to possess very superior talents. See Nevä.

The dress of these people is calculated for the climate in which they live: they are particularly careful of their extremities. On their legs they wear one or two pair of thick worsted stockings; and they envelop their legs with wrappers of coarse flannel or cloth several feet in length, and over these they frequently draw a pair of boots, so large as to receive their bulky contents with ease. The lower sort of people are grossly ignorant: of which we shall give a very surprising instance in the words of Mr. Coxe:

"In many families, the father marries his son while a boy of seven, eight, or nine years old, to a girl of a more advanced age, in order, as it is said, to procure an able-bodied woman for the domestic service: he cohabits with this person, now becomes his daughter-in-law, and frequently has several children by her. In my progress through Russia, I observed in some cottages, as it were, two mistresses of a family; one the peasant's real wife, who was old enough to be his mother; and the other, who was nominally the son's wife, but in reality the father's concubine. These intemperate marriages, sanctioned by invertebrate custom, and permitted by the parish priests, were formerly more common than they are at present; but as the nation becomes more refined, and the priests somewhat more enlightened; and as they have lately been discommoded by government, they are daily falling into disuse; and it is to be hoped, will be no longer tolerated."

The peasants of Russia, like those of Poland, are divided into those of the crown and those of individuals; the first of which are in the best condition; but all of them undergo great hardships, being subject to the despotic will of some cruel overlord. They may obtain freedom, 1. By manumission on the death of their master, or otherwise: 2. By purchase; and, lastly, by serving in the army or navy. The Emperors have redressed some of the grievances of this class of her subjects. The hardihood of the peasants arises in a great measure from their mode of education and way of life, and from the violent changes and great extremes of heat and cold to which they are exposed.

"The people of Finland differ widely from the Russians in their look and dress: they are for the most part fair complexions, and many of them red hair: they have their beards, wear their hair parted at the top, and hanging to a considerable length over their shoulders (a). We could not avoid remarking, that they were in general more civilized than the Russians; and that even in the smallest villages we were able to procure much better accommodation than we usually met with in the largest towns which we had hitherto visited in this empire."

The peasants of Sweden (Mr. Coxe informs us) are more honest than those in Russia; in better condition, and possessing more of the conveniences of life, both with respect to food and furniture. They are well clad in brown cloth of their own weaving. Their cottages, though built with wood, and only of one story, are comfortable and commodious. The room in which the family sleep is provided with ranges of beds in tiers (if I may so express myself), one above the other: upon the wooden tellers of the beds in which the women lie, are placed others for the reception of the men, to which they ascend by means of ladders. To a person who has just quitted Germany, and been accustomed to tolerable inns, the Swedish cottages may perhaps appear miserable hovels; to me, who had been long used to places of inferior accommodation they seemed almost palaces. The traveller is able to procure many conveniences, and particularly a separate room from that inhabited by the family, which could seldom be obtained in the Polish and Russian villages. During my course through those two countries, a bed was a phenomenon which seldom occurred, excepting in the large towns, and even then not always completely equipped; but the poorest huts of Sweden were never deficient in this article of comfort: an evident proof that the Swedish peasants are more civilized than those of Poland and Russia. After having witnessed the slavery of the peasants in those two countries, it was a pleasing satisfaction to find myself again among freemen, in a kingdom where there is a more equal division of property: where there is no vassalage; where the lowest order enjoy a security of their persons and property; and where the advantages resulting from this right are visible to the commonest observer."
The peatants of Holland and Switzerland are all in a very tolerable condition; not subject to the undisputed control of a hireling master, they are free men, and enjoy in their several situations the blessings of freedom. In Bohemia, Hungary, and a great part of Germany, they are legally slaves, and suffer all the miseries attending such a condition. In Spain, Savoy, and Italy, they are little better. In France, their situation was such as to warrant the Revolution; but whether by carrying matters too far, they are now worse than they were at any former period, remains to be ascertained.

PEAT, a well known inflammable substance, used in many parts of the world as fuel. There are two species:

1. A yellowish-brown or black peat, found in moorish grounds in Scotland, Holland, and Germany. When fresh, it is of a viscous consistence, but hardens by exposure to the air. It consists, according to Kirwan, of clay mixed with calcareous earth and pyrites; sometimes also it contains common salt. While soft, it is formed into oblong pieces for fuel, after the pyriticaceous and flaky matters are separated. By distillation it yields water, acid, oil, and volatile alkali; the ashes containing a small proportion of fixed alkali; and being either white or red according to the proportion of pyrites contained in the substance.

The oil which is obtained from peat has a very pungent taste; and an empyreumatic smell, less fetid than that of animal substances, more so than that of mineral bitumens; it congeals in the cold into a pitchy mass, which liquefies in a small heat: it readily catches fire from a candle, but burns less vehemently than other oils, and immediately goes out upon removing the external flame; it diffuses almost totally in a reticulated spirit of wine into a dark brownish red liquor.

2. The second species is found near Newbury in Berkshire. In the Philosophical Transactions for the year 1757, we have an account of this species; the difference of which is as follows.

PEAT is a composition of the branches, twigs, leaves, and roots of trees, with grases, saw plants, and weeds, which having lain long in water, is formed into a mass so soft as to be cut through with a sharp spade. The colour is a blackish brown, and it is used in many places for firing. There is a stratnum of this peat on each side the Kennet, near Newbury in Berks, which is from about a quarter to half a mile wide, and many miles long. The depth below the surface of the ground is from one foot to eight. Great numbers of entire trees are found lying irregularly in the true peat. They are chiefly oaks, elders, willows, and firs, and appear to have been torn up by the roots: many horse's heads, and bones of several kinds of deer; the horns of the antelope, the heads and tails of boars, and the heads of beavers, are also found in it. Not many years ago an urn of a light brown colour, large enough to hold about a gallon, was found in the peat-pit in Speen-moor, near Newbury, at about 10 feet from the river, and four feet below the level of the neighbouring ground. Just over the spot where the urn was found, an artificial hill was raised about eight feet high; and as this hill consisted both of peat and earth, it is evident that the peat was older than the urn. From the side of the river several semicircular ridges are drawn round the hill, with trenches between them. The urn was broken to thieves by the peat-diggers who found it, so that it could not be critically examined; nor can it be known whether any thing was contained in it.

With peat also may be classified that substance called in England stone-turf; which hardens after its first exposure to the air, but afterwards crumbles down. The other common turf consists only of mould interwoven with the roots of vegetables; but when these roots are of the bulbous kind, or in large proportion, they form the worst kind of turf. "Although it may appear incredible (says M. Magellan), it is nevertheless a real fact, that, in England, pit-turf is advantageously employed in Lancashire to smelt the iron-ore of that county. Mr Wilkinson, brother-in-law to Dr Priestley, makes use of pit-turf in his large smelting furnaces. I have seen in the possession of Mr S. More, secretary to the Society of Arts, a kind of black tallow, extracted by the said Mr Wilkinson from pit-turf. It was very soft, and nearly of the same consistence with butter. It burned very rapidly, with a smoky flame in the fire; but the smell was very disagreeable, like that of pit-turf." The great cause of the differences of peat most likely arises from the different mineral admixtures. Some sorts of peat yield in burning a very disagreeable smell, which extends to a great distance; whilst others are inoffensive.

Some burn into grey or white, and others into red ferruginous ashes. The ashes yield, on elixiation, a small quantity of alkaline salt, with sometimes one and sometimes another salt of the neutral kind.

The smoke of peat does not preserve or harden flax like that of wood; and the foot, into which it condenses, is more disposed to liquify in moister weather.

PEAT ashes, properly burnt for a manure, are noble improvers both of corn and grass land: but the substance from which they should be got is an under stratum of the peat, where the fibres and roots of the earth, with, &c. are well decayed. Indeed the very best are procured from the lowest stratum of all. This will yield a large quantity of very strong ashes, in colour (when burnt) like vermilion, and in taste very salt and pungent. Great care and caution should be used in burning these ashes, and also in preserving them afterwards. The method of burning them is much the same as burning charcoal. The peat must be collected into a large heap, and covered so as not to flame out, but suffer to consume slowly, till the whole substance is burnt to an ash. The ashes thus burnt are held in most esteem: but the peat-ashes burnt in common firing in many places are used for the same purposes, and sold at the same prices.

PEAT ashes are found excellent in sweetening four meadow land, destroying rubbish, and other bad kinds of grases, and in their ileal producing great quantities of natural grases. They burn great quantities of peat-ashes in some parts of Berkshire and Lancashire, and esteem them one of the best dressings for their spring crops.

The sulphureous and saline particles with which the ashes abound have a most happy effect in promoting vegetation; and if used with discretion, the increase procured by them is truly wonderful.
All ashes are of a hot, fiery, caustic nature: they must therefore be used with caution. With respect to peat-ashes, almost the only danger proceeds from laying them on the ground in quantities at improper seasons. Nothing can be better than they are for dressing low damp meadows, laying to the foundation of fifteen to twenty Winchester bushels on an acre: it is best to sow them by hand, as they will then be more regularly spread. This should be done in January or February, at the first, that the ashes may be washed in, towards the roots of the grass by the first rains that fall in the spring.

If they were spread more forward in the year, and a speedy rain should not succeed, being hot in their nature, they would be apt to burn up the grass, instead of doing it any service. The damper and finer the soil, the mire peat-ashes should be laid on; but in grass lands the quantity should never exceed thirty Winchester bushels, and on light warm lands less than half that quantity is fully sufficient.

On wheat crops these ashes are of the greatest service, but they must be laid on with the utmost discretion. Were they to be spread in any quantity before the winter, after the sowing the corn, they would make the wheat too rank, and do more harm than good; was the spreading this manure, on the contrary, deferred till the spring, the corn could not possibly winter-dress the field and the latter end of November, before the hard frosts set in, seems to be the proper season for this purpose: and it will found necessary to sow on every acre of heavy clayey wheat land about eight Winchester bushels of these ashes; on lighter warmer lands in wheat, four will be sufficient for this purpose. The winter dressing is thought by practical farmers to be of great service: trifling as the quantity may seem, it warms the root of the plant, brings it moderately forward, prevents its verdure, and disposes it to get into a growing state the first fine weather after Christmas.

About the latter end of February, or the beginning of March, on heavy lands in wheat, another dressing of ashes, by sowing of them on every acre, eight bushels more, will do much good; on light lands, in this second dressing, five bushels may be allowed.

These ashes laid on in the spring are of the greatest service, without any probability of danger; if rain falls within a few days after the dressing is laid on, it is washed in, and has a happy effect on the succeeding crop, cooperating with the manure that was laid on in November; if, on the contrary, dry weather for a week follows, the first winter-dressing has its full effect, and the quantity laid on in the spring is in fact too small, that there is very little probability of its burning or hurting the crop. This excellent manure is also of great use in the turnip husbandry on many accounts, particularly as it much contributes to preserve the young crop from being devoured by the fly.

But one of the principal advantages derived from these ashes, not yet mentioned, is the very great service they are of to every kind of artificial pasture. Saintfoué receives great benefit from this manure, and so does clover, rye grass, and trefoil, provided it is laid on with discretion; the proper season is about the month of February. The quantity must be regulated by the nature of the crop and soil; but it ought scarcely in any instance to exceed thirty Winchester bushels. Clover, with the help of this manure, grows with great luxuriance, insomuch that there are often two large crops of hay from the same field in a year, and good autumn feed afterwards. They have an excellent effect on tares or vetches: to please they seem to be hurtful.

The effects of this manure will be visible at least three years, nor does it, like some others, leave the land in an impoverished state, when its virtues are exhausted and spent. Peat-ashes are not, however, to obtain a manure for barley and oats as for the winter corn: for as these are quick growers, and occupy the land but a few months, this warm manure is often apt to push them forward too fast, and make them too much to coarse straw, yielding only a lean immature grain. Oats, however, are not so apt to be damaged by it as barley.

Peat-ashes approach, in their effects on the several crops on which they are laid, to coal-foot; but two-thirds of the quantity that is used of foot will be sufficient of the ashes, as they are in a much stronger degree impregnated with a vegetative power; and they are besides in most places easier procured in quantities, and at a cheaper rate.

Peat-ashes are almost, as we have already observed, a general manure suited to every soil. On cold clay they warm the too compact particles, disposes it to ferment, crumble, and of course fertilizes, and, in fine, not only affix it in discolours and dispersing its great vegetative powers, but also bring to its aid a considerable proportion of ready prepared aliment for plants. On light lands these ashes have a different effect; here the poros are too large to be affected, or farther separated by the salts or sulphur contained in them; but, being closely attached to the surfaces of the large particles of which this earth is generally composed, this manure disposes them, by means of its salts, to attract the moisture contained in the air: by this operation, the plants which grow on these porous soils are prevented from being scorched and burnt; and if they want, which they generally do, more nourishment than the land is of itself capable of affording, this is readily and abundantly supplied by this useful manure. In large farms it is very usual to see all the home-fields rich and well mended by the yard dung, &c. whereas the more distant lands are generally poor, impoverished, and out of heart, for want of proper manure being applied in time. See Chemistry, No. 1448.

PEAUCER, in anatomy, a name given by Winckel, in his Treatise on the Head, and by some of the French writers, to the muscles called by Albinus latissimus colli; and by others dentatus quadratus, and quadratus genu. Santorini has called the part of this which arises from the cheek muscleus riseros novus; and some call the whole platysma myoides.

PEBBLES, the name of a genus of foliis, distinguished from the flints and hornocera by their having a variety of colours. These are defined to be stones composed of a crystalline matter debased by earths of various kinds in the same species, and then subject to veins, clouds, and other variations, usually formed by incrustation round a central nucleus, but sometimes the effect of a simple concretion; and veined like the agates, by the disposition which the motion of the
the fluid they were formed in gave their differently coloured substances.

The variety of pebbles is so great, that an halily describer would be apt to make as many species as he saw specimens. A careful examination will teach us, however, to distinguish them into a certain number of essentially different species, to which all the rest may be referred as accidental varieties. When we find the same colours, or those resulting from a mixture of the same, such as nature frequently makes in a number of fones, we shall easily be able to determine that these are all of the same species, though of different appearances; and that whether the matter be disposed of in one or two, or in 20 crusts, laid regularly around a nucleus; or thrown irregularly, without a nucleus, into irregular lines; or lastly, if blended into an uniform mass.

There are the three states in which every pebble is found; for if it has been naturally and regularly formed by incrustation round a certain nucleus, we find that the same in the same species, and the crusts not less regular and certain. If the whole has been more hastily formed, and the result only of one simple concretion, that has happened while its different substances were all moist and thin, they have blended together and made a mixed mass of the joint colour of them all. But if they have been something harder when this has happened, and too far concreted to diffuse wholly among one another, they are found thrown together into irregular veins. These are the natural differences of all the pebbles; and having regard to these in the several variegations, all the known pebbles may be reduced to 34 species.

In all the strata of pebbles there are constantly found some which are broken, and of which the pieces lie very near one another; but as bodies of such hardness could not be broken without some considerable violence, their present situation seems to indicate that they have suffered that great violence in or near the places where they now lie. Befide these, we often meet with others which have as plainly had pieces broken off from them, though these pieces are nowhere to be found; whence it seems equally plain, that whatever has been the cause of their fracture, they have been brought broken, as we find them, from some other place, or else that the pieces broken from them must at some time or other have been carried from this place to some other distant one.

Several of these broken pebbles have their edges and corners so sharp and even, that it seems evident they never can have been tumbled about or removed since the fracture was made; and others have their sides and corners so rounded, blunted, and worn away, that they seem to have been rubbed together and rolled about among other hard bodies, either with great violence, or for a very long continuance; since such hard bodies could not have been reduced to the condition in which we now see them without long friction. It may be supposed by some, that these bones never were broken, but have been naturally formed of this shape; but it will be easily seen, by any one who accurately surveys their veins or coats, which surround the nucleus, like the annular circles of a tree, that they must have been originally entire; and this will be the more plain if they are compared with a bone broken by art. Such pebbles as are found in strata near the surface of the earth, are much more brittle than those which lie in deeper strata; and the more clear and transparent the sand is which is found among pebbles, the more beautiful the pebbles are generally observed to be.

The use of these stones, and their disposition in the earth, is a subject of great wonder; and may serve as one of the numerous proofs of an over-ruling Providence in the disposition of all natural bodies. The surface of the earth is composed of vegetable mould, made up of different earths mixed with the putrid remains of animal and vegetable bodies, and of the proper texture and compos ates for conducting the moisture to the roots of trees and plants. Under this are laid the sands and pebbles which serve as a fort of drain to carry off the redundant moisture deeper into the earth, where it may be ready to supply the place of what is constantly rising in exhalations; and left the strata of sand should be too thick, it is common to find thin ones of clay between, which serve to put a stop to the defcent of the moisture, and keep it from flowing off too soon; and left these thin strata of sand should yield and give way, and by their fracturing when wetted give leave to the particles of sand to blend themselves with, and even force their way through them, there are found in many places thin coats of a poor iron ore, placed regularly above and below the clay; and by these means not only strengthening and supporting the clay, but effectually keeping the sand from making its way into it.

There are many people of opinion, that the swallowing of pebbles is very beneficial to health, in helping the stomach to digest its food; and a pebble-potsh is an old woman's medicine in the colic in many parts of England. They usually order the small white stones to be picked out of gravel walks for this purpose, and eat them in large quantities in some sort of spoon meat, of which milk is an ingredient.

The thing that has given occasion to this practice seems to have been, that people observe the birds to pick up the gravel, and that they are never well unless they have frequent recourse to this to help their digestion: but this is no similiar cafe at all, for the gizzard or stomach of a bird is made very strong, because the creature hath no teeth to chew its food; and this gizzard is lined with a rough coat, by the help of which and these fones the food they swallow whole is so ground as to yield its juices to the nourishment of the animal. But the stomach of man is formed so very differently, that it can never require those affinities to the comminution of food. Many people have, however, accustomed themselves to swallow not only these small white stones, but large pebbles, even to the size of a walnut each; and these will often pass safely; and people who have long accustomed themselves to swallow them, boast of receiving no injury from them: we can never know, however, that the death of such persons is not owing to them at last; and as they can do no good, it is best always to avoid them. There are, indeed, infallacies on record in which they have undoubtedly done much mischief.

PECARY, in zoology. See TAJACU.

PECANT, in medicine, an epithet given to the humours of the body, when they offend either in quantity or quality, i. e. when they are either morbid, or in too great abundance. Moll diffuses arise from pecant humours,
Two years afterwards he took the degrees of B. and M. A. He published unfairly printed probably a poem, intitled, "The Beauty and Affection of the Creator of the World; containing the History of the Holy Scriptures, 1716, 8vo." In 1722, he had before this time obtained the rectory of Godeby near Melton Mowbray, written by Francis Hargrave, who, in his History and Antiquities of Leicestershire and Rutland, which were printed, about the time of her death in 1714. Two years afterwards he printed "TO TWO ATON ; or an Exercice on the Creation, and an Hymn to the Creator of the World; written in the express words of the sacred text, as an Attempt to shew the Beauty and Sublimity of the Holy Scriptures, 1716, 8vo." In 1721, being then curate of King's Clifton in Northamptonshire, he issued proposals for printing the History and Antiquities of his native town, which was published in 1727, in folio, under the title of "Academia teria Anglicana; or the Antiquarian Annals of Stamford in Lincoln, Rutland, and Northamptonshires; containing the History of the University, Monasteries, Guilds, Churches, Chapels, Hospitals, and Schools there, &c." inscribed to John Duke of Rutland. This work was heightened by "An Essay on the ancient and present State of Stamford, 1726, 4to." written by Francis Hargrave, who, in his pref. &c. mentions the difference which had arisen between him and Mr Peck, on account of the former's publication unfairly referring that intended by the latter. Mr Peck is also therein very roughly treated, on account of a small work he had formerly printed, intitled, "The History of the Stamford Bull-running." Mr Peck had before this time obtained the rectory of Godeby near Melton in Leicestershire, the only preferment he ever enjoyed. In 1722, he printed on a single sheet, "Queries concerning the Natural History and Antiquities of Leicestershire and Rutland," which were afterwards reprinted in 1742, but although the progress he had made in the work was very considerable, yet it never made its appearance. In 1732 he published the first volume of "Defectorata Caroja; or, a Collection of divers fearce and curious Pieces relating chiefly to Matters of English History; confuting of choice tracts, memoirs, letters, wills, epitaphs, &c. trancribed, many of them, from the originals themselves, and the rest from divers ancient MS. copies, or the MS. Collations of sundry famous antiquaries and other eminent persons, both of the last and present age; the whole, as nearly as possible, digested into order of time, and illustrated with ample notes, contents, additional discourses, and a complete index." This volume was dedicated to Lord William Manners, and was followed, in 1735, by a second volume dedicated to Dr Reynolds bishop of Lincoln. In 1735 Mr Peck printed in a 4to pamphlet, a comple catalogue of all the discourses written both for and against the poetry in the time of King James II. containing in the whole an account of 457 books and pamphlets, a great number of them not mentioned in the three former catalogues, with references after each title, for the more speedy finding a further account of the said discourses and their authors in sundry writers, and an alphabetical list of the writers on each side." In 1739 he was the editor of "Nineteen Letters of the truly reverend and learned Henry Hammond, D. D. (author of the Annotations on the New Testament, &c.) written to Mr Peter Stain­nough and Dr Nathaniel Angelo, many of them on curious subjects, &c." These were printed from the originals communicated by Mr Robert Mariden arch­deacon of Nottingham, and Mr John Worthington. The next year, 1740, produced two volumes in 4to, one of them intitled, "Memoirs of the Life and Actions of Oliver Cromwell, as delivered in three pamphlets of him written in Latin; the first, as said, by Don Juan Rodriguez de Saa Meneles, Conde de Penguiao, the Portugal ambassador; the second, as affirmed by a certain Jesuit, the lord ambassador's chaplain; yet both, it is thought, compos'd by Mr John Milton (Latin secretary to Cromwell), as was the third; with an English version of each. The whole illustrated with a large historical preface; many familiar passages from the Paradice Lost, and other works of Mr John Milton, and notes from the best historians. To all which is added, a collection of divers curious historical pieces relating to Cromwell, and a great number of other remarkable persons (after the manner of Defectorata Caroja, v. i. and ii.) The other, "New Memoirs of the Life and poetical Works of Mr John Milton; with, first, an examination of Milton's styie; and secondly, explanatory and critical notes on divers passages in Milton and Shakespeare, by the editor. Thirdly, Baptizes; a sacred dramatic poem in defence of liberty, as written in Latin by Mr George Buchanan, translated into English by Mr John Milton, and first published in 1641, by order of the house of commons. Fourthly, the Parallel, or Archibishop Laud and Cardinal Wolsey compared, a Vision by Milton. Fifthly, the Legend of Sir Nicholas Throckmorton, kn. chief butler of England, who died of poison, anno 1570, an historical poem by his nephew Sir Thomas Throckmorton, kn. Sixth, Herod the Great, by the editor. Seventh, the Resurrection, a poem in imitation of Milton, by a friend. And eighth, a Discourse on the Harmony of the Spheres, by Milton; with prefaces and notes." These were the first publications which he
PECORA, in zoology, the fifth order of the class mammalia, in the Linnaean system. See Zoology.

PECQUET (John), was a physician in Dieppe, and died at Paris in 1674. He was physician in ordinary to the celebrated Fouquet, whom he entertained at his spare hours with some of the most amusing experiments in natural philosophy. He acquired immortal honour to himself by the discovery of a lacteal vein, which conveys the chyle to the heart; and which from his name is called le Réserveur de Pecquet. This discovery was a fresh proof of the truth of the circulation of the blood; though it met with opposition from many of the learned, particularly from the famous Riouan, who wrote a treatise against the author of it, with this title: Allevius Pecquetum & Pecquetianos. The only works which we have of Pecquet, are, 1. Experientia unius Anastasis, published at Paris, 1654. 2. A Dissertation, De Thoracis Laetibus, published at Amsterdam, 1661. He was a man of a lively and active genius; but his sprightly lines sometimes led him to adopt dangerous opinions. He recommended, as a remedy for all diseases, the use of brandy. This remedy, however, proved fatal to himself, and contributed to shorten his days, which he might have employed to the advantage of the public.

PECTEN, the SCALLOP; a genus of shell-fish, the characters of which are these: The animal is a tethys; the shell bivalve and unequall; the hinge toothless, having a small ovated hollow. This shell-fish is one of the spinners, having the power of spinning threads like the mussels; but they are much shorter and coarser than even those of that fish; so that they can never be wrought into any kind of work like the longer and finer threads of the pinna marina. The use of the threads which are spun by the scallop is to fix the creature to any solid body near its shell. All these proceed, as in the mussels, from one common trunk. It is an evident proof that the fish has a power of fixing itself at pleasure to any solid body by means of these threads, that after forms the scallops are often found tossed upon rocks, where there were none the day before; and yet these are fixed by their threads, as well as those which had remained ever so long in their place. They form their threads in the very same manner as the mussels; only their organ which serves for spinning is shorter, and has a wider hollow, whence the threads are necessarily thicker and shorter.

Mr Barbut divides the genus offera into four families; which he thus names according to their characters. 1. The winged equilateral pectens. 2. The pectens, that have one ear inwardly, spring by being clisiated. 3. The pectens that have their valves more gibbous on one side than on the other. 4. The rough ones, commonly called offera. Of the locomotive powers of the pecten, we have already treated under the article Animal Motion, which see p. 411. col. 2.

The pectens, such as the folio pecten, the ducal mantle pecten, the knotted, and others, seem to be in general inhabitants of the Indian seas; some of them frequent those of Africa and the South Seas. The most remarkable species is the maximus or great scallop, being the same with what Barbut calls the ducal mantle pecten. It has 15 rays, very prominent and broad, and fitted both above and below. They are rugged and imbricated with scales. They grow to a large size; are found in beds by themselves; are dredged up, and barrelled for sale. The ancients say that they have a power of removing themselves from place to place by vast springs or leaps. This shell was used both by the Greeks and Latins as a food. When dressed with pepper and cummin, it was taken medicinally. The scallop was commonly worn by pilgrims on their hat, or the cape of their coat, as a mark that they had crossed the sea in their way to the Holy Land, or some distant object of devotion.

The name pecten seems to have been given to these animals, from the longitudinal flire with which their surface is covered, which resemble somewhat the teeth of a comb; and hence also the Greek name Pecch. By the general character of this shell, it evidently includes cockles as well as scallops, which are the pectens without cars, and having left flat or elated shells. They are called by all authors, by a name which is only a diminutive of pecten, pectinulus. The having ears indeed is the common mark of distinction between the pectens and the cockles, which last usually have none; yet the genera are not distinct, as some have imagined: for there are shells universally allowed to be pectens or scallops, which have no ears, and others as universally allowed to be pecctnules or cockles which have. Hence then appears the errors of Lifier, who made them two distinct genera, and gave the ears and the equal convexity of both shells as the great characters of them; which, though they be good marks to distinguish the species by, are far from being so unalterable as to found different genera upon.

Barbut, we have seen, ranks the pectens under the genus offera; but he says, that though the generic character of the hinge agrees in both, the animal inhabiting the pectens is very different from that of the oyster; for which reason Linnaus has divided the genus into fctenas. The pectes by some are esteemed as delicious a food as the oyster. They differ very materially in a variety of circumstances. The pectens, as we have already observed, fail on the surface of the water; and besides, if they are attacked by a foe, they let down the membrane which nature has provided them for a fail, and drop to the bottom. "Behold (says Barbut) the splendor of the pectines, which rival the glowing colours of the papilionaceous tribe, as numerous as they are beautiful, flitting from place to place, and may well be called the papiliones of the ocean. What superior qualities do not the pectines enjoy above the offera edulis, which, constantly confined to its native bed, seems wholly destined to afford food to other creatures, not having any means of defence, but its flily car, which is frequently attacked and formed by its numerous enemies? This creature is not only useful to man as a dainty food, but the shell being levigated
motion are exerted in vain. It is probable, however, that they have the faculty of operating their own relief from those circumstances, and that they may be accidentally afflicted by other bodies. It must, however, be acknowledged, that the means of relief cannot be numerous or considerable in such as are attached to other oysters, to a body heavier than themselves, or to a rock; but such situations are the most uncommon in the oyster-beds that I was acquainted with on the French coasts in the Channel. Perhaps, indeed, a very angular or heavy shell may be sufficient to render an oyster immovable. This is undoubtedly the case with such of them as have been obliged by worms, or other more formidable enemies, so to increase their shells as to make them thick and unwieldy. But we do not know whether these animals, in unfavourable circumstances, may not be able to supply these manoeuvres that I have mentioned, by others that I have not as yet been able to observe. An oyster that has never been attached, may fix itself by any part of the margin of either of its valves, and that margin will become the middle, or nearly so, if the oyster is young. I would not be surprised that oysters, which have been fixed to a rock from the beginning, should be able to detach themselves. I have seen them operate upon their shells in so many different ways, and with such admirable contrivance, when those shells have been pierced by their enemies (among whom I must be ranked), that I do not think it at all impossible for them to quit the place to which they are attached. It will easily be imagined how delicate and difficult such observations and experiments must be, considering the finiteness of the animal, the delicacy of its organs, the transparency of the matter that forms the layers of its shells, the opacity of the shells themselves, the villiatures of the sea, and the seas, &c. But it was of use to show, that, contrary to the opinion generally entertained by the learned as well as by navigators, oysters are endowed with a locomotive faculty, and by what means that faculty is exerted. I must add, that those which first flowed me these motions, were brought from the coasts of Bretagne, put into a bed at La Hogue, then at Coursolle, whence they were carried to Havre; and that, as all those transportations were made in a dry carriage, the oysters could not be in perfect vigour. It was necessary also to show, that these animals have much more sensibility and more industry than is generally attributed to them.

It is not often that a sagacious observer of nature is seduced from his object by the pride of appearing above it, or the desire of generalization. To think of grasping the whole of nature, when we are unable to consider in the whole the first and most interesting of her kingdoms, is a vain illusion. Yet some have endeavoured to confound the kingdoms, while they have taken the liberty of dividing the highest of them into beings differently animalized. Under the pretence of having a better idea of it, they leaped off all the extremities; that is to say, they rid themselves of every thing they were not well acquainted with, or that threw difficulties into their way. This, to be sure, was very convenient, but very injurious to the proceeding of an enlarged mind, and very unfit to inform us with regard to the economy of nature. The organization of the oyster, though very different from that...
PECULIAR, in the canon law, signifies a
form of freehold, that is, an estate or
property in land and personal effects, to
which the owner is entitled, and from
which he is free from the jurisdiction of
the church. It is derived from the Latin
peculium, meaning property or goods.

PECULAR, a peculiarity, is a
characteristic or feature that is unique
to a particular thing or person.

PECULATION, the act of using
property or goods for personal profit.

PECULIUM, a private estate, is
an asset or property that is
owned by an individual or
organization.

PECULIUS, a term used in
Latin to refer to a private or
personal estate.

PEDANTIC, pedantic is an
adjective that describes being
intense or overzealous in
learning or teaching.

PEDIATRY, pediatrics is the
branch of medicine that focuses
on the health and safety of infants
and children.

PEDANT is a person who
shows an excessive or
unreasoning love of learning.

PEDANTICAL, pertaining to
or having to do with pedantry.

PEDIATRICIAN, a pediatrician is
a doctor who specializes in the
health and care of infants and
children.

PEDESTAL, a pedestal is
a stand or base upon which
an object is placed.

PEDESTRIAN, a pedestrian is
a person who travels on foot.

PEDESTRIANISM, pedestrianism is
the practice of walking as a form
of transportation.

PEDESTRIANIZATION, the process
of converting an area into a
dedicated space for pedestrians.

PEDESTRIANIZED, pedestrianized is
an adjective that describes an area
that has been converted into a pedestrian
space.

PEDIMENT, a pediment is an
architectural feature that
consists of a triangular roof
or canopy.

PEDESTRIANIZATION, the process
of converting an area into a
dedicated space for pedestrians.

PEDESTRIANIZED, pedestrianized is
an adjective that describes an area
that has been converted into a pedestrian
space.
To swell up little and low things, to make a vain show of science, to heap up Greek and Latin, without judgment, to tear those to pieces who differ from us about a passage in Suetonius or other ancient authors, or in the etymology of a word, to stir up all the world against a man for not admiring Cicero enough, to be interested for the reputation of an ancient as if he were our next of kin, is what we properly call pedantry.

PEDARIAN, in Roman antiquity, those senators who signified their votes by their feet, not with their tongues; that is, such as walked over to the side of those whose opinion they approved of, in divisions of the senate.

Dr. Middleton thus accounts for the origin of the word. He says, that though the magistrates of Rome had a right to a place and vote in the senate both during their office and after it, and before they were put upon the roll by the censors, yet they had not probably a right to speak or debate there on any question, at least in the earlier ages of the republic. For this seems to have been the original distinction between them and the ancient senators, as it is plainly intimated in the formula of the consular edict, sent abroad to summon the senate, which was addresed to all senators, and to all those who had a right to vote in the senate. From this distinction, those who had only a right to vote were called in ridicule pedarian; because they signified their votes by their feet, not their tongues, and upon every division of the senate went over to the side of those whose opinion they approved. It was in allusion to this old culmum, which seems to have been wholly dropped in the latter ages of the republic, that the mute pedarian; as Cicero informs us, who in giving an account to Atticus of a certain debate and decree of the senate upon it, says that it was made with the eager and general concurrence of the pedarians, though against the authority of all the confuls.

PEDATURA, a term used, in Roman antiquity, for a space or proportion of a certain number of feet set out. This word often occurs in writers on military affairs: as in Hymenius de Castrisarmatione, we meet with meminerimus iuxta ad computationem cohortis equitata militarium pedaturn ad militcentos sesquinginta dari debet; which is thus explained: The pedatura, or space allowed for a cohors equitata or provincial cohort, consisting of both horse and foot, could not be the same as the pedatura of an uniform body of infantry, of the same number, but must exceed it by 360 feet; for the proportion of the room of one horsemann to one foot soldier he assigns as two and a half to one.

PEDASTAS, the same with sodomite.

PEDESTAL, in architecture, the lowest part of an order of columns, being that part which sustains the column, and serves it as a foot or stand. See COLUMN.

PEDEAN, in Grecian antiquity. The city of Athens was anciently divided into three different parts; one on the descent of an hill; another on the sea-shore; and a third in a plain between the other two. The inhabitants of the middle region were called pedians, Pedaietes, formed from pedon, 'plain,' or 'flat,' or as Aristotle will have it, Pedone: those of the hill, Diacrians; and those of the shore, Paralians.

These quarters usually composed so many different factions. Pisistratus made use of the Pedians against the Diacrians. In the time of Solon, when a form of government was to be chosen, the Diacrians chose it democratic; the Pedians demanded an aristocracy; and the Paralians a mixed government.

PEDICLE, among botanists, that part of a stalk which immediately sustains the leaf of a flower or a fruit, and is commonly called a footstalk.

PEDICULUS, the louse, in zoology, a genus of insects belonging to the order of aptera. It has six feet, two eyes, and a fort of fting in the mouth; the feelers are as long as the thorax; and the belly is def pressed and sublubated. It is an oviparous animal. They are not peculiar to man alone, but infet other animals, as quadrupeds and birds, and even fishes and vegetables; but these are of peculiar species on each animal, according to the particular nature of each, some of which are different from those which infest the human body. Nay, even insects are infest with vermian which feed on and torment them. Several kinds of beetles are subject to lice; but particularly that kind called by way of eminence the lowf bottle. The lice on this are very numerous, and will not be shook off. The earwig is often infested with lice, just at the feting on of its head; these are white, and shining like mites, but they are much smaller; they are round-backed, flat-bellied, and have long legs, particularly the foremost pair. Snails of all kinds, but especially the large naked sorts, are very subject to lice; which are continually seen running about them, and devouring them. Numbers of little red lice, with a very small head, and in shape resembling a tortoise, are often seen about the legs of spiders, and they never leave the animal while he lives; but if he is killed, they at once instantly forsake him. A fort of whitish lice is found on humble-bees; they are also found on ants; and fishes are not less subject to them than other animals.

Kircher tells us, that he found lice also on flies, and M. de la Hire has given an accurate account of the creature which he found on a common fly. Having occasion to view a living fly with the microscope, he observed on its head, back, and shoulders, a great number of small animals crawling very nimbly about, and often climbing up the hairs which grow at the origin of the fly's legs. He with a fine needle took up one of these, and placed it before the microscope used to view the animalculae in fluids. It had eight legs; four on each side. These were not placed very distant from each other; but the four towards the head were separated by a small space from the four towards the tail. The feet were of a particular structure, being composed of several fingers, as it were, and fitted for taking hold of any thing; but the two nearest the head were also more remarkable in this particular than those near the tail; the extremities of the legs for a little way above the feet were dry and void of flesh like the legs of birds, but above this part they appeared plump and fleshy. It had two small horns upon its head, formed of several hairs arranged close together; and there were some other clusters of hairs by the side of these
Pediculus. between the latitude of Madeira and the Indies, drown and destroy the lice; and have the same effect as the rubbing over the lousy heads of children with butter and oil. The sweat, in these hot climates, is not rank as in Europe, and therefore it is not apt to breed lice; but when people return into latitudes where they sweat rank again, their nativitie subjects them to the same visitations of these vermin as before. The people in general in the Indies are very subject to lice in their heads, tho' free from them on their bodies. The reason of this is, that their heads sweat less than their bodies, and they take no care to comb and clean them. The Spaniards wash their heads thoroughly once every week with soap, to prevent their being lousy. This makes them escape much better than the other negroes who are laves thare; for the lice grow to numerous in their heads, that they often eat large holes in them.

Cleanliness is doubtless the grand secret by which to keep clear from lice, especially when we wear woollen clothes. It is also necessary where there is any danger, to take nourishing, succulent food, and to use wholesome drink. J. Mercurial advises frequent purges as a cure in the pedicular disease: it is necessary also to rub with garlic and mustard, to take treacle inwardly, also salted and acid food, to bathe, and to foment the body with a decoction of lupines, or of gall-nuts; but the most effectual remedies are sulphur and tobacco, mercurial ointment, black pepper, and vinegar. Monkeys and some Hottentots, we are told, eat lice; and are thence denominated phthiraphages. On the coast of the Red Sea it is reported, that there is a nation of small stature and of a black colour, who use loculics for the greatest part of their food, prepared only with salt. On such food those men live till 40, and then die of a peculiar or lousy difeased. A kind of winged lice devour them, their body putrefies, and they die in great torment. It is also a fact that the negroes on the west coast of Africa take great delight in making their women clear their bodies of lice, and those latter devour them with greediness as fast as they find them.

In ancient medicine lice were esteemed an aperient febrifuge, and proper for curing a pale complexion. The natural repugnance to these ugly creatures (fays Lamery) perhaps contributed more to banish the fever than the remedy itself. In the jaundice five or six were swallowed in a soft egg. In the suppuration of urina, which happens frequently to children at their birth, a living leuca is introduced into the urethra, which by the tickling which it occasions in the canal, forces the sphincter to relax, and permits the urine to flow. A bug produces the same effect. Farriers have also a custom (fays M. Bourgeois) of introducing one or two lice into the urethra of horses when they are seized with a retention of urine, a difficile pretty common among them. But, according to the Continuation of the Materia Medica, to use the pedicular medicine with the greatest advantage, one would need to be in Africa, where these insects are carefulliy sought after and swallowed as a delicious morsel. The great difficult between those which infect mankind is into the head and body lute. The former is hard and high coloured, and the latter is compact and more of an athen colour. If it were possible to give a reason why some families of the same species stick to the head and others to the clothes, &c. it would also in all probability be possible to understand the nature of many contagious diseases.

Pediciluvium, or Bathing of the Feet. The uses of warm bathing in general, and of the pediluvium in particular, are so little understood, that they are often propperously used, and sometimes as injudiciously attained from.

In the Edinburgh Medical Essays, we find an ingenious author's opinion of the warm pediluvium, notwithstanding that of Borelli, Boerhaave, and Hoffman, to the contrary, to be, That the legs becoming warmer than before, the blood in them is warmed; this blood rarifying, dilutes the veifels; and in circulating impart a great degree of warmth to the rest of the mafs; and as there is a portion of it constantly pausing through the legs, and acquiring new heat there, which heat is in the course of circulation communicated to the rest of the blood, the whole mafs rarify, occupies a larger space, and of consequence circulates with greater force. The volume of the blood being thus increased, every veifel is diffended, and every part of the body feels the effects of it; the diffant parts a little later than those first heated. The benefit obtained by a warm pediluvium is generally attributed to its making a derivation into the parts im­merfed, and a revulsion from those affected because they are relieved; but the cure is performed by the direct contrary method of operating, viz. by a greater force of circulation through the parts affected, removing what was stagnant or moving too sluggishly there. Warm bathing is of no service where there is an irregu­lar obstruction, though, by its taking off from a pain in general, it may seem to give a moment's ease; nor does it draw from the other hand, warm bathing of any sort should never be used. On the other hand, where ob­structions are not of long standing, and the impeded matter is not obstinate, warm baths may be of great use to resolve them quickly. In recent colds, with flight humoral peripneumonies, they are frequently an immediate cure. This they effect by increasing the force of the circulation, opening the skin, and driving freely through the lungs that lentor which flagellated or moved slowly in them. As thus conducing to the resolution of obstructions, they may be considered as abort and false fevers; and in using them we imitate nature, which by a fever often carries of an obliterating caufe of a chronic ailment. Borelli, Boerhaave, and Hoffman, are all of opinion, that the warm pediluvium acts by driving a larger quantity of blood into the parts im­merfed. But arguments must give way to facts: the experiments related in the Medical Essays seem to prove a demonstration, that the warm pediluvium acts by rarifying the blood.

A warm pediluvium, when rightly tempered, may be used as a safe cordial, by which circulation can be rouz'd, or a gentle fever rais'd; with this advantage over the cordials and sudorifies, that the effect of them may be taken off at pleasure.
Pediluvia are sometimes used in the small-pox; but Dr Stevenson thinks their frequent tumultuous operations render them suspected, and at best of very doubtful effect; and he therefore prefers Mons. Martin of Laufranne's method of bathing the skin, not only of the legs, but of the whole body, with a soft cloth dipped in warm water, every four hours, till the eruption; by which means the pustules may become universally higher, and consequently more safe.

**PEDIMENT.** See Architecture, p. 240, &c.

**PEDLAR,** a travelling foot-trader. See Hawkers.

In Britain (and formerly in France) the pedlars are despised; but it is otherwise in certain countries. In Spanish America, the busines is so profitable, that it is thought by no means dishonourable; and there are many gentlemen in Old Spain, who, when their circumstances are declining, spend their sons to the Indies to retrieve their fortunes in this way. Almost all the commodities of Europe are distributed through the southern continent of America by means of these pedlars. They come from Panama to Paita by sea; and in the road from the port last mentioned, they make Peru their first voyage to Lima. Some take the road through Casamalia; others through Truxillo, along shore from Lima. They take their passage back to Panama by sea; and perhaps take with them a little cargo of brandy. At Panama they again stock themselves with European goods, returning by sea to Paita, where they are put on shore; there they hire mules and load them, the Indians going with them in order to lead them back. Their travelling expences are next to nothing; for the Indians are brought under such subjection, that they find lodging for them, and provender for their mules, frequently thinking it an honour done them for their service; and that they are sufficiently rewarded by this public testimony of their affections. The queen dowager wished to raise disturbances in Portugal by aiming to recover the regency to herself; but the readiness of the regent's administration, the attachment of the best part of the nobility to him, his having, in an absolute degree, the confidence of the people; not only secured the interior tranquillity of the state, but raised the credit likewise of the crown of Portugal to a very great height in the sentiments of its neighbours; for in the course of his regency he had made it his continual study to pursue the public good; to ease the people in general, and the inhabitants of Lisbon in particular, of several impositions; to maintain the laws in their full vigour; to give the king an excellent education; and that it had been at all practicable, to diffuse a perfect unanimity through the court, by affuaging the malice and envy of his enemies. The king when he came of age, and the cortes or parliament, expressed their entire satisfaction with the regent's administration; and all parties entirely approved of the king's marriage with Donna Isabella, the regent's daughter, which was celebrated in 1446. The enmity of his enemies, however, was not in the least abated by the regent's being out of office. They still persecuted him with their unjust calumnies, and unfortunately made the king hearken to their falsehoods. The unfortunate duke, when ordered to appear before the king, was advised to take with him an escort of horse and foot. In his passage he was proclaimed a rebel, and quickly after he was surrounded by the king's troops. Soon after he was attacked, and in the heat of action he was killed; nor was the envy of his enemies even then satisfied; his body was forbid burial; and was at length taken away privately by the peasants. His virtue, however hated in courts, was adored by the uncorrupted part of his countrymen. At length, thro' an inspection of his papers, the king saw, when it was too late, the injustice that had been done the man who had behaved so well in so high and difficult an office; and whose papers only discovered signs of further benefit...
beacuue, loyal subjects, Peduncle, Pebbles.

Henry Douglas of Cavers, gunner, and a great many terraces on the neighbouring hills, vestiges which five arches.

In the neighbourhood of Tweedale, a county of Scotland, extending 25 miles in length and 18 in breadth. It is bounded on the east by Ettrick Forest, on the south by Annandale, on the west by Clydestede, and on the north by Mid Lothian.

Tweedale is a hilly country, well watered with the Tweed, the Yarrow, and a great number of smaller streams that fertilize the valleys, which produce good harvests of oats and barley, with some proportion of wheat. All the rivers of any consequence abound with trout and salmon. The lake called Wylt. Watrs Loch swarms with a prodigious number of eels. In the month of August, when the west wind blows, they tumble into the river Yarrow in such flocks, that the people who wade in to catch them run the risk of being overturned.

There is another lake on the borders of Annandale, called Loch-gennan, which forms a catacaot over a precipice 230 paces high: here the water falls with such a momentum as to kill the fish underneath. About the middle of this country is the hill or mountain of Braidalbh, from the top of which the sea may be seen on each side of the island. Tweedale abounds with limestone and freestone. The hills are generally as green as the downs in Suffex, and feed innumerable flocks of sheep, that yield great quantities of excellent wool. The country is well shaded with woods and plantations, abounds with all the necessaries of life, and is adorned with many fine seats and populous villages. The earls of March were hereditary sheriffs of Tweedale, which bequests the title of marquis on a branch of the ancient house of Hay, earls of Errol, and hereditary high constables of Scotland. The family of Tweedale is, by the female side, descended from the famous Simon de Frazer, proprietor of great part of this country, who had a great share in obtaining the triple victory at Rolin. The chief, and indeed the only town of consequence in Tweedale, is Peebles, a small inconsiderable royal borough, and seat of a prebendary, pleasantly situated on the banks of the Tweed, over which there is at this place a lately built bridge of five arches. In the neighbourhood of Peebles, near the village of Romans, on the river Lene, we see the vestiges of two Roman castella, or stationary forts; and a great many terraces on the neighbouring hills, which perhaps have served as itinerant encampments.

In the shire of Tweedale there are many ancient and honourable families of the gentry. Amongst these, Douglas of Cavers, who was hereditary sheriff of the country, still preserves the standard and the iron mace of the gallant lord Douglas, who fell in the battle of Otterburn, just as his troops had defeated and taken Henry Percy, iurnamed Hotspur. In the churchyard of Drumalzier, belonging to an ancient branch of the Hay family, the famous Merlin is supposed to lie buried. There was an old traditional prophecy, that the two kings' sons should be united when the waters of the Tweed and the Tweed should meet at his grave. Accordingly, the country people observe that this meeting happened in consequence of an inundation at the accession of James VI. to the crown of England.

Peek, in the seas language, is a word used in various senses. Thus the anchor is said to be a-peek, when the ship being about to weigh comes over her anchor in such a manner that the cable hangs perpendicularly between the haufe and the anchor.

To heave a-peek, is to bring the peek so as that the anchor may hang a-peek. A ship is said to ride a-peek, when lying with her main and fore yards hoisted up, one end of her yards is brought down to the throuds, and the other raised up on end; which is chiefly done when the lies in rivers, left other ships falling foul of the yards should break them. Riding a-broad peek, denotes much the same, excepting that the yards are only raised to half the height.

Peek is also used for a room in the hold, extending from the bids forward to the scra: in this room men of war keep their powder, and merchant men their victuals.

Peel, in the Isle of Man, formerly Holm-town, has a fort in a small island, and a garnison well supplied with cannon. In it are the ancient cathedral, the lord's house, with some lodgings of the bishops, and some other remains of antiquity.

Peers, in general, signifies an equal, or one of the same rank and station; hence in the acts of some councils, we find these words, with the consent of our peers, bishops, abbots, &c. Afterwards the same term was applied to the vassals or tenants of the same lord, who were called peers, because they were all in equal condition, and obliged to serve and attend him in his courts; and peers in feft, because they all held sefs of the same lord.

The term peers is now applied to those who are impeached in an inquest upon a person for convicting or acquitting him of any offence laid to his charge; and the reason why the jury is so called, is because, by the common law and the custom of England, every person is to be tried by his peers or equals; a lord by the lords, and a commoner by commoners. See the article Jury.

Peel of the Realm, a noble lord who has a seat and vote in the House of Lords, which is also called the House of Peers.

These lords are called peers, because though there is a distinction of degrees in nobility, yet in public actions they are equal, as in their votes in parliament, and in trying any nobleman or other person impeached by the commons, &c. See Parliament.

House of Peers, or House of Lords, forms one of the three estates of parliament. See Lords and Parliament.

In a judicative capacity, the house of peers is the supreme court of the kingdom, having at present no original jurisdiction over causes, but only upon appeals and writs of error; to redress any injustice or mistake of the law committed by the courts below. To this authority they succeeded of course upon the dissolution of
of the Aula Regia. For as the barons of parliament were confiderr members of that court, and the rest of its jurisdiction was dealt out to other tribunals, over which the great officers who accompanied these barons were respectively delegated to preside, it followed, that the right of receiving appeals, and superintending all other jurisdictions, still remained in that noble assembly, from which every other great court was derived. They are therefore in all cafes the last resort, from whose judgment no farther appeal is permitted; but every subordinate tribunal must conform to their determinations: The law reposing an entire confidence in the honour and confidence of the noblepersons who compose this important assembly, that they will make themselves masters of those questions upon which they undertake to decide; since upon their decision all property must finally depend. See Lords, Nobility, &c.

Peers, in the anti-revolution government of France, were twelve great lords of that kingdom; of which five were dukes and five counts; and of these, five were ecclesiastics and five laymen: thus the archbishop of Rheims, and the bishop of Laon and Langres, were dukes and peers; and the bishops of Chartres, the Marquis of Noyons, and Beauvais, were counts and peers. The dukes of Burgundy, Normandy, and Aquitaine, were lay peers and dukes; and the counts of Flanders, Champaign, and Touloufe, lay peers and counts. These peers assist at the coronation of kings, either in person or by their representatives, where each performed the functions attached to his respective dignity: but as the fix lay peersages were all united to the crown, except that of the count of Flanders, six lords of the first quality were chosen to represent them: but the ecclesiastical peers generally assisted in person. The title of peer was last paid to every lord whose estate was erected into a peerage; the number of which, as it depended entirely on the king, was uncertain.

Petures, a woman's whip is noble by descent, creation, or marriage. For, there are the noblemen of several ranks, so there are noblewomen; thus king Henry VIII. made Anne Bullen marchioness of Pembroke; king James I. created the Lady Compton, wife to Sir Thomas Compton, countess of Buckingham, in the lifetime of her husband, without any addition of honour to him; and also the same king made the Lady Finch, vicountess of Maidstone, and afterwards countess of Winchelsea, to her and the heirs of her body: and king George I. made the Lady Schullenberg, duchess of Kendal.

If a peeress, by descent or creation, marries a person under the degree of nobility, she still continues noble: but if she obtains that dignity only by marriage, she loses it, on her afterwards marrying a commoner: yet by the courtesy of England, the generally retains the title of her nobility.

A countess or baroness may not be arabled for debt or treason; for though in respect of their sex, they cannot sit in parliament, they are nevertheless peers of the realm, and shall be tried by their peers, &c.

Pewit, in ornithology. See Larks.

Pegasus, among the poets, a horse imagined to have wings; being that whereon Bellerophon was fabled to be mounted when he engaged the Chimera. See Chimera.

The opening of the fountain Hippocrene on mount Helicon is ascribed to a blow of Pegasus's hoof. It was esteemed to have flown away to heaven, where it became a constellation. Hence,

Pegasus, in astronomy, the name of a constellation of the northern hemisphere, in form of a flying horse. See Astronomy, n o 406.

Pegmares, a name by which certain gladiators were distinguished, who fought upon moveable scaffolds called pegmatae, which were sometimes unexpectedly raised, and by this means surprized the people with gladiators in hot contention. They were sometimes suddenly lifted up as to throw the combatants into the air; and sometimes they were let down into dark and deep holes, and then set on fire, thus becoming the funeral piles of these miserable wretches; and roasting them alive to divert the populace.

Pegu, a very considerable kingdom of Asia, beyond the Ganges. The country properly so called is about 750 miles in length from north to south, and as much in breadth from east to west. It is situated on the eastern side of the bay of Bengal, nearly opposite to Arix, and on the north-east of the coast of Coromandel. It is bounded on the north by the kingdoms of Arakan and Ava; on the east by the Upper and Lower Siam; on the south by part of Siam and the Sea; and on the west by the sea and part of Arakan.

The kingdom of Pegu is said to have been founded about 1100 years ago. Its first king was a seaman; concerning whom and his successors we know nothing till the discovery of the East Indies by the Portuguese in the beginning of the 16th century. In 1518 the throne of Pegu was poise by one Brenfagukan, with whom Antony Correa the Portuguese ambassador solemnly concluded a peace in 1519. This monarch was poise by a very large and rich empire, nine kingdoms being in subjection to him, whose revenues amounted to three millions of gold. We have no further account of his transactions after the conclusion of the treaty with the Portuguese. In 1529 he was murdered on the following occasion: Among other princes who were his tributaries was Para Mandar, king of the Barmas. These people inhabited the high lands called Pangozowars, to the northward of the kingdom of Pegu. Their prince, by one of the terms of his vassalage, was obliged to furnish the king of Pegu with 36,000 Barmas, to labour in his mines and other public works. As the king used frequently to go and see how his works went forward, and in these journeys took along with him none but his women, the Barmas observing these visits frequently repeated, formed a design of robbing the queen and all the concubines of their jewels; and pursuant to this design, the next time the king visited the works, they murdered him, and having stripped the ladies, fled to their own country.

By this enormity all Pegu was thrown into confusion; but instead of revenging the death of their king, the people divided everywhere into factions; so that Daeha Rupi, the lawful heir to the crown, found himself unable to maintain his authority. Of these commotions, the king of the Barmas taking the advantage,
of conquering the kingdom of Pegu.

With this view he invaded the country with an army of more than a million of foot, and 3000 elephants; besides a great fleet which he sent down the river Ava towards Bagou or Pegu, the capital of the empire; while he himself marched thither by land. Juft at this time Ferdinand de Miraies arrived at Pegu from Goa with a large galleon richly laden on account of the king of Portugal. As soon as Dacha Rupi heard of his coming, he sent to desire his assistance against the enemy. This he obtained by great presents and promises; and Miraies, sitting out in a galliot, joined the king's ships. Had the numbers been anything near an equality, the superior skill of Miraies would undoubtedly have gained the victory: But the fleet of the Barma covered the whole river, though as large as the Ganges, while that of Dacha Rupi could scarce be observed in comparison with them. Miraies did every thing that man could do, and even held out alone after the natives had deferted him; but at last, oppressed and overwhelmed with numbers, he was killed, with all his men.

Thus Para Mandara became master of all Pegu; after which he attacked the tributary kingdoms. In 1544 he besieged Martavan, the capital of a kingdom of the same name, then very great and flourishing. The land-forces which he brought against it consisted of 700,000 men, while by sea he attacked it with a fleet of 1700 sail, of which were large galleys, and in them 700 Portuguese commanded by John Cayero, who had the reputation of being a valiant and experienced officer. The siege, however, continued seven months, during which time the Barma lost 120,000 men; but at last the besieged king, finding himself straitened for want of provisions, and unable to withstand so great a power, offered terms of capitulation. The besiegers would admit of no terms, upon which the disfavored king applied to the Portuguese in the service of his enemy; for by their alliance he doubted not to be able to drive away the Barma. Accordingly, he sent one Seixas to Cayero, intreating him to receive himself, his family, and treasure, on board the four ships he had under his command; offering, on that condition, to give half his riches to the king of Portugal, to become his vaiffal, and pay such tribute as should be agreed upon. Cayero consulted the principal officers, and in their presence asked Seixas what he thought the treaty might amount to. Seixas answered, that out of what he had seen, for he had not seen all, two ships might be loaded with gold, and four or five with silver. This proposal was too advantageous to be declined; but the rest of the officers envying the great fortune which Cayero would make, threatened to discover the whole to the king of Barma if he did not reject it. The unhappy king of Martavan had now no other recourse but to set fire to the city, make a sally, and die honourably with the few men he had with him; but even here he was disappointed; for by the defection of 4000 of his troops the enemy were apprised of his design, and prevented it. Thus betrayed; he capitulated with the Barma king for his own life and the lives of his wife and children, with leave to end his days in retirement. All this was readily granted, but the conqueror intended to perform no part of his promise.

This city was plundered and burnt, by which above 60,000 persons perished, while at least an equal number were carried into slavery. Six thousand cannon were found in the place; 100,000 quintals of pepper, and an equal quantity of other spices. The day after this destruction, 21 gibbets were erected on an hill adjoining to the city; on which the queen, her children, and ladies, were executed, by hanging them up alive by the feet: however, the queen expired with anguish before she suffered such a cruel indignity. The king, with 50 of his chief lords, was cast into the sea, with stones about their necks. This monstrous cruelty so provoked the tyrant's soldiers, that they mutinied, and he was in no small danger of suffering for it: however, he found means to pacify them; after which he proceeded to besiege Prom, the capital of another kingdom. Here he increased his army to 900,000 men. The queen by whom it was governed offered to submit to be his vaifal; but nothing would satisfy the Barma monarch less than her surrender at discretion, and putting all her treasure into his hands. This he, who knew his perfidy, refused to do; on which the city was fiercely assaulted, but greatly to the disadvantage of the Barma, who lost near 100,000 men. However, the city was at last betrayed to him, when Mandara behaved with his usual cruelty. Two thousand children were slain, and their bodies cut in pieces and thrown to the elephants; the queen was stripped naked, publicly whipped, and then tortured, till she died; the young king was tied to her dead body, and both together cast into a river, as were also 300 other people of quality.

While the tyrant was employed in fortifying the city, he was informed, that the prince of Ava had followed down the river Queniot with 400 rowing vessels having 30,000 soldiers on board; but that, hearing of the queen's disaster, he stopped at Melatay, a strong fortress about 12 leagues north of Prom, where he waited to be joined by his father the king of Ava with 80,000 men. On this news the Barma king sent his foster-brother Chauimigre along the river-side two thousand children were slain, and their bodies cut in pieces and thrown to the elephants; the queen was stripped naked, publicly whipped, and then tortured, till she died; the young king was tied to her dead body, and both together cast into a river, as were also 300 other people of quality.

A most desperate engagement ensued, in which only 800 of the prince's army were left, and 115,000 out of 220,000 Barma who opposed him were killed. The 800 Avans retired into the fort; but Mandara coming up soon after, and being enraged at the terrible havoc made in his army, attacked the fortresses most violently for seven days; at the end of which time, the 800, finding themselves unable to hold out any longer, rushed out in a dark and rainy night, in order to tell their lives at as dear a rate as possible. This last effort was fo extremely violent, that they broke through the enemy's troops in several places, and even preceeded so hard on the king himself that he was forced to jump into the river. However, they were at last all cut off, but not before they had destroyed 12,000 of their enemies.

Mandara having thus become master of the fort, commanded it to be immediately repaired; and sailed up the river to the port of Ava, about a league from the
In the neighborhood, the capital, where he burnt between 2000 and 3000 vehicles, and lost in the enterprise about 8000 men. The city itself he did not think proper to invest, as it had been newly fortified, was defended by a numerous garrison, and an army of 80,000 men was advancing to its relief. The king also apprehensive of Man dara's power, had implored the protection of the emperor of Siam; offering to become his tributary on the same terms of peace as those which the Barma monarch, fo that he dispatched an embassage to the Kalaminham or sovereign of a large territory adjacent, requesting him to divert the emperor from his purpose. On the embassadors return from this court, it appeared that the treaty had already taken effect; but as the season was not yet arrived for invading Ava, Chaumigrem, the king's elder-brother was sent with 150,000 men to reduce Sbadi or Savadi the capital of a small kingdom about 150 leagues north-east from Pegu. The general, however, failed in his attempt; and afterwards endeavouring to revenge himself on a town in the neighbourhood, he was surprized by the enemy and put to flight.

In the mean time, the empire of Siam fell into great distractions; the king, together with the heir to the crown, were murdered by the queen, who had fallen in love with an officer, whom she married after her husband's death. However, both of them were soon after killed at an entertainment; and the crown was given to a natural brother of the late king, but a coward and a tyrant. On this Mandara resolved to invade the empire of Siam; and, his principal courtiers concurring in the scheme, he collected an army of 800,000 men, with no fewer than 20,000 elephants. In this army were 1000 Portuguese, commanded by one James Suarez, who already had a pension of 200,000 ducats a-year from the king of Pegu, with the title of his brother, and governor of the kingdom. With this formidable army he set out in April 1548. His first achievement was the taking of a fortress on the borders of the enemy's country; before which, being several times repulsed, and having lost 3000 of his men, he revenged himself by putting all the women to the sword. He next besieged the capital itself; but though the siege was continued for five months, during which time the most violent attacks were made upon it, the assailants were constantly repulsed with great loss. However, it was still resolved to continue the siege, and a mount of earth was raised, on which were placed 40 pieces of cannon, ready to batter it anew, when, in October, advice was received of a rebellion having broke out in Pegu.

The person who headed the rebels on the present occasion was Shoripam Shuy, near a kin to the former monarch than twelve years before. He was a religious person, of great understanding, and esteemed a saint. As he was a famous preacher, he made a great son, in which he felt the tyranny of the Barmas in such a manner, that he was immediately taken out of the pulpit, and proclaimed king by the people, who, as a token of sovereignty, gave him the title of Shemindoo. The first act of sovereignty which he exerted was to cut in pieces 15,000 Barmas, and seize on the treasure; and so agreeable was this change of government to all ranks of people, that in three weeks time all the strong holds of Pegu fell into his hands.

On this news the king immediately raised the siege in which he was engaged, and in 17 days got to Martavan. Here he was informed, that Shemindoo had polled 500,000 men in different places, in order to intercept his passage; at the same time that he had the satisfaction to find 50,000 of his best troops deserted. To prevent a greater defection, after 14 days they, he departed from Martavan, and soon met Shemindoo at the head of 600,000 men. A desperate engagement followed: in which Shemindoo was entirely defeated, with the loss of 300,000 men. Of the Barma troops were slain 60,000; among whom were 280 Portuguese.

The morning after this victory, the tyrant marched to the city; the inhabitants of which surrendered, on condition of having their lives and effects spared. The kingdom being thus again brought under his subjection, his next step was to punish the principal personages concerned in the rebellion: their heads he cut off, and confiscate their estates, which amounted to no less than ten millions of gold. Others say, that he put all without distinction to the sword, excepting only 12,000, who took shelter in James Suarez's house, that alone affording an asylum from the general slaughter. The plunder was incredible, Suarez alone getting three millions. All these cruelties, however, were insufficient to secure the allegiance of the tyrant's subjects; for in less than three months news was brought that the city of Martavan had revolted; and that the governor had not only declared for Shemindoo, but murdered 2000 Barmas. Mandara then summoned all the lords of the kingdom to meet him with their forces, within 15 days, at a place called Mouchan, not far from his capital, whither he himself went with 300 men, to wait their arrival. But in the meantime he received intelligence that the shemin or governor of Zatan, a city of some consequence, had submitted to Shemindoo, and also lent him a large sum of gold. The shemin was immediately sent for in order to be put to death: but he, supposing Mandara's design, escaped himself by pretending sickness; after which, having consulted with his friends, he disguised himself, and, with about 600 men, and having with these privately advanced to the place where the king was, he killed him, with the few attendant that were about him at the time. The guards in the court being alarmed with the noise, a skirmish ensued with the shemin's men, in which about 800 were slain on both sides, most of them Barmas. The shemin then retreated to a place called Pontel; whither the people of the country, hearing of the death of the king, who was universally hated, returned to him. When he had assembled about 5000 men, he returned to seek the troops which the late king had had under his command and finding them dispersed in several places, easily killed them all. With the Barmas were slain 800 out of 300 Portuguese. The remainder surrendered, with Suarez their leader; and were spared, on condition of their remaining in the service of the shemin.

The shemin, now finding his forces daily increase, assumed the title of king; and, to render himself the more popular, gave out that he would exterminate
The air of Pegu is very healthy, and presently recovers sick strangers. The soil also is very rich and fertile in corn, rice, fruit, and roots; being enriched by the inundations of the river Pegu, which are almost incredible, extending above 30 leagues beyond its channel. It produces also good timber of several kinds. The country abounds with elephants, buffaloes, goats, hogs, and other animals, particularly game; and deer is so plenty in September and October, that one may be bought for three or four pence; they are very flythy, but have no fat. There is flora of good poultry; the cocks are vastly large, and the hens very beautiful. As for fish, there are many forts, and well salted. In Pegu are found mines, not only of gold, iron, tin, and lead, or rather a kind of copper or mixture of copper and lead, but also of rubies, diamonds, and sapphires. The rubies are the best in the world; but the diamonds are small, and only found in the craws of poultry and pheasants. Besides, only one family has the privilege of telling them; and none dare open the ground to dig for them. The rubies are found in a mountain in the province of Kablan, or Kaplan, between the city of Pegu and the port of Sirian.

The inhabitants are of an olive, or rather a tawny complexion. The women are branded by some traveller as having hooked off all modishly, on account of their exposing some parts of their bodies which ought to be concealed from sight. Some also tell us, that the men wear bells, which at a certain age, viz. 25 or 30, or, according to others, when they are capable of making use of women, are inflected on each side the virile member between the skin and the flesh, which is opened for that purpose, and healed in seven or eight days. The Peguans may be ranked among the most superstitious of all mankind. They maintain and worship crocodiles; and will drink nothing but the waters of the ditches where those monstrous animals harbour. By thus exposing themselves to the manifest hazard of their lives, they have frequently the misfortune to be devoured. They have five principal festivals in the year, called falans, which they celebrate with extraordinary magnificence. In one of them the king and queen make a pilgrimage about 12 leagues from the city, riding on a triumphal car, so richly adorned with jewels, that it may be said without an hyperbole that they carry about with them the value of a kingdom. This prince is extremely rich; and has in the chapel of his palace idols of inestimable value, some of them being of maffy gold and silver, and adorned with all sorts of precious stones. The talapous, or priests of this country, have no poffessions; but such is the respect paid them by the people, that they are never known to want. They preach to them every Monday not to commit murder; to take from no person any thing belonging to him; to do no hurt to give no offence; to avoid impurity and superstitious; but above all, not to worship the devil: but these duties have no effect in the last respect. The people, attached to manichém, believe that all good comes from God; that the devil is the author of all the evil that happens to men; and that therefore they ought to worship him, that he may not afflict them. This is a common notion among the Indian idolaters.

The inhabitants of Pegu are accused by some authors with being slovenly in their houses, and nasty in their...
Pegu, on account of their seasoning their virtuus with fidol, a composition made of flinking fish, reduced to a consistency like mustard, so nauseous and offensive that none but themselves can endure the smell of it. Balbi says, he could sooner bear the scent of flinking carron; and yet with this they feast their rice, and other soups, instead of oil or butter. As they have no wheat in this country, their bread is rice made into cakes. Their common drink is water, or a liquor distilled from cocoa-nut water. They are a spirited and warlike people; open, generous, and hospitable; and have neither the indolence nor the jealousy of most other eastern nations.

The men here, as in most eastern countries, buy their wives, or pay their parents a dowry for them. They have an odd custom; which is to offer their daughters to flangers, and hire them out for a time: some say they hire out their wives in the same manner. Their marriages for a time are well regulated, and often prove very beneficial to the family. In case of a separation, the father is obliged to take care of the boys, and the mother of the girls. We are told that no woman is looked upon as a wife, but rather the better, for she has had the virtue of European husbands: he is likewise the heir of all his children. The men here, as in these countries, according to the humour or interest of the parties, they hire out their wives in the same manner.

In Pegu, the inheritance of all land is in the king; he is likewise the heir of all his subjects who die without issue; but in case they have children, two-thirds go to them, and the reft to his majesty.

In the government of this country, despotism prevails in its full extent, and despotism too of the very worst kind; for the inhabitants are under the absolute power of a few petty tyrants, who are themselves nothing more than slaves to the king of Ava. As they have little or no emolument, except what they can raise by extortion, it is exercised in the most unlimited manner. They take cognizance of all disputes between individuals that come to their ears, without the cafe of being laid before them by either of the parties; and on whatever side the cause is determined, there is a never-failing charge brought in against both, for justice, as they exprefs it; and this price of justice is often three or four times greater than the value of the matter in agitation.

But the inconveniences that this government labours under are not only those of despotism; the unhappy subjects feel these of anarchy too. There are about twenty persons concerned in the government of Rangoon, who, though one is subordinate to another, and though matters of the first consequence are determined in a council of the whole, can yet act separately; and any one member of this body can by his own authority give orders, which no inhabitant of Pegu dares to disobey. Thofe orders may be contrary to the sense of the whole body; in which cafe, they are, indeed, revered in council: but then there are infinaces, and according to the sense of the whole body, in which cafe, they are, indeed, revered in council: but then there are infinaces, and

* Fuller's account of the kingdom of Pegu.

As to the religion of the Peguers, it is the same at bottom with that which prevails over the rest of India and Tibet; only varies in dress somewhat in different countries, according to the humour or interest of the priests. They hold the existence of one supreme God, of whom they make no image; but they have many inferior created gods, whose images are set up in the temples for the laity to worship. Not content with these, we are told they worship the devil alfo. Many are ftehn to run about the streets every morning, with rice in one hand and a torch in the other, crying "Hi, luul, hello," that he may not hurt them all the day. Besides the Manichean doctrine of two principles, one the author of good and the other of evil, from whence their worshipping the devil has its rise, they believe an eternal succession of worlds without creation. The Peguers hold the doctrine of the Metempsychotis, or transmigration of the human fouls, which, after passing through the bodies of various animals, shall attain to the perfection and felicity of their gods; which in effeét is no other than a flate of annihilation. They have a strong opinion of the faticity of apes and crocodiles, infomuch that they believe the perions to be perfectly happy who are devoued by them. Their temples are of a conical form, and some of them a quarter of a mile round. They obferve a great many festivals, some of which are called japaI. The images of their inferior gods are in a fitting posture, with their legs akimbo, and toes of equal length; their arms and hands very small in proportion to their bodies, their faces longer than human; their ears long, and the lappets very thick. The congregation bow to them when they come in and when
Travels into Dalmatia.

PEGUNTUM (anc. geog.), Ptolemy; Peguntius, (Pliny); a town or citadel of Dalmatia, on the Adriatic; opposite to the island Brattia, scarce five miles off, and 40 miles to the city of Salona. According to Porphyrion, a mountain, a large hollow, and submarine springs are seen here. "This hollow (says he) seems to have been excavated by some ancient river. The springs which bubble up under the sea are so considerable, that they might pass for the rising again of a river sunk under ground. Vuillia has the fame derivation of the word Viril, which in Slavonian signifies a continent; and this etymology, rendering the name of Vuillia the Berullia of Porphyrion harmless to that of Peguntum, since it is clear that Viril and Virile are synonymous, induces me to believe, that the cattle named Peguntium by ancient geographers was situated in this place, and not at the mouth of the Cettina. No remarkable vestiges of antiquity now exit on the spot; yet it is evident, by the quantity of fragments of vases, tiles, and sepulchral inscriptions now and then dug up, that this tract of coast was well inhabited in the Roman times. The principal cause why the tracts of ancient habitations cannot be discovered about Vuillia, is the steepness of the hill above it, and the quantity of stones brought down from thence by the waters. The mouth of the hollow of Vuillia is dredged by farmers, on account of the fudden impetuous gusts of wind that blow from thence, and in a moment raise a kind of hurricane in the channel between the Primorie and the island of Brazza, to the great danger of barks surprized by it."

PEIGNE FORT ET DURS, (Lat. pana fortis et dura), signifies a special punishment inflicted on those who, being arraigned for felony, refrain not to put themselves on the ordinary trial, but stubbornly stand mute; it is vulgarly called prosing to death. See ARRANGEMENT.

PEIRCE (James), an eminent dissenting minister, was born at Wapping, in London, in the year 1674, and was educated at Utrecht and Leyden; after which he spent some time at Oxford, in order to enjoy the benefit of frequenting the Bodleian library. He then for two years preached the Sunday evening's lecture at the meeting-house in Miles-Lane, London, and then settled at Cambridge. In 1713 he was removed to a congregation at Exeter, where he continued till the year 1718; when the Calvinists among the dissenters proposing a subscription to articles of faith to be signed by all the dissenting ministers in the kingdom, several articles were proposed to him and Mr John Hallet, another dissenting minister at Exeter, in order to their subscribing; they both refused, imagining this proceeding of their dissenting brethren to be an unworthy imposition on religious liberty and private judgment; for which they were ejected from their congregation. Upon this, a new meeting was opened for them at Exeter, of which Mr Peirce continued minister till his death, in 1726. He was a man of the strictest virtue, exemplary piety, and great learning. He wrote, 1. Exercitatio philosophica de Homoeomer. 2. Thirteen pieces on the Controversy between the Church of England and the Dissenters. 3. Ten pieces on the Controversy about the Ejection at Exeter. 4. Six pieces on the Doctrine of the Trinity. 5. A paraphrase and Notes on the Epistles of St Paul to the Colossians, Philippians, and Hebrews. 6. An Essay in favour of giving the Eucharist to Children. 7. Fourteen Sermons.

PEIRESC (Nicolas Claude Fabri), born in 1580, was descended from an ancient and noble family, seated originally at Pisa in Italy. At ten years of age, he was sent to Avignon, where he spent five years in the Jansen college, in the study of what in Scotland and on the Continent is called humanity. From Avignon he was, in 1595, removed to Aix, and entered upon the study of philosophy. In the interim, he attended the proper matters for dancing, riding, and handling arms; in all which, though he performed the lessons regularly, it was with reluctance: 'for this was done only to please an uncle whose heir he was to be, he never practiced by himself, eleminating all the time lost that was not spent in the pursuits of literature. During this period his father was presented with a medal of the emperor Arcadius, which was found at Belgenier, Peirese begg the favour of it; and, charmed with deciphering the characters in the exergue, and reading the emperor's name, he carried the medal with a transport of joy to his uncle; who for his encouragement gave him two more, together with some books upon the subject. This is the epoch of his application to antiquities, for which he became afterwards so famous. In 1596, he was sent to finish his course of philosophy under the Jesuits at Tourn, where he turned his attention particularly to cosmography, as being necessary to the understanding of hiliary, abating, however, nothing of his application to antiquity, in which he was much aided by Petrus Rogerus, one of the professors, and a skilful medallist: nor did he omit the study of humanity in general, wherein he was the master and instructor of a brother who was with him. But to do all this he was obliged to set up late at nights; and so much labour and attention, as he was naturally of a tender constitution, increased the weakness of his stomach formerly contracted, and for which he had used a kind of digestive powder. Being recalled by his uncle in 1597, he returned to Aix, and entered there upon the study of the law; which he prosecuted, however, so as to find leisure to visit and converse frequently with Peter A. R. Bagarr, a most skilful antiquary, who was afterwards made master of the jewells to Henry IV.

The following year he went again to Avignon, to carry on his course of law under one Peter David; who, being well skilled in rarities, was pleased to see Peiresc join this study to that of the law. But Ghibertus of Naples, auditor to Cardinal Aquaviva, fed his curiosity the most, in showing him some rarities, such as he had never seen before. Ghibertus also lent him Galtrius's Treatise upon Coins, and advs.
vited him to go into Italy, especially to Rome, where he would meet with curiosities to satisfy his most ardent wishes. Accordingly, his uncle having procured a proper governor, he and his brother set out upon that tour Sept. 1599; and passing through Florence, Bononia, and Ferrara, when he had stayed a few days at Venice, he fixed his residence at Padua, in order to complete his course of law. But once a quarter, going to Venice to get cash for bills of exchange, he took these opportunities of introducing himself to the most distinguished literati there; and was particularly careted by F. Contarin, procurator of St Mark, who was professed of a curious cabinet of medals; and other antiquities, without knowing the value of them. This was fully shown to him by Percièfe, who likewise explained the Greek inscriptions upon his medals, and the monumental stones. After a year's stay at Padua, he set out for Rome, and arrived there Oct. 1600, in order to be in time for seeing the Jubilee: to celebrate which, the Porta Santà would be opened in the beginning of the next year. He passed six months in this city, viewing the numberless curiosities there, and generally acknowledged, that he had taken the helm of learning into his hand, and began to guide the commonwealth of letters.

Having now spent almost three years in Italy, he began to prepare for his departure; and in the end of 1602, having packed up all the rarities, gems, &c. which he had procured, and put them into the road to Marseilleilles, he left Padua, and, crossin the Alps to Geneva, went to Lyons; where receiving money, he made a handom present to his governor, who took the route of Paris. From Lyons he went to Montpelier, to procure himself a passport for Italy; and from thence passed to Florence; and not long after presented himself in the city, where he had spent seven years and some months. He arrived at Aix in October; and not long after presented to the court a patent from the king for the ordering of the family affairs. In 1618, having procured a faithful copy of "the Acts of the Monastery of Maren in Switzerland," he published a second edition of that work. As it was written in defence of the royal line of France against Theodoric Peffordius, who had attempted to prove the title of the Austrian family to the French crown by right of succession, he was, upon this publication, nominated the fane year, by Louis XIII. abbot of Sancta Maria Aquilieriensis. He stayed in France till 1623; when, upon a message from his father, now grown old and sickly, he left Paris, where he had spent seven years and some months. He arrived at Aix in November; but, bringing Parius along with him, he obtained leave to return to Montpelier in a few days. He waited upon Parius back again, under whom he continued pursuing his studies till the end of 1603, when he returned to Aix, at the earnest request of his uncle, who, having resigned to him his senatorial dignity, had ever since the beginning of the year laboured to get the king's patent. The degree of doctor of law was a necessary qualification for that dignity. Parisèfe, therefore, having kept the usual exercises, took that degree Jan. 16, 1604, when the afoid patent was given in to the senate, and ordered to be recorded; yet Parisèfe procured leave not to be presently entered into the lift of senators. The bent of his inclination was not so much to business as to advance arts and sciences, and to affit all the promoters of learning. For this purpose, he resolved to lead a single life; so that when his father had concluded a match for him with a respectable lady, he begged to be excused.

In 1605, he accompanied G. Varius, first president of the senate at Aix, who was very fond of him, to Paris; whence, having visited every thing curious, he crost the water, in company with the king's ambaf- sador, 1606, to England. Here he was very grati- agiously received by king James I.; and having seen Oxford, and visited Camblen, Sir Robert Cotton, Sir Henry Savile, and other learned men, he passed over to Holland; and after visiting the several towns and universities, with the literati in each, he went through Antwerp to Brussels, and thence back to Paris, to see the ceremony of the Dauphin's baptism; which being solemnized Aug. 24, he returned home in September 1606, being expected for the ordering of the family affairs.

Priently after this, he purchased the barony of Rians; and at the solicitation of his uncle, having approved himself before that assembly, he was received a senator on the 1st of July 1607. Jan. 1608 he left his uncle; and the following year, falling himself into a dangerous fever, recovered by eating musk-melons before supper, for which he had conceived a longing. He was ordered by his physician to eat them before his meals without bread, and to drink a glafs of pure wine upon them. He continued this method all his life afterwards; and grew fond of them, that, though he could abstain from any other meat as he list, yet towards them he professed he was unable to miter himself. He frequently experienced, that in the musk- melon season he was never troubled with the gravel. In 1618, having procured a faithful copy of "the Acts of the Monastery of Maren in Switzerland," he published a second edition of that work. As it was written in defence of the royal line of France against Theodoric Peffordius, who had attempted to prove the title of the Austrian family to the French crown by right of succession, he was, upon this publication, nominated the same year, by Louis XIII. abbot of Sancta Maria Aquilieriensis. He stayed in France till 1623; when, upon a message from his father, now grown old and sickly, he left Paris, where he had spent seven years and some months. He arrived at Aix in October; and not long after presented to the court a patent from the king for the ordering of the family affairs. To this the court of parliament not affenting, decreed unanimously, that, being already admitted into the first rank, he should abide perpetually therein; not returning, as the custom of the court was, to the inferior auditory, wherein trials are usually had of criminal cases. In 1624, he buried his father, who had been long afflicted with the gout. In 1627, he prevailed with the archbishop of Aix to establish a polt thence to Lyons, and so to Paris and all Europe; by which the correspondence conftantly held with the literati every where was much facilitated. In 1629, he began to be much tormented with the strangury and hemorrhoids; and in 1631, having completed the marriage of his nephew Claudius with Margaret Alrefia, a noblewoman of the county of Avignon, he bestowed upon him the barony of Rianty, together with a grant of his senatorial dignity, only reserving the function to himself for three years. But the parliament not waiting his surrender of it, he retented that affront so heinously, that he procured, in 1635, letters patent from the king to be restored, and
the office for five years longer, which happened to be till his death: for being seized, June 1637, with a fever that brought on a flux of urine, this put an end to his life on the 24th of that month, in his 57th year.

The character of Peirefc may be summed up in a few words. His person was of a middle size, and of a thin habit: his forehead large, and his eyes grey; a little hawk-nosed; his cheeks tempered with red; the hair of his head yellow, as also his beard, which he used to wear long; his whole countenance bearing the marks of uncommon and rare courtly and affability. In his diet he affected cleanliness, and in all things about him; but nothing superfluous or costly. His clothes were suitable to his dignity; yet he never wore silk. His bed was exceedingly plain, holes: the lower part of it was furnished, and his table continually loaded and covered with papers, transcripts, notes, collections from books, epistles, and such like papers. His bed was exceeding plain, holes: the lower part of his bed was adorned according to his condition, and very well furnished; but he neglected his own chamber. Instead of tapestry, there hung the pictures of his chief friends and of famous men, besides innumerable bundles of commentaries, transcripts, notes, collections from books, epistles, and such like papers. His bed was exceeding plain, and his table continually loaded and covered with papers, books, letters, and other things; as also all the seats round about, and the greatest part of the floor.

These were so many evidences of the turn of his mind; in respect to which, the writer of his eulogium compares him to the Roman Atticus; and Bayle, considering his great stock, which ends here, is commanded by a passage, which he calls "the attorney-general of the literary republic." The works which he published are, "Historia provinciae Galliae Narbonensis;" "Nobilium ejusdem provinciarum Originals, et separatum Fabricicum;" "Commentarii rerum omnium memoria digitarum, in qua estate gestarum;" "Liber de ludicris naturae operibus;" "Mathematica et astronomia variarum Observationum mathematicarum;" "Epitome ad S. P. Urbanum VIII. cardinale Barberinum, &c.;" "Auctores antiqui Graeci et Latini de ponderibus et mensuris;" "Elogia et epistola;" "Inscriptiones antiquae et modernae;" "Genealogia domus Austricae;" "Catalogus libros bibliothecae Universitatis;" "Societatis regii Academiae Carolinae;" "Immacolati Saxoni, Britannici, &c.;" "Linguae orientales, Hebraea, Samaritana, Arabica, Egyiptica, et Indices librarium harum lingvarum;" "Observationes in varios auctores." It is remarkable, that though Peirefs bought more books than any man of his time, yet his collection left was not large. The reason was, that, as fast as he purchased, he kept continually making presents of them to such learned men as he knew they would be useful to.

PEKIN, the capital city of the empire of China, in Asia, where the emperor generally resides. It is situated in a very fertile plain, 20 leagues distant from the great wall. This name, which signifies the northern court, is given to it, to distinguish it from another considerable city called Nancking, or the southern court. The emperor formerly resided in the latter; but the Tartars, a restless and warlike people, obliged this prince to remove his court to the northern provinces, that he might more effectually repel the incursions of those barbarians, by opposing to them a numerous militia which he generally keeps around his person. It is an exact square, and divided into two parts; namely, that which contains the emperor's palace, which is in the new city, or, as it is called, the Tartar's city, because it is inhabited by Tartars ever since they conquered this empire; the other, called the Old City, is inhabited by the Chinese. The circuit of both these together is 52 Chinese miles, each of which contains 240 geometrical paces; being, without the suburbs, full six leagues in circumference, according to the most accurate measurement made by order of the emperor.

Those who have paid attention to the population of this place, reckon the number of inhabitants at 2,000,000, though there are others that double that number.

Grosier tells us, "that the height and enormous thicknefs of the walls of the Tartar city excite admiration; twelve horsemen might easily ride abreast upon them; they have spacious towers raised at intervals, a bow-shot distant from one another, and large enough to contain bodies of reserve in case of necessity. The city has nine gates, which are lofty and well arched. Over them are large pavilion-roofed towers divided into nine stories, each having several apertures or port-holes: the lower story forms a large hall for the use of the soldiers and officers who quit guard, and those appointed to relieve them. Before each gate a space is left of more than 360 feet: this is a kind of place of arms, inclosed by a semicircular wall equal in height and thickness to that surrounding the city. The great road, which ends here, is commanded by a pavilion-roofed tower like the first, in such manner, that as the cannon of the former can batter the houses of the city, those of the latter can sweep the adjacent country. The streets of Pekin are straight, about 120 feet wide, a full league in length, and bordered with shops. It is astonishing to see the immense concourse of people that continually fills them, and the confusion caused by the prodigious number of horses, camels, mules, and carriages, which cross or meet each other. Besides this inconvenience, one is every now and then stopped by crowds, who stand listening to fortune-tellers, jugglers, ballad-fingers, and a thousand other mountebanks and buffoons, who read and relate stories calculated to promote mirth and laughter, or distribute medicines, the wondrous effects of which they explain with all the eloquence peculiar to them. People of distinction oblige all their dependents to follow them. A mandarin of the first rank is always accompanied in his walks by his whole tribunal; and, to augment his equipage, each of the inferior mandarins in his suit is generally attended by several domestics. The nobility of the court, and princes of the blood, never appear in public without being surrounded by a large body of cavalry; and, as their presence is required in the palace every day, their train alone would be sufficient to create confusion in the city. It is very singular, that at all this prodigious concourse no women are ever seen: hence we may judge how great the population of China must be, since the number of females in this country, as well as everywhere else, is superior to that of the other sex.

"As there is a continual influx of the riches and merchandise of the whole empire into this city, the number of strangers that resort hither is immeasurable. They are carried in chairs, or ride on horsecback: the latter is more common: but they are always attended by a guide acquainted with the streets, and who knows,
Pekin knows the houses of the nobility and principal people of the city. They are also provided with a book, containing an account of the different quarters, squares, remarkable places, and of the residence of those in public offices. In summer there are to be seen small temporary shops, where people are served with water cooled by means of ice; and one finds everywhere cafes supplied with refreshments of tea and fruits. Each kind of provision has a certain day and place appointed for its being exposed to sale.

The governor of Pekin, who is a Mantchev Tartar, is styled Governor of the Nine Gates. His jurisdiction extends not only over the foldedors, but also over the people in every thing that concerns the police. No police can be more active; and it is surprising to see among an infinite number of Tartars and Chinese, mixed together, the greatest tranquillity prevail. It is rare, in a number of years, to hear of houses being robbed, or people assassinated. All the principal streets have guard-rooms, and foldedors patrol night and day, each having a sabre hanging from his girdle, and a whip in his hand, to correct, without distinction, those who excite quarrels or cause disputes. They are warned to make a continual noise, to shew one to walk through streets, where they are about to be seen. They are, the person to whom this indulgence is granted must carry a lantern, and give a sufficient reason for his going out. In the evening, as soon as the foldedors are warned to their quarters by beat of drum, two centinels go and come from one guard-room to another, making a continual noise with a kind of calafnet, to show that they are not asleep. They permit no one to walk abroad in the night-time. They even examine those whom the emperor dispatches on business, and if their reply gives the least cause of suspicion, they have a right to convey them to the guard-room. The foldedors in each of the guard-rooms are obliged to answer every time the centinels on duty call out.

"It is by these wise regulations, observed, with the greatest strictness, that peace, silence, and safety reign throughout the whole city. The governor is also obliged to go the round; and the officers stationed on the walls, and in the towers over the gates (in which are kept large kettle-drums that beat every time the guard is relieved), are continually dispatching batches to examine the quarters belonging to the gates where they are posted. The least neglect is punished next morning, and the officer who was on guard is cashiered. This police, which prevents nocturnal assemblies, would appear no doubt extraordinary in Europe, and in all probability would not be much relished by young men of fortune and ladies of quality. But the Chinese think justly; they consider it to be the duty of the magistrates of a city to prefer good order and public tranquillity to vain amusements, which generally occasion many attempts against the lives and property of the citizens. It is true, the support of this police costs the emperor a great deal; for part of the foldedors we have mentioned are maintained for this purpose only. They are all infantry, and their pay is generally very high. Their employment consists not only in watching for those who may occasion disturb-

dance in the day-time, or walk abroad during the night; they must also take care that the streets are kept clean and swept every day; that they are watered morning and evening in time of dry weather; and that every nuisance is removed. They have orders also to assist in this labour themselves; and to clear the kennels, that the water may have a free course."

The walls of the emperor's palace, including that and the gardens, are about two miles in length. "Although (says Groser) the Chinese architecture has no resemblance to that of Europe, the imperial palace of Pekin does not fail to strike beholders by its extent, grandeur, and the regular disposition of its apartments, and by the singular structure: its pavilion-roofs, ornamented at each corner with a carved plat-band, the lower extremity of which is turned upwards. These roofs are covered with varnished tiles of a beautiful yellow colour, that, at a distance, they make as splendid an appearance as if they were gilded. Below the upper roof there is another of equal brilliancy, which hangs drooping from the wall, supported by a great number of beams, daubed over with green varnish, and interspersed with glittering filkes. This upper roof, with the projection of the first, forms a kind of crown to the whole edifice. The palace is a small distance from the south gate of the Tartar city. The entrance to it is through a spacious court, to which there is a descent by a marble staiway, ornamented with two large copper lions, and a balustrade of white marble. This balustrade runs in the form of a hedge, along the banks of a rivulet, that winds across the palace with a serpentine course, the bridge over which are of marble. At the bottom of this first court arises a facade with three doors: that in the middle is for the emperor only; the mandarins and nobles pass through those on each side. These doors conduct to a second court, which is the largest of the palace: it is about 300 feet in length, and 50 in breadth. An immense gallery runs round it, in which are magazines, containing rich effects, which belong to the emperor as his private property; for the public treasure is entrusted to a sovereign tribunal called Hou-pou. The first of these magazines is filled with plate and vessels of different metals; the second contains the finest kinds of furs; the third, dresses lined with sable, ermine, miniver, and foxes' skins, which the emperor sometimes gives in presents to his officers; the fourth is the depository of jewels, pieces of curious marble, and pearls filled up in Tartary; the fifth, containing two stories, is full of wardrobes and trunks, which contain the silk fluts used by the emperor and his family; the rest are filled with bows, arrows, and other pieces of armour taken from the enemy or pretented by different princes."

"The royal hall, called Wei-botien, or the Hall of the Grand Union, is in this second court. It is built upon a terrace about 18 feet in height, inclosed with white marble, and ornamented with balustrades of excellent workmanship. Before this hall all the mandarins range themselves, when they go, on certain days, to renew their homage, and perform those ceremonies that are appointed by the laws of the empire. This hall is almost square, and about 130 feet in length. The ceiling is carved, varnished green, and loaded with gilt dragons. The pillars which support the roof
That the law qualified men for the office of a Flemish Jesuit, who caused a new set of instruments to be made, with extraordinary care, neatness, and precision.

"This fabric stands in a court of a moderate extent, and is built in the form of a square tower, contiguous to the city wall on the infidels', and raised but ten or twelve feet above its basework. The ascent to the top is by a very narrow staircase; and on the platform above were placed all the old instruments, which, though but few, took up the whole room, till Father Verbiest introduced his new apparatus, which he disposed in a more convenient order. These are large, well cast, and embellished; and were the neatness of the divisions answerable to the work, and the telescopes fashioned to them according to the new method, they would be equal to those of Europe; but the Chinefe artificers, it seems, either too negligent, or incapable of following his directions. As to the old instruments, they were, by order of the emperor Kang-hi, set aside as useless, and laid in the hall near the tower, where they may be seen through a cross-barred window, all covered with rust, and buried in oblivion.

"In this famed observatory there are five mathematicians employed night and day, each in a proper apartment on the top of the tower, to observe all that passes over their heads: one of them is gazing towards the zenith, and the other towards the four points of the compass, that nothing may escape their notice. Their observations extend not only to the motions of the heavenly bodies, but to fires, meteors, winds, rain, thunder, hail, storms, and other phenomena of the atmosphere; and these are carefully entered in their journals, and an account of them is brought every morning to the surveyor of the mathematicals, and registered in his office."

PELAGIUS, a Christian foe who appeared about the fifth or end of the fourth century. They maintained the following doctrines. 1. That Adam was by nature mortal, and, whether he had sinned or not, would certainly have died. 2. That the consequences of Adam's sin were confined to his own person. 3. That new-born infants are in the same situation with Adam before the fall. 4. That the law qualified men for the kingdom of heaven, and was founded upon equal promises with the gospel. 5. That the general resurrection of the dead does not follow in virtue of our Saviour's resurrection. 6. That the grace of God is given according to our merits. 7. That this grace is not granted for the performance of every moral act; the liberty of the will, and information in points of duty, being sufficient. &c. The founder of this sect was, PELAGIUS, a native of Great Britain; but whether of England, Scotland, or Wales, is as uncertain as it is immaterial (A). He was born towards the close of the fourth century, and educated in the monastery of Banchor near Chester, to the government of which he was advanced A.D. 404. He was long esteemed and loved by St Jerome and St Augulfus, who kept up a friendly correspondence with him by letters before

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(A) Dr Henry thinks he was born in North Wales; that his real name was Morgan, of which Pelagius is a translation: and that he was born on the 13th of November A.D. 354, the same day with his great antagonist St Augulfus. The fame learned historian gives us the following account of Pelagius and his great coadjutor Celestius. "He received a learned education in his own country, most probably in the great monastery of Banchor near Chester, to the government of which he was advanced A.D. 404. He was long esteemed and loved by St Jerome and St Augulfus, who kept up a friendly correspondence with him by letters before..."

before they discovered the heretical pravity of his opinions; for Pelagius, being a cautious and useful man, for some time vened his peculiar notions as the sentiments of others, without discovering that they were his own. At length, however, he threw off the mask, and openly published and defended his doctrines at Rome about the beginning of the fifth century. This involved him in many troubles, and drew upon him the indignation of his former friends St. Jerome and St. Augustin, who wrote against him with great acrimony. He is acknowledged, even by his adversaries, to have been a man of good sense and great learning, and an acute disputant, though they load him with the most bitter reproaches for his abuse of these talents. His personal biblimies are painted in very strong colours; and he is represented by these good fathers, in the heat of their zeal, as a very ugly fellow, broad-shouldered, thick-necked, fat-headed, lame of a leg, and blind of an eye. Even the most northern parts of this island (Britain) has produced some men of learning in this period. Celestius, the disciple and friend of Pelagius, was a Scotman, who made a prodigious noise in the world by his writings and disputations about the beginning of the sixth century. He defended and propagated the peculiar opinions of his master Pelagius with so much learning, zeal, and acumen, that those who embraced these opinions were frequently called Celestians. Before he became a priest, he wrote several books, which were universally admired for their orthodoxy, learning, and virtuous tendency. After he had spent his youth in his own country in a studious privacy, he travelled for his further improvement to Rome, where he became acquainted with Rufinus and Pelagius, and was by them infected with their heresies. From that time he became the most indefatigable and undaunted champion of these heresies, and thereby brought upon himself the indignation of the orthodox fathers of these days, who gave him many very bad names in their writings. St. Jerome, whose commentaries on the Epistles he had premeditated to criticize, calls him an ignorant, stupid fool, having his belly swelled and diffused with Scots pottage; a great, corpulent, barking dog, who was fitter to kick with heels than to bite with his teeth; a Cerberus, who, with his master Pluto (Pelagius), deferred to be knocked on the head, that they might be put to eternal silence. Such were the flowers of rhetoric which these good fathers employed against the enemies of the orthodox faith! But candour obliges us to observe, that this was perhaps mere the vice of the age in which they lived than of the men. Both Pelagius and Celestius were very great travellers; having visited many different countries of Asia and Africa, as well as Europe, with a view to elude the persecutions of their enemies, and to propagate their opinions. It is no inconsiderable evidence of their superior learning and abilities, that their opinions gained great ground in all the provinces both of the eastern and western empire, in spite of the writings of many learned fathers, and the decrees of many councils against them. The Pelagian and Celestian heresy (says Photius) not only flourished in great vigour in the West, but was also propagated into the East.
PELAIAH, a Levite (Nehem. viii. 7. x. 10.) He was one of the principal Levites that returned from captivity, and was one of those that signed the covenant that Nehemiah renewed with the Lord.

PELALIAH, son of Amazi and father of Jeroham, of the family of Pahhar son of Machiah, of whom mention has been made; he was of the race of the priests (Nehem. xi. 12.)

PELASGUS. See Pelasgians.

PELASGIA (Pliny); the ancient name of Lefbos; from called from the Pelasgi, its first inhabitants (Diodorus Siculus.) Also the ancient name of Pelasgius, from Pelagus, a native of the country (Nicolaus Damascenus, Ephorus).

PELASGICUM (Paulianus, Pliny); the north wall of Athens, so called from the builders, the Pelasgi. There was an ecclesiastic pronounced on any that should build houses under this wall; because the Pelasgi, while dwelling there, entered into a conspiracy against the Athenians (Thucydides).

PELASGIIOTIS, a third part of Thebaly, (Strabo.) So called from a very ancient people, the Pelasgi, called Pelasgiotes (Ptolemy; who formerly, together with the Aiolians, occupied Thebaly, and thence that part was called Pelasgium Argos) befores many other parts of Greece. The poets extend the appellation to Greeks in general. Pelasgi, the epithet. Some of the inhabitants of Crete were called Pelagi (Homer;) who thus also calls the neighbouring people to the Cilicians in Troy. The Pelasgi were the descendants of Peleg, and inhabited Greece before the Ionians, the polity of Javan, possessed it, hence the Lacondemonians and Jews were related (1 Maccab. xii. 21.) The Pelasgiotes was situated between Pieria and Macedonia to the north and west, Thessaly to the south, and Magnesia to the east, (Strabo, Pliny.)

PELATAE, were free born citizens, among the Athenians, who by poverty were reduced to the necessity of serving for wages. During their servitude they had no voice in the management of public affairs, as having no vote in the election of those who called the laws; this restriction was removed whenever they had released themselves from their servile situation, which they were allowed to do when able to support themselves. While they continued servants, they had also a right to change their masters. We find them sometimes distinguished by the name of Theba.

PELATIAH, son of Hananiah, and father of Ishi, of the tribe of Simeon. He subdued the Amalekites upon the mountain of Soir (1 Chron. iv. 42.) The time of this action is unknown.

PELATH, son of Beniaiah, a prince of the people, who lived in the time of Zedekiah king of Judah, and opposed the wholesome advice given by Jeremiah, to humble his heart Nebuchadnezzar. Ezekiel (xxi, 2, 3, 4) being a captive in Medopotamia, had a vision, in which he saw five and twenty men at the door of the temple of Jerusalem, among which were Jazaniah the son of Azur, and Pelatiah the son of Beniaiah, who were the most remarkable. Then the Lord said to him, "Son of man, these are the men that have thoughts of iniquity, and who are forming pernicious designs against this city, saying: Have not the hordes been built a long time? Jerusalem is the pot, and we are the flesh. Thus faith the Lord, Ye have made a great havoc in this city, and have filled its streets with dead bodies. These men are the flesh, and the city is the pot. But as for you, I will make you come forth from the middle of this city, and I will make you perish by the hand of your enemies." As he was prophesying in this manner, Pelatiah the son of Beniah died.

PELE (Stephanus). There were two towns of this name in Tholosy; one subject to Euryphylus, the other to Achilles; both extinct. Pelas the gentilic name (id.)

PELEG, son of Eber, was born in the year of the world 1757. The scripture says his father gave him the name of Peleg, signifying division, because in his time the earth began to be divided (Gen. xi. 16. x. 23;) whether it was then that man had begun to distribute the earth among his descendants, some years before the building of Babel, or that Peleg came into the world the same year that Babel was begun, and at the division of languages, or that Eber by a spirit of prophecy gave his son the name of Peleg (some years before the tower of Babel was begun, is not absolutely certain. That which here perplexes the interpreters is, first, that Peleg came into the world not above 100 years after the deluge. But it should seem, that the number of men was not then sufficient for such an undertaking as that of Babel. Secondly, Joktan the brother of Peleg had already thirteen sons at the time of this dispersion, which happened after the confusion of Babel (Gen. x. 26, 27, 28, 8c.) Peleg being born in the thirty-fourth year of Eber (Gen. xi. 16.), it is impossible his brother Joktan should have such a number of children at the birth of Peleg. It seems therefore that he was not born at the time of the dispersion. To this may be answered, that Moses has there enumerated the names of the thirteen sons of Joktan (in Gen. x. 25,) by way of anticipation, though they were not born till a good while after the confusion of Babel; but as they possessed a very large country, it was convenient for them to take notice of them, and to name them among the other descendants of Noah, who divided the provinces of the east among themselves. However this may have been, at the age of thirty years Peleg begat Reu; and he died at the age of 239.

PELETHITES. The Pelethites and Cherethites were famous under the reign of King David. They were the most valiant men in the army of that prince, and had the guard of his person. See Ezekiel xxv. 16. Zophaniah ii. 5. 1 Samuel xxx. 14. 2 Samuel xv. 18. xx. 7. Patrick's Comn. Pool's Annot. and Delany's Hist. of the Life of David.

PELETHRONII, a name or epithet given to the Lapithes, either because they inhabited the town of Pelathonum at the foot of mount Pelion in Thesla, or because one of their number bore the name of Pelathonius. It is to them, we are told, that mankind are indebted for the invention of the bit with which they tamed their horses with so much dexterity.

PELETHONIUM (Nicander and Scholiais); a town of Thesaly, situated in a flowery part of mount Pellos; and hence the appellation throna, signifying a

N 2 of flowers.
PELEUS, in fabulous history, a king of Thessaly, son of Aeacus and Eridite, the daughter of Chiron. He married Thetis one of the Nereids, and was the only mortal man who ever married an immortal. He was concerned in the murder of his brother Phoeus, and was therefore obliged to leave his father's dominions. He fled to the court of Eurytus the son of Actor, who reigned at Phthias, or according to the opinion of Ovid, the truth of which is questioned, to Ceyx king of Trachinia. He was purified of his murder by Eurytus, with the usual ceremonies, and the king gave him his daughter Antigone in marriage. After this, as Peleus and Eurytus went to the chase of the Calydonian boar, the father-in-law was accidentally killed by an arrow which his son-in-law had aimed at the beast. This unfortunate accident obliged him to banish himself from the court of Phthia, and he went to Iolchos, where he was also purified of the murder of Eurytus by Acastus the king of the country. His residence at Iolchos was short: Alcydamia the wife of Acastus fell in love with him; but when the god found him insensible to her passionate declarations, he accused him of attempts upon her virtue. The king her husband partly believed the accusations of his wife; but not willing to violate the laws of hospitality, by putting him instantly to death, he ordered his officers to conduct him to Mount Pelion, on pretence of hunting, and there to tie him to a tree and to leave him a prey to the wild beasts of the place. The orders of Acastus were faithfully obeyed; but Jupiter knowing the innocence of his grandson Peleus, ordered Vulcan to set him at liberty. As soon as he had been delivered from danger, Peleus assembled his friends in order to punish the ill treatment which he had received from Acastus. He took Iolchos by force, drove the king from his possessions, and put to death the wicked Alcydamia.

On the death of Antigone, Peleus made love to Thetis, of whose superior charms Jupiter himself had been enamoured. His pretensions were rejected; for as he was but a mortal, the goddess fled from him with the utmost abhorrence, and the more effectually to evade his inquiries, she generally assumed the shape of a bird, or a tree, or of a tygress. Peleus's passion was fanned by refusal; he offered a sacrifice to the gods; and Proteus informed him, that to obtain Thetis he must surprise her while she was asleep in her grove, near the shores of Thessaly. This advice was immediately attended to; and Thetis, unable to escape from the grasp of Peleus, at last confented to marry him. Their nuptials were celebrated with the greatest solemnity, all the gods attending and making them each the most valuable presents. The goddess of Discord was the only one of the deities who was absent; and the prince filled this seeming neglect by throwing an apple into the midst of the assembly of the gods, with the inscription of Dexta pudbris. The celebrated Achilles was the fruit of this marriage, whose education was early entrusted to the Centaur Chiron, and afterwards to Phoönix, the son of Amyntor. Achilles, it is well known, went to the Trojan war, at the head of his father's troops; and Peleus gloriéd in having a son who was superior to all the Greeks in valor and intrepidity. His death, however, was the source of great grief to Peleus; but Thetis, to comfort her husband, promised him immortality, and ordered him to retire into the groves of the island of Leuce, where he should see and converse with the names of his son. Peleus had a daughter called Polydora, by Antigone.

PELEW ISLANDS, a cluster of small islands situated between the latitudes of 5° and 7° north, and the longitudes 134° and 136° east. Various conjectures have been formed respecting the time of their first discovery by Europeans. Mr Keate, the editor of the only voyage in which we have any account of their climate, soil, and produce, together with the manners of their inhabitants, thinks they were first noticed by the Spaniards from the Philippines, and by them named Palos from the number of trees growing in them resembling the masts of ships. This conjecture has been vehemently opposed by a critic, who affirms that the whole of Mr Keate's introduction is err· nous, and that the islands in question were first discovered by a French Jesuit named Per Park. The Jesuit, he imagines, was directed to them by one of the inhabitants, who had found his way to the Moluccas, where he was baptized. They are said to have been again noticed by P. Centova in 1724, who saw at Agdane, the capital of the Merian islands, some of the inhabitants; and from their account gives a description not very favourable of these harmless islanders. Centova's description is to be found in the 15th volume, and the relation of the discovery by P. Pepin in the 11th volume, of Lettres Edifiantes et Curieuses, published at Paris 1751.

The latest and most authentic account of them, however, is given from the Journals of Captain Wilson of the Antelope, a packet belonging to the East India company, which was wrecked upon one of them in August 1783. This ship was fitted out in England by the court of directors in the summer 1782, as was generally understood, for a secret expedition. Whatever may have been her destination, as she was proceeding from Macao in equable weather, the man who, on the night of the 10th of August, had the look out, suddenly called out Breakers! But the found of the word had scarce reached the ears of the officer on deck, before the ship struck and stuck fast; and in less than an hour bulged and filled with water. Having secured the gunpowder, small arms, bread and such other provisions as were liable to be spoiled by water, Captain Wilson, after many difficulties, effected a landing. The crew of the Antelope consisted of 33 Europeans beside the captain, and 16 Chinese; and the only possible means by which they could be delivered from an island, which at first appeared to them uninhabited, was by building a ship capable of transporting them to the nearest European settlement in that quarter of the globe. Whilts they were meditating upon this undertaking, the natives appeared on the second day after their arrival; and their intercourse with them was facilitated by means which appear
The natives are all of a deep copper colour, going perfectly naked. They are of a middling stature, very straight, muscular, and well formed; but their legs, from a little above their ankles to the middle of their thighs, are tattooed so very thick, as to appear dyed of a far deeper colour than the rest of their skin. Their hair is of a fine black, long, and rolled up behind, in a manner, close to the back of their heads, which appeared both neat and becoming; but few of them had beards, it being the general custom to pluck them out by the roots.

They were not of the same height, nor could that be readily explained by their different figures, but it was at least partly explained by their hair being longer and more thickly rolled. Their legs were tattooed so thick, as to be mistaken for swellings, or rather their wearing wide trousers; but having been thrown by a tempest upon this very spot, where they were not easy to account for. They ran in and out of the tents, of the natives picked up a bullet, which had been carelessly dropped on the ground, and immediately expressed his surprise, that a bullet so small to the eye should be so very ponderous to the touch; and on their entering the tent, a large Newfoundland dog, and a spaniel which had been tied up there to prevent their being lost, set up a most violent barking, and the natives a noise but little less loud, which at first it was not easy to account for. They ran in and out of the tent, and seemed to wish that they might be made to bark again. This the Malay soon explained to be the effect of their joy and surprise, as there were the first large animals they had ever seen, there being no quadrupeds of any species on these islands, except a very few grey rats in the woods.

After some time it was agreed on by Captain Wilson and his people, that some of the crew should be sent to the king of the place in order to solicit his friendship, and intreat his permission to build a vessel that might carry them back to their own country.

This business was allotted to the captain's brother; and during his absence, Raa Kook, the king's brother, and several of the natives, remained with our people. This amiable chief seemed to place an entire confidence in those he was among; he endeavoured to accommodate himself to their manners; would sit at table as they did, instead of squatting on his hams; and inquired particularly into the principles and causes of every thing he observed about him, lending his personal affidance in all that was going forward, and even defiring thecook to let him aid him in blowing the fire.

In order to conciliate their affections, Captain Wilson had presented Arna Kooker, another of the king's brothers, with a pair of trowlers; but having conceived a great passion for a white shirt, one was immediately given to him; which he had no sooner put on, than he began to dance and jump about with so much joy, that every body was diverted by his singular gesticulations, and the contrail which the linen formed with his skin. This prince was about 40, of a short stature, but so plump and fat that he was nearly as broad as he was long. He polished an abundant share of good humour, and a wonderful turn for mimicry; and had besides a countenance so lively and expressive, that though our people at this time were strangers to almost all he said, yet his face and gestures made them accurately comprehend whatever he was describing.

After three or four days, Abha Thulle the king arrived with a great retinue. He was received with every mark of respect by the ship's company, who were exercised before him, and fired three volleys in different postions. The surprize of the natives, their hooting, hallowing, jumping, and chattering, produced a noise almost equal to the discharge of the muskets; and when one of the men shot a bird, which was done to display the effect of their arms, the surprize occasioned was wonderful. Some of the natives ran for it, and carried it to the king, who examined it with great attention, but was unable to comprehend how it could be wounded, not having seen any thing pass out of the gun.

Raa Kook expressed great impatience to know the king whatever had impressed his own mind; and taking his brother by the hand, led him to a grindstone which was fixed behind one of the tents. He immediately put it in motion, as he had frequently done before; at the rapidity of which the king was greatly astonished, particularly when he was informed that it would sharpen iron. Captain Wilson ordered a hatchet to be brought and ground, that they might more readily perceive its operation, when Raa Kook eagerly seized the handle, and began turning it, appearing highly delighted to let his brother see how well he understood it. The whole appeared like something supernatural; but the circumstances which most bewildered their ideas was, how the sparks of fire could come, and how a stone so well wetted could become so sharp.

The king then visited the different tents, and inquired about every thing he saw: all was novelty, and of course interested his attention. When he got to the tent where the Chinese men were, who had been brought with them from Macao, Raa Kook, whose re-
tentative mind never lost a single trace of any thing he had been informed of, acquainting the king that these were people quite different from the English, and that he had learnt there were many other nations besides these intermixed throughout the world, some of which fought with guns and others with boarding-skees, an instrument which he held very cheap in comparison with the former.

When the king heard his brother disconcerting about a variety of nations, who all spoke differently, and had before him the example of the Chinese, whose language was not the same with the English, he appeared instantly thoughtful and serious, as if struck by conceptions which had never before crossed his mind. He remained a while pensive and bewildered; and this circumstance impressed on every one at the time an idea that there was every reason to imagine that there had never been a communication between those people and any other nation; and indeed it is evident, that if Pere Papin did really visit them in 1710, they had before 1783 lost the remembrance of every trace of European manners. This indeed is not surprising, as they had no other record than knots similar to the quipes of Peru at the landing of the Spaniards.

Raa Kook would now show his brother the kitchen, which was in the hollow of a rock, a little above the cove. It was at the time when the cook was preparing dinner; and though the implements were exceedingly scanty, an iron pot, a tea kettle, a tin sauce-pan, with a skimmer, a pair of tongs, and a frying-pan, were here of sufficient consequence to excite admiration; nor were the bellows now forgotten by Raa Kook, who taking them up, as he explained their use to the king, seemed ambitious to let his brother see what an adept he was at blowing. The little barb cook, who was always close shaven, and never wore any thing on his head, was likewise pointed out to the king as an object of merit and curiosity.

Sometime after this the king requested five of Captain Wilson's men to attend him in a war he was going to make against the inhabitants of a neighbouring island called Orokong, who, as he said, had done him an injury. But before this request was made known, he had long struggled with a delicacy of sentiment which no one would have expected to find in regions so disjoined from the rest of mankind. This was no other than that it might prove a temporary inconvenience to the unfortunate strangers, who had fought his protection, and might be considered by them as an ungenerous proceeding. It was, however, no sooner made known, than Captain Wilson instantly complied: and every face, which had before been clouded with doubt and apprehension, became immediately brightened and gay.

In this enterprise little more was done than braving their enemies, stripping some cocoanut trees of their fruit, and carrying off a number of yams and other provisions; but in another, which was undertaken against the island of Artingall, they were more successful, and marked signs of the same fanganiary disposition which some demon has infused into the whole human race. Nine prisoners of war who had been taken upon this occasion were cruelly put to death; and notwithstanding the English treaty renounced against this, reasoning, all the arguments they could use were of no avail. In justification of their conduct, they alleged the necessity of doing it for their own security, declaring that they had formerly only detained them as servile servants, but that they always found means to get back to their own country, and return with such a force as frequently made great depredations.

Having given this general account of the character and conduct of these hitherto unknown people we now proceed to lay before our readers what we have learned of their government, customs, manners, and arts, together with a description of the face of their country. In this the editor of Captain Wilson's voyage must be our guide; and if our narrative does not satisfy the man of science, it is to be observed, that the Antelope was not a ship sent out purposely to explore undiscovered regions, nor were there people on board properly qualified to estimate the manners of a new race of men; they had amongst them no philosophers, botanists, or draughtsmen, experienced in such scientific pursuits as might enable them to examine with judgment every object which presented itself. Diletta threw them upon these islands; and while they were there, all their thoughts were occupied on the means of liberating themselves from a situation of all others the most afflicting to the mind, that of being cut off for ever from the society of the rest of the world.

It, however, clearly appears, form their uniform testimony, that at Pelew the king was considered as the first person in the government.

"He was looked up to as the father of his people; and though divested of all external decorations of royalty, had every mark of distinction paid to his person. His rupacks or chiefs approached him with the greatest respect; and his common subjects, whenever they passed near him, or had occasion to address him, made his hand behind them, and crouched towards the ground. Upon all occurrences of moment, he convened the rupacks and officers of state; their councils were always held in the open air, where the king first flated the business upon which he had assembled them, and submitted it to their consideration. Each rupack delivered his opinion, but without rising from his feet; and when the matter before them was settled, the king standing up put an end to the council.

"When any message was brought him, whether in council or elsewhere, if it came by one of the common people, it was delivered at some distance in a low voice to one of the inferior rupacks, who, bending in a humble manner at the king's side, delivered it in the same manner with his face turned aside. His commands appeared to be absolute, though he acted in no important business without the advice of his chiefs; and every day in the afternoon, whether he was at Pelew or with the English, he went out in public for the purpose of hearing any request, or of adjusting any difference or dispute which might have arisen among his subjects."

But these, according to our editor, seldom happened; for as their real wants were but few, and they knew nothing to create artificial ones, every one was chiefly occupied with his own humble pursuits; and as far as the ship's crew, who remained among them about three months, could decide, they appeared to conduct themselves towards each other with the greatest civility and benevolence; never wrangling or entering into quarrels.
some contentions, as is customary among those who

call themselves a polished and enlightened people.

Even when children showed a disposition of this kind,
they strongly marked their displeasure, by filling with
rebuke their little amainities.

The character of the king is thus drawn by the ed-
iter: “The excellent man who reigned over these sons
of nature, showed himself in every part of his conduct
firm, noble, generous, and benevolent; there was a
dignity in all his deportment, a gentleness in all his
manners, and a warmth and tenderness about his heart
that won the love of all who approached him. Nature
had bestowed on him a contemplative mind, which he
had to his duty by those reflections that good fortune
decided and observation confirmed. The happiness of his
people seemed to be always in his thoughts. In order
to more effectually to stimulate them to useful labour,
he had himself learnt all the few arts they possessed,
and was looked on in some of them to be the best work-
man in his dominions. Placed as he was by Providence in
his obscure scenes, he lived beloved by his chiefs,
and revered by his people; over whom, whilst he pre-
erved a dignity which distinguished his superior station,
he reigned more as the father than the sovereign. The
eyes of his subjects beheld their naked prince with so
much awe and respect as those are viewed with by
governed polished nations, and are decorated with all
the dazzling parade and ornaments of royalty; nor was
the purple robe or the splendid diadem necessary to
point out a character which the matterly hand of na-
ture had rendered so perfect.”

Next in power to the king was his brother Raa
Kook, who was official general of all his forces. It
was his duty to summon the rupacks to attend the
king for whatever purpose they were wanted. He was
also his presumptive heir; the succession of Pelew not
go ing to the king’s children till it had passed through
his brothers; so that after the demise of Abba Thulle,
the sovereignty would have descended to Raa Kook;
on his demise to Aria Kooker; and on the death of
this last it would have reverted to Qui Bill, the king’s
elder son, when Lee Boo, his second son, of whom
we have much to say, would have become the heredi-
tary general.

The office of first minister is described as follows;

“King was always attended by a particular chief
or rupack, who did not appear to possess any heredi-
tary office, but only a delegated authority. He was
always near the king’s per ton, and the chief who was
always first consulted; but whether his office was
religious or civil, or both, our people could not learn
with any certainty. He was not considered as a war-
ner, nor ever b rearm, and had but one wife, whereas
as the other rupacks had two. The English were never
invited to his house, or introduced into it, although
they were conducted to those of almost every other
chief.

Of the rupacks it is observed, “That they could
only be regarded as chiefs or nobles; they were not
all of the same degree, as was plain by a difference in
the bone (a) they wore; they generally attended the
king, and were always ready at his command to ac-
company him on any expedition with a number of ca-
noes properly manned, and armed with darts and spears,
who were to remain with him till they had his per-
mition to return home with their dependents. In this
part of their government we may trace an outline of
the feudal system; but from the few opportunities our
people had of investigating points of internal govern-
ment, it appeared that the titles of rupacks were per-
sonal badges of rank and distinction; nor did they appre-
head they were hereditary honours, unless in the reign-
ing family, who must of necessity be of this class.”

As to property, it was understood, “That the people
possessed only such as arose from their work and la-
bour, but no absolute one in the soil, of which the king
appeared to be general proprietor. A man’s house,
furniture, or canoe, was considered as his private
property, as was also the land allotted him, as long as he
occupied and cultivated it; but whenever he removed
with his family to another place, the ground he held
reverted to the king, who gave it to whom he pleased,
or to those who solicited to cultivate it.”

All that part of the island which they had an op-
portunity of seeing is said to have been well cultivated.
It was covered with trees of various kinds and sizes,
many of which must have been very large, as they
made canoes of their trunks, some of which were
capable of carrying 28 or 30 men. Among the timber-
trees was noticed the ebony, and a tree which when
pierced or wounded yielded a thick white liquor of the
confidence of cream. “They had also a species of
the manchinel tree, in cutting down of which our
people frequently got blistered and swelled; the inha-
bitants pointed out the cause, saying it was owing to
their being sprinkled by the sap. This they reckoned
among the unlucky trees, and advised our people
against the use of it.”

But the most singular tree noticed at Pelew, was one
in its size and manner of branching not unlike our
cherry-tree, but in its leaves resembling the myrtle.
Its peculiarity was, that it had no bark, but only an
outward coat of about the thickness of a card, which
was darker than the infide, though equally close in
texture. Its colour was nearly that of mahogany, and
the wood was so extremely hard, that few of the tools
which the English had could work it. They also found
cabbage-trees, the wild bread fruit, and another tree
whose fruit something resembled an almond. But
yams and cocoa nuts, being their principal articles of
fruitfulness, claimed their chief attention.

The island Coorooara, of which Pelew is the capital,
likewise produced plantains, bananas, Seville oranges
and lemons, but neither of them in any considerable

quantity. None of the islands which the English vis-
ited had any kind of grain. As to birds, they had
plenty of common cocks and hens, which, though not
domesticated, kept running about near their houses
and plantations; and what appears extremely singular
is, that the natives had never made any use of them.

(a) This was a mark of rank worn upon the wrist,
with which Captain Wilson was invested by the king; but
what animal it came from our people could not learn.
till our people told them they were excellent eating. Pigeons they accounted a great dainty; but none but those of a certain dignity were permitted to eat of them. The English left them two geese, which were the only remains of their live flock.

From the description of the country it appears to be very mountainous; but some of the valleys are represented as extensive and beautiful, affording many delightful prospects. The soil being very rich, produces a great abundance of graps, which, as there are no cattle to eat it, grows very high, and was scorched and burnt up by the sun. Our people saw no river at Pelew; their supplies of fresh water being obtained from small streams and ponds, of which there are a great many.

From this account of the scanty produce of these islands, it is evident that no luxury reigned among their inhabitants, whose principal article of food appears to be fish; they had no salt, nor did they make use of sauce or any seasoning in any thing they eat. Their drink was also as simple as their diet; it principally consisted of the milk of the cocoa nut; but upon particular occasions they used a kind of sweeter drink and sherbet, which latter had the addition of some juice of orange.

The islands appeared to be populous, though to what extent could not be ascertained. Their houses were raised about three feet from the ground, upon stumps which appeared as if hewn from the quarry. The interior part of them was without any division, the whole forming one great room, which roofed in a ridge like our barns, the outside being thatched thick and close with bamboos or palm leaves. All their implements, utensils, weapon of war, and canoes, are much of the same kind with those which were found in the South Sea islands.

In their marriages they allow a plurality of wives, though in general not more than two. When a woman is pregnant, the utmost attention is paid to her; but upon other occasions no more respect is shown to one fel than the other. "One of our people endeavoured to make himself agreeable to a lady belonging to one of the rupacks, by what we should call a marked affiduity, Arra Kooker, with the greatest civility, gave him to understand that it was not right to do so."

They have places particularly appropriated to sepulture; their graves being made nearly the same as they are in our country churchyards. The corpse is attended only by women, who at the place of interment make a great lamentation. The men, however, assemble round the body before it is carried to the grave, on which occasion they prefer a solemn silence; their minds, from principles of fortitude or philosophy, being armed to meet the events of mortality with manly sublimity, divested of the external testimony of human weakness."

On the article of religion our editor observes, "That, among all the race of men whom navigation has brought to our knowledge, few appear to be without a sense of something like religion, however it may be mixed with idolatry or superstitition. And yet our people, during their continuance with the natives of Pelew, never saw any particular ceremonies, or observed anything that had the appearance of public worship, But though there was not found on any of the islands they visited any place appropriated to religious rites, it would perhaps be going too far to declare that the people of Pelew had absolutely no idea of religion. Independent of external testimony, there may be such a thing as the religion of the heart, by which the mind may in awful silence be turned to contemplate the God of Nature; and though unblest by those lights which have pointed to the Christian world an unerring path to happiness and peace, yet they might, by the light of reason only, have discovered the efficacy of virtue, and the temporal advantages arising from moral rectitude.

"Superstition is a word of great latitude, and vaguely defined; though it hath in enlightened ages been called the offspring of ignorance, yet in no time hath it existed without having some connection with religion. Now the people of Pelew had beyond all doubt some portion of it, as appeared by the with expressed by the king when he saw the ship building, that the English would take out of it some particular wood, which he perceived they had made use of, and which he observed was deemed an omen, or prophetic. "They had also an idea of an evil spirit, that often counteracted human affairs. A very particular instance of this was seen when Mr Barker, a most valuable member in the English society, fell backwards from the side of the vessel, whilst he was on the rocks: Raa Kook, who happened to be present, observed that it was owing to the unlucky wood our people had suffered to remain in the vessel, that the evil spirit had occasioned this misfortune."

They likewise appear to entertain a strong idea of divination, as was evident from the ceremonies they practised before they undertook any enterprise of moment. A few occurrences which are mentioned in the course of the narrative, would also lead us to believe that they could not be altogether unacquainted with the nature of religious worship; for when they were present at the public prayers of the English, they expressed no surprise at what was doing, but seemed desirous to join in them, and constantly preferred the most profound silence. The general even were in the habit of receiving a message from the king which arrived during divine service. And upon another occasion, when Captain Wilfon told Lee Boo, that good men would live again above, he replied, with great earnestness, "All fame Pelew, bad men stay in earth; good men go into sky; become very beautiful," holding his hand up, and giving a fluttering motion to his fingers. Some later voyagers, however, have affirmed, that these people, notwithstanding their superstitious, have no notion whatever of a Deity; a circumstance to which it is extremely difficult to give full credit."

The most wonderful circumstance in the history of this people, excepting that last mentioned, are the acute-ness of their understanding, their hospitality, and the implicit confidence which they placed in utter strangers. That their manners were pleasing, and their society not disagreeable, is evident from the conduct of Madan Blanchard, one of the seamen, who, when the vessel was built and ready to take her departure with his Captain and companions, was left behind at his own particular request. That they had the fullest confidence in Captain Wilfon and his crew, is put beyond
yond a doubt by the behaviour of the king and Raa
Kook when their guests were to leave them. Raa
Kook solicited his brother's permission to accompany
the English, but from prudential motives was refused.
The sovereign, however, resolved to entrust his second
son Lee Boo to Captain Wilton's care, that he might
improve his mind, and learn such things as at his return
would benefit his country.

The instructions which he gave the young man, and
the fortitude which he showed upon this occasion,
would have done honour to the most enlightened mind.
Upon delivering him to Captain Wilton, he used these
expressions: "I would wish you to inform Lee Boo
of all things which he ought to know, and make him
an Englishman. The subject of parting with my son
I have frequently revolved; I am well aware that the
distant countries he must go through, differing much
from his own, may expose him to dangers, as well as
diseases, that are unknown to us here, in consequence
of which he may die; I have prepared my thoughts to
this; I know that death is to all men inevitable; and
whether my son meets this event at Pelew or elsewhere
is immaterial. I am satisfied, from what I have ob-
served of the humanity of your character, that if he is
sick you will be kind to him; and should that happen,
which your utmost care cannot prevent, let it not hin-
der you, or your brother, or your son, or any of your
countrymen, returning here; I shall receive you, or any
of your people, in friendship, and rejoice to see you
again." How noble is this the language of a king, a father,
and a philosopher, who would have been delighted to see his son with European accom-
plishments. But alas! the fabulous history of this
amiable youth must force a tear from the eye of every
reader whose heart is not callous to the genuine feel-
ings of nature and humanity. As soon as they ar-

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rived at Macao, the house into which he first entered,
and the different articles of furniture, fixed him in
silent admiration; but what struck his imagination most
was the upper walk and flat ceilings of the rooms,
being utterly unable to comprehend how they could be
so formed. When he was introduced to the ladies of
the family, his deportment was so easy and polite, that
it could be exceeded by nothing but his abundant good
nature; and at his departure, his behaviour left on the
mind of every one present the impression, that, how-
ever great the surprise might be which the scenes of a
new world had awakened in him, it could hardly be
exceeded by that which his own amiable manners and
native politeness would excite in others.

They were now conducted to the house of an Eng-
lish gentleman, who introduced them into a large hall,
which was lighted up, with a table in the middle, cov-
ered for supper, and a sideboard handsomely decor-
ated. Here a new scene burst at once upon Lee Boo's
mind; he was all eye, all admiration. The vessels of
glass particularly riveted his attention; but when he
surveyed himself in a large pier glass at the upper end
of the hall, he was in raptures with the deception.
It was in truth, to him, a scene of magic, a fairy
tale.

Soon after the people of the vessel came on shore, some
of them went to purchase things they were in want of;
in doing which they did not forget Lee Boo, who was
a favourite with them all. Among the trinkets they
brought him was a string of large glass beads, the first
of which almost threw them into an ecstacy; he
hugged them with a transport which could not have
been exceeded by the interested poltroonry of a string of
original pearls. His imagination suggested to him
that he held in his hand all the wealth the world
could afford him. He ran with eagerness to Captain
Wilton to show him his riches, and begged he would
get him a Chinese vessel to carry them to the king
his father, that he might see what the English had done
for him; adding, that if the people faithfully exe-
cuted their charge, he would at their return present
them with one or two beads as a reward for their ser-
ices.

Having no quadrupeds at Pelew, the sheep, goats,
and other cattle, which he met with at Macao, were
viewed with wonder; but soon after, seeing a man pass
the house on horseback, he was so much affected
that he wanted every one to go and look at the strange
animal. After the matter, however, was explained to
him, he was easily persuaded to get upon horsecback
himself; and when he was informed what a noble, do-
cile, and useful animal it was, he besought the cap-
tain to send one to his uncle Raa Kook, as he was sure
it would be of great service to him.

Omitting a number of other particulars of this kind,
which excited his curiosity and showed the excellent
disposition of his heart, we shall follow him to Eng-
land, the country from which he was never to return.
Here he had not been long before he was sent to an
academy to be instructed in reading and writing, which
he was extremely eager to attain, and most assiduous
in learning. His temper was mild and compassionate
in the highest degree; but it was at times governed
by discretion and judgment. If he saw the young
asked for relief, he would rebuke them with what little
English he had, telling them it was a shame to beg
when they were able to work; but the intreaties of old
age he could never withstand, saying, "Must give
poor old man, old man able to work."

He always addressed Mr. Wilton by the name of
Captain, but never would call Mrs. Wilton by any
other name than mother, looking on that as a mark of
the greatest respect; and such was the gratitude of
his heart for the kindness they showed him, that if
any of the family were ill, he always appeared unhap-
py, would creep softly up to the chamber, and sit fi-
lent by the bedside for a long time together without
moving, peeping gently from time to time between the
curtains, to see if they slept or lay still.

He was now proceeding with hasty strides in gaining
the English language, reading, and accounts, when
he was overtaken by that fatal disease, the small-pox,
which the greatest pains had been taken to guard him
against; and not withstanding the utmost care and at-
tention of his physician he fell a victim to this scourge
of the human race.

Upon this trying occasion, his spirit was above com-
plaining, his thoughts being all engrossed by the kind-
ness of his benefactors and friends. He told his at-
tendant, that his father and mother would grieve very
much, for they knew he was sick. This he repeated
several times, and begged him to go to Pelew, and
tell Abba Thulie that Lee Boo take much drink to
make small-pox go away, but he die; that the captain
O
and mother very kind; all English very good men; much sorry he could not speak to the king the number of fine things the English had got." Then he reckoned up the presents which had been given him, deeming that they might be properly distributed among the chiefs, and requesting that particular care might be taken of two glass pedestals, which he begged might be presented to his father.

We have given this short history of Lee Boon, because it exhibits in a strong light the manners of the natives of the Pelew islands, to which we know nothing similar in the history of man from the savage state to that of civilization. They appear to have had no communication with any other people, and were yet neither treacherous, cruel, nor cowardly. They are a striking instance of the weakness of all the philosophic theories by which mankind are usually traced from their origin through the several stages of savagery, barbarism, and civilization, down to the period of refinement, ending in effeminacy.

Since the publication of Captain Wilson's voyage we have some further accounts of these islands, all confirming what we were first told of the gentleness of the people. Two armed ships were, by order of the court of directors, fitted out at Bombay in 1790, for the purpose of surveying the islands of Pelew, and furnishing the natives with domestic animals, and such other things as might add to the comforts of life. Among the presents to the king were swords and other European implements of warfare, of which it is at least possible that he and his people might have been equally happy had they remained for ever in total ignorance. The foundation of a town was likewise laid on one of the islands, and possession of it taken in the name of the English; we trust with no remote view of enslaving the people, or of driving them from their native country. It has been likewise announced in a late publication, that Captain M'Culloch, who commanded the armed ships, was so delighted with the manners of the king and his subjects, that he has resolved to pass the remainder of his days on these islands at the early age of 34; and we hope he will prove a father to the people.

PELIAE (fab. hist.) twin-brother of Nereus, was son of Neptune by Tyro, daughter of Alcmenes. His birth was concealed by his mother, who wished her father to be ignorant of her incontinence. He was exposed in the woods, but his life was preserved by shepherds; and he received the name of Pelias, from a spot of the colour of lead in his face. Some time after Tyro married Cretheus, son of Aeolus, king of Iolcos, and became mother of three children, of whom Aeoleon was the eldest. Pelias vitiated his mother, and was received in her family; and after the death of Cretheus, he unjustly feized the kingdom, which belonged not to him, but to the children of Tyro by the deceased king. To strengthen himself in his usurpation, Pelias conferred the oracle; and when he was told to beware of one of the descendants of Aeolus, who should come to his court with one foot shod and the other bare, he privately removed the son of Aeoleon, after he had openly declared that he was dead. These precautions proved vain. Jason, the son of Aeoleon, who had been educated by Chiron, returned to Iolcos, when come to years of maturity; and having left one of his shoes in crossing the river Ananus or the Evenus, Pelias immediately perceived that this was the person whom he had so much dreaded. His unpopularity prevented him from acting with violence to a stranger, whose uncommon drefs and commanding aspect had raised admiration in the people. But his asseveration was greatly excited, when he saw Jason arrive at his palace, with his friends and his relations, and boldly demanded the kingdom which he had usurped. Pelias, conscious that his complaints were well founded, endeavoured to divert his attention, and told him that he would voluntarily resign the crown to him, if he went to Colchis to avenge the death of Phryxus, the son of Athamas, whom Aeoleon had cruelly murdered. He further declared, that the expedition would be attended with the greatest glory, and that nothing but the infirmities of old age had prevented himself from vindicating the honour of his country, and the injuries of his family, by punishing the afflains. This so warmly recommended, was with equal warmth accepted by the young hero, and his intended expedition was made known all over Greece. While Jason was absent in the Argonautic expedition, Pelias murdered Aeoleon and all his family; but, according to the more received opinion of Ovid, Aeoleon was still living when the Argoauts returned, and he was restored to the flower of youth by the magic of Medea. This change in the vigour and the constitution of Aeoleon astonished all the inhabitants of Iolcos; and the daughters of Pelias, who have received the patronymic of Pelaiades, expressed their desire to see their father's infirmities vanished by the same powerful magic. Medea, who wished to avenge the injuries which her husband Jason had received from Pelias, raised the defiles of the Pelaiades, by cutting an old ram to pieces, and boiling the flesh in a cauldron, and then turning it into a fine young lamb. After they had seen this successful experiment, the Pelaiades cut their father's body to pieces, after they had drawn all the blood from his veins, on the assurance that Medea would replenish them by her wonderful power. The limbs were immediately put into a cauldron of boiling water; but Medea suffered the flesh to be totally consumed, and refused to give the promised ailhance, and the bones of Pelias did not even receive a burial. The Pelaiades were for number, Alcate, Pitidice, Polape, and Hippothoe, to whom Hyginus adds Medua. Their mother's name was Anaxibia, the daughter of Bias or Philomachus, the daughter of Amphion. After this parricide, the Pelaiades fled to the court of Aedemus, where Acaeus, the son-in-law of Pelias, purified them, and took their protector prisoner. The Pelaiades died, and were buried in Arcadia.

PELICAN, in ornithology. See PELICANUS.

PELICAN, in chemistry, is a glass alembic consisting of one piece. It has a tubulated capital, from which two opposite and crooked beaks pull out and enter again at the belly of the cucurbit. This vessel has been contrived for a continued distillation and coagulation, which chemists call circulation. The volatile parts of substances put into this vessel rise into the capital, and are obliged to return through the crooked beaks into the cucurbit; and this without interruption, or luting and unluting the vessels. Although the pelican seems to be a very convenient instru.
PELICANUS, inornithology, a genus belonging to the order of anseres. The bill is straight, without teeth, and crooked at the point; the face is naked, and the feet are palmated. Mr. Latham enumerates no less than 30 different species of this genus, besides varieties. The most remarkable seem to be the following:

1. The carbo, or corvornant, sometimes exceeds seven pounds in weight; the length three feet four; the extent four feet two; the bill duckly, five inches long, deliquit of nostrils; the base of the lower mandible is covered with a naked yellow skin, that extends under the chin, and forms a fort of pouch; a loose skin of the same colour reaches from the upper mandible round the eyes and angles of the mouth; the head and neck are of a dark blackness, but under the chin of the male the feathers are white; and the head in that face is adorned with a short, loose, pendant crest; in some the crest and hind-part of the head are streaked with white. The coverts of the wings, the scapulars, and the back, are of a deep green, edged with black, and glossed with blue; the quill-feathers and tail duckly; the legs are short, strong, and black; the middle claw ferrated on the inside; the irides are of a light ash-colour.

These birds occupy the highest parts of the cliffs that jut over the sea; they make their nests of sticks, sea-tang, grafts, &c., and lay fix or seven white eggs of an oblong form. In winter they disperse along the shores, and visit the fresh waters, where they make great havoc among the fish. They are remarkably voracious, having a most flen-then digestion, promoted by the infinite quantity of small worms that fill their intestines. The corvornant has the rankest and most disagreeable smell of any bird, even when alive. Its form is disagreeable; its voice hoarse and croaking, and its qualities base. These birds, however, have been trained to fish, and are called falvo. Whitelock tells us, that he had a call of them manned like hawks, and which would come to hand. He took much pleasure in them; and relates, that the beak he had was one presented him by Mr. Wood, master of the corvornants to Charles I. It is well known that the Chinese make great use of these birds, or a congnerous sort, in fishing; and that not for amusement, but profit.

2. The granicus, or flag, called in the north of England the crane, is much inferior in size to the corvornant: the length is 27 inches; the breadth three feet six; the weight three pounds three quarters. The bill is four inches long, and more slender than that of the preceding: the head is adorned with a crest two inches long, pointing backward; the whole plumage of the upper part of this bird is of a fine and very shining green; the edge of the feathers a purplish black; but the lower part of the back, the head, and neck, wholly green; the belly is duckly; the tail of a duckly hue, tinged with green; the legs are black, and like those of the corvornant.

Both these kinds agree in their manners, and breed in the same places; and, what is very strange in web-footed birds, will perch and build in trees; both swim with their head quite erect, and are very difficult to be shot; for, like the grebes and divers, as soon as they see the flash of the gun, they pop under water, and never rise but at a considerable distance.

3. The bannus, gannet, or solan goose, weighs seven pounds; the length is three feet one inch; the breadth six feet two inches. The bill is six inches long, straight almost to the point, where it inclines down; and the irides are irregularly jagged, that it may hold its prey with more security; about an inch from the base of the upper mandible is a sharp process pointing forward; it has no nostrils; and in their place a long faw, that reaches almost to the end of the bill. The whole is of a dirty white, tinged with ash-colour. The tongue is very small, and placed low in the mouth; a naked skin of a fine blue surrounds the eyes, which are of a pale yellow, and are full of vivacity; this bird is remarkable for the quickness of its fight. Martin tells us, that solan is derived from an Irish word expressive of that quality.

From the corner of the mouth is a narrow slip of black bare skin, that extends to the hind-part of the head; beneath the chin is another, that, like the pouch of the pelican, is dilatable, and of size sufficient to contain five or six entire herrings; which in the breeding season it carries at once to its mate or young.

The young birds, during the first year, differ greatly in colour from the old ones; being of a duckly hue, speckled with numerous triangular white spots; and at that time resemble in colours the speckled diver. Each bird, if left undisturbed, would only lay one egg in the year; but if that be taken away, they will lay another; if that be also taken then a third; but never more that afeon. Their egg is white, and rather less than that of the common goose; the nest is large, and formed of any thing the bird finds floating on the water, such as grafts, sea-plants, flavings, &c. These birds frequent the Isle of Alifa, in the Frith of Clyde; the rocks adjacent to St. Kilda; the Stalls of Soultkerry, near the Orkneys; the Skelgyl Isles, off the coasts of Kerry, Ireland; and the Bays of the Frith of Edinburgh: the multitudes that inhabit these places are prodigious. Dr Harvey's elegant account of the latter, will serve to give some idea of the numbers of these, and of the other birds that annually migrate to that little spot.

There is a small island, called by the Scotch Basi Island, not more than a mile in circumference; the surface is almost wholly covered during the months of May and June with nests, eggs, and young birds; so that it is scarcely possible to walk without treading on them; and the flocks of birds in flight are so prodigious as to darken the air like clouds; and their noise is such, that you cannot without difficulty hear your next neighbour's voice. If you look down upon the sea from the top of the precipice, you will see it on every side covered with infinite numbers of birds of different kinds, swimming and hunting for their prey.
The Pelican

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The pelican

The pelican is a large water bird that is found in many parts of the world. It is known for its distinctive pouch under its beak, which it uses to catch fish. The pelican is often depicted in works of art and literature, symbolizing various qualities such as wisdom, knowledge, and longevity. In this text, the pelican is mentioned in the context of its habitat and behavior, highlighting its role in the ecosystem and its adaptability to different environments. The pelican's presence in various regions underscores its importance in the biodiversity of the areas it inhabits.
Pelicans. Kind are taught to choose the properest habitations and feeding places, and to shift their quarters feasably, by the unerring hand of God.

"From the account given above of the multitudes of sea-fowls that feed their food on this coast, we may justly conclude that there must be inexhaustable stores of fish there. Let us for a moment confine our attention to the consumption made by a single species of fowls. The Solan goose is almost infallibly voracious; he flies with great force and velocity, toils all the day with very little intermission, and digests his food in a very short time; he digests to eat any thing worse than herring or mackerel, unless it be in a very hungry place, which he takes ear to avoid or abandon. We shall take it for granted that there are 100,000 of that kind around the rocks of St Kilda; and this calculation is by far too moderate, as no less than 20,000 of this kind are destroyed every year, including the young ones. We shall suppose, at the same time, that the folan goose fijourn in these seas for about seven months of the year; that each of them destroys five herring in a day; a subsistence infinitely poor for so greedy a creature, unless it were more than half supported at the expense of other fishes. Here we have 100,000,000 of the finest fish in the world devoured annually by a single species of the St Kilda sea-fowls.

"If, in the next place, it be considered, that much the greatest part of the other tribes have much the same appetite for herring, and partake it from place to place, in the several migrations it makes from one sea to another, the consumption must be prodigiously great. Taking these into the account, and allowing them the same quantity of food, and of the same kind, by reason of their vast superiority in numbers of those, their stomachs are considerably weaker; we see there are no less than 200,000,000 of herrings swallowed up every year by the birds of a very small district of rocks, which occupy to inconsiderable a space in the Deucalidian ocean.

"Should all the articles of this account be fulfilled, articles which seem no less just than plain, and should our curiosity lead us into a new calculation, allowing between 600 and 700 to every barrel, it is evident that more than 350,000 barrels are annually carried away by such creatures."

The birds are well known on most of the coasts of England, but not by the name of the Solan goose. In Cornwall and in Ireland they are called gannets; by the Welsh, gann. Mr Ray supposed the Cornish gannet to be a species of large gull: a very execusable mistake; for during his six months residence in Cornwall, he never had an opportunity of seeing that bird, except flying; and in the air it has the appearance of a gull. On that supposition he gave us the title of a genus, which admirably expresses the rapid descent of this bird on its prey. Mr Moyle first detected this mistake; and the Rev. Dr William Borlase, by presenting us with a fine specimen of this bird, confirms the opinion of Mr Moyle; at the same time giving the following natural history of the bird.

"The gannet comes on the coasts of Cornwall in the latter end of summer, or beginning of autumn; hovering over the hollar of pilchards that come down to us through St George's Channel from the northern coast of Spain. The gannet seldom comes near the land, but is constant to its prey, a sure sign to the fishermen that the pilchards are on the coast; and when the pilchards retire, generally about the end of November, the gannets are seen no more. The bird now went was killed at Chandour, near Mountbatten, Sept. 30, 1762, after a long struggle with a water-fowl, affixed by the beakmen; for it was strong and pugnacious. The person who took it observed that it had a transparent membrane under the eye-bird, with which it covered at pleasure the whole eye, without obfuscating the sight or shutting the eye lid; a gracious provision for the security of the eyes of so weighty a creature, whose method of taking its prey is by darting headlong on it from a height of 50 feet or more into the water. About four years ago, one of these birds flying over Penzance, (a thing that rarely happens,) and seeing some pilchards lie on a fir-plant, in a cellar used for curing fish, darting itself down with fierce violence, that it struck its bill quite through the board (about an inch and a quarter thick), and broke its neck."

These birds are sometimes taken at sea by a deception of the like kind; the fishermen fastening a pillow to a board, as in St Kilda: they catch herrings, and which in the same manner decoys the unwary gannet to its own destruction.

In the Cataracta of Juba may be found many characters of this bird: he says, that the bill is toothed; that its eyes are fiery; and that its color is white; and in the very name is expressed its furious devent on its prey. The rest of his account favours of table. We are uncertain whether the gannet breeds in any other parts of Europe besides our own islands; except, as Mr Ray suspects, the fula (described in Clusius's Exotics, which breeds in Feroe Isles) be the same bird.

4. The fula, or booby, is somewhat less than a goose; the basis of the bill yellow, and bare of feathers; the eyes of a light grey color; the lower part of the bill of a light brown. The colours of the body are brown and white; but varied so in different individuals, that they cannot be described by them. Their wings are very long; their legs and feet pale yellow, flapped like the feet of corvants. They frequent the Bahama islands, where they breed all months in the year, laying one, two, or three eggs, on the bare rock. While young, they are covered with a white down, and continue so till they are almost ready to fly. They feed on fish like the rest of this genus; but have a very troublesome enemy of the man-of-war bird which lives on the spoils obtained from other sea-birds, particularly the booby. As soon as this rapacious enemy perceives that the booby has taken a fish, he flies furiously at him, upon which the former dives to avoid the blow; but as he cannot swallow his prey below water, he is soon obliged to come up again with the fish in his bill as before, when he suffers a new affault; nor does his enemy cease to persecute him till he lets go the fish, which the other immediately carries off.

5. The great booby, called by Linnaeus pelicanus Bozanius pufius, frequents the rivers and sea-coasts of Florida, pursuing and devouring fishes like others of the genus. Mr Catsey informs us, that he has several
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Pelicanus.

The pelican or man-of-war bird, is in the body

synopsis of the size of a large fowl; in length three feet,

and breadth 1.4. The bill is flender, five inches long,

and much curved at the point; the colour is dusky;

from the base a reddish dark coloured skin

spreads on each side of the head, taking in the eyes;

from the under mandible hangs a large membranaceous

bag attached some way down the throat, as in

the pelican, and applied to the same uses; the colour

of this is a fine deep red, sprinkled on the sides with

a few scattered feathers; the whole plumage is brownish-

black, except the wing coverts, which have a rufous

tinge; the tail is long, and much forked; the outer

feathers are 18 inches or more in length; the middle

ones from seven to eight: the legs are small, all the

toes are webbed together, and the webs are deeply in-

dented; the colour of them is dusky red.

The female differs in wanting the membranaceous

pouch under the chin; and in having the belly white:

in other things is greatly like the male.

The frigate pelican, or man-of-war bird (a), as it

is by some called, is chiefly, if not wholly, met with

between the tropics, and ever out at sea, being only

seen on the wing. It is usual with other birds, when

fatigued with flying, to rest themselves on the surface

of the water; but nature, from the exceeding length

of wing ordained to this, has made the flitting there

from utterly impossiible, at least writers not only to in-

form us, but every one whom we have talked with

avers the same: though perhaps this is no defect of

nature, as it fiercely seems to require much rest: at

least, from the length of wing, and its apparent easy

gliding motion (much like that of the kite), it appears

capable of fulfilling very long flights; for it is often

seen above 100, and not unfrequently above 200, leagues

from land. It has indeed been known to settle on the masts of ships; but this is not a frequent

circumstance, though it will often approach near, and

hover about the top-mast flag. Sometimes it soars so

high in the air as to be scarcely visible, yet at other

times approaches the surface of the sea, where, hovering

at some distance, the moment it spies a fish, it darts down on it with the utmost rapidity, and feld-m

without success, flying upwards again as quick as it

defended. It is also seen to attack* gulls and other

birds which have caught a fish, when it obliges them

to disgorge, and then takes care to seize it before it falls

into the water. It is an enemy to the flying fish;

for, on being attacked beneath by the dolphin

and other voracious fish, to escape their jaws, these

fiem-volatiles leap out of the water in clusters, making

use of their long fins as wings to buoy them up in the

air, which they are enabled to do as long as they re-

main wet; but the men they become dry are use-

less, and drop into their proper element again: during

their flight, the frigate darts in among the fish, and

seizes one or two at a look. These birds know the ex-

act place where the fish are to rise from the bubbling

of the water, which directs them to the spot; in this they

are accompanied by gulls and other birds, who act in

conest with them.

These birds, which, though not uncommon every-

where within the tropics, yet are less frequent in some

places than others, were seen by Cook in 1740 deg. In

the old route of navigators, they are mentioned fre-

quently as being met with at Ascension Island, Ceylon,

Eait Indies, and China. Dampier saw them in great

plenty in the island of Aves in the West Indies. Our

later navigators talk of them frequenting various

places of the South Sea, about the Marquesas, Easter

Isles, and New California, also at Otaheite, though at

this last place not in such plenty as in many others.

They are said to make nails on trees, if there be any

within a proper distance; otherwise on the rocks. They

lay one or two eggs of a flesh colour, marked with crip-

son spots. The young birds are covered with greyish

white down: the legs are of the same colour, and the

bill is white. There is a variety of this species, which

is less, measuring only two feet nine inches in length;

the extent from wing to wing is five feet and a half. The

bill is five inches long, and red; the base of it, and bare

space round the eye, are of the same colour; the noftrils

are sufficiently apparent, and appear near the base; the

shape of the bill is as in the larger one: the head, bind

part of the neck, and upper parts of the body and wings,

are ferrugious brown; the throat, fore part of the

neck, and breast, are white; the tail is greatly forked as

in the other; the legs are of a dirty yellow.

In my collection (says Latham) is a bird very fa-

miliar to this, if not the same; general colour of the

plumage full black; breast and belly mottled with ash-

colour; the inner ridge of the wing the same; the bill

has the long narrow, as is seen in the greater one; but

the nostrils are sufficiently apparent, being about half

an inch in length, rather broader at that part than the

base. This has a large red pouch at the chin and

throat, as in the former species. It is most likely that

mine is the male bird, as others, suspected to be of

the opposite sex, have little or no traces of the jugular

pouch. This supposition seems justified from a pair

in the Hunterian museum, in both of which the plum-

age is wholly black; the one has a large pouch, the

other

(a) It is also called tislur, or tailor, by the French, from the motion of its tail representing a pair of shears

when opened; and when on the wing, it opens and shuts them frequently, in the manner of using that infor-

ment.—Olsen, Vmp. ii. p. 304.

(c) Thought by Obeck to be one of the sorts of birds used in fishing by the Chinese.
Pelicans, other definite of it. Some have supposed that the greater and leffer frigates are the fame bird, in different periods of age."

7. The oncorhynthus, or pelican of Asia, Africa, and America; though Linnaeus thinks that the pelican of America may possibly be a different variety. This creature, in Africa, is much larger in the body than a cormorant, and somewhat of the same shape and colour. Its four toes are all webbed together; and its neck in some measure resembles that of a cormorant: but that singularity in which it differs from all other birds is in the bill and the great pouch underneath. This enormous bill is 15 inches from the point to the opening of the mouth, which is a good way back behind the eyes. At the base the bill is somewhat greenish, but varies towards the end, being of a reddish blue. It is very thick in the beginning, but tapers off to the end, where it hooks downwards. The under chap is still more extraordinary; for to the lower edges of it hang a bag, reaching the whole length of the bill to the neck, which is said to be capable of containing 15 quarts of water. This bag the bird has a power of wrinkling up into the hollow of the under-chap; but by opening the bill, and putting one's hand down into the bag, it may be diffused at pleasure. The skin of which it is formed will then be seen of a bluish ash colour, with many fibres and veins running over its surface. It is not covered with feathers, but with a short downy fulstance as smooth and as soft as fatin, and is attached all along to the under edges of the chap, is fixed backward till its head by proper ligaments, and reaches near half way down. When this bag is empty, it is not seen; but when the bird is filled with fishes, it is then incredible to what an extent it is often filled. For the first thing the pelican does in fishing is to fill up the bag; and then it returns to digest its burden at leisure. When the bill is opened to its widest extent, a person may run his hand into the bird's mouth, and conceal it in this monstrous pouch, thus adapted for very singular purposes. Yet this is nothing to what Ruyfch affures us, who avers that a man has been seen to hide his whole leg, boot and all, in the monstrous jaws of one of these animals. At first appearance this would seem impossible, as the sides of the under chap, from which the bag depends, are not above an inch in width when the bird's bill is first opened; but then they are capable of great separation; and it must necessarily be so, as the bird prey upon large fishes, and hides them by dozens in its pouch. Tertius affirms, that it will hide as many fish as will serve 60 hungry men for a meal.

This pelican was once also known in Europe, particularly in Russia; but it seems to have deferted those coasts. This is the bird of which so many fabulous accounts have been propagated: such as its feeding its young with its own blood, and its carrying a provision of water for them in its great reservoir in the defert. But the absurdity of the first account answers itself; and as for the latter, the pelican uses its bag for very different purposes than that of filling it with water.

Clavigero, in his History of Mexico, says that "there are two species, or rather varieties, of this bird in Mexico; the one having a smooth, bill, the other a notched one. Although the Europeans are acquainted with this bird, I do not know whether they are equally well acquainted with the singular circumstance of its afflicting the sick or hurt of its own species; a circumstance which the Americans at times take advantage of to procure fish without trouble. They take a live pelican, break its wing, and after tying it to a tree, conceal themselves in the neighbourhood; there they watch the coming of the other pelicans with their provisions, and as soon as they see these throw up the fish from their pouch, run in, and take a little for the captive bird, they carry off the rest."

This amazing pouch may be considered as analogous to the crop in other birds; with this difference, that as theirs lie at the bottom of the gullet, so this is placed at the top. Thus, as pigeons and other birds macerate their food for their young in their crops, and then supply them; so the pelican supplies its young by a more ready contrivance, and macerates their food in its bill, or stores it for its own particular sustenance.

The ancients were particularly fond of giving this bird admirable qualities and parental affections: Struck, perhaps, with its extraordinary figure, they were willing to supply it with as extraordinary appetites; and having found it with a large resevoir, they were pleased with turning it to the most tender and parental uses. But the truth is, the pelican is a very heavy, sluggish, voracious bird, and very ill fitted to take its flight, or to make those cautious provisons for a distant time; which we have been told they do.

The pelican, says Labar, has strong wings, furnished with thick plumage of an ash-colour, as are the rest of the feathers over the whole body. Its eyes are very small, when compared with the size of its head; there is a narrowness in its countenance, and its whole air is melancholy. It is as dull and reluctant in its motions as the flamingo is sprightly and active. It is flow of flight, and when it rises to fly, performs it with difficulty and labour. Nothing, as it were, but the spur of necessity, could make these birds change their situation, or induce them to ascend into the air: but they must either starve or fly.

They are torpid and inactiv to the last degree, so that nothing can exceed their indolence but their gluttony; it is only from the stimulations of hunger that they are excited to labour; for otherwise they would continue always in fixed repose. When they have raised themselves about 30 or 40 feet above the surface of the sea, they turn their head with one eye downwards, and continue to fly in that posture. As soon as they perceive a fish sufficiently near the surface, they dart down upon it with the swiftness of an arrow, seize it with unreeling certainty, and stow it up in their pouch. They then rise again, though not without great labour, and continue hovering and fishing, with their head on one side as before.

This work they continue with great effort and industry till their bag is full, and then they fly to land to devour and digest at leisure the fruits of their industry. This, however, it would appear, they are not long in performing; for towards night they have another hungry call, and they again reluctantly go to labour. At night, when their fishing is over, and the toil of the day crowned with success, these lazy birds retire a little way from the shore; and, though with the webbed feet and clumsy figure of a goose, they will be contented to perch nowhere, but upon trees among the light and airy.  

Plate xcclxxi.
pany and conversation of men, and in music both vocal and instrumental; for it would willingly stand," says he, "by those that sung or sounded the trumpet; and stretching out its head, and turning its ear to the music, listened very attentively to its harmony, though its own voice was little pleasanter than the braying of an ass." Gefner tells us, that the emperor Maximilian had a tame pelican which lived for above 80 years, and that always attended his army on their march. It was one of the largest of the kind, and had a daily allowance by the emperor's orders. As another proof of the great age to which the pelican lives, Aldrovandus makes mention of one of those birds that was kept several years at Meclhin, and was w'ely believed to be 50 years old. - We often see these birds at our shows about town.

Mr Edwards, in his History of Birds, describes the pelican of America from one, the body of which was fent him stuffed and dried. From the point of the bill to the angles of the mouth measured 13 inches, and the wing when closed measured 18 inches. The pouch when dry appeared of the confi'ance and colour of a brown dry ox's bladder, having fibres running its whole length, and blood vessels crossing them; and proceeding from the sides of the lower part of the bill, which opened into this pouch, its whole length. The greater bone of the wing being broken, was found to be light, hollow, void of marrow, and the sides of it thin as parchment. Sir Hans Sloane writes thus of it (see Naut. Hist. of Jamaica, vol. ii. p. 322.): "This seems to be the same with the white pelican, only of a darker colour. They are frequent in all the seas of the hot West Indies. They fish after the same manner as man-of-war birds, and come into the sheltered bays in stormy weather, where they very often perch on trees: they fly over the seas as gulls, and take the fish when they sly them, by falling down upon them, and then rise again and do the like. They are not reckoned good food. When they are seen at sea, it is a sign of being near land." Water, in his voyage and description of the islands of America, says, "The pelican is not found on the South Sea side of the line from which they abound on the northern side; they are of a dark grey colour, and under the throat hangs a bag: the old ones are not eaten, but the young are good meat." Mr Edwards, in another place, gives the description of a pelican, which he says is double the biggest of the largest swan. His drawing was made from the pelican shown at London in 1745, which was brought by Capt. Pelly from the Cape of Good Hope, where they are larger than anywhere else. The body, legs, and feet, very much resemble the pelican of America; and it differs little but in the head and neck, which last is very long, like a swan's; the bill is slimmer, and the upper part only hooked at the end: the pouch is shaped something different, hanging more down in the middle. Mr Edwards thus describes it. "From the point of the bill to the angle of the mouth is 20 inches of our English measure, which is six inches more than any natural historian has found it; the academy of Par is having measured one which was about 14 inches, Paris measured I suppose; and our countryman, Wiltoughby, measured one brought from Russia, which he makes 14 inches English. I thought it something incredible in Wiltoughby's description, that a man should
Pelican

should put his head into the pouch under the bill, but
I saw it performed in this bird by its keeper, and am
ture a second man’s head might have been put in with
it at the same time.”

The Academy of Paris think the bird they have de-
cribed is the pelican of Aristotle, and the Onocrotalus
of Pliny. They are also confirmed in the opinion
that this is a long-lived bird; for, out of a great num-
ber kept at Verailles, none had died for more than 12
years, being the only animis kept in the menageriy
of which some have not died in that time. Some au-
tors say they live 60 or 70 years.

Capt. Keeling, in his voyage to Sierra Leon, says
the pelicans there are as large as swans, of a white
colour with exceeding long bills t and M. Thevenot,
in his travels to the Levant, observes, that the pelicans
about some part of the Nile near the Red Sea swim
by the bank side like geese, in such great numbers that
they cannot be counted. Father Morella, in his voy-
age to Congo, says pelicans are often met with in the
road to Singa, and are all over black, except on their
breast, which is of a flesh colour like the neck of a
turkey. He adds further, that father Francisco de Pa-
via informed him, that on his journey to Singa he ob-
erved certain large white birds, with long beaks, necks,
and feet, which, whenever they heard the least sound
of an instrument, began immediately to dance, and
leap about the rivers, where they always reside, and
whereof they were great lovers; this, he said, he took
a great pleasure to contemplate, and continued often
upon the banks of the rivers to observe.

It would extend our article beyond all proportion,
were we to touch on each individual species of this ex-
tensive genus, together, with their accidental varieties.
But as the genus is unquestionably very curious, we
shall here subjoin a list of books, which such of our
readers as desire it may have recourse to for further
information: Edward’s History of Birds: Natural His-
tory of Jamaica: Mem. de l’Académie Royale des Sciences,
deépuis 1665 jusqu’a 1699. tom. 3, troisième partie, p.
186; Willoughby’s Pennant’s British and Arctic Zoology;
and Latham’s Synopsis of Birds: the last of which is the
fullest and most scientific of any we have yet seen.

PELION (Diodorus Siculus, &c.), Pelion mons, un-
derwood, (Mela, Virgil, Horace, Seneca), a moun-
tain of Thessaly, near Olla, and hanging over the Sinus
Pelaicus, or Pegaeicus; its top covered with pines,
the fides with oaks, (Ovid). Said also to abound in
wild ash, (Val. Plancy). From this mountain was
cut the spear of Achilles, called pelius, which none
but himself could wield, (Homer). Dicareus, Ari-
Stote’s scholar, found this mountain 1250 paces higher
than any other of Thessaly, (Pliny). Pelius, Cicero;
Pellucem, (Carullus), the epithet.

PELLA (anc. geog.), a town situated on the confines
of Emathia, a district of Macedonia, (Ptolemy); and
therefore Herodotus allot it to Botina, a maritime
district on the Sinus Thermaicus. It was the royal re-
fidence, situated on an eminence, verging to the south-
west, encompassed with unpassable marshes summer and
winter: in which, next the town, a citadel like an
island rise, placed on a bank or dam, a prodigious
work, both supporting the wall and securing it from
any hurt by means of the circumambient water. At a
distance, it seems close to the town, but is separated
from it by the Ludias, running by the walls, and joined
to it by a bridge, (Liv.); distant from the sea 120
Stadia, the Ludias being far navigable, (Strabo).
Mela calls the town Pelis, though most Greek authors
write Pella. The birth place of Philip, who enlarged
it; and afterwards of Alexander, (Strabo, Melcl). Con-
tinued to be the royal residence down to Pericles, (Li-
v.). Called Pella Colonii, (Pliny); Colonia Julia
Augusta, (Coin). It afterwards came to decline, with
but few and mean inhabitants, (Lucian). It is now
called Των Παπαρών, The Little Palace, (Hollinrux).

Pellane, both the gentilicium name and the epithet,
(Lucian, Juvenal, Martial.)—Another Pella; (Po-
ylus, Pliny); a town of the Decapoli, on the other
side the Jordan; abounding in water, like its cognomi-
tual town in Macedonia; built by the Macedonians,
(Strabo); by Seleucus, (Eusebius): anciently called
Butis, (Stephanus); Agamas, (Strabo); situated 35
miles to the north-east of Gerasa, (Ptolemy). Thir-
ther the Christians, just before the siege of Jerusa-
lem by Titus, were divinely admonished to fly, (Eu-
senius). It was the utmost boundary of the Perea, or
Transjordan country, to the north, (Josephus).

PELLETIER (James), a doctor of physic, and an
eminent mathematician, was born at Mans in 1517,
and died at Paris in 1582. He was an excellent Latin
and French poet, a good orator, physician, and gram-
marian. He wrote Oeuvres Politiques, Commentaires La-
ties, etc.

PELLITS, in heraldry, those roundles that are
black; called also opristes and gunflames, and by the
French torteaux de fable.

PELLICLE, among physicians, denotes a thin
film or fragment of a membrane. Among chemists it
signifies a thin surface of crystals uniformly spread over
a small liquor evaporated to a certain degree.

PELLISON, or PELSON FONTANIER, (Paul),
one of the finest geniuses of the 17th century, was the
son of James Pellisson counsellor at Caftres. He was
born at Beziers in 1624, and educated in the Protestant
religion. He studied with faccaces the Latin, Greek,
French, Spanish, and Italian tongues, and applied
himself to the reading the best authors in these lan-
guages; after which he studied the law at Caftres with
reputation. In 1652 he purchased the post of secre-
tary to the king, and five years after became first de-
puty to M. Fouquet. He suffered by the disgrace of
that minister; and in 1661 was confined in the Bastile,
from whence he was not discharged till four years after.
During his confinement he applied himself to the study
of controversy; and in 1670 abjured the Protestant
religion. Louis XIV. beloowed upon him an annual
pension of 2000 crowns: and he likewise enjoyed se-
veral polit. In 1676 he had the abbey of Giment,
and some years after the priory of St Orens at Auch.
He died in 1693. His principal works are, 1. The
History of the French Academy. 2. Reflections on
religious Disputes, &c. in 4 vols 12mo. 3. The History
of Louis XIV. 5. Historical Letters and Miscellanies,
in 3 vols 12mo.

PELOPIA, a festival observed by the Eleans in
honour of Pelops. A ram was sacrificed on the occa-
sion, which both priests and people were prohibited
from...
from partaking of, on pain of excommunication from Jupiter's temple; the neck only was allotted to the officer who provided wood for the sacrifice. This officer was called 


PELOPONNESUS, (Dionysius,) a large peninsula to the south of the reit of Greece; called, as it were, Peloponnisus or infula, though properly not an island, but a peninsula; yet wanting but little to be one, viz. the ithmus of Corinth, ending in a point like the leaf of the plantane or plane-tree. Anciently called Apis and Paeloja; a peninsula second to no other country for nobleness; situated between two seas, the Egean and Ionian, and resembling a plantane-leaf, on account of its angular recesses or bays. (Pliny, Strabo, Mela.) Strabo adds from Homer, that one of its ancient names was Argo, with the epithet Achaticum, to distinguish it from Thesaly, called Pela
gicum. Divided into six parts; namely, Argolis, Laconica, Meglena, Elis, Achaea, and Arcadia, (Mela.) Now called the Morea.

PELOPS, in fabulous history, the son of Tantalus king of Phrygia, went into Elis, where he married Hippodamia the daughter of Oenomaus king of that country; and became so powerful, that all the territory which lies beyond the Ithmus, and composes a considerable part of Greece, was called Peloponnesus, that is, the island of Pelops, from his name and the word Next.

PELTIA, a small, light, manageable buckler, used by the ancients. It was worn by the Amazons. The pelta is said by some to have resembled an ivy leaf in form; by others it is compared to the leaf of the plantane or plane-tree. Anciently called 

PELTARIA, in botany: A genus of the siliqua order, belonging to the tetradasyma clafs of plants; and in the natural method ranking under the 39th order, Siliquea. The siliqua is entire, and nearly orbicular, compressed plane, and not opening.

PELUSIUM (anc. geog.), a noble and strong city of Egypt, without the Delta, distant 20 statas from the sea; situated amidst marshes; and hence its name and its strength. Called the key or inte of Egypt (Diodorus, Hirtius); which being taken, the rest of Egypt lay quite open and exposed to an enemy. Called Sin (Ezekiel). Pelasgius the epithet (Virgil, Diodorus.) From its ruins arose Damietta. E. Long. 32°. N. Lat. 31°.

Mr Savary gives us the following account of this place: "The period of its foundation, as well as that of the other ancient cities of Egypt, is lost in the obscurity of time. It flourished long before Herodotus. As it commanded the entrance of the country on the side of Asia, the Pharaohs rendered it a considerable forbos, one of them raised a rampart of 30 leagues in length from the walls of this town to Helopolis. But we find from the history of nations that the long wall of China, which the weakness of the Greek emperors led them to build round Constantinople, and many others, built at an immense expense, were but feeble barriers against a warlike people; these examples have taught us, that a flate, to be in security against a foreign yoke, must form warriors within itself, and that men must be opposed to men. This rampart, which covered Pelusium, did not stop Cambyses, who attacked it with a formidable army. The feeble character of the Son of Amasis, unable to prevent the defeition of 200,000 Egyptians, who went to found a colony beyond the cataracts, had not force sufficient to oppose that torrent which broke in upon his country. Cambyses, after a bloody battle, wherein he cut his enemies to pieces, entered Pelusium in triumph. That memorable day, which saw the defeition of one part of the Egyptian militia and the ruin of the other, is the true epoch of the subjugation of that rich country. Since that period, it has paused under the yoke of the Persians, the Macedonians, the Romans, the Greeks, the Arabs, and the Turks. A continued slavery of more than 2000 years seems to secure them an eternal bondage.

"Herodotus, who visited Pelusium some years after the conquest of Cambyses, relates an anecdote which I cannot omit: 'I surveyed (says he) the plain where the two armies had fought. It was covered with human bones collected in heaps. Tho' of the Persians were one side, tho' of the Egyptians on the other, the inhabitants of the country having taken care to separate them after the battle. They made me take notice of a fact which would have appeared very alarming to me without their explanation of it. The skulls of the Persians, which were light and fragile, broke on being lightly struck with a stone; tho' of the Egyptians, thicker and more compact, resisted the blows of flint. This difference of solidity they attributed to the custom the Persians have of covering their heads from their infancy with the tiara, and to the Egyptian custom of leaving the heads of their children bare and shaven, exposed to the heat of the sun. This explanation appeared satisfactory to me.' Mr Savary affirms us that the same customs still subsist in Egypt, of which he frequently had ocular demonstration."

"Pelusium (continues he), after passing under the dominion of Persia, was taken by Alexander. The brave Antony, general of cavalry under Gabinius, took it from his succours, and Rome restored it to Ptolemy Auletes. Pompey, who credit had established this young prince on the throne of Egypt, after the fatal battle of Pharamaia took refuge at Pelusium. He landed at the entrance of the harbour and, on quitting his wife Cornelia and his son, he repeated the two following verses of Sophocles, 'The free man who seeks an asylum at the court of a king will meet with flavery and chains.' He thers found death. Scarcely had he landed on the shore, when Theodore the rhetorician, of the isle of Chio, Septimius the courtier, and Achilles the eunuch, who commanded his troops, wishing for a victim to present to his conqueror, flaved him with their swords. At the sight of the affrays Pompey covered his face with his mantle, and died like a Roman. They cut off his head, and embalmed it, to offer it to Caesar, and left his body naked on the shore. It was thus that this great man, whose warlike talents had procured the liberty of the hea, for the Romans, and added whole kingdoms to their extended empire, was basely slain in letting foot on the territory of a king who owed to him his crown. Philip his freedman, collecting together, under favour of the night, the wreck of a boat, and stripping of his own cloak to cover the sad remains of his master, burnt them.
PELVIS, in anatomy. See here, n° 3—43.

PEMBROKE (Mary Countess of). See HERBERT.

PEMBROKE, in Pembroke-shire, in England, is the principal town in the county. It is situated upon a creek of Milford-Haven, and in the most pleasant part of Wales, being about 256 miles distant from London. It is the county-town, and has two handsome bridges over two small rivers which run into a creek, forming the west side of a promontory. It is well inhabited, has several good houses, and but one church. There is also a custom-house in it. There are several merchants in it, who, favoured by its situation, employ near 200 sail on their own account; so that, next to Caermarthen it is the largest and richest town in South Wales. It has one long street, upon a narrow part of a rock; and the two rivers seem to be two arms of Milford-Haven, which ebb and flows close up to the town. It is governed by a mayor, bailiffs, and burgesses; and was in former times fortified with walls, and a magnificent castle seated on a rock at the west end of the town. In this rock, under the chapel, is a natural cavern called Wegan, remarked for having a very fine echo: this is supposed to have been a store-room for the garrison, as there is a circular leading into it from the castle: it has also a wide mouth towards the river. This structure being burnt a few years after it was eroded, it was rebuilt. It is remarkable for being the birth-place of Henry VII., and for the brave defence made by the garrison for Charles I.

PEMBROKESHIRE, a county of Wales, bounded on all sides by the Irish sea, except on the east, where it joins to Caermarthenshire, and on the north-east to Cardiganshire. It lies the nearest to Ireland of any county in Wales; and extends in length from north to south 35 miles, and from east to west 29, and is about 140 in circumference. It is divided into seven hundreds, contains about 420,000 acres, one city, eight market towns, two foresters, 145 parishes, about 2300 houses, and 25,900 inhabitants. It lies in the province of Canterbury, and diocese of St. David's. It sends three members to parliament, viz. one for the shire, one for Haverfordwell, and one for the town of Pembroke.

PEMBROKESHIRE, considering its situation, is good; but it is in general better the farther from the sea. As there are but few mountains, the soil is generally fruitful, especially on the sea-coasts; nor are its mountains altogether unprofitable, but produce pasture sufficient to maintain great numbers of sheep and goat. Its other commodities are corn, cattle, pit-coal, murl, fish, and fowl. Among these last are falcoms, called here peregrins. Amongst the birds common here are migratory sea-birds, that breed in the

Isle of Ramsey, and the adjoining rocks called The Bishops and the Cliffs. About the beginning of April flocks of birds, of several sorts, resort to these rocks, as appear incredible to those who have not seen them. They come to them in the night-time, and also leave them then; for, in the evening, the rocks may be seen covered with them, and the next morning not one be seen at all. In like manner, not a single bird shall appear in the evening, and the next morning the rocks shall be covered with them. They also generally make a visit about Christmas, staying a week or longer; and then take their leave till breeding-time. Among these birds are the eider, razor-bill, puffin, and harry-bird. The eider lays only one egg, which, as well as those of the puffin and razor-bill, is as big as a duck's, but longer and smaller at one end. She never leaves it till it is hatched, nor then till the young one is able to follow her; and she is all this time fed by the male. This and the razor-bill breed upon the bare rocks, without any kind of nest. The puffin and harry-bird breed in holes, and commonly in the holes of rabbits; but sometimes they dig holes for themselves with their beaks. The harry-birds are never seen on land but when taken. All the four kinds cannot raise themselves to fly away when they are on land, and therefore they creep or waddle to the cliffs, and throwing themselves off, take wing. The eider is the tame bird which they call in Cornwall (England) a kidow, and in Yorkshire a scoul. The razor-bill is the merre of Cornwall. The puffin is the arctic duck of Clusius, and the harry-bird the flire-water of Sir Thomas Brown. The inhabitants of this county make a very pleasant durable fire of culm, which is the dust of coal made up into balls with a third part of mud. The country is well watered by the rivers Clethy, and in English Black-butter. Having washed it clean, they lay it to sweat between two flat flones, then fired it small, and kned it well, like dough for bread, and then make it up into great balls or rolls, which is by some eat raw, and by others fried with oatmeal and butter. It is accounted excellent against all distempers of the liver and spleen; and some affirm that they have been relieved by it in the sharpflits of the nose.

PEN, a town of Somersetshire in England, on the north-east side of Wincanton, where Kenwold a West Saxon king, so totally defeated the Britons, that they were never after able to make head against the Saxons; and where, many ages after this, Edmund Ironside gained a memorable victory over the Danes, who had before, i.e. in 1001, defeated the Saxons in that same place.

PEN, a little instrument usually formed of a quill, serving to write withal.
PEN

Pens are also sometimes made of silver, brass, or iron.

Dutch Pens are made of quills that have paffed through hot ashes, to take off the grofer fat and moisture, and render them more transparent.

Fountain Pen, is a pen made of silver, brass, &c. contrived to contain a confiderable quantity of ink, and let it flow out by gentle degrees, fo as to supply the writer a long time without being under the neceffity of taking fresh ink.

The fountain pen is compos'd of several pieces, as in Plate CCCLXXII, where the middle piece F carries the pen, which is screwed into the infide of a little pipe which again is foldered to another pipe of the fame bignefs as the lid G; in which lid is folderd a male screw, for screwing on the cover, as alfo for floppling a little hole at the place and hindering the ink from paffing through it. At the other end of the piece F is a little pipe, on the outside of which the top-cover H may be screwed. In the cover there goes a port-crayon, which is to be screwed into the other mathematical figures, may be defcribed in the fimple form. We fhall give proper firft:

A port-crayon, which is to be screwed into the other mathematical figures, may be described in the fimple form.

The radius of $EG$ (fig. 11.) muft be to that of $FG$ as 10 to 5 nearly; their velocities, or the number of teeth in the wheels, to be equal; the motion to be in the fame direction.

If the length of $FG$ be varied, the looped figure delineated at fig. 12. will be produced. A circle may be defcribed by equal wheels, and any radius but the bars muft move in contrary directions.

To define by this circular motion a right line and an ellipse. For a right line, equal radii, the velocity as 1 to 2, the motion in a contrary direction; the fame data will give a variety of ellipses, only the radii muft be unequal; the ellipses may be defcribed in any direction. See fig. 13.

PEN, or Penflock. See Penstock.

See Pen. See Penatula.

PENANCE, a punithment either voluntary or imposed by authority, for the faults a perfon has committed. Penance is one of the seven sacraments of the Romish church. Besides fasting, alms, abstinence, and the like, which are the general conditions of penance, there are others of a more particular kind; as the repeating a certain number of ave-marys, pater-nothers, and credos, wearing a hair-shirt, and giving one's self a certain number of stripes.

In Italy and Spain it is ufual to see Christians almost naked, loaded with chains and a crofs, and lashing themselves at every step.

PENATES, in Roman antiquity, a kind of tutelar deities, either of countries or particular houses; in which laft fente they differed in nothing from the lares. See Lakes.

The penates were properly the tutelar gods of the Trojans, and were only adopted by the Romans, who gave them the title of penates.

PENCIL, an instrument used by painters for laying on their colours. Pencils are of various kinds, and made of various materials; the largest forts are made of boar's bristles, the thick ends of which are bound to a ftick, bigger or lefs according to the uses they
Pencils, are designed for: these, when large, are called

The finer sorts of pencils are made of camels, badgers, and squirrels hair, and of the down of swans; these are tied at the upper end with a piece of strong thread, and inclosed in the barrel of a quill.

All good pencils, on being drawn between the lips, come to a fine point.

Pencils, is also an instrument used in drawing, writing, &c. made of long pieces of black-lead or red-chalk, placed in a groove cut in a flp of cedar; on which other pieces of cedar being glued, the whole is planed round, and one of the ends being cut to a point, it is fit for use.

Black-lead in fine powder, purred into moulds, unites with black-lead itself, and in such quantity, in virtue perhaps of its abounding with sulphur, that though the compound remains fluid enough to be poured into moulds, it looks nearly like the coarser phur, unites a mould, so as to serve for black-lead again, consisted in mixing with it sulphur or sulphureous bodies.

On this principle the German black-lead pencils are made to be used; and many of those which are hawked about by certain perons amongst us are prepared in the same manner: their melting or softening, when held to a candle, or applied to a red-hot iron, and yielding a bluish flame, with a strong smell like that of burning brimstone, betrays their composition; for black-lead itself yields no smell or fume, and fuffers no apparent alteration in that heat. Pencils made with such additions are of a very bad kind; they are hard, brittle, and do not cut or make a mark freely either on paper or wood, rather cutting or scratching them than leaving a coloured stroke.

The true English pencils (which Vogel in his mineral history, and some other foreign writers, imagine to be prepared also by melting the black-lead with some additional substances, and casting it into a mould) are formed of black-lead alone sawed into slips, which are fitted into a groove made in a piece of wood, and another slip of wood glued over them: the fairest wood, as cedar, is made choice of, that the pencil may be the easier cut; and a part at one end, too short to be conveniently used after the reft has been worn and cut away, is left unfilled with the black-lead: that there may be no waste of so valuable a commodity. These pencils are greatly preferable to the others, though seldom to perfect as could be wished, being accompanied with some degree of the fame incoherencies, and being very unequal in their quality, on account of different sorts of the mineral being fraudulently joined together in one pencil, the fore-part being commonly pretty good, and the reft of an inferior kind. Some, to avoid these imperfections, take the finer pieces of black-lead itself, which they saw into slips, and fix for use in part-rayons: this is doubtless the surest way of obtaining black-lead rayons, whose goodness can be depended on.

Pendant, an ornament hanging at the ear, frequently composed of diamonds, pearls, and other jewels.

Pendants, in heraldry, parts hanging down from the label, to the number of three, four, five, or six at most, resembling the drops in the Doric froze; when they are more than three, they must be specified in blazoning.

Pendants, of a Ship, are those funnels, or long colours, which are split and divided into two parts, ending in points, and hung at the head of masts, or at the yard-arm ends.

PENDENIS, in Cornwall, at the mouth of Fal-mouth haven, is a peninsula of a mile and a half in compass. On this Henry VIII erected a castle, opposite to that of St Maw's, which he likewise builded. It was fortified by Queen Elizabeth, and served then for the governor's house. It is one of the largest castles in Britain, and is built on a high rock. It is stronger by land than St Maw's, being regularly fortified, and having good outworks.

PENDULOUS, a term applied to any thing that bends or hangs downwards.

PENDULUM, a vibrating body suspended from a fixed point. For the history of this invention, see the article Clock.

The theory of the pendulum depends on the inclined plane. Hence, in order to understand the nature of the pendulum, it will be necessary to premise some of the properties of this plane; referring, however, to Inclined Planes, and Section VI. in the article Mechanics, for the demonstration.

I. Let AC (fig. 1.) be an inclined plane, AB its perpendicular height, and D any heavy body; then the force which impels the body D to descend along the inclined plane AC, is to the absolute force of gravity as the height of the plane AB is to its length AC; and the motion of the body will be uniformly accelerated.

II. The velocity acquired in any given time by a body descending on an inclined plane AC, is to the velocity acquired in the same time by a body falling freely and perpendicularly as the height of the plane AB to its length AC. The final velocities will be the same; the spaces described will be in the same ratio; and the times of description are as the spaces described.

III. If a body descend along several contiguous planes, AB, BC, CD, (fig. 2.) the final velocity, namely, that at the point D, will be equal to the final velocity in descending through the perpendicular AE, the perpendicular heights being equal. Hence, if these planes be supposed indefinitely short and numerous, they may be conceived to form a curve; and therefore the final velocity acquired by a body in descending through any curve AB, will be equal to the final velocity acquired in descending through the planes AB, BC, CD, or to that in descending through AE, the perpendicular heights being equal.

IV. If from the upper or lower extremity of the vertical diameter of a circle a cord be drawn, the time of descent along this cord will be equal to the time of descent through the vertical diameter; and therefore...
If a pendulum vibrates in the small arc of a circle, the time of one vibration is to the time of the pendulum, a body's falling perpendicularly through half the length of the pendulum as the circumference of a circle is to its diameter.

Let PE (fig. 5.) be the pendulum which describes the arch ANC in the time of one vibration; let PN be perpendicular to the horizon, and draw the cords AC, AN; take the arc EF infinitely small, and draw EFG, efg perpendicular to PN, or parallel to AC; describe the semicircle BGN, and draw ef g perpendicular to EG; now let t be time of describing through the diameter 2PN, or through the cord AN; then the velocities gained by falling through 2PN, and by the pendulum's describing through the arch AE, will be as √2PN and √BF; and the space described in the time t, after the fall through 2PN, is 4PN. But the times are as the spaces divided by the velocities.

Therefore $\frac{4PN}{\sqrt{2PN} \times 2\sqrt{2PN}} \times t = \frac{E e}{\sqrt{BF}},$ time of describing $E e = \frac{2\sqrt{2PN} \times BF}{\sqrt{2PN} \times 2\sqrt{2PN}}.$ But in the similar triangles PEF, Efr, and KGF, Ggs.

As PE=PN : EF : Ee : er = $\frac{PN \times E e}{\sqrt{BF}}$ and KG = KD : FG : Gs : $G = \frac{KD \times G s}{\sqrt{EF} \times \sqrt{FG}}$

But $er = G s = \frac{PN \times E e}{\sqrt{EF} \times \sqrt{FG}}$ Hence $E e = \frac{KD \times EF \times G s}{\sqrt{EF} \times \sqrt{FG}}.$

And by substituting this value of $E e$ in the former equation, we have the time of describing $E e = t \times PN \times G g.$

But by the nature of the circle FG = $\sqrt{BF} \times FN,$ and $EF = \sqrt{PN \times PF} \times FN.$

Hence, by substitution, we obtain the time of describing $t \times PN \times \sqrt{BF} \times FN \times G g.$

$E e = \frac{2KD \times EF \times \sqrt{BF} \times 2PN}{t \times PN \times G g}$

And $2KD \times \sqrt{PN \times PF} \times FN \times \sqrt{BF} \times 2PN = t \times PN \times G g = \frac{2KD \times \sqrt{PN \times PF} \times FN \times \sqrt{BF} \times 2PN}{t \times \sqrt{2PN \times G g}}$

$= \frac{2BD \times \sqrt{2PN} - NF \times G g}{t \times \sqrt{2PN} \times G g}$

But NF, in its mean quantity for all the arches $G g$ is nearly equal to NK; for if the semicircle described on the diameter BN, which corresponds to the whole arch $AN,$ be divided into an indefinite number of equal arches $G g,$ &c., the sum of all the lines NF will be equal to as many times NK as there are arches in the same circle equal to $G g$ and the time of describing $E e = \frac{2BN \times \sqrt{2PN} - NK}{2BN \times \sqrt{2PN} - NK} \times G g.$

Whence the time of describing the arch AED $t \times \sqrt{2PN} = \frac{2BN \times \sqrt{2PN} - NK}{2BN \times \sqrt{2PN} - NK} \times BGN;$ and the time of describing the whole arch ADC, or the time of one vibration, is $t \times \sqrt{2PN}$ $= \frac{2BN \times \sqrt{2PN} - NK}{2BN \times \sqrt{2PN} - NK} \times 2BGN.$ But when the arch ANC is very small, NK vanishes, and then
Pendulum, then the time of vibration in a very small arc is

\[
\frac{1}{2} x \sqrt{2 \cdot PN} = \frac{1}{2} \sqrt{2 \cdot BGN} = \frac{1}{2} \sqrt{2 \cdot PN}.
\]

be the time of descent through \(2 \cdot PN\); then since the spaces described are as the squares of the times, \(t\) will be the time of descent through \(PN\); therefore the diameter \(BN\) is to the circumference \(2 \cdot BGN\), as the time of falling through half the length of the pendulum is to the time of one vibration.

Prop. IV. The length of a pendulum vibrating seconds is twice the space through which a body falls in one second, as the square of the diameter of a circle is to the square of its circumference.

Let \(d\) be the time of falling through half the length of the pendulum. Let \(s\) be the space described by a body falling perpendicularly in the first second; then since the spaces described are in the subduplicate ratio of the times of description, therefore

\[
d = \sqrt{d^2} = \sqrt{s^2}.
\]

It has been found by experiment, that in latitude \(\phi\) a body falls about \(16.11\) feet in the first second; hence the length of a pendulum vibrating seconds in that latitude is

\[
\frac{22.22}{3.14159} = 3 \text{ feet} \; 3.174 \text{ inches}.
\]

Prop. V. The times of vibrations of two pendulums in similar arcs of circles are in a subduplicate ratio of the lengths of the pendulums.

Let \(PN, PO\) (fig. 6.) be two pendulums vibrating in the similar arcs \(AB, CD\); the time of a vibration of the pendulum \(PN\) is to the time of a vibration of the pendulum \(PO\) in a subduplicate ratio of \(PN\) to \(PO\).

Since the arcs \(AN, CO\) are similar and similarly placed, the time of descent through \(AN\) will be to the time of descent through \(CO\) in the subduplicate ratio of \(AN\) to \(CO\): but the times of descent through the arcs \(AN\) and \(CO\) are equal to half the times of vibration of the pendulums \(PN, PO\) respectively. Hence the time of vibration of the pendulum \(PN\) in the arc \(AB\) is to the time of vibration of the pendulum \(PO\) in the similar arc \(CD\) in the subduplicate ratio of \(AN\) to \(CO\): and since the radii \(PN, PO\) are proportional to the similar arcs \(AN, CO\), therefore the time of vibration of the pendulum \(PN\) will be to the time of vibration of the pendulum \(PO\) in a subduplicate ratio of \(PN\) to \(PO\).

If the length of a pendulum vibrating seconds be \(39.174\) inches, then the length of a pendulum vibrating half seconds will be \(9.793\) inches. For

\[
\frac{\sqrt{39.174}}{\sqrt{2} \cdot 39.174} = \frac{1}{2} \sqrt{2} = \frac{1}{2} \times 1.414 = \frac{1}{2} \times 1.414 = \frac{1}{2} \times 1.414 = 0.707.
\]

\[
x = \frac{1}{2} \times 0.707 = 0.354.
\]

Prop. VI. The lengths of pendulums vibrating in the same time, in different places, will be as the forces of gravity.

For the velocity generated in any given time is directly as the force of gravity, and inversely as the quantity of matter *. Now the matter being supposed the same in both pendulums, the velocity is as the force of gravity; and the space passed through in a given time will be as the velocity; that is, as the gravity.

Cor. Since the times of pendulums vibrating in the same time in small arcs are as the gravitating forces, and as gravity increases with the latitude on account of the spherical figure of the earth and its rotation about its axis; hence the length of a pendulum vibrating in a given time will be variable with the latitude, and the same pendulum will vibrate slower the nearer it is carried to the equator.

Prop. VII. The time of vibrations of pendulums of the same length, acted upon by different forces of gravity are reciprocally as the square roots of the forces.

For when the matter is given, the velocity is as the force and time; and the space described by any given force is as the force and square of the time. Hence the lengths of pendulums are as the forces and the squares of the times of falling through them. But these times are in a given ratio to the times of vibration; hence the lengths of pendulums are as the forces and the squares of the times of vibration. Therefore, when the lengths are given, the forces will be reciprocally as the square of the times, and the times of vibration reciprocally as the square roots of the forces.

Cor. Let \(p\) be the length of pendulum, \(g\) the force of gravity, and \(t\) the time of vibration. Then since \(p = g \times t^2\), and \(t = \sqrt{g/p}\),

\[
g \times t^2 = \sqrt{g/p}.
\]

That is, the forces in different places are directly as the lengths of the pendulums, and inversely as the square roots of the times of vibration; and the times of vibration are directly as the square roots of the lengths of the pendulums, and inversely as the square roots of the gravitating forces.

Prop. VIII. A pendulum which vibrates in the arch of a cycloid describes the greatest and least vibrations in the same time.

This property is demonstrated only on a supposition that the whole mass of the pendulum is concentrated in a point: but this cannot take place in any really vibrating body; and when the pendulum is of finite magnitude, there is no point given in position which determines the length of the pendulum; on the contrary the centre of oscillation will not occupy the same place in the given body, when describing different parts of the tract it moves through, but will continually be moved in respect of the pendulum itself during its vibration. This circumstance has prevented any general determination of the time of vibration in a cycloidal arc, except in the imaginary case referred to.

There are many other obstacles which concur in rendering the application of this curve to the vibration of pendulums designed for the measures, of time the source of errors far greater than those by which its peculiar property it is intended to obviate; and it is now wholly diluted in practice.

Although the times of vibration of a pendulum in
PENDULUM.

Different arches be nearly equal, yet from what has been said, it will appear, that, if the ratio of the height of these arches to the greatest be considerable, the vibrations will be performed in different times; and the difference, though finally, will become sensible in the course of one or more days. In clocks used for astronomical purposes, it will therefore be necessary to observe the arc of vibration; which if different from that described by the pendulum when the clock keeps time, there a correction must be applied to the time shown by the clock. This correction, expressed in seconds of time, will be equal to the half of three times the difference of the square of the given arc, and of that of the arc described by the pendulum when the clock keeps time, these arcs being expressed in degrees; and so much will the clock gain or lose according as the first of these arches is less or greater than the second.

Thus, if a clock keeps time when the pendulum vibrates in an arch of $3^\circ$, it will lose 10$\frac{2}{3}$ seconds daily in an arch of $4^\circ$.

For $3^\circ = 3 \times 360^\circ = 7 \times \frac{3}{4} = 10\times \frac{3}{4}$ seconds.

The length of a pendulum rod increases with heat, and the quantity of expansion answering to any given degree of heat is experimentally found by means of a thermometer, and the degree of heat at any given time is shown by a thermometer: hence that instrument should be placed within the clock-case at a height nearly equal to that of the middle of the pendulum, and its height, for this purpose, should be examined at least once a day. Now by a table constructed to exhibit the daily quantity of acceleration or retardation of the clock answering to every probable height of the thermometer, the corresponding correction may be obtained. It is also necessary to observe, that the mean height of the thermometer during the interval ought to be used. In Six's thermometer this height may be easily obtained; but in thermometers of the common construction it will be more difficult to find this mean.

It had been daily by repeated experiments, that a brass rod equal in length to a second pendulum will expand or contract $1^\circ$ part of an inch by a change of degree temperature of one degree in Fahrenheit's thermometer; and since the times of vibration are in a subduplicate ratio of the lengths of the pendulum, hence an expansion or contraction of $1^\circ$ part of an inch will answer nearly to one second daily: therefore a change of one degree in the thermometer will occasion a difference in the rate of the clock equal to one second daily. Whence, if the clock be so adjusted as to keep time when the thermometer is at $55^\circ$, it will lose 10 seconds daily when the thermometer is at $65^\circ$, and gain as much when it is at $45^\circ$.

Hence the daily variation of the rate of the clock from summer to winter will be very considerable. It is true indeed that most pendulums have a nut or regulator at the lower end, by which the bob may be raised or lowered a determinate quantity; and therefore, while the height of the thermometer is the same, the rate of the clock will be uniform. But since the state of the weather is ever variable, and as it is impossible to raising or lowering the bob of the pendulum at every change of the thermometer, therefore the correction formerly mentioned is to be applied. This correction, however, is in some measure liable to a small degree of uncertainty; and in order to avoid it pendulum, altogether, several contrivances have been proposed by constructing a pendulum of different materials, and so disposing them that their effects may be in opposite directions, and thereby counterbalance each other; and by this means the pendulum will continue of the same length.

Mercurial Pendulum. The first of these inventions is Mercurial that by the celebrated Mr George Graham. In this, the rod of the pendulum is a hollow tube, in which a sufficient quantity of mercury is put. Mr Graham first used a glass tube, and the clock to which it was applied was placed in the most exposed part of the house. It was kept continually going, without having the hands of pendulum altered, from the 9th of June 1723 to the 14th of October 1725, and its rate was determined by trials of fixed bars. Another clock made with extraordinary care, having a pendulum about 60 pounds weight, and not vibrating above one degree and a half from the perpendicular, was placed beside the former, in order the more readily to compare them with each other, and that they might both be equally exposed. The result of all the observations was this, that the irregularity of the clock with the quicksilver pendulum exceeded not, when greatest, a sixth part of that of the other clock with the common pendulum, but for the greatest part of the year not above an eighth or ninth part; and even this quantity would have been lessened, had the column of mercury been a little shorter: for it differed a little the contrary way from the other clock, going fuller with heat and flower with cold. To confirm this experiment more, about the beginning of July 1725 Mr Graham took off the heavy pendulum from the other clock, and made another with mercury, but with this difference, that instead of a glass tube he used a brass one, and varnished the inside to secure it from being injured by the mercury. This pendulum he used afterwards, and found it about the same degree of exactness as the other.

The Gridiron Pendulum is an ingenious contrivance for the same purpose. Instead of one rod, this pendulum is composed of any convenient odd number of rods, as five, seven, or nine; being so connected, that the effect of one set of them counteracts that of the other; and therefore, if they are properly adjusted to each other, the centres of suspension and oscillation will always be equidistant. Fig. 7 represents a gridiron pendulum composed of nine rods, fixed and braced alternately. The two outer rods, AB, CD, which are of steel, are fastened to the cross piece AC, BD by means of pins. The next two rods, EF, GH, are of brass, and are fastened to the lower bar BD, and to the second upper bar EG. The two following rods are of steel, and are fastened to the cross bars EG and IK. The two rods adjacent to the central rod of brass, are fastened to the cross pieces IK and LM; and the central rod, to which the ball of the pendulum is attached, is suspended from the cross piece LM, and passes freely through a perpend bar in each of the cross bars IK, BD. From this disposition of the rods, it is evident that, by the expansion of the extreme rods, the cross piece BD, and the two rods attached to it, will defend: but since those rods are expanded by the same heat, the cross piece BD will consequently...
Angular Pendulum.

Pendulum, if be raised and therefore also the two next rods; but because these rods are also expanded, the cross bar IK will descend; and by the expansion of the two next rods, the piece LM will be raised a quantity sufficient to counteract the expansion of the central rod. Whence it is obvious, that the effect of the steel rods is to increase the length of the pendulum in hot weather, and to diminish it in cold weather; and that the brass rods have a contrary effect upon the pendulum. The effect of the brass rods must, however, be equivalent not only to that of the steel rods, but also to the part above the frame and spring, which connects it with the cock, and to that part between the lower part of the frame and the centre of the ball.

M. Thiout

Another excellent contrivance for the same purpose is described in a French author on clock-making. It was used in the north of England by an ingenious artist about forty years ago. This invention is as follows: A bar of the same metal with a rod of the pendulum and of the same dimensions, is placed against the back part of the clock-case: from the top of this a part projects, to which the upper part of the pendulum is connected by two fine pliable chains or filk en stringings, which just below pass between two plates of brass, which lower ends will always make the length of the pendulum at the upper end. These plates are supported on a pedestal fixed to the back of the case. The bar rests upon an immovable base at the lower part of the case; and is inserted into a groove, by which it is always retained in the same position. From this construction, it is evident that the extension or contraction of this bar, and of the rod of the pendulum, will be equal, and in contrary directions. For suppose the rod of the pendulum to be expanded any given quantity by heat; then, as the lower end of the bar rests upon a fixed point, the bar will be expanded upwards, and raise the upper end of the pendulum just as much as its length was increased, and hence its length below the plates will be the same as before.

Of this pendulum, somewhat improved by Mr. Crosthwaite watch and clock-maker, Dublin, we have the following description in the Transactions of the Royal Irish Academy, 1778. - A and B (fig. 8.) are two rods of steel forged out of the same bar, at the same time, of the same temper, and in every respect familiar. On the top of B is formed a gibbet C; this rod is firmly supported by a steel bracket D, fixed on a large piece of marble E, firmly set into the wall F, and having liberty to move freely upwards between crosstables of brass, 1, 2, 3, 4, which touch only in a point in front and rear (the staples having been carefully formed for that purpose); to the other end is firmly fixed by its centre the lens G; of 24 pounds weight, although it should in strictness be a little below it. This pendulum is suspended by a short steel spring on the gibbet at C; all which is entirely independent of the clock. To the back of the clock-plate are firmly screwed two cheeks nearly cycloidal at K, exactly in a line with a centre of the verge L. The maintaining power is applied by a cylindrical steel Rod, in the usual way of regulators, at M. Now, it is very evident, that any expansion or contraction that takes place in either of these exactly similar rods, is instantly counteracted by the other: whereas in all composition pendulums composed of different materials, however just a calculation may seem to be, that can never be the case, as not only different metals, but also different bars of the same metal that are not manufactured at the same time, and exactly in the same manner, are found by a good pyrometer to differ materially in their degrees of expansion and contraction, a very small change affecting one and not the other.

The expansion or contraction of straight-grained fir is prejudicial to pendulum rods, but is much less injurious to wood length wise, by change of temperature, is so small that it is found to make very good pendulum rods. The wood called *spiculito* is said to be still better. There is good reason to believe, that the previous baking, varnishing, gilding, or soaking of these woods in any melted matter, only tends to impair the property that renders them valuable. They should be simply rubbed on the outside with wax and a cloth. In pendulums of this construction the error is greatly diminished, but not taken away.

Angular Pendulum, is formed of two pieces or legs angular like a sector, and is suspended by the angular point, Pendulum. This pendulum was invented with a view to diminish the length of the common pendulum, but at the same time to preserve or even increase the time of vibration. In this pendulum, the time of vibration depends on the length of the legs, and on the angle contained between them conjointly, the duration of the time of vibration increasing with the angle. Hence a pendulum of this construction may be made to oscillate in any given time. At the lower extremity of each leg of the pendulum is a ball or bob as usual. It may be easily shown, that in this kind of pendulum, the figures of the times of vibration are as the seconds of half the angle contained by the legs: hence if a pendulum of this construction vibrates half seconds when its legs are close it will vibrate whole seconds when the legs are opened, so as to contain an angle equal to 121° 24'.

The Conical or Circular Pendulum, is so called from the figure described by the string or ball of the pendulum. This pendulum was invented by Mr. Huygens, and is also claimed by Dr. Hook.

In order to understand the principles of this pendulum Conical, it will be necessary to premise the following Lemma.

*Lemma* 1. If a pendulum, the heavy globular body, revolving within an inverted hollow paraboloid, will be equal whatever be the radii of the circles described by that body.

In order therefore, to construct the pendulum so that its ball may always describe its revolutions in a paraboloid surface, it will be necessary that the rod of the pendulum be flexible, and that it be suspended in such a manner as to form the evolute of the given paraboloid. Hence, let KH (fig. 9.) be an axis perpendicular to the horizon, having a pinion at K moved by the shaft wheel in the train of the clock; and a hardened steel point at H moving in an agate pivot, to render the motion as free as possible. Now, let it be required that the pendulum shall perform each revolution in a second, then the paraboloid surface it moves in must be such whose latus rectum is double the length of the common half second pendulum. Let O be the focus of the paraboloid MEC, and MC, the latus rectum; and make $AE=MO=MC$ the length of a common half second pendulum. At the point A of the verge, let a thin plate $AB$ be fixed at one end, and at the other end $B$ let it be fastened to the bar or arm $BD$ perpendi-
The pendulum is perpendicular to DH, and to which it is fixed at the point D. The figure of the plate AB is that of the evolute of the parabola MEC.

The equation of this evolute, being also that of the semicubical parabola, is \( \frac{27}{16} x^2 = y^3 \). Let \( \frac{27}{16} = P \); then \( P \sqrt{\frac{16}{x^2}} = y \), and in the focus \( P = 2y \). In this case

\[
\sqrt{\frac{16}{t^2}} = \text{the distance of the focus from the vertex A.}
\]

By affuming the value of \( x \), the ordinates of the curve may be found; and hence it may be easily drawn.

The string of the pendulum must be such a length that when one end is fixed at B, it may lie over the plate AB, and then hang perpendicular from it, so that the centre of the bob may be at E when at rest.

Now, if the verge KH being put in motion, the ball of the pendulum will begin to gyrate, and thereby conceive a centrifugal force which will carry it out from the axis to some point F, where it will circulate seconds or half seconds, according as the line AE is 89, inches, or \( \frac{1}{2} \) inches, and AN answerable to it.

One advantage possessed by a clock having a pendulum of this constitution is, that the second hand moves in a regular and uniform manner, without being subject to those jerks or starts as in common clocks; and the pendulum is entirely silent.

Theory has painted out several other pendulums, known by the names of Elliptic, Horizontal, Rectangular, \&c. pendulums. These, however, have not as yet attained that degree of perfection as to supplant the common pendulum.

Besides the use of the pendulum in measuring time, it has also been suggested to be a proper standard for measures of length. See the article MEASURE.

PENEAS, in botany: A genus of the monogynia order, belonging to the tetrandra class of plants; and in the natural method ranking with those of which the order is doubtful. The calyx is diphylous; the corolla campanulated; the style quadrangular; the capsule tetragonal, quadrilocular, and obovate.

PENELOPE, in fabulous history, the daughter of Learns, married Ulysses by whom she had Telemaechus. During the absence of Ulysses, who was gone to the siege of Troy, and who lived 20 years from his dominions, several princes, charmed with Penelope's beauty, told her that Ulysses was dead, offered to marry her, and pressed her to declare in their favour. She promised compliance on condition they would give her time to finish a piece of tapestry she was weaving; but at the same time she said in the night what she had done in the day, and by this artifice eluded their importunity till Ulysses's return.

PENELOPE, in ornithology: A genus of birds of the order of Gallina, the characters of which are: The beak is bare at the base; the head is covered with feathers: the neck is quite bare; the tail consists of twelve principal feathers; and the feet are for the most part bare. Linnæus, in the Systema Naturæ, enumerates six species. 1. Meleagris gallopavo, or horned pheasant. Latham calls it the horned turkey. This species is larger than a fowl, and smaller than a turkey. The colour of the bill is brown; the nostrils, forehead, and space round the eyes, are covered with slender black hairy feathers; the top of the head is red. Behind each eye there is a fleshy callous blue substance like a horn, which tends backward. On the fore part of the neck and throat, there is a loose flap of a fine blue colour, marked with orange spots, the lower part of which is becketed with a few hairs; down the middle it is somewhat looser than on the sides, being wrinkled. The breast and upper part of the back are of a full red colour. The neck and breast are inclined to yellow. Some of the plumage and tail are of a rufous brown marked all over with white spots, encompassed with black. The legs are somewhat white, and furnished with a spur behind each. A head of this kind, Mr. Latham tells us, was sent to Dr. Mead from Bengal, together with a drawing of the bird, which was called napaul phasianus. It is a native of Bengal.

2. The meleagris cristata, called by Ray penelope, auro-pene, and by Edwards the guan, or guan, is about the size of a fowl, being about two feet six inches long. - The bill is two inches long, and of a black colour; the irides are of a dirty orange colour; the sides of the head are covered with a naked purplish blue skin, in which the eyes are placed: beneath the throat, for an inch and a half, the skin is loose, of a fine red colour, and covered only with a few hairs. The tip of the head is furnished with long feathers, which the bird can erect as a crest at pleasure; the general colour of the plumage is brownish black, glossed over with copper in some lights, but the wing covert has a greenish and violet gloss. The quills are mostly inclining to a purple colour; the fore-part of the neck, breast, and belly, are marked with white spots; the thighs, under tail coverts, and the tail itself, are brownish black, the legs are red; the claws black. Some of these birds have little or no crest, and are thence supposed to be females. - They inhabit Brazil and Guiana, where they are often seen on trees. It frequently makes a noise not unlike the word jaeu. Their flesh is much esteemed.

3. Crax Campanus, called by Latham, &c. yacou. It is bigger than a common fowl. The bill is black; the head feathers are long, pointed, and form a crest, which can be erected at pleasure. The irides are of a pale rufous colour: the space round the eyes is naked, similar to that of a turkey. It has also a naked membrane, or kind of wattles, of a dull black colour. - The blue skin comes forward on the bill but is not liable to change colour like that of the turkey. The plumage has no much variation; it is chiefly brown, with some white markings on the neck, breast, wing coverts, and belly; the tail is composed of twelve feathers, pretty long, and even at the end; the legs are red. This species inhabits Cayenne, but is a very rare bird, being met with only in the inner parts, or about the Amazon's country, though in much greater plenty up the river Oyapoc, especially towards Camopi; and indeed those which are seen at Cayenne are mostly tame ones, for it is a familiar bird, and will breed in that state, and mix with other poultry. It makes the neft on the ground, and hatches the young there; but is at other times moftly seen on trees. It frequently creeds the crest, when pleased, or taken notice of, and likewise spreads the tail upright like a fan, in the manner of the turkey. It has two kinds of cry; one like
that of a young turkey, the other lower and more plaintive; the first of these is thought by the Indians to express the word crowedit, the other yacou.

4. The pipe$, or as it is called, ecras pige$, is black in the belly, and the back brown stained with black. The flesh on the neck is of a green colour. It is about the bigness of the former, and has a diving medicine$.

The head is partly black and partly white, and is adorned with a short crest. The space about the eyes, which are black, is white; the feet are red. It inhabits Guiana.

5. The marail is about the size of a fowl, and shaped somewhat like it. The bill and irides are blackish; the space round the eyes is bare, and of a pale red; the chin, throat, and fore part of the neck, are scarcely covered with feathers; but the throat itself is bare, and the membrane elongated to half an inch or more; both this and the skin round the eyes change colour, and become deeper and thicker when the bird is irritated. The head feathers are longish, so as to appear like a crest when ruffled up, which the bird often does when agitated; at which time it also crefts those of the whole body, and so disfigures itself as to be scarce known: the general colour of the plumage is a greenish black; the fore-part of the neck is tipped with white; the wings are short; the tail is long, consisting of 12 feathers, which are even at the end, and commonly pendent, but can be lifted up and spread out like that of the turkey; the legs and toes are of a bright red; the claws are crooked, and somewhat sharp. In a collection (says Latham) from Cayenne was a bird, I believe, of this very species. It was 28 inches long, the bill is like that of a fowl, brown, and rather hooked; round the eye bare; the head is crested; the feathers of the fore-part of the neck are tipped with white; the breast and belly are rufous brown; the rest of the plumage is greenish brown; the tail is 11 inches long, and rounded at the end: the quills just reach beyond the rump; the legs are brown, and claws hooked. This species is common in the woods of Guiana, at a distance from the sea, though it is much less known than could be imagined; and found, in small flocks for the most part, except in breeding time when it is only seen by pairs, and then frequently on the ground, or on low bushes; at other times on high trees, where it roosts at night.

The female makes her nest on some low bushy tree, as near the trunk as possible, and lays three or four eggs. When the young are hatched, they defend with their mother, after 10 or 12 days. The mother acts as other fowls scratching on the ground like a hen, and brooding the young, which quit their nest the moment they can shift for themselves. They have two broods in a year; one in December or January, the other in May or June. The belt time of finding these birds is morning or evening, being then met with on such trees whose fruit they feed on, and are discovered by some of it falling to the ground. The young birds are easily tamed, and seldom forsake the places where they have been brought up: they need not be houset, as they prefer the roosting on tall trees to any other place. Their cry is not inharmonious, except when irritated or wounded, when it is harsh and loud. Their flesh is much esteemed.

Bunham supposes this bird to be the female of the yacou, or at least a variety; but that this cannot be, the anatomical inspection will at once determine. The windpipe of this bird has a singular construction, passing along the neck to the entrance of the breast, where it rises on the outside of the flesh, and, after going a little way downwards, returns, and then passes into the cavity of the lungs. It is kept in its place on the outside by a muscular ligament, which is perceptible quite to the breast bone. This is found to be the case in both male and female, and plainly proves that it differs from the yacou, whose windpipe has no such circumvolution in either sex.

If this be the bird mentioned by Fermor, in his History of Guiana, p. 176. he says that the crest is cuneiform, and of a black and white colour; and observes that they are scarce at Surinam; but it does not seem quite certain whether he means this species or the yacou.

Bancroft mentions a bird of Guiana by the name of Marmole, which he says is wholly of a brownish black: the bill the same; and the legs grey. Thence, he says, are common, and make a noise not unlike the name given it, perching on trees. The Indians imitate their cry as exactly, as to lead to the discovery of the place the birds are in, by their answering it. The flesh of them is like that of a fowl: it is therefore most likely the marail.

6. The vociferating penelope. The bill of this bird is of a greenish colour; the back is brown, the breast green, and the belly is of a whitish brown. Latham calls it the crying curaffaw. It is about the bigness of a crow.

PENEOSTICA, (Antonine), a town of the Helvetii, situated between the Lacus Laufonius and Salodurum; called Petenfca by Peutinger. Thought now to be Briel, (Cluverius); the capital of a small territory in Switzerland.

PENEUS, (Strabo); a river running through the middle of Thessaly, from west to east, into the Sinus Thermaicus, between Olympus and Offa, near Tempa of Thefaly, rising in mount Pindus, (Ovid, Val. Flaccus).

PENETRAlE, a facred room or chapel in private houses, which was fet apart for the worship of the household gods among the ancient Romans. In temples also there were penelrea, or apartments of distinguished sanctity, where the images of the gods were kept, and certain solemn ceremonies performed.

PENGUIN, or PINGUIN. See PINGUIN.

PENCILLUS, among surgeons is used for a tent to be put into wounds or ulcers.

PENIEL, or PENHEL, a city beyond Jordan near the ford of the brook Jabbok. This was the occasion of its name. Jacob, upon his return from Mesopotamia, (Gen. xxxii. 24, &c.) made a stop at the brook Jabbok: and very early the next morning, after he had sent all the people before, he remained alone, and beheld an angel came, and wrestled with him till the day began to appear. Then the angel said to Jacob, Let me go for the morning begins to appear. Jacob answered, I shall not let you go from me till you have given me your blessing. The angel blessed him then in the same place, which Jacob thence called Peniel, saying, I have seen God face to face, yet continue alive.

In following ages the Israelites built a city in this place, which was given to the tribe of Gad. Gideon, returning
PEN

[124]

PEN

Penitent.

Penitent.

Penitents of penitents distinguished by the different shape and colour of their habits. These are secular societies who have their rules, statutes, and churches, and make public processions under their particular crosses or banners. Of these, there are more than a hundred, the most considerable of which are as follows: the white penitents of which there are several different forts at Rome, the most ancient of which was constituted in 1264; the brethren of this fraternity every year give portions to a certain number of young girls in order to their being married: their habit is a kind of white fackcloth, and on the shoulder is a circle, in the middle of which is a red and white cross. Black penitents the most considerable of which are the brethren of mercy, instituted in 1488 by some Florentines, in order to afflict criminals during their imprisonment, and at the time of their death; on the day of execution, they walk in procession before them, flogging the seven penitential psalms and the litanies; and after they are dead, they take them down from the gibbet and burn them; their habit is black fackcloth. There are others whose business is to bury such persons as are found dead in the streets; these wear a death's head on one side of their habit. There are also blue, grey, red, green, and violet penitents; all which are remarkable for little else besides the different colours of their habits.

Mabillon tells us, that at Turin there are a set of penitents kept in pay to walk through the streets in procession, and cut their shoulders with whips, &c.

Penitents of Convicts of the name of Jifus, a congregation of religious at Seville in Spain, consisting of women who had led a licentious life, founded in 1550. This monastery is divided into three quarters: one for professed religious; another for novices; a third for those who are under correction. When these last give signs of a real repentance, they are removed into the quarter of the novices, where, if they do not behave themselves well, they are remanded to their correction. They observe the rule of St. Augustine.

Penitents of Orvieto, are an order of nuns, instituted by Antony Simoncelli, a gentleman of Orvieto in Italy. The monastery he built was at first designed for the reception of poor girls, abandoned by their parents, and in danger of losing their virtue. In 1662 it was erected into a monastery, for the reception of such as having abandoned themselves to impurity, were willing to take up, and consecrate themselves to God by solemn vows. Their rule is that of the Carmelites. These religious have this in peculiar, that they undergo no novitiate. All required is, that they continue a few months in the monastery in a secular habit; after which they are admitted to the vows.

Penitentiary, an ecclesiastical book retained among the Romanists; in which is prescribed what relates to the imposition of penance and the reconciliation of penitents. See Penance.

There are various penitentials, as the Roman penitentiary, that of the venerable Bede, that of Pope Gregory III., &c.
Penitentiary

Penitentiary, at the court of Rome, is an office in which are examined and delivered out the secret bulls, graces, or dispensations relating to cases of conscience, confessions, &c.

Penitentiary, is also an officer in some cathedrals, vested with power from the bishop to absolve, in cases referred to him. The pope has at present his grand penitentiary, who is a cardinal, and the chief of the other penitentiary priets established in the church or Rome, who consiult him in difficult cases. He presides in the penitentiary, dispatches dispensations, absolutions, &c. and has under him a regent and 24 proctors, or advocates of the sacred penitentiary.

PENMAN-MAVR, a mountain in Caernarvonshire, 1400 feet high. It hangs perpendicularly over the sea, at so vast a height, that few spectators are able to look down the dreadful deep. On the side which is next the sea, there is a road cut out of the side of the rock, about six or seven feet wide, which winds up a steep ascent, and used to be defended on one side only by a wall built in some parts about a yard high, and in others by only a bank, that scarce rose a foot above the road. The sea was seen defiance its wave: 40 fathoms below, with the mountain rising as much above the traveller's head. This dangerous road was a few years ago secured by a wall built high, to the building of which the city of Dublin largely contributed, it being in the High road to Holyhead.

PENN (Sir William), was born at Bristol in 1621, and inclined from his youth to maritime affairs. He was made captain at 21 years of age, rear-admiral of Ireland at 23, vice-admiral at 25, admiral of Ireland to the Straits at 29, vice-admiral of England at 31, and General in the first Dutch war at 32. Whence returning in 1655, he was chosen representative for the town of Weymouth; and in 1660 was made commissioneer of the admiralty and navy, governor of the town and fort of Kinsale, vice-admiral of Munster, and a member of that provincial council. In 1664 he was chosen great captain-commander under the duke of York, and distinguished himself in an engagement against the Dutch fleet; after which he took leave of the sea, but continued in his other employments till 1669. He died in 1670.

Penn (William), an eminent writer among the Quakers, and the planter and legislator of Pennsylvania, was the son of the above Sir William Penn, and was born at London in 1644. In 1660, he was entered a gentleman-commoner of Christ-church, in Oxford; but having before received an impression from the preaching of one Thomas Lee a Quaker, withdrew with his other students from the national worship, and held private meetings, where they preached and prayed among themselves. This, owing great offence to the heads of the college, Mr Penn, though but 16 years of age, was fined for nonconformity; and continuing his religious exercise, was at length expelled his college. Upon his return home, he was, on the same account, treated with great severity by his father, who at last turned him out of doors; but his repentment afterwards abating, he sent him to France in company with some persons of quality; where he continued a considerable time, and returned not only well skilled in the French language, but a polite and accomplished gentleman. About the year 1666, his father committed to his care a considerable estate in Ireland. Being found in one of the Quaker meetings in Cork, he, with many others was thrown into prison; but, on his writing to the earl of Orrery, was soon discharged. However, his father being informed he still adhered to his opinions, sent him to England, and finding him inflexible to all his arguments, turned him out of doors a second time. About the year 1668, he became a public preacher among the Quakers: and that year was committed close prisoner to the Tower, where he wrote several treatises. Being discharged after seven months imprisonment, he went to Ireland, where he also preached amongst the Quakers. Returning to England, he was in 1670 committed to Newgate, for preaching in Gracechurch street meeting-house, London; but being tried at the sessions-house in Old Bailey, he was acquitted. In September the same year, his father died; and being perfectly reconciled to him, left him both his paternal blessing and a plentiful estate. But his persecutions were not yet at an end: for in 1671 he was committed to Newgate for preaching at a meeting in a Wheeler-street, London; and during his imprisonment, which continued six months, he also wrote several treatises. After his discharge, he went into Holland and Germany; and in the beginning of the year 1672, married and settled with his family at Rickmanworth in Hertfordshire. The same year he published several pieces; and particularly one against Reeve and Muggleton. In 1677, he again travelled into Holland and Germany in order to propagate his opinions: and had frequent conversations, with the princes Elizabeth, daughter to the queen of Bohemia and sister to the princess Sophia, mother to king Geo. I. In 1681, king Charles IL, in consideration of the services of Mr Penn's father, and several debts due to him from the crown at the time of his decease, granted Mr Penn and his heirs the province lying on the west side of the river Delaware in North America, which from thence obtained the name of Pennsylvania. Upon this Mr Penn published a brief account of that province, with the king's patent; and proposing an easy purchase of land, and good terms of settlement for such as were inclined to remove thither, many went over. These having made and improved their plantations to good advantage, the governor, in order to secure the planters from the native Indians, appointed commissioners to purchase the land he had received, from the king of the native Indians, and concluded a peace with them. The city of Philadelphia was planned and built; and he himself drew up the fundamental constitutions of Pennsylvania in 24 articles. In 1681, he was elected a member of the Royal Society, and the next year embarked for Pennsylvania, where he continued about two years and returned to England in August 1684. Upon the accession of King James to the throne, he was taken into a great degree of favour with his Majesty, which exposed him to the imputation of being a Papist; but from which he fully vindicated himself. However, upon the Revolution, he was examined before the council in 1688, and obliged to give security for his appearance on the first day of next term, which was afterwards continued. He was several times discharged.
charged and examined; and at length warrants being
issued out against him, he was obliged to conceal him-
selt for two or three years. Being at last permitted to
appear before the king and council, he represented his
innocence so effectually that he was acquitted. In Au-
t. 1699, he, with his wife and family, embarked for
Pennsylvania; whence he returned in 1701, in order to
vindicate his proprietary right, which had been attack-
ded during his absence. Upon Queen Anne’s accession
to the crown, he was in great favour with her, and was
often at court. But in 1707, he was involved in a law-
suit with the executors of a person who had been for-
merly his received: and though many thought him
ag-
grieved, the court of chancery did not think proper to
relieve him; upon which account he was obliged to live
within the rules of the Fleet for several months, till
the matter in dispute was accommodated. He died in
1718.

At one period of his life, Mr Penn lodged in a house
in Norfolk-street in the Strand. In the entrance to it
he had a peeping-hole, through which he could see
any person that came to him. A creditor one day
sent in his name, and having been made to wait more
than a reasonable time, he knocked for the servant
whom he asked, “Will not thy master see me?”
“Friend (answered the servant) he has been thee, but
he does not like thee.”

Mr Penn’s friendly and pacific manner of treating
the Indians produced in them an extraordinary love
for him and his people; so that they have maintained
a perfect amity with the Quakers in Pennsylvania ever
since. He was the greatest bulwark of the Quakers,
in whose defence he wrote numberless pieces. Besides
the above works, he wrote a great number of
others of which are,

1. His primitive Christianity revived. 2. His defence of a paper, inti-
tiled "Gospel Truths against the Exceptions of the Bi-

His Good advice to the Church of England, Ro-
man Catholic, and Protestant Differenters. 5. The Sandy
Foundation shaken. 6. No Cross, no Crown. 7. The
great Case of Liberty of Conscience debated. 8. The
Christian Quaker and his Testimony stated and vind-
cated. 9. A discourse on the general rule of Faith
and Practice, and Judge of Controversy. 10. Eng-
land’s present Interest considered. 11. An Address
to Protestants. 12. His Reflections and Maxims
13. His advice to his Children. 14. His Rise and
Progress of the People called Quakers. 15. A Treat-
ise on Oaths. Most of these have passed several ed-
tions, some of them many. The letters between Wil-
liam Penn and Dr Tillotson, and William Penn and
William Pople, Esq.; together with Penn’s letters to
the princes Elizabeth of the Rhine, and the coun-
tefs of Hornes, as also one to his wife on his going to
Pennsylvania, are inserted in his works, which were first
printed in 3 folio vol.; and the parts fine printed and abridged into 1 vol folio, are very
much and deservedly admired for the good sense they
contain.

PENNATULA, or Sea-Pen, in natural history, a
genus of zoophytes, which, though it swarms about
freely in the sea, approaches near to the gorgonia.
This genus hath a bone along the middle of the in-
side, which is its chief support; and this bone re-
Peels the supply of its 10aceous matter by the same
Polype mouthes that furnish it with nourishment.
Linnaeus reckons seven species. The name zoophytes
under which this genus is ranked, is well known sig-
nificantly, that the creature partakes of both the animal
and vegetable nature; but some have supposed it to be
nothing more but a focus or sea plant. It is cer-
tainly an animal, however, and as such is free or loco-
motive. Its body generally expands into processes on
the upper parts, and these processes or branches are
furnished with rows of tubular denticles; they have a
polype head proceeding from each tube.

The Sea-Pen is not a coraline, but distinguished
from it by this specific difference, corals, corallines,
aleomaria, and all that order of beings, adhere simply
by their bases to submarine substances, but the sea-
pen, either swims about in the water or floats upon
the surface.

The Honourable Dr Coote Moleworth lately lent
one of these animals to the ingenious Mr Ellis, the
author of many curious papers on the nature of cora-
llines, which was taken in a trawl to 72 fathoms water,
the same species are frequently found in the ocean from the coast
of Norway to the Mediterranean sea, sometimes at con-
derable depths, and sometimes floating on the surface.
Mr Ellis’s description of that sent him by Dr Mole-
worth is as follows:

Its general appearance greatly resembles that of a quill
feather of a bird’s wing (See Plate CCCCXXXVIII, fig. 1.) it is about four inches long, and of a reddish
colour; along the back there is a groove from the quill
part to the extremity of the feathered part, as there is
in a pen; the feathered part consists of fins proceeding
from the same, as expressed in the figure. The fins
move the animal backward and forward in the water,
and are furnished with suckers or mouths armed with
filaments, which appear magnified as fig. 2. There is
no perforation at the bottom, and therefore Mr Ellis is
of opinion that the exuvia of the animals upon which it
feeds are discharged by the same aperture at which the
food is taken in; and in this it is not singular, Nature
having observed the fame economy in the Greenland
polype, described by Mr Ellis in his Essay on Coral
lines. Each sucker has eight filaments, which are
protruded when prey is to be caught; but at other
times they are drawn back into their cases, which
are furnished at the end with spicula, that close together
round the entrance, and defend this tender part from
external injuries.

Dr Bohadish, of Prague, had an opportunity of ob-
serving one of these animals alive in the water, and
he gives the following account of what he saw: “A
portion of the item contracted, and became of a strong
purple colour, fo as to have the appearance of a ligat-
ure round it: this apparent ligature, or zone, moved
upwards and downwards successively through the
whole length of the item, as well the feathered as the
naked part; it began at the bottom, and moving up-
wards to the other extremity, it there disappeared,
and at the same instant appeared again at the bottom,
and ascended as before; but as it ascended through the
feathered or pinnated part, it became paler. When
this zone is much constricted, the trunk above it
swells and acquires the form of an onion; the con-
striction
Pennatula. Friction of the trunk gives the colour to the zone, for the intermediate parts are paler in proportion as the zone becomes deeper. The end of the naked trunk is sometimes curved like a hook; and at its extremity there is a finus or chink, which grows deeper while the purple ring is ascending, and shallower as it is coming down. The fins have four motions, upward and downward, and backward and forward, from right to left, and from left to right. The feathery filaments, or claws, move in all directions; and with the cylindrical part from which they proceed are sometimes protruded from the fins, and sometimes hidden with them.

Upon dissecting this animal the following phenomena were discovered. When the trunk was opened lengthwise, a saltish liquor flowed out of it, fo viscous as to hang down an inch. The whole trunk of the item was found to be hollow, the outward membrane being very strong, and about a tenth part of an inch thick: within this membrane appeared another much thinner; and between these two membranes, in the pinnated part of the trunk, innumerable little yellowish eggs, about the size of a white poppy seed, were seen floating in a whitish liquor; about three parts of the cavity within the inner membrane is filled by a kind of yellowish bone: this bone is about two inches and an half long, and one twentieth of an inch thick; in the middle it is four square, but towards the ends it grows round and very taper, that end being finest which is next the pinnated part of the trunk. This bone is covered in its whole length with a clear yellowish skin, which at each end runs out into a ligament; one is inserted in the top of the pinnated trunk, and the other in the top of the naked trunk: by the help of the upper ligament the end of the bone is either bent into an arch, or dilated in a straight line. The fins are composed of two skins; the outward one is strong and leathery, and covered over with an infinite number of crimson streaks; the inner skin is thin and transparent: the suckers are also in the same manner composed of two skins, but the outward skin is something finer. Both the fins and suckers are hollow, so that the cavity of the suckers may communicate with those of the fins, as the cavity of the fins does with that of the trunk.

Dr Shaw, in the History of Algiers, says, that these animals are so luminous in the water, that in the night the fishermen discover fishes swimming about in various depth of the sea by the light they give: From this extraordinary quality Linnaeus calls this species of the sea pen, Pennatula phosphorea, and remarks, after giving the synonyms of other authors, Habitat in oceano fundum illuminans.

There are other kinds of sea-pens, or species of this animal, which have not a resemblance to a pen. There is the kidney shaped sea pen (see fig. 3), the feather of the peacock fin (see fig. 4), the penatula filosa of Linnaeus (see fig. 5), his penatula retigata (see fig. 6), his penatula mirabilis (see fig. 7), and the finger-shaped sea pen (see fig. 8). The kidney shaped sea pen was discovered some time ago on the coast of South Carolina, and sent to Mr Ellis by John Gregg, Esq: of Charlestown. It is of a fine purple colour; the kidney part is about an inch from end to end, and about half an inch wide in the narrowest part; a tail proceeds from the middle of the body, which is roundish, and about an inch long; it is also full of rings like an earth-worm, and along the middle both of the upper and under part of it there is a small groove which runs from one end to the other, but there is no perforation at either extremity. The upper part of the body is convex, and about an inch thick; the whole surface is covered with small yellow starry openings, through which little suckers are protruded, each furnished with fix tentaculas, or filaments, like what are observed on some corals; the under part of the body is quite flat, and is full of ramifications of feathery fibres, which proceeding from the termination of the tail, as a common centre, branch out so as to communicate with the starry openings on the exterior edge and upper surface of the animal. Of all the penatulae yet known the feather shaped one, or as it is called the siluer sea pen (see fig. 1), is the largest as well as the most specious in its appearance. It is of a beautiful silver white, elegantly frizzled on each of the feather-like processes with lines or streaks of the deepest black. It is very rare, and is a native of the Indian seas. There is a very fine specimen of this species in the British Museum.

PENNI (Giovanni Francischi), born at Florence in 1488, was the disciple of Raphael, who observing his genius and integrity, intrusted his domestic concerns entirely to his management; by which means he got the appellation of il fature, or the "favorid," which he retained ever after. The genius of Penni was universal; but his greatest pleasure was in painting landscapes and buildings: he was an excellent designer, and coloured extremely well in oil, distemper, and trefco. He painted portraits in an exquisite style; and had such happy natural talents, that Raphael left him heir to his fortune in partnership with Julius Romano his fellow-disciple. After Raphael's death, Penni painted many pictures at Rome, particularly in the palace of Chigi, so exactly in the style of his master, that they might not underduly have been imputed to him: he finished, in conjunction with Julio and Pierino del Vaga, the celebrated designs of the battles of Constatine, and others which Raphael had left imperfect; but differing with them about a copy of the transfiguration, which the pope intended for the king of France, they separated. Penni went to Naples; but the air of that country, disagreeing with his constitution, he died soon after in 1528. He had a brother called Luca, Penni, who worked at Genoa and other parts of Italy in conjunction with Pierino del Vaga, who married his sister; he went thence to England, where he worked for Henry VIII. and for several merchants; was employed by Francis I. at Fountainbleau; but at last quitted the pencil and devoted himself to engraving.

PENNY, or Penny, in commerce, an ancient English coin, which had formerly considerable course; but is now generally dwindled into an imaginary money, or money of account. Camden derives the word from the Latin pennis, "money."

The ancient English penny, penig, or pening, was the first silver coin struck in England; nay, and the only one current among our Saxon ancestors; as is agreed by Camden, Spelman, Dr Hicks, &c.

The penny was equal in weight to our three-pence; five of them made one shilling, or shilling Saxon; so a mark or mancuse, equal to our 7½ d.

Till the time of King Edw. I. the penny was struck with a cross so deeply indented in it, that it might be easily
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PENROSE (Thomas), was the son of the Reverend Mr Penrose, rector of Newbury, Berks, a man of high character and abilities, descended from an ancient Cornish family, beloved and respected by all who knew him. Mr Penrose, jun. being intended for the church, pursued his studies with success, at Christ-church, Oxon, until the summer of 1762, when he moved to the naval and military line overpowering his attachment to his real interest, he left his college, and embarked in the unfortunate expedition against Nova Colonia, in South America, under the command of Captain Macnamara. The issue was fatal. The Clive (the largest vessel) was burnt; and though the Ambuscade escaped (on board of which Mr Penrose, acting as lieutenant of marines, was wounded), yet the hardships which he afterwards sustained in a prize vessel, in which he was stationed, utterly ruined his constitution. Returning to England with ample testimonials of his gallantry and good behaviour, he finished, at Hertford College Oxon, his course of studies; and having taken orders accepted the curacy of Newbury, the income of which, by the voluntary subscription of the inhabitants, was considerably augmented. After he had continued in that station about nine years, it seemed as if the clouds of disappointment, which had hitherto overshadowed his prospects, and tinctured his poetical essays with gloom, were clearing away; for he was then presented by a friend, who knew his worth and honoured his abilities, to a living worth near 500 l. per annum. It came, however, too late; for the state of Mr Penrose's health was now such as left little hope except in the abstinence of the waters of Brtilt. Thither he went; and there he died in 1779, aged 36 years. In 1768 he married Miss Mary Slocock of Newbury, by whom he had one child, Thomas, who was educated at Winton College.

Mr Penrose was respected for his extensive erudition, admired for his eloquence, and equally beloved and esteemed for his social qualities. By the poor towards whom he was liberal to his utmost ability, he was venerated to the highest degree. In oratory and composition his talents were great. His pencil was ready as his pen, and on subjects of humour had uncommon merit. To his poetical abilities the public, by their recep-
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reception of his Flights of Fancy, &c. have given a favourable testimony. To sum up the whole, his figure and address were as pleasing as his mind was ornamented.

PENRYN, a town of Cornwall, in England, seated on a hill at the entrance of Falmouth-haven by Pen-dennis castle. It consists of about 300 houses; and the streets are broad and well paved. There are so many gardens and orchards in it, that it refembles very much a town in a wood. It is well watered with rivulets, and has an arm of the sea on each side of it, with a good cullomhouse and quay, and other neat buildings. It drives a considerable trade in pilchards, and in the Newfoundland fishery. It was anciently governed by a portreeve; but James I. made it a corporation, confiding of a mayor, 11 aldermen, 12 common-council-men, with a recorder, steward, &c. an office of record every three weeks, with a prison, and power to try felons in their jurisdiction. And he granted, that the mayor and two aldermen should be justices of the peace, and that they should have a guildhall. There was once a monastery in this place, which was a cell to Kirton; and there are still to be seen a tower, and part of the garden walls, the ruins of a collegiate church. It has neither church nor chapel, but belongs to the parish of Gluvias, a quarter of a mile off. It has sent members to parliament ever since the first year of Queen Mary; and James II. granted it a new charter, whereby their election was vested in the mayority only; but it was never made use of, all the inhabitants that pay foot and lord, who are not much above 100, being the electors. Mr. Rymer gives a very remarkable account how Penryn was once saved by a company of strolling players. He says, that towards the latter end of the 16th century the Spaniards were landing to burn the town just as the players were setting Sampson upon the Philistines; which performance was accompanied with such drumming and shouting, that the Spaniards thought some ambush was laid for them, and scampered back to their ships. Queen Elizabeth founded a free-school in this place. W. Long, 57. N. Lat. 50. 23.

PENSACOLA, a settlement in North America, situated at the mouth of a river on the gulf of Mexico, it was established by the French, and ceded to Great Britain in 1763. Its first discoverer was Sebastian Cabot in 1497.

The year 1781, so disastrous to Britain in other respects, was also remarkable for the reduction of Pensacola by the Spaniards under Don Bernardo Galvez. Great preparations for this expedition had been making at the Havannah; but it was for some time retarded by a dreadful hurricane which attacked the Spanish fleet, and by which four ships of the line, besides others of inferior note, were lost, together with the people on board, to the amount of more than 2000. By this disaster the remainder were obliged to put back to the Havannah to repair; but as soon as the fleet was again judged capable of putting to sea, an embarkation was made of near 8000 men, with Don Bernardo at their head, together with five ships of the line, who arrived at Pensacola on the 9th of March 1781. This force was soon augmented by ten ships of the line and frigates; while General Campbell, the British governor, could oppose such a formidable armament with few more than 1000 men, consisting of some regulars and seamen, with the inhabitants. The entrance of the harbour, which was the principal object of defence, was guarded by two small armed vessels, but they were insufficient to second the batteries that had been erected for its protection; and the Spaniards, without the assistance of some ships of force, were incapable of refilling a vigorous attack. Notwithstanding this prodigious odds, however, the Spaniards met with the most determined opposition. Every inch of ground was disputed with the greatest resolution. The harbour was not forced without the greatest difficulty, nor could the vessels be taken that defended it; the companies belonging to them, after setting them on fire, retired on shore.

The Spaniards, now in possession of the harbour, invested the place in form, and made their approaches in a cautious and regular manner; while, on the other hand, the besieged were no less active and vigilant in their own defence. Sallies were made occasionally with great success, at the same time that an uninterrupted fire was kept up in such a manner as not only greatly to annoy, but even to strike the besiegers with alonement. This incensed the Spanish general the more, as he knew that the garrison could expect no relief, and therefore that all their efforts could only prolong the date of their surrender. The resistance was the more mortifying, as he was perfectly conscious of the bravery of his troops; and he had artillery fit, as his officers expressed themselves, "to be employed against Gibraltar." With all these advantages, however, so resolute was the defence of the garrison, that the siege had continued for two months, very little hope could be entertained of its speedy termination. As they despaired therefore of making any effectual impression by means of their cannon, they erected a battery of mortars, with which they bombarded a fortress, and in this way they were favoured by an unexpected accident. On the 9th of May a shell burst open the door of the powder magazine under the redoubt, by which it was blown upon the lots of near 100 men killed and wounded. Fortunately for the garrison, however, two flank-works still remained entire, from both which heavy a fire was kept up, that though an assault was immediately given, the assailants were repulsed with great slaughter. This afforded leisure to the garrison to carry off the wounded men, with some of the artillery, and to spike up the rest. As the enemy, however, soon recovered themselves, and prepared for a general storm, it was thought proper to abandon the flank works, and retire into the body of the place. The possession of these outworks, however, gave the enemy such advantages, that the place was no longer tenable. Their situation, on a rising ground, enabled them to command the battery opposite to their chief approach with small arms, and to single out the men at their guns. A capitulation therefore became absolutely necessary, which was obtained on honourable terms. The town, with the whole province of West Florida, was confirmed to the Spaniards by the treaty of 1783. W. Long, 87. 20. N. Lat. 30. 22.

PENSANCE, a town of Cornwall, in England, at the bottom of Mountbay, about ten miles from the Land's End. It was burnt in 1595 by the Spaniards, who,
who, with four galleys, surprized this part of the coast, and set fire to several villages and farms; but it was soon after rebuilt, made one of the coinage towns, and has now a considerable trade. It lies in the parish of Madern noted for its restorative spring, very effectual in the cure of lamenefs as well as the cholick, &c. It is well built and populous, and has many ships belonging to it. The shore abounds so with lead, tin, and copper ore, that the veins thereof appear on the utmost extent of land at low-water mark.

PENSILES NORTH, Hanging Gardens, in antiquity. See Babylon, n° 5.

PENNSYLVANIA, or Pennsylvania, is one of the United States of North America; formerly called the Province of Pennsylvania. It was named from its honorable founder, the first proprietary and governor, William Penn, to whom it was granted by King Charles the Second, anno 1682. (See William Penn.) It is bounded on the east, by the river Delaware; which separates it from New Jersey; on the south, by an east and west line; which divides it from the States of Delaware and Maryland and a part of Virginia, at the distance of about fifteen miles south, from the parallel of its capital, PHILADELPHIA, extending westward, from the fild river, 5° of Longitude; and from thence northward to the beginning of the 43° of North Lat. which separates it from part of the State of New York, on the north. It extends about 320 miles east and west, and 155 north and south; containing about 41,000 square miles, and near 26 millions of acres of land.

It was intended, by charter, to contain 3° of Lat. between the parallels of 39° and 45° N. and between about 70° and 76° of Long. West from London; but the grant being afterwards found to encroach upon that of Maryland, to lord Baltimore, which was prior to the grant of Pennsylvania, the boundary between them was afterwards, by agreement, settled, as above. William Penn likewise, in 1682, obtained of the Duke of York, afterwards James II. of England, &c. the three lower counties on Delaware river and bay; which were in consequence, called the Territories of Pennsylvania; but since, the State of Delaware.

The first proprietor William Penn, being one of the people called Quakers, the province was consequently settled at first, mostly by people of that religious society; and in the first year arrived between 20 and 30 ships, with about 3000 settlers, or new colonists; and within the two next succeeding years, about as many more, which afterwards were annually succeeded by many others.

Besides a few families of English, there were many Dutch and Swedes in the country before; who were the first European settlers before it, with what is, now called the State of New York, was taken from the Dutch by the English, in 1664. It is likewise said to have included about ten Indian nations, containing many thousands of those Aborigines: all which the proprietor treated with such prudence, justice, and kindness, on his first arrival, in 1682, and afterwards, that he very remarkably attracted and engaged their love and affection; and his memory has ever since been revered among the Indians, even after their residence has been entirely removed without the limits of the province, or state; for though the country was granted to him by the king, yet he always agreed with, and gave them full satisfaction for their lands, before he settled them; and the heat of advice, for their real happiness, which they remained not only sensible of, but also frequently acknowledged in their public treaties afterwards, and demonstrated by a long continued friendship, a conduct of great advantage to the future settlement and prosperity of the province.

Pennsylvania enjoys a pleasant and salubrious air; though the transition from heat to cold, and vice versa, in the extreme, is sometimes very sudden and injurious. The winter is longer, and more severe than in England; the summer hotter and dryer; the spring very short; the autumn long and mild; but, notwithstanding the length and severity of the winter, it is generally more clear, agreeable, and healthy, than in England, but the summer less so: by reason of its more intense heat, fudden, and greater changes, than are usual in that country; which sometimes cause fevers, lingering and putrid fevers, in the latter part of summer, &c. The snows, in winter, are frequently very deep; and the frosts so intense, that sometimes the river Delaware, even nigh Philadelphia, where it is near a mile broad, has been so hard frozen over, in one night, as to bear people walking upon it the next morning; hence, in that season, its navigation is frequently obstructed; and sometimes for many weeks together successively; and the spring commences near a month later, at Philadelphia, than about London; yet the corn harvest in Pennsylvania, is near a month earlier than in England.

The nature of the land and soil must necessarily be various, in a country so extensive; but there is more of a similarity, in this respect, through the whole of it, than is to be found in the same extent in England, and it is well watered by rivers and springs. It is more of a middling, improvable kind, than very rich;—And, if the whole be divided into three parts, viz. grazing, arable, or least useful, the first, or, what may be called very rich land, is but a small proportion, compared with the second; which is a middling kind, and comprises the greater part of the late, or present improved lands, in Pennsylvania;—which, in many places, abounds with great plenty of iron ore, as well as with limestone, marble, &c. in others; from the first of which are made large quantities of pig and bar iron, hollow-ware, &c.

Most of the land, if not all, which is capable of improvement, is now suppos’d to be taken up, or surveyed to private persons; though much of it still remains unsettled, or in a wilderness state. All the improved parts of Pennsylvania, before the revolution, were divided into eleven counties, and since into twenty-two.

As to the face of the country, it abounds with hills, valleys, woods, and plains, and is crossed by several ranges, or chains, of mountains, running from N. E. to S. W.; as the South, North, or Endless Mountains, so called; which in different places, take different names; as the Kittatinny, and Alleghany mountains, &c. It is mostly covered with woods, and timber of various kinds, where not improved, or entirely barren; among which, has been said, there are above seventeen species, or varieties, of oak.

The principal rivers are the Delaware and Susquehanna; each several hundred miles in length; which have
have many large navigable branches, for boats, barges, and small vessels; besides the Alleghany, which waters the N. W. part of the state, and joins the Monongahela, at Pittsburg; where they form the Ohio; which from thence proceeds out of the bounds of the state, to the Mississippi. These three rivers take their rise in the state of New York, a little northward of Pennsylvania; but the rivers generally, in this country, are broader and shallower, than in some other parts of the world.

The Delaware, on the west side of which stands the flourishing city of Philadelphia, in N. Lat. 40° is navigable for ice vessels, thirty miles above the city, where it is near a mile broad; and about 130 from the sea, along the course of the river and bay of Delaware; above which are rocks, or falls, in several places; tho' passable for boats, barges, rafts, &c. at certain times, above 100 miles further. The Schuylkill is a large branch of the Delaware; which it joins about four miles below Philadelphia, after having replenished the interior parts of the country; but its navigation, for large vessels, is obstructed by a sand bar, at its mouth; and, in some places above, it has rocks or falls; though at certain times, they are passable for boats, flats, rafts, and canoes, for many miles.

The Susquehanna waters much of the interior parts of the state, being in some places, very crooked, broad and shallow. It empties into the head of Chesaapeake bay, in Maryland; but its navigation is much obstructed by falls, or rocks and shallows, in divers places.

The chief towns in Pennsylvania, next after the city of Philadelphia, besides the two old boroughs of Chester and Bristol, (which have long seemingly been on the decline) are Lancaster, York, Carlisle, Reading, Germantown, Harrisburg, and Pittsburg, the last of which is situated above 260 miles westward from Philadelphia, at the junction of the rivers Alleghany and Monongahela; and each of them may probably contain from about 2000 to 6000 inhabitants. Besides, there are many other considerable towns in the state: —but, in a country, like Pennsylvania, where, so long as the chief employment continues to be agriculture, many large towns are neither so proper, convenient nor common, as where the inhabitants, for want of land, become more engaged in manufacturing, &c.

As to the produce of Pennsylvania, Indian corn is an original, and strawberries, with grapes of various kinds, grow naturally in the woods, as well as mulberries. Deer among the quadrupeds, and wild turkeys, among the winged tribe, were formerly very plentiful, but now scarce. But molt kinds of European grain and fruits, as well as domestic, or tame animals have been naturalized there; some of the fruits have been melliorated by the change, while others degenerate. But the principal staple of Pennsylvania, and its vicinity, is wheat, flour, rye, and Indian corn. And the quantity of grain, of different kinds, manufactured and unmanufactured, exported from the port of Philadelphia, in 1774, before the revolution, has been computed, above two millions of bushels; and in 1775, the quantity of flour alone, exported from thence, amounted to above 325,000 barrels each containing 14 cwt. In which year, the value of the exports from the port of Philadelphia, when the chief staple or principal of them, was only at about half the price, to which it has since advanced, was estimated at near 800,000l. sterling; which employed near 800 sea vessels. And in the year 1775, were built 5480 tons of shipping, or new vessels; which employment afterwards, as well as before, was constantly upon the increase every year. —But the province was very early famed for the finenes of its flour and bread, and the goodness of its beer, &c.

Reflecting the produce and trade of Pennsylvania, in a judicious Treatise, published in London, anno 1731, among other things, is the following account, though they have since greatly increased both in quantity and variety. viz.—"The produce of Pennsylvania, for exportation, is wheat, flour, biscuit, barrelled beef, and pork, bacon hams, butter, cheese, cider, apples, soap, myrtle-wax and tallow candles, strong beer, refined oil, strong waters, deer-skin, and other peltry, hemp, some little tobacco, limer; (i. e. sawed boards, and timber, for building houses, cypress wood, fingles, cafe-flakes and heading, masts, and other ship timber) also drugs of various sorts; (as sassafras, calamus aromaticus, snake root, &c.) Lastly, the Pennsylvanians build about 2000 tons of shipping a year, for sale, over and above what they employ in their own trade; which may be about 6000 tons more. They send great quantities of corn to Portugal and Spain, and frequently sell their ships, as well as cargo; and the produce of both is sent thence to England, where it is always laid out in goods, and sent home to Pennsylvania. They receive no less than from 4000 to 6000 100 l. from the Dutch trade of Curacoa alone, for provisions and liquors. And they trade to Surinam, in the like manner, and to the French part of Hispaniola, as also to the other French islands; from whence they bring back molasses, and also some money. From Jamaica they sometimes return with all money, and no goods; because their rum and molasses are too dear there. And all the money they can get from all parts; as also sugar, rice, tar, pitch, &c. is brought to England, to pay for the manufactures, &c. They carry home from us, which has been for many years past, 250,000 l. per annum. They trade to our provinces of New England, Virginia, Maryland, Carolina, and to all the islands, in the west Indies, (excepting the Spanish ones) as also to the Canaries, Madeira, and the Azores Islands; likewise to Newfoundland for fish; which they carry to Spain, Portugal, and up the Mediterranean; and remit the money to England; which, one way or other, may amount to 60,000l. yearly."

Hence, as the trade of Pennsylvania, particularly its exports, as well as the number of its inhabitants, before the revolution, in 1776, usually doubled, at least, every twenty years, some idea of its great increase, improvement and prosperity, before that time, as well as since, may be formed; which, in the space of forty-five years, between these two periods, must consequtently, at least, have been doubled twice; besides the advancement made since the revolution.

The first constitution and government of Pennsylvania, under William Penn, was formed on such a generous plan of liberty and prudent religious toleration; and the moderation and manners of the early settlers and inhabitants were so remarkably amiable and inviting, that the province was so settled...
Pennsylvania,settled and improved, with very extraordinary rapidity; and in a manner almost unparalleled in any other country, where force, or compulsion, has not been used: for it was founded entirely upon the pacific plan. It affords a very remarkable example of the happy effects of the peaceable principle of forbearance, justice and moderation, as well as good policy of that people (the Quakers) who first established, and for so many years directed and conducted the government and public affairs, &c. Reflecting which says the tract, last quoted "That Pennsylvania, which has not any peculiar staple, (like Carolina, Virginia, and Maryland), and was begun to be planted so late as 1680) should at present, in 1731, have more white people in it, than all Virginia, Maryland, and both the Carolinas, is extremely remarkable! And although the youngest colony on the continent, they have by far, the finest capital city of all British America."

By the last constitution of Pennsylvania, since the revolution, established in September 1790, and, as at present existing in 1795, all legislative powers are vested in a senate, and house of representatives; elected by the citizens of Philadelphia, and the several counties in the state, in proportion to their number of taxable inhabitants. The representatives can never be fewer than sixty, nor more than one hundred. The state is divided into districts, (each consisting of one or more contiguous counties) for the choice of senators; who cannot be more than one third, nor less than one fourth of the number of the representatives. The present house of representatives consists of 78 members, and the senate of 40. The qualifications of the electors are full age, and two years residence in the state, with payment of taxes, assessed at least six months before exercising the rights of an elector; but the sons of freeholders are entitled to vote for senators and representatives without any qualification except full age (a). The supreme executive power is lodged in a governor, chosen every three years by the people; he must be, at least, thirty years of age, and have been a citizen or inhabitant of the state for seven years next preceding his election; and no one person can be governor more than nine years in twelve (a). The governor has the appointment of all officers, not otherwise provided for by the constitution; which exclusion only applies to the state treasurer, who is appointed by the legislature; and the sheriffs and coroners, who are elected by the people of the respective counties once in three years.

The inhabitants of Pennsylvania mostly consist of such people as have removed thither from Europe, and of their descendants; many of whom still have customs and manners of the different countries from which they originally came, according to their rank in life. The first and early settlers, or colonists, for many years, as before observed, were mostly Friends, or the People called Quakers, a sober, industrious, and peaceable people; but they have since been long exceeded, in number, by those of other religious societies; and the Presbyterians alone, are now suppos'd to be more numerous than they. The Germans, and their descendants, were suppos'd, before the revolution, to compose near one third part of the inhabitants. They were an honest and industrious people; and have contributed much to cultivate and improve the country. In the year 1749, about twenty-five sail of ships arrived with German passengers alone which brought about 12,000 souls; and in some other years near as many came annually. Before the year 1776, when their importation was suspended, it appears near 40,000 of them, at different times, had arrived in the province, since the first settlement of it; and their internal increase has been very great. Besides, the people, who arrived from Ireland, were very numerous, before the revolution, sometimes about 10,000 in a year. Before which period, the inhabitants were thought to double, in number, at least, every twenty years. They were computed at above 360,000, prior to that time; and since, in the year 1795, they are suppos'd to be about 450,000, in number: for it cannot be reasonably expected they should long continue to increase in so great proportion as they have done. As to the Aborigines or Indians, there have been few, or none of them, resident within the state for many years past: For, as the country advances, and becomes more occupied, they remove further back into the wilderness. The Negroes, or black people, were never very numerous in the province: as the Quakers were always adverse to the debatable traffic in those people; and at present, the total abolition of holding them in bondage is fast advancing, among all sorts of people in the state; the importation of them, for sale, having long since ceased; so that there are but few, or no slaves, now in the country, except such as are introduced by strangers.

The Dutch and Swedes, who were settled here before Mr. Penn became proprietor, choosing still to reside in this country, as they did in New York and the Jerseys, obtained the same privileges as the rest of his majesty's subjects; and their descendants are now in a manner the same people with the English, speaking their language, and being governed by their laws and customs. Mr. Penn, however, not satisfied with the title granted him by King Charles II. and his brother, bought the lands also of the Indians for a valuable consideration, or what they esteemed cash (though 20 miles were purchased, at first, for less than an acre about Philadelphia would pay now), paying them in cloth, tools, and

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(a) The qualifications of a representative, so far as they differ from those of an elector, are, that the former shall have been a citizen, or inhabitant of the state, three years next preceding his election, and the last year thereof an inhabitant of the city or county for which he shall be chosen. Every senator must have attained to the age of twenty-five years, and have been a citizen or inhabitant of the state four years next before his election; and the last year thereof an inhabitant of the district for which he shall be chosen.

(b) He has a negative on every bill; but if after such negative, two thirds of each house agree to pass the bill, it shall be a law; and if any bill sent to the governor, be not returned within ten days, it shall be a law.
Pennsylvania and utensils, to their entire satisfaction; for they had not hands to cultivate the hundredth part of their lands. and if they could have raised a product, there was nobody to buy; the purchase, therefore, was all clear gain to them; and, by the coming of the English, their peltry trade became so profitable, that they soon found their condition much altered for the better; and are now as well clothed and fed as the European paupers in many places.

Pennsylvania was one of the most flourishing colonies in North America, having never had any quarrel with the natives. Whenever they desired to extend their settlements, they purchased new lands of the French, never taking any by force; but the Indians now let a very high price upon their lands, in comparison of what they did at first, and will hardly part with them at any rate. In an estimate of the proprietary estate of the province, published above 40 years ago, we find, that the proprietaries, who alone could purchase lands here from the natives, had bought seven millions of acres for no more than 750 l. sterling, which the proprietaries afterwards sold at the rate of 15 l. for every 100 acres. The Indian council at Onandago, however, disapproved of their deputies parting with so much land; and, in the year 1755, obliged the proprietaries to reconvey great part of the same to the Indians.

A dispute subsisted a long time between the proprietors of this province and Lord Baltimore, proprietary of Maryland, about the right to certain lands; which was at last amicably adjudged, though greatly in favour of the Penns.

About the year 1704 there happened some alteration in the constitution of the province. The establishment that took place, and subsisted till the American war broke out, consisted of an governor, council, and assembly, each with much the same power and privileges as in the neighbouring colony of New York. The lieutenant governor and council were appointed by the proprietors Thomas and Richard Penn, with his majesty's approbation; but the laws enacted here were not repealed within six months after they had been presented to the king for his approbation or disallowance, they were not repealable by the crown after that time.

As to the different religious societies, in Pennsylvania, they are numerous. They consist of the Friends or Quakers; who were the first settlers of the province as before observed; and have ever since flourished in the free enjoyment of their religion. They neither give titles nor use compliments in their conversation or writings, believing that whatsoever is more than yes, no, and may, may, come of evil. They conscientiously avoid, as unlawful, kneeling, bowing, or uncovering the head to any person. They discard all superfluities in drest or equipage; all games, sports, and plays, as unbecoming the Christian. Swear not at all, is an article of their creed literally observed in its utmost extent. They believe it unlawful to fight in any cause whatever; and think that if their enemy finite them on the one cheek, they ought to turn to him the other also. They are generally honest, punctual, and even punctilious in their dealings; provident for the necessities of their poor; friends to humanity, and of course enemies to slavery; strict in their discipline; careful in their observance even of the punctilios in drest, speech, and manners, which their religion enjoins; faithful in the education of their children; industrious in their several occupations. In short, whatever peculiarities and mistakes those of other denominations have supposed they have fallen into, in point of religious doctrines, they have proved themselves to be good citizens. The Episopalians, according to the manner of the Church of England, with the German and Swedifh Lutherans; the Presbyterians, with the German Calvinists; the Church of Rome, and the Jews; the Baptists, with those among the Germans, called Mennonists and Dunkards; the Moravians, or United Brethren, and Schwenkfelders; besides the Methodists, &c all of which have generally lived there always in much friendship and harmony, notwithstanding their different religious opinions. (All which fice in their proper places.)

In the Philosophical Transactions for 1757, there is an account of a copper spring in Pennsylvania. This spring rises from a copper mine, and will diffuse iron in less time by three-fourths than the waters of Wicklow in Ireland, lately described by Dr William Henry and Dr Bond. From the solution of iron in these waters, about half the quantity of pure copper is procured by melting it in a crucible: but though these waters melt iron sooner than the Irish waters, yet the solution does not produce so great a proportion of copper; for the pure copper procured from the solution of iron in the Irish waters is to the solution as 16 to 20. In the neighbourhood of this spring, which supplies 800 hds. in 24 hours, are many ores of vitriol and sulphur; the water is of a pale green colour, of an acid, sweet, astringent, inky, and nauseous taste. It is very heavy; for the hydrometer, which was immersed in it, stood at the same height as in a solution of one ounce of vitriol in a quart of water. A very small quantity of the solution of pot ashes instantaneously precipitates the metallic parts of this water in three different colours; ochre at the top, green in the middle, and white at bottom; a clean knife kept in it for a few minutes, is covered with a bright copper colour. But besides a large proportion of copper, this water contains also a large proportion of vitriol of iron. A pint of it exhausted by a flow fire left 400 grains of solid contents, which appeared to be chiefly sulphate; for 196 grains of it, dissolved and filtered, did not leave above four grains of indissoluble matter. It appears therefore, that the proportion of vitriolic parts in this water is in direct ratio of a pint; consequently it is a stronger solution of vitriol than sea-water is of marine salt. So that, besides the copper to be obtained from a solution of iron, it will afford great quantities of vitriol, and the great plenty of water and fuel will make the establishment of copperworks extremely cheap and commodious. This water mixed with common water is frequently used as an emetic and cathartic by the country people, and is found very efficacious in the cure of cutaneous disorders and fomes.

Amongst the other curiosities of this state may be reckoned another spring about 14 feet deep and about 100 square, in the neighbourhood of Reading. A full mill stream issues from it. The waters are clear and full of filies. From appearances it is probable that
PENSION, a sum of money paid annually for services or considerations already past. The yearly payment of each member to the houses of the ins of courts is likewise named pensions; and the yearly assembly of the society of Gray's Inn, to consult on the affairs of the house, is also called a pENSION.

PENSIONARY, or PENSIONER, a person who has an appointment or yearly sum, payable during life, by the office of his chapel, company, or particular person.

Grand Pensionary, an appellation given to the first minister of the states of Holland. The grand pensionary is chairman in the assemblies of the states of that province: he proposes the matters to be consulted on; collects the votes; forms and pronounces the resolutions of the state; opens letters; confers with foreign ministers, &c. His business is also to inspect the finances, to maintain the authority of the states, and to see that the laws are observed; and he is perpetual deputy of the states general of the United Provinces. His commission is, however, given him only for five years: after which it is deliberated whether or not it shall be renewed; but there is no instance of its being revoked; therefore death only puts an end to the functions of this important minister.

Pensionary, is also the first minister of the regency of each city in Holland. His office is to give his advice in affairs relating to the government, either of the state in general, or of the city in particular; and in assemblies of the states of the province, he is speaker in behalf of his city. The function, however, of these pensionaries is not everywhere alike; in some cities they give only their advice, and are never found in assemblies of the magistrates, except when expressly called thither: in others they attend constantly; and in others they make the propositions on the part of the burgomasters, draw up their conclusions, &c. They are called pensionaries, because they receive an appointment or pension.

Pensioner, in general, denotes a person who receives a pension, yearly salary, or allowance. Hence the ban of gentlemen pensioners, the noblesse of guard to the king's person, conists of 40 gentlemen, who receive a yearly pension of 100l.

This honourable band was first instituted by King Henry VIII. and their office is to attend the king's person, with their battle-axes, to and from his chapel royal, and to receive him in the presence-chamber, or coming out of his privy-lodging; they are also to attend at all great solemnities, as coronations, St George's feast, public audiences of ambassadors, at the sovereign's going to parliament, &c.

They are each obliged to keep three double horses and a servient, and so are properly a troop of horse. They wait half at a time quarterly; but on Christmas-day, Easter-day, Whitunday, &c. and on extraordinary occasions, they are all obliged to give their attendance. They have likewise the honour to carry up the sovereign's dinner on the coronation-day and St George's feast; at which times the king or queen usually confer the honour of knighthood on two such gentlemen of the band as their captain presents.

Their arms are gilt battle-axes; and their weapons, on horseback, in time of war, are cuirassiers' arms, with sword and pistols. Their standard in time of war is, argent, a cross gules. Their captain is always a nobleman, who has under him a lieutenant, a standard-bearer, a clerk of the check, secretary, paymaster, and harbinger.

Pensioner, in the university of Cambridge and in that of Dublin, has a very peculiar meaning; for those students, either under graduates or bachelors of arts, are called pensioners who live wholly at their own expense, and who receive no emolument whatever from the college of which they are members. They are divided into two kinds, the greater and the less; the former of which are generally called fellow-commoners, because they eat with the fellows of their college; the latter are always called pensioners, and eat with the scholars, who are those students of the college, either under-graduates or bachelors who are upon the foundation, who receive emoluments from the society, and who are capable of being elected fellows. See Servitor and Sizar.

Penstock, a sluice or flood-gate, serving to retain or let go at pleasure the water of a mill-pond, or the like.

Pentarctylos, in national history, a name given by Linnius and some other authors to a kind of fella marina or tea flar-fish, composed of five principal rays, with several transverse hairy or downy processes.

Pentachord (compounded of omnit five, and signifying five), an ancient musical instrument with five strings. The invention of the pentachord is referred to the Seychians; the strings were of bullock's leather, and they were thruck with a placcum made of goats-horn.

Pentacrostic, in poetry, a set of verses so disposed, as that there are always five acrostics of the same name, in five divisions of each verse. See Acrostic.

Pentactinodos, in national history, a name given by some authors to those species of star-fish which are composed of a body divided into five rays.

Pentadactylon, five fingers, in botany, a name given by some authors to the viscous or palma Chryphi, from the figure of its leaf.

Pentadactylos, the five-fingered fish, in ichthology, the name of a fish common in all the seas about the East Indies, and called by the Dutch there vif vinger vish.

It has this name from five black stripes which it has on each side, resembling the prints of five fingers. Its head is flat, convex at the bottom, plain in the sides, and inclined in the fore part. The finot is thick, obtuse, and round; the lower jaw at its extremity bent and
and rounded; the nostrils are double; the balls of the eyes oval; the iris of a silver colour; the first fin of the back is small, the second is more elevated; those of the breath are infected obliquely, that of the anus is greatly extended, and that of the tail much floped. The whole body is covered with scales of a moderate size, thin, flexible, and slightly indented on their hinder edge; the back is red-dull, the sides of a silver colour, and the fins white. The fish is described by some as about nine inches long; by others as a foot and a half. It is a dry but not ill-tailed fish.

PENTÆDROSTYLA, in natural history, the name of a genus of spars: (See Sfars). The bodies of this genus are spars in form of pentagonal columns, terminated by pentagonal pyramids at one end, and regularly affixed at the other to some solid body.

PENTAGON, in geometry, a figure of five sides and five angles. See Geometry.

In fortification, pentagon denotes a fort with five bastions.

PENTAGONOTHECA, in botany, the name given by Vaillant to the plant called by Linnaeus, Plu-nier, Houtouin, and others, pisonia.

PENTAGRAM, an instrument designed for drawing figures in what proportion you please, without any skill in the art.

The instrument is otherwise called a parallelogram.

The common pentagram (Plate CCC.LXXXIII. fig. 14.) consists of four brass or wooden rulers, two of them from 15 to 18 inches long, the other two half that length. At the ends, and in the middle, of the longer rulers, as also at the ends of the shorter, are holes, upon the exact fixing whereof the perfection of the instrument chiefly depends. Those in the middle of the long rulers are to be at the same distance from those at the end of the long ones and those of the short ones; so that when put together they may always make a parallelogram.

The instrument is fitted together for use by several little pieces, particularly a little pillar, No. 1, having at one end a screw and nut, whereby the two long rulers are joined; and at the other a little knot for the instrument to slide on. The piece, No. 2, is a rivet with a screw and nut, wherewith each short ruler is fastened to the middle of each long one. The piece, No. 3, is a pillar, one end whereof, being hollowed into a screw, has a nut fitted to it. At the other end is a worm to screw into the table; when the instrument is to be used, it joins the ends of the two short rulers. The piece, No. 4, is a pen, portcroyan, or pencil, screwed into a little pillar. Lastly, the piece, No. 5, is a brass point, moderately blunt, screwed likewise into a little pillar.

Use of the Pentagram, or Parallelogram. 1. To copy a design in the same scale or bigness as the original: screw the worm No. 3 into the table; lay a paper under the pencil No. 4, and the design under the point No. 5. This done, conducting the point over the several lines and parts of the design, the pencil will draw or repeat the same on the paper.

2. If the design be to be reduced—e. g., into half the space, the worm must be placed at the end of the long-ruler, No. 4, and the paper and pencil in the middle. In this situation conduct the brads point over the several lines of the design, as before; and the pencil at the same time will draw its copy in the proportion required; the pencil here only moving half the lengths that the point moves.

Hence, on the contrary, if the design be to be enlarged by one half, the brads point, with the design, must be placed in the middle, at No. 3, the pencil and paper at the end of the long ruler, and the worm at the other.

3. To enlarge or reduce in other proportions, there are holes drilled at equal distances on each ruler, viz. all along the short ones, and half way of the long ones, in order for placing the brads point, pencil, and worm, in a right light therein; i.e., if the piece carrying the point be put in the third hole, the two other pieces must be put in its third hole:

If, then, the point and design be placed at any hole of the great rulers, and the pencil with the paper at any hole of the short ruler, which forms the angle therewith, the copy will be less than half the original. On the contrary, if it be placed at one of the holes of that short ruler, which is parallel to the long ruler, the copy will be greater than half the original.

The construction of this instrument requires a degree of accuracy which most of our instrument-makers are strangers to; for which reason there are very few of the instruments that succeed. Few will do any thing tolerably but straight lines; and many of them not even those.

In order to prove that the figure described by a pentagram is similar to the given figure, let C (fig. 15.) be the fixed centre of motion; P the pencil for tracing the given figure PP, and p the pencil which traces the other figure pp; p, &c. must be so adjusted, that p, C, and P, may lie in one straight line; then, since Bp: A p : : BP: AC, whatever be the situation of the pentagram, the angles PCP and P C P are vertical; and therefore PCP will in every position of the instrument be a right line: but PC: : C : : BA: A P, in each of the two positions in the figure, and consequently the triangles PCP, P C P are similar; and PP: pp (:: PC: : C) : : BA: A P, or in a given ratio. Hence it appears, that, by moving the pencil p, A P, may be equal to BA, or less in any proportion; and consequently p p may be equal to PP, or less, in the same proportion.

PENTAMETER, in ancient poetry, a kind of verse, consisting of five feet, or metres, whence the name. The two first feet may be either dactyls or spondees at pleasure; the third is always a spondee; and the last anapestis: such is the following verse of Ovid.

1. Carminibus uivos tempos in omne meis.

2. A pentameter verse subjoined to an hexameter, constitutes what is called elegiac. See Elégiac.

PENTANDRIA (from πεντάνταρχον, and αν a man or husband): the name of the fifth class in Linnaeus's sexual method, consisting of plants which have hermaphrodite flowers, with five stamina or male organs. See Botany, p. 430.

PENTAPETALOUS, an appellation given to flowers which consist of five petals or leaves.

PENTAPETES, in botany: A genus of the dodecandria order, belonging to the monadelphia class of plants; and in the natural method ranking under the
Pelletier. There is but one species known in the gardens of this country, viz. the phacienia, with half-pointed, spear-shaped, fawed leaves. It is an annual plant, a native of India, and rises to the height of two or three feet, adorned with fine scarlet flowers, consisting of one petal cut into five segments. In the centre of the flower arises a short thick column, ... to which it is adhered. It is a tender plant, and must be brought up in the hot-house.

PENTAPOLIS. This name is given to the five cities, Sodom, Gomorrah, Admah, Zeboim, and Zoar (Wisd. x. 6.). They were all five condemned to utter destruction, but Lot interceded for the preservation of Zoar, otherwise called Baal. Sodom, Gomorrah, Admah, and Zeboim, were all consumed from fire and heaven, and in the place where they flooded was made the lake Asphaltites, or the lake of Sodom.

PENTAPOLIS (Ptolemy), a district of Cyrenaica; situated on the Mediterranean; denominated from its five cities; namely, Berenice, Arinone, Polemais, Cyrene, and Appollonia.

PENTAPHILINES (Josephus); taking name from five principal cities, Gaza, Gath, Azeton, Azor, and Ekron.

PENTATEUCH. This word, which is derived from the Greek πεντατέυχος, from πέντε, five, and τέυχος, an instrument or volume, signifies the collection of five instruments, or books of Moses, which are Genesis, Exodus, Leviticus, Numbers, and Deuteronomy: each of which books we have given an account of under their several names.

There are some modern critics who have disputed Moses's right to the pentateuch. They observe that the author always speaks in the third person. "Now the man Moses was very meek above all the men which were upon the face of the earth. The Lord spake unto Moses, saying, &c. Moses said to Pharaoh, &c." Thus they think he would never have spoken of himself; but would at least sometimes have mentioned himself in the first person. Besides this, say they, the author of the pentateuch sometimes abridges his narrative like a writer who collected from some ancient memoirs. Sometimes he interrupts the thread of his discourse; for example, he makes Lamech the bigamist to say (Gen. iv. 23.), "Hear my voice, ye wives of Lamech, hearken unto my speech; for I have slain a man to my wounding, and a young man to my hurt," without informing us before hand to whom this is related. These observations, for example (Gen. xii. 6.), "And the Canaanite was then in the land," cannot be reconciled to the age of Moses, since the Canaanites continued to be the masters of Palestine all the time of Moses. The passage out of the book of the wars of the Lord, quoted in the book of Numbers (xxi. 14.), seems to have been changed in afterwards, as also the first verses of Deuteronomy. The account of the death of Moses, which is at the end of the same book, cannot certainly belong to this legislator; and the fame judgment may be made of other passages, wherein it is said, that the places mentioned lay beyond Jordan; that the bed of Og was at Ramah to this day; that the havoth of Jair, or the cities of Jair, were known to the author, though probably they had not that name Pentateuch till after Moses's time (Num. xxxii. 41, Deut. iii. 14.).

It is observed also in the text of the pentateuch, that there are some places that are defective; for example, in Exodus (xii. 8.), we see Moses speaking to Pharaoh, where the author omits the beginning of his discourse. The Samaritan differs in the same place what is wanting in the Hebrew. In other places, the same Samaritan copy adds what is deficient in the Hebrew text; and what it contains more than the Hebrew seems so well connected with the rest of the discourse, that it would be difficult to separate them. Lastly, they believe that they observe certain strokes in the pentateuch which can hardly agree with Moses, who was born and bred in Egypt; as what he says of the earthly paradise, of the rivers that watered it, and ran through it; of the five cities, Babylon, Erech, Reph, and Calneh; of the gold of Pifon, of the Bdelium, of the stone of Sopher, or onyx-stone, which was to be found in that country. These particulars, observed with such curiosity, seem to prove, that the author of the pentateuch lived beyond the Euphrates. Add what he says concerning the ark of Noah, of its judgment may be made of other places, the same which was brought--up in this country. Thefe particulars, observed with such curiosity, seem to prove, that the author of the pentateuch lived beyond the Euphrates. Add what he says concerning the ark of Noah, of its

PENTATHLON, in antiquity, a general name for the five exercises performed at the Grecian games, viz. wrestling, boxing, leaping, running, and playing at the discus.

PENTECOST, a solemn festival of the Jews; so called, because it was celebrated on the 50th day after the 16th of Nisan, which was the second day of the passover. The Hebrews called it the feast of weeks, because it was kept seven weeks after the passover. They then offered the first fruits of the wheat harvest, which was then completed; besides which they presented at the temple seven lambs of that year, one calf, and two rams, for a burnt offering; two lambs for a peace offering; and a goat for a sin offering (Levit. xix. 15, 16. Exod. xxxiv. 22, and Deut. xvi. 9, 10.) The feast of the pentecost was instituted among the Israelites, first to oblige them to repair to the temple of the Lord, there to acknowledge his absolute dominion over the whole country, and to offer him the first-fruits of their harvest; and, secondly, that they might call to mind, and give thanks to God, for the law which he had given them from mount Sinai, on the 50th day after their coming out of Egypt.
The modern Jews celebrate the pentecost for two days. They deck the synagogue and their own houses with garlands of flowers. They hear a sermon or oration in praise of the law, which they suppose to have been delivered on this day. The Jews of Germany make a very thick cake, consisting of seven layers of paste, which they call Sina. The seven layers represent the seven heavens, which they think God was obliged to reassend from the top of this mountain. See Leo of Modena et Bostorf's Syag Jud.

It was on the feast of pentecost that the Holy Ghost miraculously descended on the apostles of our Lord, cv. 28.

PENTHESILEA, queen of the Amazons, succeeded Ortygia, and gave proofs of her courage at the siege of Troy, where she was killed by Achilles. Pliny says that she invented the battle-axe.

PENTHORUM, in botany; a genus of the pentagynia order, belonging to the pentandria class of plants. The calyx is quinqued; there are either five petals or none; the capsule is five-pointed and quinqued-ocular.

PENTLAND or PICTLAND EIRTH, is a narrow strait of six miles between the main land of Scotland and the Orkney isles. This strait is the great thoroughfare of shipping between the eastern and western seas, the terror of the boldest mariners, and the grave of thousands; where the winter's storms afford many natives on the opposite shores a better livelihood than they could obtain by fishing or husbandry. They search from place to place, and from one cavern to another, in the hopes of finding timber, caiks, and other floating articles; of the wrecked vessels, of whom six or eight are thus sacrificed sometimes in one night. The navigation of this pass is rendered more dangerous by the island of Strom, and two rocks called the Skerries, lying near the middle of it.

PENULA, among the ancient Romans, was a coarse garment or cloak worn in cold or rainy weather. It was shorter than the lacerna, and therefore more proper for travelers. It was generally brown, and succeeded the chlamys after that became monastic. Clovis III. Childebert, and Dagobert, the power of these mayors in France was so great, that they left the sovereign only the empty title, and in the end seized on the throne itself. See PIPER.

PEPIN DE HERISTAL, or LE GROS, mayor of the palace under Clovis III. Childerbert, and Dagobert. The power of these mayors in France was so great, that they left the sovereign only the empty title, and in the end seized on the throne itself. See PIPER.

PEPLUM, in botany: A genus of the monogynia order, belonging to the hexandria class of plants; and in the natural method ranking under the 17th order Calyceal: hema. The perianthium is campanulated; the mouth cleft in 12 parts; there are five petals inserted into the calyx: the capsule is bilocular.

PEPLUS, a long robe worn by the women in ancient times, reaching down to the feet, without sleeves, and so very fine, that the shape of the body might be seen through it. The Athenians used much ceremony in making the peplos, and dressing the statue of Minerva with it. Homer makes frequent mention of the peplos of that goddess.

PEPPER, Pipers, in natural history, an aromatic berry of a hot dry quality, chiefly used in seasoning. We have three kinds of pepper: 1. Present used in the shop, the black, the white, and the long pepper. Black pepper is the fruit of the piper, and is brought from the Dutch settlements in the East Indies. See PIPER.

The common white pepper is fictitious, being prepared from the black in the following manner: they steep this in sea-water, exposed to the heat of the sun for several days, till the rind or outer bark looses; they then take it out, and, when it is half dry, rub it till the rind falls off; then they dry the white fruit, and the remains of the rind blow away like chaff. A great deal of the heat of the pepper is taken off by this process, so that the white kind is more fit for many purposes than the black. However, there is a sort of native white pepper produced on a species of the same plant; which is much less the fictitious, and indeed little inferior to the black.

The long pepper is a dried fruit, of an inch or an inch and an half in length, and about the thickness of a large goose quill; it is of a brownish grey color,
cyindrical in figure, and said to be produced on a plant of the fame genus.

Pepper is principally used by us in food, to affift digestion; but the people in the East Indies esteem it as a stomachic, and drink a strong infusion of it in water by way of giving them an appetite; they have also a way of making a fiery spirit of fermented fresh pepper with water, which they use for the same purposes. They have also a way of preserving the common and long pepper in vinegar, and eating them afterwards at meals.

Jamaica Pepper, or Pimento. See Pimenta.

Pepper-Mint. See Mentha.

Pepper-Pot. See Capsicum.

Pepper-Water, a liquor prepared in the following manner, for microscopical observations: put common black pepper, grossly powdered, into an open vessel to as to cover the bottom of it half an inch thick, and put to it rain or river-water, till it covers it an inch; shake or stir the whole well together at the first mixing, but never disturb it afterwards: let the vessel be exposed to the air uncovered; and in a few days there will be seen a pellicle or thin skin swimming on the surface of the liquor, looking of several colours.

This is a congregation of multitudes of small animals; and being examined by the microscope, will be seen all in motion: the animals, at first sight, are so small as not to be distinguishable, unless to the greatest magnifiers; but they grow daily till they arrive at their full size. Their numbers are also continually increasing, till the whole surface of the liquor is full of them, to a considerable depth. When dilatated, they will sometimes all dart down to the bottom; but they soon return up to the surface again. The skin appears from time to time in warm weather, and the animals grow the quickest; but in the severest cold it would succeed, unless the water freezes.

About the quantity of a pin's head of this scum, taken up on the nib of a new pen, or the tip of a hair-pencil, is to be laid on a plate of clear glass; and if applied first to the third magnifier, then to the second, and finally to the first, will show the different animals it contains, of several kinds and shapes as well as sizes.

PEPPERMINT-TREE, in botany; the Eucalyptus piperita.

In a journal of a voyage to New South Wales, by John White, Esq; we have a plate of this tree, with the following account of it: "This tree grows to the height of more than 100 feet, and is about 30 feet in circumference. The bark is very smooth, like that of the poplar. The young branches are long and slender, angulated near the top; but as they grow older, the angles disappear. Their bark is smooth, and of a reddish brown. The leaves are alternate, lanceolate, pointed, very entire, smooth on both sides, and remarkably unequal or oblique at their base; the veins alternate, and not very conspicuous. The whole surface of both sides of the leaves is marked with numerous minute reticulate spots, in which the essential oil resides. The footstalks are about half an inch in length, round on the under side, angular above, quite smooth. The flowers we have not seen. What Mr White has sent as the ripe capsules of this tree (although not attached to the specimens of the leaves) grow in clusters, from six to eight in each, fiddle and conglomerated. These clusters are supported on angular alternate footstalks, which form a kind of panicle. Each capsule is about the size of an hawthorn berry, globular, but as it was cut off at the top, rugged on the outside, hard and woody, and of a dark-brown colour. At the top is a large orifice, which shows the internal part of the capsule divided into four cells, and having a square column in the centre, from which the partitions of the cell arise. These partitions extend to the rim of the capsule, and terminate in four small projections, which look like the teeth of a calyx. The seeds are numerous, small, and angular.

"The name of peppermint tree has been given to this plant by Mr White, on account of the very great resemblance between the essential oil drawn from its leaves and that obtained from the peppermint (mentha piperita) which grows in England. This oil was found by Mr White to be much more efficacious in removing all cholicky complaints than that of the English peppermint, which he attributes to its being less pungent and more aromatic. A quart of the oil has been sent by him to Mr Wifion.

"The tree above described appears to be undoubtedly the same genus with that cultivated in some greenhouses in England, which Mr L'Héritier has described in his Species AU. ficum by the name of Eucalyptus obliqua, though it is commonly called in the gardens Micropteris obliqua; but we dare not assert it to be the same species, nor can this point be determined till the flowers and every part of both be seen and compared; we have compared the best specimens we could procure of each, and find no specific difference. The eucalyptus obliqua has, when dried, an aromatic flavour, somewhat similar to our plant. We have remarked, indeed, innumerable minute white spots, besides the numerous ones, on both surfaces of the leaves in some specimens of the garden plant, which are not to be seen in ours; and the branches of the former are rough, with small scaly tubercles. But how far these are constant, we cannot tell. The obliquity in the leaves, one side being shorter at the base than the other, as well as a narrowness all the way up, as in the Brigham mitida of the Hortus Kewensis, is remarkable in both plants."

The figure represents a branch of the peppermint tree in leaf; on one side of it part of a leaf separate, bearing the gall of some insect; on the other the fruit above described."

PERA, one of the suburbs of Constantinople, where embassadors and Christians usually reside. See Constantiopolis.

PERAMBULATOR, in surveying, an instrument for measuring distances, called the pedometer, way-wifdr and surveying-wheel. See Pedometer.

It consists of a wheel AA, two feet seven inches in diameter, and a half in diameter; consequently half a pole, or eight feet three inches, in circumference. On one end of the axis is a nut, three quarters of an inch in diameter, and divided into eight teeth; which, when moving the wheel round, fall into the eight teeth of another nut, fixed; and this turn the rod once round in the time the wheel makes one revolution. This rod, lying along a groove in the side of the carriage of the instrument, under the dotted line, has at its other end a square hole, into which is fitted the end B of a small cylinder P. This cylinder
The cylinder is disposed under the dial-plate of a movement, at the end of the carriage, in such a manner as to be moveable about its axis: its end is cut into a peptural screw, which, falling into the 32 teeth of a wheel perpendicular thereon, upon driving the instrument forward, that wheel makes a revolution each 16th pole. On the axis of this wheel is a pinion with fixed teeth, which, falling into the teeth of another wheel of 60 teeth, carries it round every 15th pole, or half a mile.

This last wheel, carrying a hand-or index round with it over the divi of a dial-plate, whose outer limb is divided into 160 parts, corresponding to the 160 poles, points out the number of poles passed over.

Again, on the axis of this last wheel is a pinion, containing 20 teeth, which, falling into the teeth of a third wheel which hath 40 teeth, drives it once round in 320 poles, or a mile. On the axis of this wheel is a pinion of 12 teeth, which, falling into the teeth of a fourth wheel having 72 teeth, drives it once round in 12 miles.

This fourth wheel, carrying another index over the inner limb of the dial-plate, divided into 12 for miles, and each mile subdivided into halves, quarters, and sixteens, serves to register the revolutions of the other hand, and to keep account of the half miles and miles passed over as far as 12 miles.

The use of this instrument is obvious from its construction. Its proper office is in the surveying of roads and large distances, where a great deal of expedition, and not much accuracy is required. It is evident, that driving it along and observing the hands, has the same effect as dragging the chain and taking account of the chains and links.

Its advantages are its hardness and expedition; its contrivance is such, that they may be fitted to the wheel of a coach, in which rate it performs its office, and measures the road without any trouble at all.

PERCA, the perch; a genus of fishes belonging to the order of Thoryctico. The head is furnished with a peptural screw, which, falling into the teeth of a third wheel, drives it once round in 320 poles, or a mile. On the axis of this wheel is a pinion of 12 teeth, which, falling into the teeth of a fourth wheel having 72 teeth, drives it once round in 12 miles.

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Perception

the cognizance of objects distant and apart from ourselves, and learn that we are but a small part in the system of nature. By what process the senses give us this information, we have endeavoured to show elsewhere, (See Metaphysics, Part I. Chap. i.) and we should not again introduce the subject, but to notice a singular opinion of a very able writer, whose work has been given to the public since our article alluded to had issued from the press.

Dr. Sayers, who is an ornament to that school in which we are strongly inclined to enlist ourselves, has endeavoured to prove that no man can perceive two objects, or be conscious of two ideas at the same instant. If this be true, not only our theory of time (See Metaphysics, Part II. Chap. viii.) is grossly absurd, but even memory itself seems to be an imaginary faculty. If a man be not conscious of his present existence, at the very instant when he thinks of a past event, or reviews a series of past transmutations, it is difficult, to us indeed impossible, to conceive what idea he can have of time, or what he can mean when he fays that he remembers a thing. But let us examine the reasoning by which the ingenious author endeavours to establish his opinion.

If we reflect (fays he;) upon the surprising velocity with which ideas pass through the mind, and the remarkable rapidity with which the mind turns itself; or is directed from one object of contemplation to another, this might alone give us some suspicion that we may probably be mistaken in supposing ideas to be synchronously perceived. Other arguments may be adduced to strengthen this suspicion. It will be granted, I believe, that the mind, whether immaterial or the result of organization, has certainly a wholeness or unity belonging to it, and that it is either not composed of parts, or that no one of the parts from which it originates is itself mind: in this case, it is difficult to conceive how two ideas should be impressed upon the mind at the same instant; for this would be supposing that part of the mind could receive one idea, and part another, at the same time; but if the parts do not perceivedly fign:flly, this is evidently impossible. If, on the other hand, this self-division of the mind does not take place, then if two ideas are nevertheless to be perceived at the same instant, it should appear that these ideas must be fo blended with each other, that neither of them could appear distinct. If we examine the manner in which a complex idea is perceived, we shall find very clearly, that the whole of such an idea is never present to the mind at once. In thinking of a centaur, for instance, can we at the same moment be thinking of the parts of a man and the parts of a horse? Can we not almost detect the gliding of the mind from the one to the other? In contemplating the complex idea of gold, are the ideas of its colour, ductility, hardness, and weight, all present to the mind at the same instant? I think, if we accurately attend to it, we shall find a perceptible time has elapsed before this complex idea has been perfectly formed in our mind; but if all the parts of a complex idea cannot be recalled at the same instant, is it not reasonable to infer that these parts are also fingly impressed, and not all originally perceived at the same instant?"?

This reasoning is plausible, but perhaps not convincing. Surely we have all been conscious of bodily pain or pleasure with our eyes open, and been affected by perception of disagreeable smells at the very infant that we looked at objects beautifully coloured. That our ideas pass through the mind with great velocity, and that the mind can rapidly turn itself from one subject of contemplation to another, are truths which cannot be controverted; but instead of leading us to suppose that two or more objects cannot be synchronously perceived, or two or more ideas synchronously apprehended, they appear to furnish a complete proof of the reverse of all this. For we beg leave to ask how we come to know that ideas pass with velocity through the mind, if we be not all the while conscious of something that is permanent? If we can contemplate but one idea at once, it is plainly impossible that two or more can be compared together; and therefore we cannot possibly say that any particular train has passed through the mind with a degree of velocity greater or less than that which we have usually experienced; nay, we cannot say that we have ever experienced a train of ideas at all, or even been conscious of a single idea, besides the immediate object of present apprehension. That the mind is an individual, we most readily grant; but that it should therefore be incapable of having two ideas synchronously excited in it, is a proposition for which the author has brought no evidence. That it is difficult to conceive how this is done, we acknowledge; but not that it is more difficult than to conceive how a single idea is excited in the mind; for of the mode in which mind and matter mutually operate upon each other, we can form no conception. We know that objects make an impression on the organs of sense: that this impression is by the nerves communicated to the brain, and that the agitation of the brain excites sensation in the mind: but in what way it excites sensation we know not; and therefore have no reason to suppose that two or more different agitations may not excite two or more synchronous sensations, as well as one agitation excites one sensation. That the agitation given to the brain operates on the mind, is known by experience; but experience gives us no information respecting the mode of that operation. If the mind be, as our author and we suppose it to be, an individual mind, it cannot, as mind, be either divisible or extended; and therefore it is certain that the operation in question cannot be, in the proper sense of the word, impression. Hence we have no right to infer, if two objects be perceived at once, either that the idea of the one must be impressed on a part of the mind different from that which receives the impression of the other, or that the two impressions must be so blended with each other, that neither of them could appear distinct; for this would be to reason from one mode of operation to another; with which, upon acknowledged principles, it can have nothing in common.

By far the greater part of our ideas are relics of vivid sensations; and of every thing which we can actually see at once, we may at once contemplate the idea. That he could at once perceive a centaur, if such a being were presented us, cannot surely be doubted by any one who has ever looked at a horse in close proximity; and therefore that we can at the same moment contemplate the whole idea of a centaur, is a fact of which consciousness will not permit us to doubt.

If, indeed, we choose to analyze this complex idea in-
PERCEPTION, if we examine the term, is self-evident that the mind
must glide from the one to the other, because the very
analysis consists in the separation of the parts, of which,
if after that process we think of them, we must think in
succession: but that we may have at the same in-
stant, either an actual or ideal view of all the parts of
the centaur united, is a proposition so evident as to
admit of no other proof than an appeal to experience.
In contemplating what the author calls the complex
idea of gold, it cannot be denied that the ideas of its
colour, ductility, hardness, and weight, are never all
prent to the mind at the same instant: but the reason
is obvious. There is no whole in the particular
parts of the word, but some of them are ideas, and some
notions, acquired by very different processes and very
different faculties. Colour is an idea of sensation, im-
mediately suggested through the organ of sight; duct-
ility is a relative notion, acquired by repeated experi-
ments; and gold might be made the object of every
sense, without suggesting any such notion. The writ-
er of this article never found an experiment made on the
ductility of gold, and has therefore a very obscure and
indistinct notion of that property of the metal; but he
is conscious, that he can perceive, at the same in-
stant, the yellow colour an irregular figure of a guinea,
and have a very distinct, though relative notion, of
its hardness.

We conclude, therefore, that the mind is capable
of two or more simultaneous perceptions, or synchronous
ideas; that, during every train which passes through it,
it is conscious of its own permanent existence; and
that if it were limited to the apprehension of one idea at
once, it could not be said in the future or anticipated
of the future, but would appear to it-
self, could it make any comparison, to pass away like
a flash of lightning.

PERCH, in land-measuring, a rod or pole of 16½
feet in length, of which 40 in length and 4 in breadth
make an acre of ground. But, by the customs of fe-
veral counties, there is a difference in this measure.
In Staffordshire it is 24 feet; and in the forest of
Sherwood 23 feet; the foot being there 18 inches
long; and in Hertfordshire a perch of ditching is 21
feet, the perch of walling 16½ feet, and a pole of
denihed ground is 12 feet, &c.

PERCHE, a territory of Orleans in France,
35 miles long, and 30 broad; bounded on the north
by Normandy; on the south, by Maine and Dauphiné,
on the east, by Brabant; and on the west, by Maine.
It takes its name from a forest, and is pretty fertile.
The inhabitants carry on a pretty good trade; and
the principal town is Bellefle.

PERCULATION, the same with FILTRATION.
See CRYSTALLIZATION, no. 568.

PERCUSSION, in mechanics, the impression a
body makes in falling or striking upon another; or
the shock of two bodies in motion.

PERDICIUM, in botany; A genus of the poly-
gamia superflua order, belonging to the fynomena
class of plants; and in the natural method ranking
under the 49th order, Compuestas. The receptacle is
naked; the pappus is simple; the florets bilabiate.
PERDIX. See TETRADO
PEREASLA, a strong populous town of Po-
land, in the palatinate of Klavin, situated on the river
Perea, in Lat. 53° 44°, N. Long. 49° 46.

PERENNIALS, or PERENNIAL FLOWERS, in bot-
any; a term applied to those plants whose roots will
abide many years, whether they retain their leaves in
winter or not. Those which retain their leaves are
called evergreen; but such as cast their leaves are
named deciduous, or perennials.

PERFECT, something to which nothing is want-
ing, or that has all the requisites of its nature and
kind.

PERFECT Cadence, in music. See Cadence.

PERFECT Tense, in grammar. See PRETERITE.

PERFECTION, the state or quality of a thing
PERFECT.

Perfection is divided, according to Chauvinus, into
physical, moral, and metaphysical.

Physical or natural perfection, is that whereby a
thing has all its powers and faculties, and those too
in full vigour; and all its parts both principal and se-
condary, and those in their due proportion, constitu-
tion, &c., in which sense man is said to be perfect
when he has a found mind in a found body. This
perfection is by the schools frequently termed perfectu-
num, because a thing is enabled thereby to perform all its
operations.

Moral perfection is an eminent degree of virtue or
moral goodness, to which men arrived by repeated acts
of piety, beneficence, &c. This is usually subdivided
into absolute or inherent, which is actually in him to
whom we attribute it; and imputative, which exists in
some other, and not in him it is attributed to.

Metaphysical, transcendental, or essential perfection,
is the possession of all the essential attributes, or of all
the parts necessary to the integrity of a substance; or it is
that whereby a thing has or is provided of every thing
belonging to its nature. This is either absolute, where all
imperfectness is excluded, such is the
perfection of God; or secundum quid, and in its
kind.

PERFORANS MANUS,
PER FORANUS MANUS,
PERFORATUS MANUS,
PERFORATUS PEDIS,
PERFORATUS PEDIS,
PER FORATUS PEDIS,
See Anatomy, Table of the Muscles.

PERFUME, denotes either the volatile effluvia,
from any body affecting the organ of smelling, or the
substance emitting those effluvia; in which last sense
the word is most commonly used. The generality of
perfumes are made up of musk, ambergris, civet, rose
and cedar woods, orange-flowers, jaffamines, jonquils,
tuberose, and other odoriferous flowers. Those drugs
commonly called aromatics, such as tobacco, frankin-
calls, clove, nutmeg, &c., enter the composition
of a perfume; some are also compounded of aromatic
herbs or leaves, as lavender, marjoram, sage, thyme,
hyssop, &c.

The use of perfumes was frequent among the He-
brews, and among the orientals in general, before it was
known to the Greeks and Romans. In the time of Mo-
ses perfumes must have been known in Egypt, since he
speaks of the art of the perfumer, and gives the com-
position of two kinds of perfumes (Exod. xxx. 25.), of
which one was to be offered to the Lord upon the
golden altar, which was in the holy place; and the
other.
other was appointed for the anointing of the high priest and his sons (ibid. 34, &c.), as also of the tabernacle, and all the vessels that were used in divine service.

The Hebrews also perfumes which they made use of in embalming their dead. The composition is not known, but it is certain that they generally made use of myrrh, aloes, and other strong and aromatic drugs, proper to prevent putrefaction (John xix. 49.) See the article Embalming.

Besides the perfumes for these purposes, the Scripture mentions other occasions wherein the Hebrews used perfumes. The spoule in the Canticles (i. 3.) commends the scent of the perfumes of her lover; and her lover in return says, that the scent of the perfumes of his spoule surpasses the most excellent odours (ibid. iv. 10, 14.) He names particularly the spikenard, the calamus, the cinnamon, the myrrh, and the aloes, as making a part of these perfumes. The voluptuous woman described by Solomon (Prov. vii. 17.) says, that she had perfumed her bed with myrrh, aloes, and cinnamon. The epicures in the book of Wisdom (vi. 27) encourage another to the luxuriant use of odours and costly perfumes.

Idub (vii. 9.) reproaches Judah, whom he describes as a spoule faithless to God, with being painted and perfumed to please strangers, "Thou wentest to the king with ointment, and didst increase thy perfumes." Ezekiel (xxii. 41) laments to the Jews with having profaned the odours and perfumes, the use of which was reserved to sacred things, by applying them to their own use.

They came afterwards to be very common among the Greeks and Romans, especially those composed of musk, ambergris, and civet. The nardus and melabathrum were held in much estimation, and were imported from Syria. The unguentum nardusum was very much prepared, and contained many ingredients. Melabathrum was an Indian plant. Perfumes were also used at sacrifices to regain the gods; at feasts, to increase the pleasures of sensual; at funerals, to overpower nauseous smells, and please the manes of the dead; and in the theatres, to prevent the offensive effluvia, proceeding from a crowd, from being perceived.

Since people are become sensible of the harm they do to the head, perfumes are generally diluted among us; however, they are still common in Spain and Italy.

PERGAMA (Virgil), the citadel of Troy; which, because of its extraordinary height, gave name to all high buildings (Servius). Others say the walls of Troy were called Pergamus.

PERGAMUS (Pliny); also called Pergamum, (Virgil); Pergamum (Plutarch); a town of Crete, built by Agamemnon in memory of his victory, (Velleius). Here was the burying-place of Lycurgus, (Aristopenes, quoted by Plutarch). It was situated near Cydonia (Servius); to what point not said: but Scylax helps us out, who places the Daedalymenae temple of Diana, which stood near Cydonia (Strabo), to the north of the territory of Pergamum.—Another PERGAMUM (Pliny, Strabo); a town of Myia, situated on the Cucus, which runs by it. It was the royal residence of Eumenes, and of the kings of the Attali (Livy). There an ancient temple of Aesculapius stood; an asylum (Tacitus). The ornament of Pergamum was the royal library, yea with that of Alexandria in Egypt; the kings of Pergamum and Egypt rivaling each other in this respect (Pliny). Strabo ascribes this rivalry to Eumenes. Plutarch reckons up 200,000 volumes in the library at Pergamum. Here the membrana pergaminea, whence the name parchment, were invented for the use of books, (Varro, quoted by Pliny). The country of Galen, and of Oribasius chief physician to Julian the Apostate (Euapius), called by some the age of Galen. Here P. Scipio died (Cicero). Attalus son of Eumenes dying without issue, bequeathed his kingdom to the Roman people, who reduced it to a province, (Strabo). Pergamum, the epiphlet (Martial). Here was one of the nine conventus juridici, or assemblies of the Aphia Romana, called Pergamum, and the ninth in order (Pliny); which he also calls jurisdictio Pergamum.

PERGAMUS, an ancient kingdom of Aphi, formed out of the ruins of the empire of Alexander the Great. It commenced about the year 283. The first sovereign was one Philoerus an eunuch, by birth a Paphlagonian, of a mean condition; and in his youth a servile servant to Antigonus one of Alexander's captains. He afterwards served Lyssimachus king of Macedon and Thrace, who appointed him keeper of his treasures. He digged in Pergamum. While he held this employment, having fallen under the displeasure of Arinoe wife to Lyssimachus, the found means to make a quarrel between him and his master; upon which Philoerus seized on the castle of Pergamum, together with the treasures entrusted to his care, amounting to 90,000 talents. At first he offered his service together with his treasures, to Seleucus king of Syria: but both Seleucus and Lyssimachus dying soon after, he kept possession of the town and treasure aloft till his death; which happened 20 years after his revolt from Lyssimachus.

Philetarus left the city of Pergamum to his brother, or, according to some, to his brother's son Eumenes I., and he, laying hold of the opportunity offered by the discontents among the Seleucides, polled himself of many strong-holds in the province of Aphi; and having hired a body of Galatians, defeated Antiochus, as he was returning from a victory gained over his brother Seleucus Callinicus. By this victory he obtained possession of the greater part of Aphi; however, he did not long enjoy his acquisitions; for he died next year of immoderate drinking, a vice to which he was greatly addicted.

Eumenes was succeeded by Attalus I., nephew of Philoerus, and the first who took upon him the title of king of Pergamum. He defeated the Gauls, who were desirous of settling in his territory; and, according to Livy, was the first of the Attalic princes who refused to pay a contribution to the barbarians. When Seleucus Cerammon was engaged in other wars, he invaded his territories, and conquered all the provinces on this side of Mount Taurus; but was soon driven out of his new acquisitions by Seleucus and his grandson Achaus, who entering into an alliance against him, deprived him of all his newly acquired territories, and even befeiged him in his capital. Upon his death...
Pergamus. Attalus invited to his assistance the Gauls who had settled in Thrace; and with their help not only obliged the enemy to raise the siege of Pergamus, but quickly recovered all the provinces he had lost. After this he invaded Ionia and the neighbouring provinces, where several cities voluntarily submitted to him. The Teians, Colonians, with the inhabitants of Egea and Lemnos, sent duplities declaring themselves ready to acknowledge him for their sovereign; the Carianas, on the other side the river Lykos, opened their gates to him, having first expelled the governor set over them by Achaeus. From thence he advanced to Apia, and encamping on the banks of the river Megeithus, received homage from the neighbouring nations. But here the Gauls, being frightened by an eclipse of the moon, refused to proceed farther; which obliged Attalus to return to the Hellespont, where he allowed his allies to settle, giving them a large and fruitful territory, and promising that he would always afford and protect them to the utmost of his power.

Attalus having thus settled his affairs with equal honour and advantage to himself, entered into an alliance with Rome, and afterwards joined them in their war against Philip king of Macedon. Here he had the command of the Rhodian fleet; with which he not only drove the Macedonians quite out of the seas, but having landed his men, he, in conjunction with the Athenians, invaded Macedon, and obliged Philip to raise the siege of Athens, which he had greatly diversified; for which services the Athenians not only heaped on him all the favours they could, but called one of their tribes by his name; an honour they had never before bestowed on any foreigner before.

Attalus, not contented with all he had yet done against Philip, attempted to form a general confederacy of the Greeks against him. But while he was haranguing the Bœotians to this purpose, and exhorting them with great vehemence to enter into an alliance with the Romans against their common enemy, he fell down speechless. However, he came to himself again, and desired to be carried by sea from Thessob to Pergamus, where he died soon after his arrival, in the 72d year of his age and 43d of his reign.

This prince was a man of great generosity, and such an enthusiastic in learning and learned men, that he caused a grammarian named Daphidus to be thrown into the sea from the top of a high rock, because he spoke disrespectfully of Homer.

Attalus was succeeded by his eldest son Eumenes II. He was exceedingly attached to the Romans, inasmuch that he refused the daughter of Antiochus the Great in marriage, lest he should thus have been led into a difference with that people. He also gave notice to the Roman senate of the transgressions of Ariarathes king of Cappadocia, who was making great preparations both by sea and land. Nor did Eumenes stop here; for when he saw the war about to break out between Antiochus and the Romans, he sent his brother Attalus to Rome to give information of the proceedings of Antiochus. The senate heaped honours both on Eumenes and his brother; and in the war which followed, gave the command of their fleet to the king of Pergamus in conjunction with C Livius Salinator. The victory gained on this occasion was in great measure owing to Eumenes, who boarded some of the enemy's ships in person, and during the whole action behaved with uncommon bravery. Some time afterwards Eumenes, entering the territories of Antiochus with a body of 5000 men, ravaged all the country about Thyatira, and returned with an immense booty. But in the mean time Antiochus invading Pergamus in his turn, ravaged the whole country, and even laid siege to the capital. Attalus, the king's brother, held out with an handful of men till the Achaean, who were in alliance with Eumenes, sent 1000 feet and 100 horse to his assistance. As this small body of auxiliaries were all chosen men, and commanded by an experienced officer, they behaved with such bravery that the Syrians were obliged to raise the siege. At the battle of Magnesia it, Eumenes behaved with the greatest bravery; not only fulfilling the first attack of the enemy's elephants, but driving them back again on their own troops, which put the ranks in disorder, and gave the Romans an opportunity of giving them a total defeat by attacking them opportunistly with their horse. In consequence of this defeat, Antiochus was obliged to conclude a peace with the Romans on such terms as they pleased to prescribe; one of which was, that he should pay Eumenes 400 talents, and a quantity of corn, in recompense for the damage he had done him.

Eumenes now thought of obtaining some reward from the Romans equivalent to the services he had done them. Having gone to Rome, he told the senate, that he was come to beg of them that the Greek cities which had belonged to Antiochus before the commencement of the late war, might now be added to his dominions; but his demand was warmly opposed by the ambassadors from Rhodes, as well as by deputies from all the Greek cities in Asia. The senate, however, after hearing both parties, decided the matter in favour of Eumenes, adding to his dominions all the countries on this side of Mount Taurus which belonged to Antiochus; the other provinces lying between that mountain and the river Meander, excepting Lycia and Caria, were bestowed on the Rhodians. All the cities, which had paid tribute to Attalus, were ordered to pay the same to Eumenes; but such as had been tributary to Antiochus were declared free.

Soon after this Eumenes was engaged in a war with Prusias king of Bithynia, who made war upon him by the advice of Hannibal the celebrated Carthaginian general. But Eumenes, being affiled by the Romans, defeated Prusias in an engagement by sea, and another by land; which so disheartened him, that he was ready to accept of peace on any terms. However, before the treaty was concluded, Hannibal found means to draw Philip of Macedon into the confederacy, who sent Philocles, an old and experienced officer, with a considerable body of troops to join Prusias. Hereupon Eumenes sent his brother Attalus to Rome with a golden crown, worth 15,000 talents, to compel Prusias for making war on the allies of the Roman people without any provocation. The senate accepted the present, and promised to adjut all every thing to the satisfaction of their friend Eumenes, whom they looked upon to be the most ready ally they had in Asia. But in the mean time Prusias, having ventured another sea-fight, by a contrivance of Hannibal's, gained a complete
complete victory. The Carthaginian commander adviced him to fill a great many earthen vessels with various kinds of serpents and other poisonous reptiles, and in the heat of the light with an appliance for setting them on fire, and let the serpents loose. All the soldiers and seamen were commanded to attack the ship in which Eumenes was, and only to defend themselves as well as they could against the reft; and that they might be in no danger of misfiring the ship, an herald was sent before the engagement with a letter to the king. As soon as the two fleets drew near, all the ships of Prusias, singling out that of Eumenes, discharged such a quantity of serpents into it, that neither folders nor sailors could do their duty, but were forced to fly to the shore, left they should fall into the enemy's hands. The other ships, after a faint resistance, followed the king's example, and were all driven ashore with great slaughter, the officers being no less annoyed by the stings of the serpents, than by the weapons of the enemy. The greatest part of the ships of Eumenes were burnt, several taken, and the others so much shattered that they became quite unserviceable. The fame year Prusias gained two remarkable victories over Eumenes by land, both of which were entirely owing to stratagems of Hannibal. But, while matters were thus going on to the disadvantage of Eumenes, the Romans interfered, and by their deputies not only put an end to the differences between the two kings, but prevailed on Prusias to betray Hannibal; upon which he inflicted himself, as hath been related under the article Hannibal.

Eumenes being thus freed from such a dangerous enemy, engaged in a new war with the kings of Cappadocia and Pontus, in which also he proved victorious. His friendship for the Romans he carried to such a degree of enthusiasm, that he went in person to Rome to inform them of the machinations of Perseus king of Macedon. He had before quarrelled with the Rhodians, who sent ambassadors to Rome to complain of him. But as the ambassadors happened to arrive while the king himself was present in the city, the Rhodian ambassadors could not obtain any hearing, and Eumenes was disgraced with new marks of censure. This journey, however, had almost proved fatal to him; for, on his return, as he was going to perform a sacrifice at Delphi, two serpents, sent by Perseus, rolled down two great stones upon him as he entered the straits of the mountains. With one he was dangerously wounded on the head and with the other on the shoulder. He fell with the blows from a steep place, and thus received many other bruises; so that he was carried on board his ship when it could not well be known whether he was dead or alive. His people, however, soon finding that he was still alive, conveyed him to Corinth, and from Corinth to Eginia, having cauaged their vessels to be carried over the Ilissus.

Eumenes remained at Eginia till his wounds were cured, which was done with such secrecy, that a report of his death was spread all over Asia, and even believed at Rome; nay, his brother Attalus was so convinced of the truth of this report, that he not only assumed the government, but even married Stratonice the wife of Eumenes. But in a short time Eumenes convinced them both of his being alive, by returning Pergamus to his kingdom. On the receipt of this news, Attalus resigned the fovereignty in great haste, and went to meet his brother; carrying an helmet, as one of his guards. Eumenes received both him and the queen with great tenderness, nor did he ever fay any thing which might tend to make them uneasy; only it is said he whispered in his brother's ear when he first saw him, "Be in no haste to marry my wife again till you are sure that I am dead."

The king being now more than ever exasperated against Perseus, joined the Romans in their war against him; but during the course of it he suddenly cooled in his affections towards those allies whom he had hitherto served with so much zeal, and that to such a degree, that he admitted ambafladors from Perseus, and offered to band neuter if he would pay him 1000 talents, and for 1500, to influence the Romans to grant him a safe and honourable peace. But those negotiations were broke off without effect, by reason of the distrust which the two kings had of one another. Eumenes could not trust Perseus unless he paid him the money beforehand; while, on the other hand, Perseus did not care to part with the money before Eumenes had performed what he promised; neither could he be induced to pay the sum in question, though the king of Pergamus offered to give hostages for the performance of his promise. What the reason of such a sudden change in the disposition of Eumenes was, is nowhere told; however, the fact is certain. The negotiations above-mentioned were concealed from the Romans as long as possible; but they soon came to be known; after which the republic began to entertain no small jealousy of their old friend, and therefore heaped favours on his brother Attalus, without taking any notice of the king himself. Eumenes had sent him to Rome to congratulate the senate on the happy issue of the war with Perseus, not thinking that his practices had been discovered. However, the senate, without taking any notice of their dissatisfaction to Eumenes at first, entertained Attalus with the greatest magnificence; then several of the senators who visited him proceeded to acquaint him with their suspicions of the king, and desired Attalus to treat with him in his own name, assuring him, that the kingdom of Pergamus would be granted him, if he demanded it, by the senate. These speeches had at first some effect; but Attalus, being of an honest disposition, and afficted by the advice of a physician called Stratus, a man of great probity, resolved not to comply with their desire. When he was admitted to the senate, therefore, he first congratulated them on the happy issue of the Macedonian war, then modestly recounted his own services; and lastly, acquainted them with the motive of his journey; intreated them to send ambafladors to the Gauls, by whom their authority might secure his brother from any danger of their hostilities; and he requested them also, that the two cities of Thessalonica and Maronea might be bestowed on him; felf. The senate, imagining that Attalus designed to choose some other day to sue for his brother's kingdom, not only granted all his requests, but fent him richer and more magnificent presents than they had ever done before. Upon this Attalus immediately set out on his return to Pergamus; which so provoked the senators, that they declared
AttaIus, thus rendering ineffectual their promise which they were ashamed openly to revoke; and as for the Gauls, who were on all occasions ready to invade the kingdom of Pergamus, they sent ambassadors to them, with instructions to behave in a manner as would rather tend to encourage them in their design than dissuade them from it.

Eumenes, being alarmed at these proceedings, resolved to go in person to Rome, in order to justify himself. But the senate, having already condemned him in their own minds, resolved not to hear his vindication. For this reason, as soon as they heard of his design, they made an act that no king should be permitted to enter the gates of Rome. Eumenes, however, who knew nothing of this act, set forward on his journey, and landed at Brundusium; but no sooner did the Roman senate get intelligence of his arrival there, than they sent a few senators and princes to the decree of the senate, and telling him at the same time, that if he had any business to transact with the senate he was appointed to hear it, and transmit it to them; but if not, that the king must leave Italy without delay. To this Eumenes replied, that he had no business of any consequence to transact, and that he did not stand in need of any of their assistance; and without saying a word more, went on board his ship, and returned to Pergamus.

On his return home, the Gauls, being encouraged by the cold reception which he had met with at Rome, invaded his territories, but were repulsed with great loss by the king, who, afterwards invaded the dominions of Prusias, and possessed himself of several cities. This produced new complaints at Rome; and Eumenes was accused, not only by the ambassadors of Prusias, but also by those of the Gauls and many cities in Asia, of keeping a secret communication with Perseus king of Macedon. This last charge was confirmed by some letters which the Romans themselves had intercepted; so that Eumenes found it impossible to keep up his credit any longer at Rome, though he sent his brothers Athenaeus and Attalus thither to intercede for him. The senators, in short, had conceived the most implacable hatred against him, and feared absolutely bent on his destruction, when he died, in the 39 year of his reign, leaving his kingdom and his wife to his brother Attalus. He left one son, but he was an infant, and incapable of governing the kingdom; for which reason Eumenes chose rather to give the present possession of the crown to his brother, reserving the succession to his son, than to endanger the whole by committing the management of affairs to his son's tutors.

Attalus, in the beginning of his reign, found himself greatly diffraeted by Prusias king of Bithynia, who not only overthrew him in a pitched battle, but advanced to the very walls of Pergamus, ravaging the country as he marched along; and at last reduced the royal city itself. The king, however, saved himself by a timely flight, and dispatched ambassadors to Rome, complaining of the bad usage of Prusias. The latter endeavoured to defend himself, and to throw the blame on Attalus. But, after a proper inquiry was made into the matter, Prusias was found to be entirely in the wrong; in consequence of which, he was at last obliged to conclude a peace with his adversary on the following terms. 1. That he should immediately deliver up to Attalus 20 ships with decks. 2. That he should pay 500 talents to Attalus within the space of 20 years. 3. That he should pay 100 talents to some of the other Asiatic nations by way of reparation for the damages they had sustained from him. And, 4. Both parties should be content with what they had before the beginning of the war.

Some time after this, Prusias having made an unnatural attempt on the life of his son Nicomedes, the latter rebelled, and, with the assistance of Attalus, drove his father from the throne, and, as is said, even murdered him in the temple of Jupiter. The Romans took no notice of these transactions, but showed the same kindness to Attalus as formerly. The last enterprise in which we find Attalus engaged, was against Andrianus the pretended son of Perseus king of Macedon, when he afflicted the Romans; after which he gave himself up entirely to ease and luxury, committing his affairs entirely to his ministers; and thus continued to his death, which happened in the 82d year of his age, about 138 B.C.

Attalus II. was succeeded by Attalus III. the son of Eumenes; for the late king, considering that he only held the crown as a truft for his nephew, passed by his own children in order to give it to him, tho' he appears to have been by no means worthy of it. He is said to have been deprived of his sences throu' the violence of his grief for his mother's death; and indeed, throughout his whole reign, he behaved more like a madman than anything else. Many of his subjects of the highest quality were cut off with their wives and children, upon the most groundless suspicions; and for these executions he made use of mercenaries hired out from among the most barbarous nations. Thus he proceeded till he had cut off all the best men in the kingdom; after which he fell into a deep melancholy, imagining that the ghosts of those whom he had murdered were perpetually haunting him. On this he flung himself up in his palace, put on a mean apparel, let his hair and beard grow, and seducled himself from all mankind. At last he withdrew from the palace, and retired into a garden, which he cultivated with his own hands, and filled with all sorts of poisonous herbs. These he used to mix with wholesome pulate, and send packets of them to such as he suspected. At last, being weary of his amusements, and living in solitude, because no body durst approach him, he took it in his head to follow the trade of a foundry, and make a brazen monument. But, while he laboured at melting and casting the brass, the heat of the sun and furnace threw him into a fever, which in seven days put an end to his tyranny, after he had sat on the throne five years.

On the death of the king, a will was found, by which he left the Roman people heirs of all his goods; upon which they seized on the kingdom, and reduced it to a province of their empire by the name of Asia Proper. But Arilonicus, a son of Eumenes by an Ephesian courtean reckoning himself the lawful heir to the crown, could by no means be satisfied with this usurpation of the Romans, and therefore assembled a considerable army to maintain his pretensions. The people in general, having been accustomed to a mon-
Pergamus, narchy, dreaded a republican form of government; in consequence of which, they afflicted Arilonicus, and soon put him in a condition to reduce the whole kingdom. The news, however, were soon carried to Rome; and Licinius Craflus, the pontifex maximus, was sent into the caft, with orders to enforce obedience to the king's will. Historians take no notice of any forces which were sent along with this commander; whence it is supposed, that he depended on assistance from the Asiatics, who were in alliance with Rome, or from the Egyptians. But when he came thither, he found both the Syrians and Egyptians so reduced, that he could not expect any assistance from them. However, he was soon supplied with troops in plenty by Bithynia, Cappadocia, and Phaphagonia; but managed matters so ill, that he was entirely defeated and taken prisoner. Those who took him, designed to carry him to Arilonicus; but, he not able to endure the disgrace, would have laid violent hands on himself if he had not been disarmed. However, being allowed to keep a rod for managing the horse on which he fat, he struck a Thracian soldier who stood near him fo violently with it, that he beat out one of his eyes; upon which the other drew his sword, and ran him thro' on the spot. His head was brought to Arilonicus, who exposed it to public view; but the body was honourably buried.

Arilonicus had no great time to enjoy the fruits of his victory. Indeed he behaved very improperly after it; for, instead of preparing to oppose the next army, which he might have been assured the Romans would send against him, he spent his time in feasting and revelling. But he was soon routed out of his lethargy by Perpenna the new confull, who having assembled with incredible expedition the troops of the allies, came unexpectedly upon him, obliged him to venture an engagement at a disadvantage, and entirely defeated him. Arilonicus fled to a city called Stratonic; but was so closely pursued by the conqueror, that the garrifon, having no method of supplying themselves with provisions, delivered up their leader, as well as a philosopher named Biflours, who had been the companion and counsellor of Arilonicus. The philosopher behaved with great resolution after being taken, and openly defended his siding with Arilonicus, because he thought his cause just. He exhorted the latter to prevent the disgrace and misery of captivity by a voluntary death; but Arilonicus, looking upon death as a greater misery than any captivity, suffered himself to be treated as his conquerors pleased.

In the mean time, a new confull, named Manius Aquilinus, being arrived from Rome, sent a moft haughty message to Perpenna, requiring him immediately to deliver up Arilonicus, as a captive belonging to his triumph when the war should be ended. With this demand Perpenna refused to comply, and his refusal had almost produced a civil war. However, this was prevented by the death of Perpenna, which happened soon after the dispute commenced. The Pergame¬nians, notwithstanding the defeat and captivity of their leader, still held out with much obstinacy that Aquilinus was obliged to besiege, and take by force, almost every city in the kingdom. In doing this, he took a very effectual, though exceeding cruel method. Most of the cities in the kingdom had no other water than what was brought from a considerable distance in Pergunnah aqueducts. These Aquilinus did not demolish but poisoned the water, which produced the greatest abhorrence of him throughout all the caft. At last, however, the whole country being reduced, Aquilinus triumphed, the unhappy Arilonicus was led in chains before his chariot, and probably ended his miserable life in a dungeon. The country remained subject to the Romans while their empire lasted, but is now in the hands of the Turks. The city is half ruined, and is still known by the name of Pergamus. It is inhabited by about 3000 Turks, and a few families of poor Christians.

E. Long. 27, 27. N. Lat. 30. 3.

PERGUNNAH, in the language of Hindoostaan, means the largest subdivision of a province, whereas the revenues are brought to one particular head Cuthbery, from whence the accounts and cash are transmitted to the general Cuthery of the province.

PERIAGOGE, in rhetoric, is used where many things are accumulated into one period which might have been divided into several.

PERIAGUA, a fort of large canoe made ufe of in the Leeward islands, South America, and the gulf of Mexico. It is composed of the trunks of two trees hollowed and united together; and thus differs from the canoe, which is formed of one tree.

PERIANDER, tyrant of Corinth and Corcyra, was reckoned among the seven wise men of Greece; though he might rather have been reckoned among the most wicked men, since he changed the government of his country, deprived his countrymen of their liberty, usurped the sovereignty, and committed the most shocking crimes. In the beginning of his reign he behaved with mildness; but after his having sent to the tyrant of Syracuse to consult him on the safest method of government, he abandoned himself to cruelty. The latter, having heard Periander's envoys, took them into a field, and, instead of answering them, pulled up before them the ears of corn which exceeded the reit in height. Periander, on being told of this action, understood what was meant by it. He first secured himself by a good guard and then put the most powerful Corinthians to death. He abandoned himself to the most enormous crimes; committed incest with his mother, killed to death his wife Melitta, daughter of Procles king of Epidaurus, notwithstanding her being with child; and was so enraged at Lycophon, his second son, for lamenting his mother's death, that he banished him into the island of Corcyra. Yet he pafled for one of the greatest politicians of his time; and Heraclides tells us, that he forbade voluptuousness; that he imposed no taxes, contenting himself with the custom arising from the sale and the import and export of commodities; that, tho' wicked himself, he hated the wicked, and caused all pimps to be drowned; lastly, that he established a female, and settled the expence of its members. He died 585 B.C.

PERIANTHIUM, (from πειραθιον, "round," and ἄθος, "the flower,") the flower cup properly so called, the most common species of calyx, placed immediately under the flower, which is contained in it as in a cup. See BOTANY, p. 433, col. 1.

PERICARDIUM, in anatomy, a membranous bag filled with water, which contains the heart in man and...
and many other animals. It is formed by a duplicature of the median tum, or membrane which divides the thorax into two unequal parts. See Anatomy, n. 121.

PERICARPIUM, (from περικερύς “round,” and καρπός “fruit,”) the feed vesel; an entral of the plant big with feeds, which it discharges when ripe. The feed-vesel is in fact the developed seed bud, and may very properly be compared to the fecundated ovary in animals; for it does not exist till after the fertilizing of the feeds by the male dust, and the consequent fall of the flower. All plants, however, are not furnished with a feed-vesel; in such as are deprived of it, the receptacle or calyx performs its functions by inclining the feeds, as in a matrix, and accompanying them to perfect maturity.

PERICHORUS, in antiquity, a name given by the Greeks to their profane games or combats, that is, to such as were not consecrated to any of the gods.

PERICLES, was one of the greatest men that ever flourished in Greece. He was educated with all imaginable care; and besides other matters, he had for his tutors Zeno, Eleates, and Anaxagoras. He learned from the laft of these to fear the gods without superstition, and to account for an eclipse from a natural cause. Many were unjust enough to suspect him of atheism, because he had perfectly studied the doctrine of that philosopher. He was a man of undoubting courage; and of such extraordinary eloquence, supported and improved by knowledge, that he gained almost as great an authority under a republican government as if he had been a monarch; but yet he could not escape the satirical frokes of the comic poets. His discourses with the women were one of the vices with which he was chiefly charged. He died the third year of the Peloponnesian war, after long sickness, which had weakened his understanding. Aephaia, Pericles's favourite, was a learned woman of Miletus; she taught Socrates rhetoric and politics. As Pericles cared not much for his wife, he willingly gave her up to another, and married Aephaia, whom he passionately loved.

PERICRANIUM, in anatomy, a thick solid coat or membrane covering the outside of the cranium or skull. See Anatomy, n. 4.

PERIGEE, in astronomy, that point of the sun or moon's orbit wherein they are at the least distance from the earth, in which sense it flands opposed to apogee.

PERIGEUX, an ancient episcopal town of France, capital of the province of Perigord, seated on the river Isle, in E. Lon. o. 53. N. Lat. 45. 18. It is remarkable for the ruins of the temple of Venus, and an amphitheatre.

PERIGORD, a province of France, which makes part of Guienne, bounded on the north by Angoumois and a part of Marne, and on the ealt by Quercy and Limousin; on the south by Agenois and Baza-
dois; and on the west, by Bourledois, Angoumois, and a part of Saintonge. It is about 83 miles in length, and 60 in breadth. It abounds in iron mines, and the air is pure and healthy. Perigex is the capital town.

PERIGORD-Stone, an ore of mangaenite, of a dark grey colour, like the bafaltes or trappe. It may be scraped with a knife, but is extremely difficult to be broken. It is found of no regular figure, is very compact, heavy, and as black as charcoal. Its appearance is glittering and flinted, like the ore of antimonii; its particles being disposed in the form of needles, crossing one another without any agglutination, infomuch that some are loose as iron-shot; when fluck to a lodestone; resembling the scoria from a blacksmith's furnace. By calcination it becomes harder and of a reddish-brown colour, but is not attracted by the magnet. It has a considerable specific gravity, does not melt per /, but with borax runs into a glass of the colour of an amethyst. It is scarcely affected by nitrous acid without the addition of sugar. It seems also to contain some argil and iron. It is met with in Gascony and Dauphiny in France, and in some parts of England. It is employed by the French potters and enamellers in the glazy varnish of their earthen wares.

PERIGRAPHE, a word usually understood to express a careless or inaccurate delineation of anything; but in Vellus it is used to express the white lines or impressions that appear on the musculus rectus of the abdomen.

PERIHELION, in astronomy, that part of a planet or comet's orbit wherein it is in its least distance from the sun, in which sense it stands in opposition to aphelium.

PERIMETER, in geometry, the bounds or limits of any figure or body. The perimeters of surfaces or figures are lines; those of bodies are surfaces. In circular figures, instead of perimeter, we say circumference, or periphery.

PERINEUM, or PERINEUM, in anatomy, the space between the anus and the parts of generation, divided into two equal lateral divisions by a very distinct line, which is longer in males than in females.

PERINSKIOLD (John), a learned Swedish writer, born at Stredniva in Suederania, in 1654, studied under his father, who was professor of eloquence and poetry, and afterwards became well skilled in the antiquities of the north. He was made professor at Upsal, secretary antiquary of the king of Sweden, and councillor of the chancery of antiquities. He died in 1720. His principal works are; 1. A History of the Kings of Norway. 2. A History of the Kings of the North. 3. An Edition of John Meffenius on the Kings of Sweden, Norway, and Denmark, in 14 vols folio, &c. All Perinskiold's works are excellent, and highly esteemed.

PERIOD, in astronomy, the time taken up by a star or planet in making a revolution round the sun; or the duration of its course till it return to the same part of its orbit. See Planet.

The different periods and mean distances of the several plants are as follow:

<table>
<thead>
<tr>
<th>Planet</th>
<th>Days</th>
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<th>mean Diff.</th>
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<tr>
<td>Saturn</td>
<td>10579</td>
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<td>953800</td>
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<tr>
<td>Jupiter</td>
<td>4332</td>
<td>12</td>
<td>52010</td>
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<tr>
<td>Mars</td>
<td>686</td>
<td>27</td>
<td>152309</td>
</tr>
<tr>
<td>Earth</td>
<td>365</td>
<td>9</td>
<td>100000</td>
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<td>Venus</td>
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<tr>
<td>Mercury</td>
<td>87</td>
<td>23</td>
<td>18670</td>
</tr>
</tbody>
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There is a wonderful harmony between the distances of...
of the planets from the sun, and their periods round
him; the great law whereof is, that the squares of the
periodical times of the primary planets, are to each
other as the cubes of their distances from the sun:
and likewise, the squares of the periodical times of the
secondaries of any planet are to each other as the cubes
of their distances from that primary. This harmony
among the planets is one of the greatest confirmations
of the Copernican hypothesis. See Astronomy, n°
414.

For the periods of the moon, see Astronomy, n°
422, and observe Index to astronomy.

Period, in chronology, denotes a revolution of a
certain number of years, or a series of years, whereby,
in different nations, and on different occasions, time is
measured; such are the following.

Calippic Period, a system of seventy-six years. See
Calippic, and Astronomy, n° 1, &c.

Dionysian Period, or Victorian Period, a system of
532 lunae-solem and Julian years; which being eclipsed,
the characters of the moon fall again upon the same
day and era, and revolve in the same order, accord-
ing to the opinion of the ancients.

This period is otherwise called the great paschal
cycle, because the Christian church first used it to find
the true time of the pascha or Easter. The sum of these
years arise by multiplying together the cycles of the
sun and moon.

Hipparchus’s Period, is a series of 304 solar years,
returning in a constant round, and restoring the new
and full moons to the same day of the solar year, ac-
cording to the sentiment of Hipparchus. This period
arises by multiplying the Calippic period by four.

Hipparchus assumed the quantity of the solar year
to be 365 days 5 hours 55; 10"; and hence con
duced, that in 104 years Calippus’s period would err a whole
day. He therefore multiplied the period by four, and
from the product cast away an entire day. But
even this does not restore the new and full moons to the
same day throughout the whole period; but they are
sometimes anticipated 1 day 8 hours 234 29" 20".
See Astronomy, n° 14.

Julian Period. See Julian.

Period, in grammar, denotes a small compass of
discourse, containing a perfect sentence, and distinc-
ted at the end by a point, or full stop, thus (.); and
in members of division marked by commas, col-
ons, &c.

Father Buffier observes two difficulties in the use of the
period, or point; i.e. in distinguishing it from the
colon, or double point; and in determining justly the
end of a period, or perfect sentence. It is remarked,
that the supernumerary members of a period, separated
from the real by colons and semicolons, usually com-
 mencement with a conjunction: yet it is true these same
conjunctions sometimes rather begin new periods than
supernumerary members of old ones. It is the sense of
things, and the author’s own discretion, that must
make the proper distinction which of the two in effect
it is. No rules will be of any service, unless this be ad-
mitted as one, that when what follows the conjunctive
is of as much extent as what precedes it, it is usually
a new period; otherwise not.

The second difficulty arises hence, that the sense
appears perfect in several short detached phrases, where-
in it does not seem there should be periods; a thing
frequent in free discourse: as, We are all in sufpen-
s: make your proposals immediately: you will be to blame for
detaining us longer. Where it is evident, that simple
phrases have perfect senses like periods, and ought to
be marked accordingly; but the shortness of the dis-
course making them easily comprehended, the point
is neglected.

De Colonius defines period a short but perfect sen-
tence, consisting of certain parts or members, depend-
ing one on another, and connected together by one com-
mon vinculum. The celebrated definition of Aristotle
is, a period is a discourse which has a beginning, a
middle, and an end, all visible at one view. Rhetorici-
ens consider period, which treats of the structure of
sentences, as one of the four parts of composition.
The periods allowed in oratory are three: A period of
two members, called by the Greeks δίοδος, and by the
Latins binembris; a period of three members, τριοδος,
trimembris; and a period of four, quadrinembris, tetra-
colos. See Punctuation.

Period, in numbers, is a distinction made by a point
or comma, after every sixth place, or figure; and is
used in numeration, for the easier distinguishing and
naming the several figures or places; which see under
Numeration.

Period, in medicine, is applied to certain diseases
which have intervals, and returns, to denote an entire
curse or circle of such disease; or its progress from
one state through all the rest till it return to the same
again.

Galen describes period as a time composed of an in-
tention and remission, wherein it is usually divided into
two parts, the paroxytm or exacerbation, and remis-
ion.

In intermittitent fevers, the periods are usually flated
and regular; in other diseases, as the epilepsy, gout,
&c. they are vague or irregular.

Period, in oratory. See there, n° 47.

PERIODIC, or Periodical, fomething that ter-
minalizes and comprehends a period; such is a periodic
mouth; being the space of time wherein the moon
dispatches her period.

PERIOECT, επιπέδος, in geography, such inhabi-
tants of the earth as have the same latitude, but
opposite longitudes, or live under the same parallel; and
the same meridian, but in different semicircles of that
meridian, or in opposite points of the parallel. Thence
have the same moon seasons throughout the year,
and the same phenomena of the heavenly bodies; but
when it is noon-day with the one, it is midnight with
the other, there being twelve hours in an east and west
direction. Thence are found on the globe by the hour
index, or by turning the globe half round, that is, 180
degrees either way.

PERIOSTEUM, or Periostium, in anatomy, a
nervous vascular membrane, endued with a very quck
sense, immediately surrounding, in every part, both
the internal and external surfaces of all the bones in the
body, excepting only fo much of the teeth as stand
above the gums, and the peculiar places on the bones,
in which the muscles are inserted. It is hence divided
into the external and internal periostium; and where
it
it externally surrounds the bones of the skull, it
is generally called the periocranium. See Anatomy, p. 4.

PERIPATETICS, philosophers, followers of Ari-
totle, and maintainers of the peripatetic philosophy; called also Aristotelians. Cicero says, that Plato left
two excellent disciples, Xenocrates and Aristotle, who
founded two sects, which only differed in name: the
former took the appellation of Academicians, who were
those that continued to hold their conferences in the
Academy, as Plato had done before; the others, who
followed Aristotle, were called Peripatetics, from
peri-\patetikos, "I walk," because they disputed walking
in the Lyceum.

Ammonius derives the name Peripatetic from Plato
himself, who only taught walking; and adds, that the
disciples of Aristotle, and those of Xenocrates, were
equally called Peripatetics; the one Peripatetics of the
Academy, the other Peripatetics of the Lyceum; but
that in time the former quitted the title Peripatetic for
the sake of Academic, on account of the place where
they assembled; and the latter retained simply that of
Peripatetic. The greatest and last part of Aristotle's
philosophy was borrowed from Plato. Sertorius affirms,
and says he could demonstrate, that there is nothing
exquisite in any part of Aristotle's philosophy, dialectics,
ethics, politics, physics, or metaphysics, but is
found in Plato. And of this opinion are many of the
ancient authors, such as Clemens Alexandrinus, &c.
Gale attempts to show, that Aristotle borrowed a good
deal of his philosophy, both physical and metaphysical,
about the first matter, and metaphysical about the first being, his affec-
tions, truth, unity, goodness, &c. from the Scriptures;
and adds from Clesarchus, one of Aristotle's scholars,
that he made use of a certain Jew, who
affiliated him therein.

Aristotle's philosophy preferred itself in paris natura-
ibus for a long time; in the earlier ages of Christianity,
the Platonic philosophy was generally preferred; but
this did not prevent the doctrine of Aristotle from
taking its way into the Christian church. Towards the
end of the fifth century, it rose into great credit; the
Platonics interpreting in their schools some of the
writings of Aristotle, particularly his dialectics, and
recommending them to young persons. This appears
to have been the first step to that universal dominion
which Aristotle afterwards obtained among the learned,
which was at the same time much promoted by the
controversies which Origen had occasioned. This
father was zealously attached to the Platonic system;
and therefore, after his condemnation, many, to avoid
the imputation of his errors, and to prevent their being
counted among the number of his followers, openly
adopted the philosophy of Aristotle. Nor was any
philosophy more prone for furnishing those weapons of
subtle distinctions and captious sophisms, which were
used in the Neotanians, Arians, and Euchistian contro-
versies. About the end of the sixth century, the
Aristotelian philosophy, as well as science in general, was
almost universally decried; and it was chiefly owing to
Bozthius, who explained and recommended it, that
it obtained a higher degree of credit among the La ins
than it had hitherto enjoyed. Towards the end of the
seventh century, the Greeks abandoned Plato to the
monks, and gave themselves up entirely to the direc-
tion of Aristotle; and in the next century, the Peri-
patetic philosophy was taught every where in their pub-
lic schools, and propagated in all places with consider-
able success. John Damascenus very much contributed
to its credit and influence, by compiling a concise,
plain, and comprehensive view of the doctrines of the
Stagirite, for the instruction of the more ignorant, and
in a manner adapted to common capacities. Under
the patronage of Photuss, and the protection of Bardes,
the study of philosophy for some time declined, but
was revived again about the end of the ninth century.
About the middle of the 11th century, a revolution
in philosophy commenced in France; when several fa-
mous logicians, who followed Aristotle as their guide,
took nevertheless the liberty of illustrating and modell-
ing anew his philosophy, and extending it far beyond
its ancient limits. In the 12th century, three methods
of teaching philosophy were in use by different doc-
tors: the first was the ancient and primitive system, which
confined its researches to the philosophical notions of
Porphyry, and the dialectical system, commonly attri-
buted to St Augustine, and in which was laid down
this general rule, that philosophical inquiries were to
be limited to a small number of subjects, left, by their
becoming too extensive, religion might suffer by a pro-
fuse mixture of human futility with its divine wisdom.
The second method was called the Aristotelian, because
it confided in explications of the works of that philo-
osopher, several of which books, being translated into
Latin, were almost everywhere in the hands of the
learners. The third was termed the tree method, em-
ployed by such as were bold enough to search after
truth, in the manner the most adapted to render their
inquiries successful, without rejecting the success of
Aristotle and Plato. A reformed system of the Peri-
patetic philosophy was first introduced into the schools
in the university of Paris, from whence it soon spread
throughout Europe; and has subsisted in some universi-
ties even to this day, under the name of schol. philos.
Y.

The foundation thereof is Aristotle's doctrine, often
misunderstood, but other misapplied: whence the ret-
tainer thereof may be denominated Reformed Peri-
patetics. Out of these have sprung, at various times, sev-
eral branches; the chief are, the Thomists, Scotchists,
and Nominalists. See these articles.

The Peripatetic system, after having prevailed with
great and extensive dominion for many centuries, be-
gan rapidly to decline towards the close of the 17th
when the disciples of Ramus attacked it on the one
hand, and had still more formidable adversaries to
encounter, in Descartes, Gassendi, and New. See
Philosophy.

PERIPATON, in antiquity, the name of that walk
in the Lyceum where Aristotle taught, and whence the
name of Peripatetics given to his followers.

PERIPETIA, in the drama, that part of a trage-
dy wherein the action is turned, the plot unravelled,
and the whole concludes. See Catastrophe.

PERIPHERY, in geometry, the circumference of
circle, ellipse, or any other regular curve, or line.
See Geometry.

PERIPHERIAS, circumstance, formed of peri-
about,” and same “I speak;” in rhetoric, a circuit-
or tour of words, much affected by orators, and a resid-
common and trite manners of expression. The peri-
phrases.
**PER** [150] **PER**

**PERIPLOCA,** Virginian silk, in botany: A genus of the digynia order, belonging to the pentandria class of plants; and in the natural method ranking under the 30th order, Contorta. The neoflora surrounds the genitals, and feeds out five filaments. There are five species, four of which are natives of warm climates, and can only be raised there. The fifth, however, is sufficiently hardy for this climate. The propagation of this climber is very easy; for if they are laid down in the ground, or a seed is sown, they will strike root at the joints, and two of the shoots, they are succeeded by a long taper pod, with compressed seeds, having down to their tops.

The propagation of this climber is very easy; for if the cuttings are planted in a light moist soil, in the autumn or in the spring, they will readily strike root. Three joints at least should be allowed to each cutting; they should be the bottom of the preceding summer's shoot; and two of the joints should be planted deep in the soil. Another, and a never-failing method, is by layers; for if they are laid down in the ground, or a little foil only loosely thrown over the young preceding summer's shoots, they will strike root at the joints, and be good plants for removing the winter following.

**PERINEUM,** derived from *peri* "about," and *neum* "lungs," in medicine, an inflammation of some part of the thorax, properly of Perizhantrium, a vessel of bone or brafs which was filled with holy water, and with which all those were sprinkled who were admitted by the ancients to their sacrifices. Beyond this vessel no profane person was allowed to pass. We are told by some, that it was placed in the Aduam, or in the recess of the temple; others say it was placed at the door, which indeed seems to be the most likely opinion. It was used both by Greeks and Romans, and has been evidently borrowed, like many other Pagan ceremonies, by the Church of Rome. The Hebrews had a vessel for purification.

**PERISCIIL**, in geography, the inhabitants of either frigid zones, between the polar circles and the poles, where the sun, when in the summer signs, moves only round about them, without setting; and consequently their shadows in the same day turn to all the points of the horizon.

**PERISTALTIC,** a vermicular spontaneous motion of the intestines, performed by the contraction of the circular and longitudinal fibres of which the fleshy coats of the intestines are composed; by means whereof the chyle is driven into the orifices of the lacteal veins, and the faces are protruded towards the anus.

**PERISTYLE,** in ancient architecture, a building encompassed with a row of columns on the infide.

**PERITONÆUM,** in anatomy, is a thin, smooth, and lebruous membrane, investing the whole internal surface of the abdomen, and containing most of the vifera of that part as it were in a bag. See Anatomy, No. 59.

**PERITROCHIUM,** in mechanics, denotes a wheel, or circle, concentric with the base of a cylinder, and moveable together with it about its axis. See Mechanics.

**PERJURY,** in law, is defined by Sir Edward Coke to be a crime committed when a lawful oath is administered, in some judicial proceeding, to a person who swears willfully, absolutely, and falsely, in a matter material to the issue or point in question. In ancient times it was in some places punished with death; in others it made the false swearer liable to the punishment due to the crime he had charged the innocent person with; in others a pecuniary mulct was imposed. But though it escaped human, yet it was thought, amongst the ancients in general, that the divine vengeance would most certainly overtake it; and there are many severe infirmities from the hand of God upon record, as monuments of the abhorrence in which this atrocious crime is held by the Deity. The souls of the deceased were supposed to be employed in punishing perjured persons. Even the inanimate creation was thought to take revenge for this crime. The Greeks supposed that no perfon could swear falsely by Styx without some remarkable punishment; and that no person guilty of perjury could enter the cave of Palemon at Corinth without being made a memorable example of divine justice. In Sicily, at the temple of the Palici, there were fountains called Delfi, from which infued boiling water, with flames and balls of fire; and we are told that if any person swore falsely near them, he was instantly struck dumb, blind, lame,
Perjury, or dead, or was swallowed up by the waters. But although perjury was thus held in general abhorrence, notwithstanding the credit which was given to such accounts of divine inflictions, it was so much practised by the Greeks, that Græc. ἔλος became a proverb. Lovers perjuries, however, were supposed to pass unnoticed, or to be very lightly punished with blackness of the nails, a decayed tooth, or some small diminution of beauty.

The ancient philosophers, however, were so afraid of perjury, that even an oath before a judge was never admitted but for want of other proof. Plato's precept was, "Not to administer an oath wantonly, but on deep grounds, and with the strictest caution." Ulpian gives his opinion thus: "Some are forward to take oaths from a contempt of religion; others, from an extraordinary awe of the Divine Majesty, carry their fear to an unreasonable superstition; so make an equitable decision of a judge necessary." "No man will perjure himself (says Anitote) who apprehends vengeance from Heaven and disgrace among men." Climias was so very ferulous, that rather than take an oath (though lawfully), he suffered the loss of three talents. Perjury, in the time of Philo Judeus, was abominated and capital punishment among the Jews; though since they have much degenerated, having been poisoned with the books of the Talmud, which says, "He who breaks his promissory oath, or any vows he enters into by the year, if he has a mind to make in the year following, let him rise foro, and void, and of no effect." Tract. iii. part 3. of the Talmud, in the treatife Nedharim, ch. 4. And the modern Jews use the same artifice, thinking they may thus lawfully deceive the Christians. See Hieron. ex Ditiis Talmud, c. 3. and Magister Ioannes de Concor. Legum, tit. iv. c. 7. In our law, no notice is taken of any perjury but such as is committed in some court of justice having power to administer an oath; or before some magistrate or proper officer invested with a similar authority, in some proceedings relative to a civil suit or a criminal prosecution: for it esteems all other oaths unnecessary at least, and therefore would not punish the breach thereof. For which reason it is much to be questioned, how far any magistrate is justifiable in taking a voluntary affidavit in any extrajudicial matter, as is now too frequent upon every petty occasion; since it is more than possible that, by such idle oaths, a man may frequently, in foro conscientiæ, incur the guilt, and at the same time evade the temporal penalties of perjury. The perjury must also be corrupt (that is, committed mala anima), wilful, positive, and absolute; not upon surprize, or the like: it also must be in some point material to the question in dispute; for if it only be in some trifling collateral circumstance, to which no regard is paid, it it no more penal than in the voluntary extrajudicial oaths before mentioned. Subornation of perjury is the offence of procuring another to take such a false oath, as constitutes perjury in the principal. The punishment of perjury and subornation, at common law, has been various. It was anciently death; afterwards banishment, or cutting out the tongue; then forfeiture of goods; and now it is fine and imprisonment, and never more to be capable of bearing testimony. But the statute 5 Eliz. c. 9. (if the offender be prosecuted thereon) inflicts the penalty of perpetual infamy, and a fine of 40 l. on the fabommer; and in default of payment, imprisonment for six months, and to stand with both ears nailed to the pillory. Perjury itself is thereby punished with six months imprisonment, perpetual infamy, and a fine of 20 l. or to have both ears nailed to the pillory. But the prosecution is usually carried on for the offence at common law; especially as, to the penalties before inflicted, the statute 2 Geo. II. c. 25. supraedes a power for the court to order the offender to be sent to the house of correction for a term not exceeding seven years, or to be transported for the same period; and makes it felony, without benefit of clergy, to return or escape within the time. It has sometimes been wilful, i.e. that perjury, at least upon capital accusations whereby another's life has been or might have been destroyed, was also rendered capital, upon a principle of retaliation; as it was universally by the laws of France. And certainly the odiousness of the crime pleads strongly in behalf of the French law. But it is to be considered, that there they admitted witneses to be heard only on the side of the prosecution, and used the rack to extort a confession from the accused. In such a constitution, therefore, it was necessary to throw the dread of capital punishment into the other scale, in order to keep in awe the witneses for the crown; on whom alone the prisoner's fate depended: so naturally does one cruel law beget another. But corporal and pecuniary punishments, exile, and perpetual infamy, are more suited to the genius of the English law; where the fact is openly discussed between witneses on both sides, and the evidence for the crown may be contradicted and disproved by those of the prisoner. Where indeed the death of an innocent person has actually been the consequence of such wilful perjury, it falls within the guilt of deliberate murder, and deserves an equal punishment; which our ancient law in fact inflicted. But the mere attempt to deploy life by other means not being capital, there is no reason that an attempt by perjury should; much less that this crime should, in all judicial cases, be punished with death. For to multiply capital punishments lessens their effect, when applied to crimes of the lesser dyes; and, detestable as it is, it is not by any means to be compared with some other offences, for which only death can be inflicted; and therefore it seems already (except perhaps in the instance of deliberate murder by perjury) very properly punished by our present law; which has adopted the opinion of Cicero, derived from the law of the twelve tables, Perjurì peccavit, divina, exitial, humana, deducit. See Oath. PERIWIG. See PERUK. PERIZONIUS (James), a very learned and laborious writer, was born at Dam in 1651. He became profeffor of history and eloquence at the university of Franeker, when, by his merit and learning, he made that university flourish. However, in 1695, he went to Leyden, where he was made profeffor of history, eloquence, and the Greek tongue; in which employment he continued till his death, which happened in 1715. He wrote many Differtations, and other learned and curious works, particularly Origines Babylonica et Egypiae.
children of a sanguine habit and delicate constitution; Perones.

and may be prevented or removed by such remedies as

invigorate the system, and are capable of removing any
tendency to gangrene in the constitution.

Perones, is an epithet applied to

some of the muscles of the perone or fibula. See

Anatomy, Table of the Muscles.

Perones, a sort of high shoes which were worn

not only by country people, but by men of ordinary

rank at Rome. In the early times of the common-

wealth they were worn even by senators: but at last

they were diffused by persons or figure, and confined
to ploughmen and labourers. They were very rudely

formed, confisting only of hides undressed, and reaching
to the middle of the leg. Virgil mentions

the perones as worn by a company of rustic soldiers on one

foot only.

Peronne, a strong town of France, in Picardy,
capital of Santerre. It is said never to have been
taken, though often beleaguered. It is seated on the river
Somme, in L. Long. 51. N. Lat. 44. 50.

Peroration, in rhetoric, the epilogue or last
part of an oration, wherein what the orator had insinu-
ated throughout his whole discourse is urged afresh with

greater vehemence and passion. The peroration con-

sists of two parts. 1 Recapitulation; wherein the

substance of what was diffused throughout the whole
speech is collected briefly and cursorily, and summed
up with new force and weight. 2. The moving the

passions; which is so peculiar to the peroration, that

the masters of the art call this part fides affiectum. The

passions to be roused are various, according to the va-
rious kinds of oration. In a panegyrick, love, admiration,
emulation, joy, &c. In an invective, hatred, contempt, &c.
In a deliberation, hope, confidence, or fear. The qualities required in the peroration are,
that it be very vehement and passionate, and that it be
short; because, as Cicero observes, tears soon dry up.
These qualities were well observed by Cicero, who
never had an equal in the management of this part of
an orator's province; for peroration was his master-

piece.

"Concerning peroration (says Dr Blair), it is need-

less to say much, because it must vary so considerably

according to the strain of the preceding discourse.

Sometimes the whole pathetic part comes in most pro-

perly at the peroration. Sometimes, when the dis-

course has been entirely argumentative, it is fit to con-
clude with summing up the arguments, placing them

in one view, and leaving the impression of them full and
strong on the mind of the audience. For the great rule of
a conclusion, and what nature obviously suggests, is
to place that last on which we choose that the strength
of our cause should rest.

"In all discourses, it is a matter of importance to
hit the precise time of concluding, so as to bring our
discourse just to a point; neither ending abruptly and
unexpectedly, nor disappointing the expectation of the
hearers when they look for the close, and continuing
to hover round and round the conclusion till they be-
come heartily tired of us. We should endeavour to

go off with a good grace; not to end with a languish-

ing and drawn-out sentence, but to close with dignity
and spirit, that we may leave the minds of the hearers

warm;
was universally admired: that intitled La fée de Louis d'Grand, in which he exalted the modern authors above the ancients, was a prelude to a style with all the learned style. After he had engaged himself from this content, he applied himself to draw up eulogies of several great men of the 17th century, with their portraits, of which he has collected 102. There are other esteemed works of Perrault.—Besides these there were two other brothers, Petru and Nicholas, who made themselves known in the literary world.

PERRON (James Davy Du.) a cardinal distinguished by his abilities and learning, was born in the canton of Bern in 1556. He was educated by Julian Davy, his father, a very learned Calvinist, who taught him Latin and the mathematics; after which, he by himself became acquainted with the Greek and Hebrew, philosophy, and the poets. Philip Delportes, abbot of Tyron, made him known to Henry III. king of France, who conceived a great esteem for him. Some time after, Du Perron abjured Calvinism, and afterwards embraced the ecclesiastical function; and having given great proofs of his wit and learning, he was chosen to pronounce the funeral oration of Mary que n Scotts. After the murder of Henry III. he retired to the house of Cardinal de Bourbon, and took great pains in bringing back the Protestants to the church of Rome. Among others, he gained over Henry Spandanus, afterwards bishop of Pamiers. He also chiefly contributed to engage Henry IV. to change his religion; and that prince sent him to negotiate his reconciliation to the holy see, in which he succeeded. Du Perron was consecrated bishop of Evereaux while he resided at Rome. On his return to France, he wrote, preached, and disputed against the reformed; particularly against Du Plessis Mornay, with whom he had a public conference in the presence of the king at Fontainebleau. He was made cardinal in 1654 by pope Clement VIII. at the solicitation of Henry IV. who afterwards nominated him to the archbishopric of Sens. The king at length sent him to Rome with Cardinal Joyeuse in order to terminate the disputes which had arisen between Paul V. and the Venetians. It is said that this pope had such an high opinion of the address of the cardinal Du Perron, that he used to say, "Let us pray to God to inspire the cardinal Du Perron, for he will persuade us to do whatever he pleases." After the death of Henry IV. he retired into the country, where he put the last hand to his works; and, setting up a printing-house, corrected every sheet himself. He died at Paris in 1611. His works were collected after his death, and published at Paris in 3 vols. folio.

PERROT (Nicholas), Sieur d'Aubracourt, one of the first geniuses of his age, was born at Coulons in 1666. After studying philosophy about three years, he was sent to Paris to follow the law. At eighteen years of age he was admitted advocate of parliament, and frequented the bar: but he soon conceived a desire for it, and therefore discontinued his practice. This displeased an uncle, but whose favour he recovered by quitting the protestant religion. He could not, however, be prevailed upon to take orders in the Romish church; and some years after, he had a desire to return to the religion he had abjured. But, that he might not do any thing rashly, he resolved to study philosophy and divinity. For that purpose he
chose for his master Mr Stuart a Scotfman and Luth-}

Perruker, a man of great learning. Almost three years he
spent in the most affluous study; and then set out
from Paris to Champagne, where he abjured the
Roman Catholic, and once more embraced the Protestant
religion. In 1637 he was admitted a member of the
French Academy; a little after which he undertook a
translation of Tacitus. While he was engaged in that
labours task, he retired to his small estate of Ablan-
court, and lived there till his death in 1664. He
was a man of fine understanding, of great piety and
integrity, and of universal learning. Morerit has
given a catalogue of his works, the greatest part of
which consist of translations, which seemed rather
originals.

Perruker, Perrue, or Perwige, was anciently
a name for a long head of natural hair; such, particu-
larly, as there was care taken in the adjusting and
trimming of. Menage derives the word rather fanci-
fully from the Latin pilus, 'hair.' It is derived, ac-
cording to this critic, thus, pilus, pelas, pelate, pelatius; pelatia, periwique, peruke, perruke. The Latins call it co-
ma; whence part of Gaul took the denomination of
Gallia Comata, from the long hair which the inhabitants
were as a sign of freedom. An ancient author says,
that Abafalon's peruke weighed 200 shekels.

The word is now used for a set of false hair, curled,
buckled, and feved together on a frame or cawl; an-
ciently called copilamentum or "false peruke." It is
doubted whether or not the use of perukes of this kind
was known among the ancients. It is true, they used
false hair: Martial and Juvenal make merry with the takers had
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Nothing can be more ridiculous than the description
Lampridius gives of the emperor Commodus's peruke:
its was powdered with scrapings of gold, and oiled (if we
may use the expression) with glutinous perfumes
for the powder to hang by. In effect, the use of per-
ukes, at least in their present mode, is not much more
than 160 years old; the year 1629 is reckoned the
epocha of long perukes, at which time they began to
appear in Paris; from whence they spread by degrees
through the rest of Europe. At first it was reputed
a scandal for young people to wear them, because the
loins of their hair at that age was attributed to a dif-
ease the very name whereof is a reproach; but at
length the mode prevailed over the scruple, and per-
sions of all ages and conditions have worn them, fore-
going without any necessity the conveniences of their
natural hair. It was, however, some time before the
clothes, which were in the manner of the French clergy,
in the year 1660; nor is the practice yet well author-
ized. Cardinal Grimaldi in 1684, and the bishop of
Lyon in 1688, prohibited the use of the peruke to
all priests without a dispensation or necessity. M. Thierry
has an express treatise, to prove the peruke indecent
in an ecclesiastic, and directly contrary to the decrees
and canons of councils. A priest's head, embellished
with artificial hair curiously adjusted, he efeems a
monster in the church, nor can he conceive any thing
so scandalous as an abbot with a florid countenance,
heightened with a well-curled peruke.

Perry (Captain John), was a famous engineer,
who refided long in Russia, having been recommended
to the czar Peter while in England, as a perfon ca-
pable of serving him on a variety of occasions relating
to his new design of establlishing a fleet, making his
rivers navigable, &c. His salary in this service was
300l. per annum, besides travelling expenses and sub-
fidence money on whatever service he should be em-
ployed, together with a further reward to his fatis-
faction at the conclusion of any work he should fini.sh.
After some conversation with the czar himself, parti-
cularly respecting a communication between the river
Volga and Don, he was employed on that work for
three summers successively; but not being well sup-
pplied with men, partly on account of the ill success
of the czar's arms against the Swedes at the battle of
Navra, and partly by the discouragement of the gover-
nor of Altaii, he was ordered at the end of 1707 to
stop, and next year was employed in refitting the ships
at Veronife, and 1709 in making the river of that
name navigable; but after repeated disappointment,
and a variety of fruitless applications for his salary, he,
at last quitted the kingdom, under the protection of
Mr Whitworth, the English ambassador, in 1712: (See
his narrative in the Preface to The State of Russia). In
1721 he was employed in stopping with success the
breach at Dagenham, in which several other under-
takers had failed; and the same year abut the harbour
at Dublin, to the objections against which he then
published an answer. He was author of The State of
Russia, 1716, 8vo, and an account of the stopping
of Dagenham Breach, 1721, 8vo; and died Feb. 11,
1733.

Perry, the name of a very pleasent and wholesome
liqour extracted from pears, in the same manner as cy-
der is from apples. See the article Cyder and Hus-
bandry, pages 227-238.

The best pears for perry, or at least the sorts which
have been hitherto deemed the fittest for making this
liqour, are so excessively tart and harsh, that no mortal
can think of eating them as fruit; for even hungry
swine will not eat them, nay hardly so much as smell
them. Of these the Boisbury pear, the Bareland pear,
and the holfie pear, are the most esteemed for perry in
Worceftershire; and the squaith pear, as it is called,
in Glouceftershire, England; in both which counties,
as well as in some of the adjacent parts, they are planted
in the hedge-rows and most common fields. There is
this advantage attending pear-trees, that they will
thrive on land where apples will not so much as live,
and that some of them grow to such a size, that a
single pear-tree, particularly of the Boisbury and the
squaith kind, has frequently been known to yield,
in one season, from one to four longheads of perry. The
Boisbury pear is thought to yield the most lasting and
most vinous liqour. The John pear, the Harpury
pear, the Drake pear, the Mary pear, the Lulum
pear, and several others of the hardest kinds, are
esteemed the best for perry, but the redder or more tawny
they are, the more they are preferred. Pears as well
as apples, should be full ripe before they are ground.

Dr
PER

Dr. Beale, in his general advertisements concerning cyder, subjoined to Mr. Evelyn's Pomona, disapproves of Palladius's saying, that perry will keep during the winter, but that it turns four as soon as the weather begins to be warm; and gives, as his reason for being of a contrary opinion, that he had himself tasted at the end of summer, a very brisk, lively and vinous liquor, made of horse pears; that he had often tried the juice of the Bobury pear, and found it both pleasanter and richer the second year, and still more for the third, though kept only in common hogheads, and in but indifferent cellars, without being bottled; and that a very honest, worthy, and ingenious gentleman in his neighbourhood, assured him, of his own experience, that it will keep a great while, and grow much the stronger for keeping, if put into a good cellar and managed with due care. He imputes Palladius's error to his possibly speaking of common eatable pears, and to the perry's having been made in a very hot country; but he would have ascribed it to a more real cause, perhaps, had he pointed out the want of a thorough regular fermentation, to which it appears plainly that the ancients were entire strangers; for all their vinous liquors were medicated by boiling before they were laid up in order to be kept.

PERSECUTION, is any pain or affliction which a person deservedly inflicts upon another: and in a more restrained sense, the sufferings of Christians on account of their religion.

Historians usually reckon ten general persecutions, the first of which was under the emperor Nero, 31 years after our Lord's ascension; when that emperor having set fire to the City of Rome, shewed the odium of that execrable action on the Christians, who under that pretence were wrapped up in the skins of wild beasts, and worried and devoured by dogs; others were crucified, and others burnt alive. The second was under Domitian, in the year 95. In this persecution St. John the apostle was sent to the isle of Patmos, in order to be employed in digging in the mines.

The third began in the third year of Trajan, in the year 100, and was carried on with great violence for several years. The fourth was under Antoninus the philosopher, when the Christians were banished from their houses, forbidden to show their heads, reproached, beaten, hurried from place to place, plundered, imprisoned, and flogged. The fifth began in the year 197, under the emperor Severus. The fifth began with the reign of the emperor Maximus in 225. The seventh, which was the most dreadful persecution that had ever been known in the church, began in the year 250, in the reign of the emperor Decius, when the Christians were in all places driven from their habitation, stripped of their estates, tormented with racks, &c. The eighth began in the year 257, in the fourth year of the reign of the emperor Valerian. The ninth was under the emperor Aurelian, A.D. 274; but this was very inconsiderable: and the tenth began in the 19th year of Diocleian, A.D. 303. In this dreadful persecution, which lasted ten years, houses filled with Christians were set on fire, and whole droves were tied together with ropes and thrown into the fire. See TOLERATION.

PERSEES, the descendants of a colony of ancient Persians, who took refuge at Bombay, Suid, and in the vicinity of those cities, when their own country was conquered 1100 years ago by the Mahometan Arabs. They are a gentle, quiet, and industrious people, loved by the Hindoos, and living in great harmony among themselves. The consequence is, that they multiply exceedingly, whilst their countrymen in the province of Kerman are visibly diminishing under the yoke of the Mahometan Persians. Of the manners and customs of this amiable race, we have the following account in Heron's elegant translation of Nisbin's Tales.

"The Persians (says he) make common contributions for the aid of their poor, and suffer none of their number to ask alms from people of a different religion. They are equally ready to employ their money and credit to screen a brother of their fraternity from the abuses of justice. When a Persees behaves ill, he is expelled from their communion. They apply to trade, and exercise all sorts of professions.

"The Persians have as little knowledge of circumcision as the Hindoos. Among them a man marries only one wife, nor ever takes a second, unless when the first happens to be barren. They give their children in marriage at six years of age; but the young couple continue to live separate, in the houses of their parents, till they attain the age of puberty. Their dress is the same as that of the Hindoos, except that they wear under each ear a tuft of hair, like the modern Persians. They are much addicted to astrology, although very little skilled in astronomy.

"They retain the singular custom of expelling their dead to be eaten by birds of prey, instead of interring or burning them. I saw (continues our author) a hill at Bombay a round tower, covered with plants of wood, on which the Persians lay out their dead bodies. When the flesh is devoured, they remove the bones into two chambers at the bottom of the tower.

"The Persians, followers of the religion of Zerdruft or Zoroaster, adore one God only, eternal and almighty. They pay, however, a certain worship to the sun, the moon, the stars, and to fire, as visible images of the invisible divinity. Their veneration for the element of fire induces them to keep a sacred fire constantly burning, which they feed with odoriferous wood, both in the temples and in the houses of private persons, who are in easy circumstances. In one of their temples at Bombay, I saw a fire which had burnt unextinguished for two centuries. They never blow out a light, lest their breath should pollute the purity of the fire. See POLYTHEISM.

"The religion of the Persians enjoins purifications as strictly as that of the Hindoos. The disciples of Zerdruft are not, however, obliged to abstain from animal food. They have accustom ed themselves to refrain from the flesh of the ox, because their ancestors promised the Indian prince who received them into his dominions never to kill burned cattle. This promise they continue to observe under the dominion of Christians and Mahometans. The horse is by them considered as the most impure of all animals, and regarded with extreme aversion.

"Their festival, denominated Ghumbals, which return frequently, and last upon each occasion five days, are all commemorations of some part the work of creation. They celebrate them not with splendour, or
with any particular ceremonies, but only dress better during those five days, perform some act of devotion in their houses, and visit their friends."

The Persees were till lately but very little known; the ancients speak of them but seldom, and what they say seems to be distorted by prejudice. On this account, Dr. Hyde, who thought the subject both curious and interesting, about the end of last century attempted a deeper investigation of a subject which till then had been but very little attended to. He applied to the works of Arabian and Persian authors, from whom, and from the relations of travellers, together with various letters from persons in India, he compiled his celebrated work on the religion of the Persees. Other accounts have been given by different men, as accident put information in their way. But the most distinguished is by M. Anquetil du Perron, who undertook a voyage to discover and translate the works attributed to Zoroaster. Of this voyage he drew up an account himself and read it before the Royal Academy of Sciences at Paris in May 1761. A translation of it was made and published in the Gentleman's Magazine for 1762, to which we refer our readers. The account begins at p. 573, and is concluded at p. 614. Remarks were afterwards made on du Perron's account by a Mr. Yates. See the same Magazine for 1766, p. 529.

PERSEPOLIS, formerly the capital of Persia, situated in N. Lat. 30° 50', E. Long. 84°, now in ruins, but remarkable for the most magnificent remains of a palace or temple that are to be found throughout the world.—This city stood in one of the finest plains in Persia, being 18 or 19 leagues in length, and some places two, in some four, and in others six leagues in breadth. It is watered by the great river Araxes, now Bendersir, and by a multitude of rivulets beside. Within the compass of this plain, there are between 1000 and 1500 villages, without reckoning those in the mountains, all adorned with pleasant gardens, and planted with shady trees. The entrance of this plain on the west side has received as much grandeur from nature, as the city it covers could do from industry or art. It consists of a range of mountains steep and high, four leagues in length, and about two miles broad, forming two flat banks, with a rising terrace in the middle, the summit of which is perfectly plain and even, all of native rock. In this there are such openings, and the terraces are so fine and so even, that one would be tempted to think the whole the work of art, if the great extent, and prodigious elevation thereof, did not convince one that it is a wonder too great for nature to produce. Undoubtedly these banks were the very place where the advanced guards from Persepolis took post, and from which Alexander found it so difficult to dislodge them. One cannot from hence defy the ruins of the city, because the banks are too high to be overlooked; but one can perceive on every side the ruins of walls and of edifices, which heretofore adorned the range of mountains of which we are speaking. On the west and on the north this city is defended in the like manner; so that, considering the height and evenness of these banks, one may fairly say, that there is not in the world a place so fortified by nature.

The mountain Relmount, in the form of an amphitheatre, circumscribes the palace, which is one of the noblest and most beautiful pieces of architecture remaining of all antiquity. Authors and travellers have been exceedingly minute in their descriptions of their ruins; and yet some of them have expressed themselves so differently from the others, that had they agreed, with respect to the latitude and longitude of the place, one would be tempted to suspect that they had visited different ruins. These ruins have been described by Garcias de Silva Figueroa, Pietro de la Valle, Char­dìn, Le Brun, and Mr. Franc­klin. We shall adopt the latest description, as being exceedingly distinct, and given by a traveller intelligent and unalarming. The ascent to the columns is by a grand staircase of blue stone containing 154 steps.

"The first object that strikes the beholder on his entrance, are two portals of stone, about 50 feet in height each; the sides are embellished with two sphinxes of an immense size, dressed out with a profusion of head-work, and, contrary to the usual method, they are represented standing. On the sides above are inscriptions in an ancient character, the meaning of which no one hitherto has been able to decipher."

"At a small distance from these portals you afford another flight of steps, which lead to the ground hall of columns. The sides of this staircase are ornamented with a variety of figures in baso relief; most of them have veils in their hands; here and there a camel appears, and at other times a kind of triumphal car, made after the Roman fashion; besides there are several led horses, oxen and rams, that at times inter­vene and diversify the procession. At the head of the staircase is another baso relief, representing a lion seizing a bull; and close to this are other inscriptions in ancient characters. On getting to the top of this staircase, you enter what was formerly a most magnificent hall; the natives have given this the name of ebal minir, or forty pillars; and though this name is often used to express the whole of the building, it is more particularly appropriated to this part of it. Although a vast number of ages have elapsed since the foundation, 15 of the columns yet remain entire; they are from 70 to 80 feet in height, and are stately pieces of masonry: their pedestals are curiously worked, and appear little injured by the hand of time. The shafts are encased up to the top, and the capitals are adorned with a profusion of fret work.

From this hall you proceed along eastward, until you arrive at the remains of a large square building, to which you enter through a door of granite. Most of the doors and windows of this apartment are still standing they are of a black marble, and polished like a mirror: on the sides of the doors, at the entrance, are baso reliefs of two figures at full length; they represent a man in the attitude of slaving a goat: with one hand he seizes hold of the hump of the beast, and throws a dagger into his heart with the other; one of the goat's feet rests upon the breast of the man, and the other upon his right arm. This device is common throughout the palace. Over another door of the same apartment is a representation of two men at full length; behind them stands a domestic holding a spread umbrella: they are supported by large round shafts, ap­
PER

At the fourth well-entrance of this apartment are two large pillars of stone, upon which are carved four figures; they are dressed in long garments, and hold in their hands spears 10 feet in length. At this entrance also the remains of a stair-case of blue stone are still visible. Various numbers of broken pieces of pillars, shafts, and capitals are scattered over a considerable extent of ground, some of them of such enormous size, that it is wonderful to think how they could have been brought whole, and set up together. Indeed, all the remains of these noble ruins indicate their former grandeur and magnificence, truly worthy of being the residence of a great and powerful monarch."

These noble ruins are now the shelter of hawks and birds of prey. Besides the information above mentioned, there are others in Arabic, Persian and Greek. Dr. Hyde observes, that the inscriptions are very rude and unartful; and that some, if not all of them, are in praise of Alexander the Great; and therefore are later than that conqueror. See the article Ruins.

PERSEVERANCE, in theology, a continuance in a state of grace to a state of glory. About this subject there has been much controversy in the Christian church. All doctors, except Unitarians, admit, that no man can ever be in a state of grace without the co-operation of the spirit of God; but the Calvinists and Arminians differ widely as to the nature of this co-operation. The former, at least such as call themselves the true disciples of Calvin, believe, that those who are once under the influence of divine grace can never fall totally from it, or die in mortal sin. The Arminians, on the other hand, contend, that the whole of this life is a state of probation; that without the grace of God we can do nothing that is good, that the Holy Spirit afflicts, but does not overpower, our natural faculties; and that a man, at any period of his life, may repent, grieve, and even quench the Spirit. See Theology.

PERSEUS, in astronomy. See there. n° 406.

PERSIA, a most ancient and celebrated empire of Asia, extending in length from the mouth of the river Araxes to that of the river Indus, about 1840 of miles; and in breadth from the river Oxus, to the Persian gulf, about 1089 of the same miles. It is bounded on the north by the Caspian Sea, the river Oxus, and mount Caucasus; on the east, by the river Indus and the dominions of the Great Mogul; on the south by the Persian gulf and the Indian ocean, and on the west, by the dominions of the Grand Signior. We learn from Sir William Jones, the illustrious president of the Asiatic Society, that Persia is the name of only one province of this extensive empire, which by the present natives, and all the learned Musulmans who reside in the British territories in India, is called Iran. It has been a practice not uncommon in all ages to denominate the whole of a country from that part of it, with which we are best acquainted; and hence have the Europeans agreed to call Iran by the name of that province of which Shiraz is the capital; See Shiraz. The same learned writer is confident that Iran, or Persia in its largest extent, comprehended within its outline the lower Asia, which, says he, was unquestionably a part of the Persian, if not of the old Assyrian empire. Thus may we look on Iran as the noblest peninsula on this inhabitable globe; and if M. Bailly had fixed on it as the Atlantis of Plato, he might have supported his opinion with more strong arguments than any that he has adduced in favour of Nova Zelandia. If, indeed the account of the Atlantis be not purely an Egyptian fable, I should be more inclined, says Sir William, to place them in Iran than in any region with which I am acquainted.

The most ancient name, however, of this country was that of Elam, or, as some write it, Alam, from Alam the son of Shem, from whom its inhabitants are descended. Herodotus calls its inhabitants Calphents; and in very ancient times the people are said to have called themselves Arati, and the country in which they dwelt Arabia. In the books of Daniel, Ezra, and from the time of Cyrus who learned riding in Media, and introduced it, it is called by the name of Perses Pharaos, which signifies a horsemans or rider, equus; whence the modern name of Persia.

That Persia was originally peopled by Elam, the opinion of Sir William has been very generally admitted; but there is the truth is, that of the ancient history of this distinguisht empire very little is perfectly known. For this ignorance, which at first seems strange, satisfactory reasons may easily be assigned: of which the principal are the superficial knowledge of the Greeks and Jews, and the loss of Persian archives or historical compositions. That the Grecian writers before Xenophon had no acquaintance with Persia, and that their accounts of it are wholly fabulous, is a paradox too extravagant to be seriously mentioned; but (says Sir William) their connection with it in war or peace had been generally confined to bordering kingdoms under feudatory princes: and the first Persian emperor, whose life and character they seem to have known with tolerable accuracy, was the great Cyrus. Our learned author, however, is so far from considering Cyrus as the first Persian monarch, that he thinks it evident a powerful monarchy had subsisted in Iran for ages before the accession of that hero; that this monarch was called the Medebidian dynasty; and that it was in fact the oldest monarchy in the world. The evidence upon which the learned writer rests this opinion, is the work of a Mahometan traveller, compiled from the books of such Persians as fled from their country upon the innovation in religion made by Zoroaster; and if these books, of which a few still remain, be genuine, and the Mahometan a faithful compiler, facts of which Sir William has not the smallest doubt, the evidence is certainly sufficient to bear the superstructure which he has raised upon it.

If the Persian monarchy was thus ancient, it is natural to suppose that Persia or Iran was the original seat of the human race, whence colonies were sent out or emigrated of themselves to people the rest of the human habitable globe. This supposition is actually made by race, our ingenious author, who strongly confirms it by remarks.
marks on the most ancient language of Persia, which he showed to have been the parent of the Sanscrit, as well as of the Greek, Latin, and Gothic (see Philology). He therefore holds, as a proposition firmly established, "that Iran or Persia, in its largest sense, was the true centre of population, of knowledge, of languages, and of arts; which instead of travelling westward only, as it has been fancifully supposed, or eastward, as might with equal reason have been asserted, were expanded in all directions to all the regions of the world." He thinks it is from good authority that the Saxon Chronicle brings the first inhabitants of Britain from Armenia; that the Goths have been concluded to come from Persia; and that both the Irish and old Britons have been supposed to have proceeded from the borders of the Caspian; for all these places were comprehended within the ancient Iran.

Of this first Persian monarchy we have no historical accounts; and must therefore, after having thus mentioned it, descend at once to the era of Cyrus. This prince is celebrated both by sacred and profane historians; but the latter are at small variance concerning his birth and accession to the throne. According to Herodotus, Abyages, the last king of the Medes being warned in a dream, that the son who was to be born of his daughter Mandane, should one day be lord of Asia, resolved to marry her, not to a Mede, but to a Persian. Accordingly he chose for her husband one Cambyses, a man of a peaceable disposition, and of no very high station. However, about a year after they were married, Abyages was frightened by another dream, which made him resolve to dispatch the infant as soon as it should be born. Hereupon the king sent for his daughter and put her under confinement, where she was soon after delivered of a son. The infant was committed to the care of one Harpagus, with strict orders to destroy it in what manner he thought proper. But he, having acquainted his wife with the command he had received, by her advice gave it to a shepherd, defiring him to let it perish by exposure. But the shepherd, out of compulsion, exposed a full-born child which his wife happened to be then delivered of, and brought up the son of Mandane as his own, giving him the name of Cyrus.

When the young prince had attained the age of ten years, as he was one day at play with other children of the same age, he was seized by his companions; and having, in virtue of that dignity, divided them into several orders and classes, the son of Artabares, a lord of eminent dignity among the Medes, refused to obey his orders; whereupon Cyrus caused him to be seized, and whipped very severely. The boy ran crying to his father; and he immediately hasted to the king's palace, loudly complaining of the affront his son had received from the son of a slave, and intreating Abyages to revenge, by some exemplary punishment, the indignity offered to him and his family. Abyages, commanding both the headman and his son to be brought before him, asked the latter, how he, who was the son of so mean a man, had dared to abuse the son of one of the chief lords of the kingdom? Cyrus replied, that he had done no more than he had a right to do; for the boys of the neighbourhood having chosen him king, because they thought him most worthy of that dignity, and performed what he, vested with that character, had commanded, the son of Artabares alone had slighted his orders, and for his disobedience had suffered the punishment he deserved. In the course of this conversation Abyages happening to recollect, that his grandson, whom he had ordered to be destroyed, would have been about the same age with Cyrus, began to question the shepherd concerning his supposed son, and at last obtained from him a confession of the whole truth.

Abyages having now discovered Cyrus to be his grandson, sent for Harpagus, who also confessed that he had not seen Mandane's son destroyed but had given him to the shepherd; at which Abyages was so much incensed, that, having invited Harpagus to an entertainment he caused him to be served with the flesh of his own son. When he had done, the king asked him whether he liked his viands; and Harpagus answering, that he had never tasted any thing more delicious, the officers appointed for that purpose brought in a basket, containing the head, hands, and feet of his son, defiring him to uncover the basket, and take what he liked best. He did as they desired, and beheld the mangled remains of his only child without betraying the least concern, so great was the command which he had over his passions. The king then asked him, whether he knew what kind of meat he had been entertained. Harpagus replied, that he knew very well, and was always pleased with what his sovereign thought fit to order; and having thus replied, with a surpining temper he collected the mangled parts of his innocent son, and went home.

Abyages having thus vented his rage on Harpagus, began next to consult what he should do with Cyrus. The magi, however, took him of his fears with regard to him, by assuring him, that as the boy had been once chosen king by his companions, the dream had been already verified and that Cyrus, never would reign in any other fene. 'The king, being well pleased with this answer, called Cyrus, and, owning how much he had been wanting in the affection which he ought to have had towards him, defired him to prepare for a journey into Persia, where he would find his father and mother in circumstances very different from those of the poor shepherd and his wife with whom he had hitherto lived. Cyrus, on his arrival at his father's house, was received with the greatest joy. When he grew up, he soon became popular on account of his extraordinary parts; till at last his friendship was courted by Harpagus, who had never forgot the cruel treatment he received from Abyages. By his means a conspiracy was formed against Abyages; who being overthrown in two succeeding engagements, was taken prisoner and confined for life.

The account given by Xenophon of the rise of Cyrus is much more conformant to Scripture: for he tells us, that Babylon was conquered by the united forces of the Medes and Persians. According to him, Cyrus was the son of Cambyses king of the Persians, and Mandane the daughter of Abyages king of the Medes. He was born a year after his uncle Cyaxares, the brother of Mandane. He lived till the age of twelve with his parents in Persia, being educated after the manner of the country, and inured to fatigues and military exercises. At this age he was taken to the court of Abyages, where he resided four years; when the revolt
While Cyrus was employed in the Babylonish war, before he attacked the metropolis itself, he reduced all the nations of Aha Minor. The most formidable of these were the Lydians, whose king Croesus assembled a very numerous army, composed of all the other nations in that part of Aha, as well as of Egyptians, Greeks and Thracians. Cyrus being informed of their vast preparation, augmented his forces to 196,000 men, and with them advanced against the enemy, who were assembled near the river Pactolus. After long marches, he came up with them at Thym-bra, not far from Sardis, the capital of Lydia. Besides the horse and foot, which amounted to 196,000 as already observed, Cyrus had 300 chariots armed with scythes, each chariot drawn by four horses abreast, covered with trappings that were proof against all sorts of missile weapons; he had likewise a great number of chariots of a larger size, upon each of which was placed a tower about 18 or 20 feet high, and in each tower were lodged 20 archers. These towers were drawn by 16 oxen yoked abreast. There was moreover a considerable number of camels each mounted by two Arabian archers, the one looking towards the head, and the other towards the hinder parts of the camel. The armies of Croesus consisted of 420,000 men. The Egyptians, who alone were 120,000 in number, being the main strength of the army, were placed in the centre. Both armies were drawn up in an immense plain, which gave room for the extending of the wings on either side; and the design of Croesus, upon which alone he founded his hopes of victory, was to surround and hem in the enemy's army.

When the two armies were in fight of each other, Croesus, observing how much his front exceeded that of Cyrus, made the centre halt, but commanded the two wings to advance, with a design to inclose the Persian army, and begin the attack on both sides at once. When the two detached bodies of the Lydian forces were sufficiently extended, Croesus gave the signal to the main body, which marched up to the front of the Persian army, while the two wings attacked them in flank; so that Cyrus' army was hemmed in on all sides, and, as Xenophon expresses it, was included like a small square drawn within a great one. This motion, however, did not at all alarm the Persian commander; but, having his troops the signal to face about, he attacked in flank those forces that were going to fall upon his rear so vigorously, that he put them to great disorder. At the same time a squadron of camels was made to advance against the enemy's other wing, which consisted mostly of cavalry. The horses were so frightened at the approach of these animals, that most of them threw their riders and trod them under foot; which occasioned great confusion. Then Artagezes, an officer of great valour and experience, at the head of a small body of horse, charged them so briskly, that they could never afterwards rally; and at the same time the chariots, armed with scythes, being driven in among them, they were entirely routed. Both the enemy's wings being thus put to flight, Cyrus commanded his chief favourite Abradates to fall upon the centre with the large chariots above-mentioned. The first ranks, consisting mostly of Lydians, not being able to stand so violent a charge, immediately gave way; but the Egyptians, being covered with their bucklers, and marching so close that the chariots had not room to penetrate their ranks, a great slaughter of the Persians ensued. Acharates himself was killed, his chariot overthrown, and the greatest part of his men were cut in pieces. Upon his death, the Egyptians advancing boldly, obliged the Persian infantry to give way, and drove them back quite to their engines. There they met with a new shower of darts and javelins from their machines; and at the same time the Persian rear advancing sword in hand, obliged their spearmen and archers to return to the charge. In the mean time Cyrus, putting to flight both the horse and foot on the left of the Egyptians, pushed on to the centre, where he had the misfortune to find his Persians again giving ground: and judging that the only way to stop the Egyptians, who were pursuing them, would be to attack them in the rear, he did so; and at the same time the Persian cavalry coming up to his assistance, the fight was renewed with great slaughter on both sides. Cyrus himself was in great danger; for his horse being killed under him, he fell among the midst of his enemies: but the Persians, alarmed at the danger of their general, threw themselves headlong on their opponents, rescued him and made a terrible slaughter; till at last Cyrus, admiring the valour of the Egyptians, offered them honourable conditions: letting them know at the same time that all their allies had abandoned them. They accepted the terms offered them: and having agreed with Cyrus that they should not be obliged to carry arms against Croesus, they engaged in the service of the conqueror, and continued faithful to him ever after.

The next morning Cyrus advanced towards Sardis, and Croesus marched out to oppose him at the head of the Lydians only; for his allies had all abandoned him. Their strength consisted mostly in cavalry; which being well apprised of, he ordered his camels to advance; by whom the horses were so frightened, that they became quite ungovernable. However the Lydians dismounted, and for some time made a vigorous resistance on foot; but were at last driven into the city, which was taken two days after; and thus the Lydian empire was totally destroyed.

After the conquest of Sardis, Cyrus turned his arms against Babylon itself, which he reduced in the manner related under that article. Having settled the civil government of the conquered kingdoms, Cyrus took a review of all his forces, which he found to consist of 600,000 foot, 120,000 horse, and 2000 chariots armed with scythes. With these he extended his dominion all over the nations to the confines of Ethiopia, and to the Red Sea; after which he continued to reign peaceably over his vast empire till his death, which happened about 329 before Christ. According to Xenophon, he died a natural death; but others tell us, that having engaged in a war with the Scythians, he was by them overthrown and cut in pieces with his whole army, amounting to 200,000 men. But this is very improbable, seeing all authors agree that the tomb of Cyrus was extant at Paphragada in Persia in the time of Alexander the Great; which it could not have been
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if his body had remained in the possession of the
Seythians, as these authors assert.

In the time of Cyrus, the Persian empire extended
from the river Indus to the Caegean Sea. On the north
it was bounded by the Euxine and Caspian Seas, and
on the South by Ethiopia and Arabia. That monarch
kept his refidence for the seven cold months at Baby-
lion, by reason of the warmth of that climate: three
months in the spring he spent at Susa, and two at Ec-
batan during the heat of summer. On his death bed
he appointed his son Cambyses to succeed him in the
empire; and to his other son, Smerdis, he gave several
considerable governments. The new monarch imme-
diately set about the Conquest of Egypt, which he
accomplished in the manner related in the history of
that country.

Having reduced Egypt, Cambyses next resolved to
turn his arms against the Carthaginians, Hammonians,
and Ethiopians. But he was obliged to drop the frist
of these enterprises, because the Phoenicians refused
to supply him with ships against the Carthaginians,
who were a Phoenician colony. However, he sent
ambassadors to Ethiopia with a design to get intelli-
gence of the state and strength of the country. But
the Ethiopian monarch, being well apprised of the
condition on which they came, treated them with great
contempt. In return for the presents sent him by
Cambyses, he sent his own bow; and advised the Per-
ians to make war upon the Ethiopians when they could
bend such a strong bow as easily as he did, and to
thank the gods that the Ethiopians had no ambition
to extend their dominions beyond their own country.

Cambyses was no sooner informed of this answer by
his ambassadours than he flew into a violent passion;
and ordered his army immediately to begin their march,
without considering that they were neither furnished
with provisions nor any other necessary. When he
arrived at Thebes in Upper Egypt, he detached
50,000 men, with orders to destroy the temple of Ju-
piter Ammon: but all these perished in the defect;
not a single person arriving either at the oracle, or
returning to Thebes. The rest of the army, led by
Cambyses himself, experienced incredible hardships;
for not being provided with any necessaries, they had
not marched a fifth part of the way when they were
obliged to kill and eat the beasts of burden. When
these failed, the soldiers fed on grass and roots, as
long as any could be found; and at last were reduced
to the dreadful necessity of eating one another; every	enth man, on whom the lot fell, being condemned to
serve as food for his companions. The king, however,
obstinately perished in his design; till, being appro-
hehensive of the danger he himself was in, he retreated
to Thebes, after having lost the greatest part of his
army.

Cambyses was a man of a very cruel and suspicious
temper, of which he gave many instances; and the
following proved indubitably the cause of his death.—
We have already observed that the king of Ethiopia
sent his bow in return for the presents brought to him
by the ambassadours of Cambyses. The only man in
the Persian army who could bend this bow was Smei-
dis the king's brother; and this instance of his personal
strength so alarmed the tyrant, that, without any
crimes alleged, he caused him to be murdered. This
gave occasion to one Smerdis, a magician, who greatly
resembled the other Smerdis in looks, to assume the
name of the deceased prince, and to raise a rebel lion
against Cambyses, who was generally hated for his
cruelty; and this he could do the more easily, as the
chief management of affairs had been committed to
this Smerdis during the king's absence. Cambyses, on
receiving the news of this revolt, immediately ordered
his army to march, in order to suppress it; but as he
was mounting his horse, his sword, falling out of its
scabbard, wounded him in the thigh. On this acci-
dent, he asked the name of the city where he was;
and being told that it was Ecbatan, he said in the
presence of his attendants, "Pace has decreed that
Cambyses the son of Cyrus shall die in this place."
For, having consulted the oracle of Butus, which was
very famous in that country, he was told that he
should die at Ecbatan. This he had always understood
of Ecbatan in Media, and had therefore resolved to
avoid it. Being now, however, convinced that his
end was near, he assembled the chief Persian lords
who served in the army, and having told them that his
brother was certainly dead, he exhorted them never
to submit to the impostor, or suffer the sovereignty
again to pass from the Persians to the Medes, to which
nation Smerdis belonged, but to use their utmost
efforts to place one of their own blood on the
throne.

As the king's wound mortified, he lived but a few days
after this; but the assembly supposing that he
had spoken only out of hatred to his brother, quietly
submitted to the impostor, who was thus for a time
established on the throne. Indeed from his conduct
during the short time which he enjoyed the kingdom,
he appears to have been not at all deserving of a
crown. He began with granting to all his subjects an
imposing exemption from taxes and military service for three Smerdis
years, and treated all of them in the most beneficent
manner. To secure himself on the throne the more
effectually, he married Atotfa the daughter of Cyrus;
thinking, that in a case of discovery he might hold
the empire by her title. She had before been married to
her brother Cambyses, on a deceitful pretense, that a
man of Peris might die; as he pleased; and by virtue of
this decision Smerdis also married her as his brother.
The extreme caution of Smerdis, however, promoted
the discovery of his imposture. He had married all
his predecessor's wives, among whom was one Phedy-
yna, the daughter of Otanes, a Persian nobleman of the
first rank. Otanes, who suspected that the king was
not Smerdis the son of Cyrus, sent a true messenger
to his daughter, desiring to know whether he was
or not; but Phedyyna, having never seen this Smerdis,
could not give any answer. Her father then desired
to enquire at Atotfa, who could not but know her
own brother. However, he was again disappointed;
for Phedyyna acquainted him that all the king's wives
were lodged in distinct and separate apartments,
without allowing to see each other. This greatly
increased the suspicions of Otanes; upon which he sent
his daughter a third message, desiring her, the next
time, he should be admitted to the king's bed, to take
an opportunity of feeling whether he had ears or not;
for Cyrus had formerly caussed the ears of Smerdis the
magician to be cut off for some crime of which he had
been
A conspiracy formed against him.

In the mean time Smerdis and his brother had by great promises prevailed on Prenaspe (the executioner of the true Smerdis) to bind himself by an oath not to discover the fraud they had put on the Persians, and even to make a public speech, declaring that the present king of Persia was really the son of Cyrus. At the time appointed, he began his discourse with the genealogy of Cyrus, putting his hearers in mind of the great favours the nation had received from that prince. After having extolled Cyrus and his family, to the great amazement of all present, he confided the whole transaction with regard to the death of Smerdis: telling the people, that the apprehensions of the danger he must inevitably run by publishing the imposture had constrained him to conceal it for long; but, now, not being able any longer to act such a dishonourable part, he acknowledged that he had been compelled by Cambyses to put his brother to death with his own hand, and that the perfon who professed the throne was Smerdis the magian. He then begged pardon of the gods and men for the crime he had committed; and fulminating many imprecations against the Persians if they failed to recover the sovereignty, he threw himself headlong, from the top of the tower on which he stood, and died on the spot.

In the mean time the conspirators, who were advancing towards the palace, were informed of what had happened: and Ota­nes was again for deferring the execution of their enterprize; but Darius infulting upon the danger of delay, they proceeded boldly to the palace; and being admitted by the guards, who did not suspect them, they killed both the usurper and his brother; after which they ex­posed their heads to the people, and declared the whole imposture. The Persians at this were so enraged, that they fell on the whole feet, and killed every one of the magi they could meet with; and had not the slaughter been stopped by night, not one of the order would have been left alive.

The day on which this slaughter happened was afterwards celebrated by the Persians with the greatest solemnity, and called by the name of Magophonia, or the slaughter of the Magi. On that festival the magi durst not appear abroad, but were obliged to flint themselves up in their houses. Smerdis the magian reigned only eight months.

When the tumult was a little subdued, the conspirators, who were fe ven in number met together in order to elect a new king, or to determine what form of government they should next introduce. Ota­nes was for a republic: but being over-rulled by the rest, he declared, that as he was determined not to be a king, neither would he be ruled by one: and therefore infulted that he and his family should ever afterwards remain free from subjection to the royal power. This was not only granted, but it was further agreed by the other six, that whoever should every year present Ota­nes with a Median veil, a mark of great distinction among the Persians, because he had been the chief author of the enterprize. They farther agreed to meet at a certain place next morning at nine o'clock on horseback, and that he whose horse first neighed should be king. This being overheard by Ochobres, who had the care of Darius’s horses, he led a mare over night, and took it to the place, and brought his master’s horse to her, and the next morning the horse remembering the place, immediately neighed for the mare; and the five lords dismounting, saluted Darius as their king.

Darius Hystaspes was elected king of Persia in the year 522 B.C. Immediately after his accession, he promoted the other conspirators to the first employments in the kingdom, married the two daughters of Cyrus, Atossa and Artaytona, Parmys the daughter of the true Smerdis, and Phedyma the daughter of Ota­nes, who had detected the imposture of the magian. He then divided the whole empire into 20 satrapies or governments, and appointed a governor over each division, ordering them to pay him an annual tribute. The inhabitants of Colchis, with some others, were enjoined only to make annual presents, and the Arabsians to furnish every year such a quantity of frankincense as equalled the weight of 1000 talents. Thus Darius received the yearly tribute of 14,560 Euboeic talents, upwards of 250,000 pounds sterling.

Under Darius, the building of the temple of Jeru­salem, which had been obstructed by Cambyses and Smerdis, went on successfully, and the Jewish state was entirely restored. The most remarkable of Darius’s other trans­actions were his expeditions against Babyl­on; against Sis­tya, India, and Greece. The expedi­tion against Babylon took place in the year 517 B.C. when the people unable to bear the oppression of the Persians, and likewise discontented because the seat of Ionian government was removed from their city to Susa in Persia, took the opportunity of the troubles which happened in the reigns of Cambyses and Smerdis, to fo­lore their city with all kinds of provis­ions sufficient to serve them for many years; after which they broke out into an open rebellion, and this quickly brought upon them Darius with all his forces. The Babylonians perceiving themselves shut up by a numerous army, turned all their thoughts towards the supporting of a long siege, which they imagined would tire out the king’s troops. To prevent the con­sumption of their provis­ions, they took the most barbarous and cruel re­solution that ever was put in execution by any nation: they agreed among themselves to get rid of all unne­
cayinary mouths; and therefore gathering together all the old men, women, and children, they instigated them without distinction; every one being allowed only to keep the wife he liked best, and a maid servant to do the work of the house. The siege continued for a year and eight months; nor was there any likelihood of its being ended, when Zopyrus, one of Darius's chief commanders, put him in possession of it by the following stratagem. He cut off his nose and ears, and having mangled his body with stripes in a most cruel manner, he fled to the Babylonians thus disfigured, pretending that he had been so treated by Darius for advising him to raise the siege. Being intrusted with the command of some forces, he cut off several parties of the Persian army, whom Darius thus sacrificed in order to raise the character of Zopyrus the higher among the Babylonians. In this manner he so much established his credit, that at last he was made commander in chief of all the Babylonian forces, and the guard of the city committed entirely to his care; and so soon was this done than he delivered up Darius, who, to prevent their rebelling a second time beat down the walls of that metropolis to the height of 50 cubits. Three thousand of the most active in the rebellion were impaled; the rest pardoned. As they had destroyed most of their women, the neighbouring nations were commanded to furnish them with wives, and 50,000 women were sent to that city, by which means it was prevented from being depopulated. Zopyrus was rewarded with the highest honours, and had the whole revenues of Babylon bestowed on him for life.

After the reduction of Babylon Darius undertook a Scythian expedition, directed against those nations which lie between the Danube and the Tanaus. His pretext for this war was, to revenge the calamities which those nations had brought upon Achaia about 120 years before, when they invaded and subdued Media; keeping it in subjection for the space of 28 years, as we have related under the article. In this expedition he was attended with an army of 700,000 men. With these he marched to the Thraian Bosphorus: which having passed on a bridge of boats, he reduced all Thrace. From Thrace he advanced to the Danube, where he had appointed his fleet to meet him. This river he passed on another bridge of boats, and entered Scythia. His enemies, however, were too wise to oppose such a formidable power in the open field; and therefore retired before him, wafting the country as they went along, till at last the king, sensible of the danger he was in, resolved to give over the enterprise and return home. In order to do so with safety, he lighted a great number of fires in the night-time, and decamped; leaving behind him the old men and the sick, who fell into the hands of their enemies. The Scyths perceiving that Darius was gone, detached a considerable body to the bridge over the Danube; and as they were well acquainted with the roads, they got thither before the Persians. The Scyths had sent express messengers before hand to persuade the Ionians, whom Darius had left to guard the bridge, to break it down and retire to their own country; and this they prevailed the more easily, that as the time performed by Darius was now expired, they were at liberty to return home, without breaking their word or being wanting in their duty. Miltiades, prince of the Chersonese of Thrace, was for embracing fo favourable an opportunity of cutting of Darius's retreat, and shaking off the Persian yoke at once; all the other commanders agreed with him, except Hyllius prince of Miletus; who represented to the Ionian chiefs, that their power was connected with that of Darius, since it was under his protection that each of them was lord in his own city; and that the cities of Ionia would not fail to depose them and recover their liberty, if the Persian power should sink or decline. This speech made a deep impression on the rest, and it was at last determined that they should wait for Darius; and in order to deceive the Scyths, they began to break down the bridge, but advised them to return back and defeat Darius. They did so, but misused him; and he having thus safely escaped so great a danger, immediately repeated the Bosphorus, and took up his winter-quarters at Sardis, leaving Megabyzus, one of his chief generals, to complete the conquest of Thrace.

The king having sufficiently refreshed his troops, who had suffered extremely in the Scythian expedition, began to think of extending his dominions eastward; and, in order to facilitate his design, resolved in the first place to discover those countries. With this view, he caused a fleet to be built and equipped at Cephalus, a city on the river Indus. The command of this fleet he gave to one Scylax, a Grecian of Caria, who was well versed in maritime affairs. Him he ordered to sail down the current, and make the best discoveries he could of the country lying on either side of the river, till he arrived at the southern ocean; from whence he was to steer his course westward, and that way return to Persia. Scylax, having exactly observed his instructions, and sailed down the river Indus, entered the Red Sea by the straits of Babelmande1, and on the 30th month from his first setting out, landed at the same place from whence Necho king of Egypt formerly sent out the Phoenicians who circumnavigated Africa. From hence Scylax returned to Susa, where he gave a full account of his discoveries; upon which Darius, marching into India at the head of a powerful army, reduced that large country, and made it a province of the Persian empire drawing from thence an annual tribute of 360 talents of gold.

Soon after the expedition of Darius against India, the revolt of the Ionians, which gave occasion to his expedition into Greece, an account of which is given under the articles Attica, Greece, Sparta, &c. The ill success which attended him here, however, was so far from making him drop the enterprise, that it only made him the more intent on reducing the Grecians; and he resolved to head his army in person, having attributed his former bad success to the inexperience of his generals. But while he was employed in making the necessary preparations for this purpose, he received intelligence that the Egyptians had revolted, so that he was obliged to make preparations for reducing them also; and before this could be done, the king died, after having reigned 36 years, leaving the throne to his son Xerxes.

This prince ascended the throne of Persia in the year 485 B. C.; and his first enterprise was to reduce the Egyptians; which he effectually did, bringing
them into a worse state of slavery than they ever had experienced before. After this he resolved on an expedition into Greece; theVarious event of which is related under the article Artaxerxes. By his misfortunes in the Greek expedition, he became at last so dispirited, that he thereupon abandoned all thoughts of war and conquests: but growing tyrannical, and oppressing his subjects, he was murdered in his bed, in the year 464 B.C. and 418 of his reign, and was succeeded by his third son Artaxerxes Surnamed Longimanus on account of the great length of his arms.

This prince is named Ahasuerus, in Scripture, and is the name of the father of Esther, and from the whole of his reign showed the greatest kindness to the Jewish nation.

In the beginning of his reign he was opposed by Hytypates the second son of Xerxes, whom, however, he overcame, though not without considerable difficulty. After this he applied himself to the settlement of the affairs of government, and reforming many abuses which had crept in; and then, being fully established on the throne, he appointed feasts and rejoicings to be made for 160 days in the city of Susa: at one of which he resolved to divorce his queen for disobedience, and afterwards married Esther, as we find it recorded in the sacred writings.

In the fifth year of the reign of Artaxerxes the Egyptians revolted anew, and, being aided by the Athenians, held out for six years; but were again obliged to submit, and continued in subjection during the whole of his reign. Nothing else remarkable happened during the life of Artaxerxes Longimanus, who died in the 418th year of his reign; and was succeeded by Xerxes II. the only son he had by his queen, though by his concubines he had 17. Xerxes having drunk immoderately at an entertainment immediately after his accession, retired to a chamber in order to refresh himself with sleep; but here he was murdered by Sogdianus, the son of Artaxerxes by one of his concubines, after he had reigned 45 days.

Sogdianus was scarce seated on the throne when he put to death Bagorazus, the most faithful of all his father's eunuchs; by which, and the murder of his sovereign, he became generally odious. Upon this, fear of the dangerous situation in which he was, he sent for one of his brothers named Ochus, whom he supped with, with a design to murder him the moment he arrived. Ochus, however, understanding his design, put off, by several pretences, his coming, till he had drawn together a powerful army, with which he advanced to the confines of Persia. Here he openly declared, that his design was to revenge his brother's death; which brought over to him many of the nobility and governors of provinces, by whom he was immediately proclaimed king. Sogdianus, seeing himself thus deserted, contrary to the advice of all his friends, came to an accommodation with Ochus; who no sooner had him in his power than he cauffed him to be suffocated among aspers; a punishment invented on purpose for him.

Ochus being firmly settled on the throne by the death of Sogdianus, changed his name to Darius; and is by historians commonly called Darius Nabon or, The Bafard. But Arsites, another of the brothers being in what manner Sogdianus had got the better
the rear of the Greek battalions; but this advice he rejected with indignation, saying, that he should thus render himself unworthy of the crown for which he was fighting. As the king's army drew near, the Greeks fell upon them with such fury, that they routed the wing opposite to them almost at the first onset; upon which Cyrus was with loud shouts proclaimed king by those who fled next to him. But he, in the mean time, perceiving that Artaxerxes was wheeling about to attack him in flank, advanced against him, having 600 choien horse, killed Artagefes captain of the king's guard with his own hand, and put the whole body to flight. In this encounter, discovering his brother, he spurred on his horse, and coming up to him, engaged him with great fury; which in some degree turned the battle into a single combat. Cyrus killed his brother's horse, and wounded him on the ground; but he immediately mounted another horse, when Cyrus attacked him again, gave him a second wound, and had already lifted up his hand to give him a third, when the guards, perceiving the danger in which their king was, discharged their arrows at once against his antagonist, who at the same time throwing himself headlong upon his brother, was pierced through by his javelin. He fell dead upon the spot; and all the chief lords of his court, resolving not to survive him, were slain in the same place.

In the mean time, the Greeks having defeated the enemy's left wing commanded by Tissaphernes, and the king's right wing having put to flight Cyrus's left, both parties, being ignorant of what had passed elsewhere, imagined that they had gained the victory. But Tissaphernes acquainting the king, that his men had been put to flight by the Greeks, he immediately rallied his troops, in order to attack them. The Greeks, under the command of Clearchus, easily repulsed them, and pursued them to the foot of the neighbouring hills. As night was drawing near, they halted at the foot of the hill, much surprised that neither Cyrus himself, nor any messenger from him, had appeared; for as yet they knew nothing of his death, and the defeat of the rest of the army. They determined, therefore, to return to their camp, which they did accordingly; but found there that the greatest part of their baggage had been plundered, and all their provisions taken, which obliged them to pass the night in the camp without any sort of refreshment. The next morning, as they were still expending to hear from Cyrus, they received the news of his death, and the defeat of that part of the army. Whereupon they sent deputies to Ariœus, who was commander in chief of all the other forces of Cyrus, offering him, as conqueror, the crown of Perse. Ariœus rejected the offer, and acquainting them that he intended to set out early in the morning on his return to Ionia, advised them to join him in the night. They followed his directions, and, under the conduct of Clearchus, began their march, arriving at his camp about midnight, whence they set out on their return to Greece. They were at a vast distance from their own country, in the very heart of the Persian empire, surrounded by a victorious and numerous army, and had no way to return again but by forcing their way through an immense track of the enemy's country. But their valour and resolution mastered all these difficulties; and in spite of a powerful army, which pursued and harassed them all the way, they made good their retreat for 2325 miles through the provinces belonging to the enemy, and got safe to the Greek cities on the Euxine sea. This retreat (the longest that was ever made through an enemy's country) was conducted at first by Clearchus; but he being cut off through the treachery of Tissaphernes, Xenophon was chosen in his room, who at last brought his men safe into Greece; but for a full account of that famous retreat, see the article Xenophon.

The war with Cyrus was scarce ended, when another broke out with the Lacedemonians, on the following account. Tissaphernes being appointed to succeed Cyrus in all his power, to which was added all which he himself possessed formerly, began to oppress the Greek cities in Asia in a most cruel manner. On this they sent ambassadors to Sparta defiring the assistance of that powerful republic. The Spartans having ended their long war with the Athenians, willingly laid hold of the present opportunity of breaking again with the Persians, and therefore sent against them an army under the command of Thimbro, who, being strengthened by the forces which returned under Xenophon, took the field against Tissaphernes. But Thimbro being soon recalled upon some complaints, Dercyllidas, a brave officer and experienced engineer, was appointed to succeed him; and he carried on the war much more advantage than his predecessor. On his arrival in Asia, finding that Tissaphernes was at variance with another governor named Pharnabazus, he concluded a truce with the former, and marching against Pharnabazus, drove him quite out of Æolis, and took several cities in other parts. The latter, however, immediately repaired to the Persian court, where he made loud complaints against Tissaphernes, but gave the king a most salutary advice, which was to equip a powerful fleet, and give the command of it to Conan the Athenian, the best sea officer of his time, by which means he would obstruct the passage of further recruits from Greece; and thus soon put an end to the power of the Lacedemonians in Asia. This advice being approved of, the king ordered 700 talents for the equipment of a fleet, with directions to give Conan the command of it.

In the mean time, Dercyllidas, with all his valour and fame, fitted himself to be drawn into such a disadvantageous situation, that he must inevitably have been destroyed with his whole army, had it not been through the cowardice of Tissaphernes, who, having experienced the Grecian valour at the battle of Cuiza, could not by any means be induced to attack them. The Lacedemonians, however having heard that the Perian monarch was fitting out a great fleet against them, resolved to put on the war as vigorously as possible; and for this purpose, sent over Agesilaus one of their kings, and a most experienced commander, into Asia. This expedition was carried on with such secrecy, that Agesilaus arrived at Ephesius before the Persians had the least notice of his design. Here he took the field with 10,000 foot and 4000 horse, and falling upon the enemy while they were totally unprepared, carried every thing before him. Tissaphernes deceived him into a truce till he had leisure to assemble his forces, but gained little by his treachery.
Peri.

ery; for Ageilaus deceived him in his turn, and while Tissaphernes marched his troops into Caria, the Greeks invaded and plundered Phrygia.

Early in the spring, Ageilaus gave out that his design was to invade Lydia; but Tissaphernes, who remembered the last year's stratagem, now taking it for granted that Ageilaus would really invade Caria, made his troops again march to the defence of that province. But Ageilaus now led his army into Lydia as he had given out, and approached Sardis; upon which Tissaphernes recalled his forces from their former rout, with a design to relieve the place. But Caria being a very mountainous country, and unfit for horse, he had marched thither only with the foot, and left the horse behind on the borders of that province. Whence, on their marching back to the relief of Sardis, the horse being some days march before the foot, Ageilaus, took the advantage of so favourable an opportunity, and fell upon them before the foot could come to their assistance. The Persians were routed at the very first onset; after which Ageilaus over-ran the whole country, enriching both himself and his army with the spoils of the conquered Persians.

By this continued ill fortune Artaxerxes was so much provoked against Tissaphernes, that he soon after caused him to be put to death.

On the death of Tissaphernes, Tithraustes, who was appointed to succeed him, sent large presents to Ageilaus, in hopes of persuading him to abandon his conquests; but finding that commander was not by any means to be induced to relinquish the war, he sent Timocrates of Rhodes into Greece, with large sums of money to corrupt the leading men in the cities; and rekindle a war against the Lacedemonians. This stratagem produced the intended effect; for the cities of Thebes, Argos, Corinth, and others, entering into a confederacy, obliged them to recall Ageilaus, to the defence of his own country.

After the departure of Ageilaus, which happened in the year 354 B.C. the Lacedemonian power received a severe blow at Cnidus, where their fleet was entirely defeated by that of Artaxerxes under Conon, 50 of their ships being taken in the engagement; after which Conon and Pharnabazus being masters of the sea, failed round the islands and coasts of Asia, taking the cities there which had been reduced by the Lacedemonians. Sebota and Abydos only held out, and refilled the utmost efforts of the enemy, though they had been besieged both by sea and land.

Next year Conon having assembled a powerful fleet, again took Pharnabazus on board, and reduced the island of Melos, from whence he made a descent on the coasts of Lydia, plundering all the maritime provinces, and loading his fleet with an immense booty. After this, Conon obtained leave of him to repair to Athens with 80 ships and 50 talents, in order to rebuild the walls of that city; having first convinced Pharnabazus, that nothing could more effectually contribute to the weakening of the power of Sparta than putting Athens again in a condition to rival its power. He no sooner arrived at Piraeus the port of Athens, but he began to work; which as he had a great number of hands, and was seconded by the zeal of all those that were well inclined to the Athenians was soon completed, and the city not only restored to its former splendor, but rendered more formidable than ever. The Lacedemonians were now reduced to the necessity of accepting such terms of peace as they could procure. The terms were, that all the Greek cities in Asia should be subject to the king of Persia, peace with as also the islands of Cyprus and Clesomena; that the Persians should be restored to the Athenians, and all the cities of Greece, whether small or great, should be declared free; and by the same treaty, Artaxerxes engaged to join those who accepted the terms he proposed, and to affit them to the utmost of his power against such as should reject them.

Artaxerxes, being now disengaged from the Greek war, turned his arms against Evagoras, king of Cyprus. This man was defended from the ancient kings of Salamis, the capital city of the island of Cyprus. His ancestors had held that city for many ages in quality of overmen; but were at last driven out by the Persians, who, making themselves masters of the whole island, reduced it to a Persian province. Evagoras, however, being a man of an enterprising genius, soon became weary of living in subjection to a foreign power, drove out the Persian governor, and recovered his paternal kingdom. Artaxerxes attempted to drive him out of it; but being diverted by the Greek war, was obliged to put off the enterprise. However, Conon, by means of Ctesias, chief physician to Artaxerxes, got all differences accommodated, and Artaxerxes promised not to molest him in the possession of his small kingdom. But Evagoras soon becoming discontented with such a narrow possession, gradually reduced under his subjection almost the whole of the island. Some, however, there were who held out against him, and these immediately applied to Artaxerxes for assistance; and he, as soon as the war with Greece was at an end, bent all his force against Evagoras, intending to drive him quite out of the island. The Athenians, however, not withholding the favours lately conferred upon them by the king of Persia, could not forbear affisting their old ally in such a dreadful emergency. Accordingly, they sent him ten men of war under the command of Philocrates; but the Lacedemonian fleet, commanded by Talentias brother of Ageilaus, falling in with them near the isle of Rhodes, surrounded them so that not one ship could escape. The Athenians, determined to assist Evagoras at all events, sent Chabrias with another fleet and a considerable body of land forces; and with the assistance of these he quickly reduced the whole island. But in a short time, the Athenians being obliged, in consequence of the treaty concluded with the Persians, to recall Chabrias, Artaxerxes attacked the island with an army of 300,000 men, and a fleet of 300 ships. Evagoras applied to the Egyptians, Lybians, Arabians, Tyrians, and other nations, from whom he received supplies both of men and money; and fitting out a fleet, with which he ventured an engagement with that of Artaxerxes. But being defeated, and obliged to quit him self up in Salamis, he was closely besieged by sea and land. Here at last he was obliged to capitulate, and abandon to the Persians the whole of the island except Salamis, which he held as a king tributary to Artaxerxes.

The Cyprian war being ended, Artaxerxes turned,
The last years of the reign of Artaxerxes were greatly disturbed by dissensions in his family; which at last ended by bringing the two sons named Oebus, who behaved with such cruelty, that almost one half of his dominions revolted as soon as he came to the throne. But by reason of the dissensions of the rebels among themselves, all of them were reduced, one after another; and among the rest, the Sidonians, finding themselves betrayed, burnt themselves to the number of 40,000, together with their wives and children.

Oebus, having quelled all the insurgents, immediately set himself about reducing Egypt, and for this purpose procured a reinforcement of other 10,000 mercenaries from Greece. On his march, he lost a great number of his men drowned in the lake Serbonis, which lies between Phoenice and Egypt, extending about 32 miles in length. When the south wind blows, the whole surface of the lake is covered with sand, in such a manner that no one can distinguish it from the firm land. Several parties of Oebus’s army were lost in it for want of proper guides; and it is said that whole armies have sometimes perished in the same place. When he arrived in Egypt, he detached three bodies to invade the country in different parts: each being commanded by a Persian and a Greek general. The first was led by Lachares the Theban, and Rosaces governor of Lydia and Ionia; the second by Nicotiratus the Theban and Artizanes; the third by Mentor the Rhodian and Bagoas an eunuch. The main body of the army he kept with himself, and encamped near Pelium, with a design to watch the events of the war there. The event was successful, as we have related under the article Egypt; and Oebus having reduced the whole country, dismantled the strong holds, plundered the temples, and returned to Babylon loaded with booty.

The king, having ended this war with such success, conferred very high rewards on his mercenaries and others who had distinguished themselves. To Mentor the Rhodian he gave 100 talents, and other presents to a great value; appointing him also governor of all the coasts of Asia, and committing to his care the whole management of the war which he was still carrying on against some provinces that had revolted in the beginning of his reign; and all these either by firatages, or by force, he at last reduced; restoring the king's authority in all these places. Oebus then, finding himself free from all troubles, gave his attention to nothing but his pleasures, leaving the administration of affairs entirely to Bagoas the eunuch, and to Mentor. These two agreed to share the power between them in consequence of which the former had the provinces of Upper Asia, and the latter all the rest. Bagoas, having arms against the Cadutiens, whose country lay between the Euxine and Caucasian seas. But these nations were too well accustomed to war to be overcome by the Persians; and therefore the king was obliged to abandon the project, after having lost a great number of his troops and all the horses which he took with him. In his Egyptian expedition, which happened immediately after the Caduian war, he was attended with little better success; which, however, was owing to the bad conduct of his general Pharnabazus. This commander being entrusted with the management of the Egyptian war, sent an ambassador to Athens, complaining that Chabrias had engaged in the service of his king, with whom the state of Athens was in alliance, and threatening the republic with his master's resentment if proper satisfaction was not given: at the same time he demanded Iphicrates, another Athenian, and the gulf general of his time, to command the Greek mercenaries in the Persian service. This the Athenians complied with; and Iphicrates having mutilated his troops, so exercised them in all the arts of war, that they became afterwards very famous among the Greeks under the name of Iphicratian fathers. Indeed he had sufficient time to instruct them; for the Persians were so slow in their preparations, that two whole years elapsed before they were ready to take the field. At the same time Artaxerxes, that he might draw the more mercenaries out of Greece, sent ambassadors to the different states in it, declaring it to be his will and pleasure that they should live at peace with each other, on the terms of the treaty lately concluded: which declaration was received with pleasure by all the states except Thebes, who aspired to the sovereignty of Greece; and accordingly refused to conform to it. All things, however, at last being ready for the expedition, the troops were mutinied at the city then called Aes, and since Ptolomaiis where they were found to consist of 200,000 Persians under the command of Pharnabazus, and 20,000 Greeks led by Iphicrates. The fleet consisted of 300 galleys, besides a vast number of other vessels which followed with provisions. The fleet and army began the same time; and that they might act in concert they separated as little as possible. It was proposed, that the war should begin with the siege of Pelium; but Neocles, the revolting king of Egypt, had provided so well for the defence of the place, that it was thought expedient to drop the enterprise, and make a defence at one of the mouths of the Nile. In this they succeeded; for the Egyptians not expecting them at that place, had not taken such care to fortify it as at Pelium. The fortresses of conqunence was easily taken, and all the Egyptians in it put to the sword. After this, Iphicrates was for embarking the troops without loss of time, and attacking Memphis the capital of Egypt. Had this opinion been followed before the Egyptians recovered from the consternation into which they were thrown, it is highly probable that the whole country might have been reduced at once; but Pharnabazus would undertake nothing before the rest of the forces were come up. Iphicrates then, in the utmost vexation at losing so favourable an opportunity, pressed Pharnabazus to allow him to attack the place with the Greek mercenaries only; but he refused this also, from a mean jealousy of the honour which Iphicrates might acquire; and in the mean time the Egyptians recovered sufficient courage to put themselves in such a posture of defence, that they could not be attacked with any probability of success; and at the same time the Nile overflowing as usual, obliged them to return to Phoenice. The expedition was again undertaken 12 years after, but without success.

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The religion of his country, and endeavoured, on the conquest of Egypt, to influence the king in favour of the Egyptian ceremonies; but in spite of all his endeavours, Ochus not only refused to comply, but killed the sacred bull, the emblem of the Egyptian god Apis, plundered the temples, and carried away their sacred records. This Bagas supposed to be the highest guilt which a human creature could commit; and therefore poisoned his master and benefactor in the 21st year of his reign. Nor did his revenge stop here; for he kept the king's body, cau(ing another to be buried in its stead; and because the king had caused his attendants eat the flesh of Apis, Bagas cut his body in pieces, and gave it so mangled to be devoured by cats, making handles for swords of his bones. He then placed Aries the youngest of the deceased king's sons on the throne, that he might the more easily preserve the whole power to himself.

Aries did not long enjoy even the shadow of power which Bagas allowed him, being murdered in the second year of his reign by that treacherous enmity, who now conferred the crown on Darius Codemanus, a distant relation of the royal family. Neither did he incline to let him enjoy the crown much longer than his predecessor; for finding that he would not suffer himself to be guided by him, in all things, the treacherous Bagas brought him a poisonous potion; but Darius got rid of him by his own artifice, cau(ing Darius in the throne as far as security from internal enemies could do so; but in a very little time his dominions were invaded, and we may say, the same moment conquered, by Alexander the Great. The particulars of that hero's conquest are related under the article Macedon; we shall therefore here only take notice of the fate of Darius himself, with which the Persian empire concluded for many ages.

After the death of Artibes, which was decisive in favour of Alexander, the latter took and plundered Persepolis, from whence he marched into Media, in order to pursue Darius, who had fled to Ecbatan, the capital of that province. This unhappy prince had an army of 50,000 foot, among whom were 4000 Greeks, who continued faithful to the king. Besides these, he had 4000 slingers and 5000 horse, most of them Bactrians, and commanded by Bessus governor of Bactria. When Darius heard that Alexander was marched to Ecbatan, he retired into Bactria, with a design to raise another army; but soon after, changing his mind, he determined to venture a battle with the forces he still had left. On this Bessus governor of Bactria, and Bellerus a Persian lord of great distinction, formed a conspiracy against him, proposing to seize his person, and if Alexander purposed them, to gain his friendship and protection by betraying their master into his hands; but if they escaped, their design was to murder him, and usurp the crown. The troops were easily gained over, by representing to them the desperate situation of Darius's affairs; but Darius himself, though informed of their proceedings, and solicited to trust his person among the Greeks, refused to give credit to the report, or follow such a fatal change. The consequence of this was, that he was in a few days seized by the traitors, who, out of respect to the royal dignity, bound him with golden chains, and shutting him up in a covered cart, fled with him towards Bactria. The cart was covered with skins, and strangers appointed to drive it without knowing who the prisoner was. Bessus was proclaimed commander in chief in the room of Darius by the Bactrian horse; but Artabazus and his sons with the forces they commanded, and the Greeks under the command of one Patron, retired from the body of the army under Bessus, and marched over the mountains towards Parthia. In the mean time Alexander arriving at Ecbatan, was informed that Darius had left the place five days before. He then dispatched orders to Clitus, who had fallen sick at Sufa, to repair, as soon as he recovered, to Ecbatan, and from thence to follow him into Parthia with the cavalry and 6000 Macedonians, who were left in Ecbatan. Alexander himself with the rest of the army pursed Darius; and the 11th day arrived at Rhages, having marched in that space of time 3300 furlongs. Most of those who accompanied him died through the fatigue of so long a march; insomuch that, on his arrival at Rhages, he could scarce multer 60 horsemen. Finding that he could not come up with Darius, who had already passed the Caspian straits, he fix'd five days at Rhages, in order to refresh his army and settle the affairs of Media. From thence he marched into Parthia and encamped at a small distance from the Caspian straits, which he passed the next day without opposition. He had scarce entered Parthia, when he was informed that Bessus and Nabarzanes had conspired against Darius, and designed to seize him. Hereupon leaving the main body of the army behind with Craterus, he advanced with a small troop of horse lightly armed; and having marched day and night without ever halting, except for a few hours, he came on the third day to a village where Bessus with his Bactrians had encamped the day before. Here he understood that Darius had been seized by the traitors; that Bessus had caused him to be shut up in a close cart, which he had sent before that he might be the more sure of his person; and that the whole army except Artabazus and the Greeks, who had taken another rout, obeyed Bessus. Alexander therefore taking with him a small body of light armed horse, for the others could not possibly proceed further, at last came in sight of the barbarians, who were marching in great confusion. His unexpected appearance struck them though far superior in number, with such terror, that they immediately betook themselves to flight, and because Darius refused to follow them, Bessus and those who were about him discharged their darts at the unfortunate prince, leaving him wallowing in his blood. After this they all fled different ways and were pursued with great slaughter by the Macedonians. In the mean time the horaces that drew the cart in which Darius was, flopped of their own accord, for the drivers had been killed by Bessus, near a village about four furlongs from the highway. Thither Polyrattus a Macedonian, being pref'd with thirst in the pursuit of the enemy, was directed by the inhabitants to a fountain to refresh himself, not far from the place where they flopped. As he was filling his helmet with water, he heard the groans of a dying man; and looking round, he discovered a cart with a team of horses, unable to move.
move by reason of the many wounds they had received. When he drew near, he perceived Darius lying in the cart and very near his end, having several darts sticking in his body. However, he had strength enough left to call for some water, which Polytarus readily brought him. Darius, after drinking, turned to the Macedonian, and with a faint voice told him, that, in the deplorable state to which he was reduced, it was no small comfort to him that his last words would not be lost; he then charged him to return his hearty thanks to Alexander for the kindn

His muttering with the flower!

Having uttered these words, he expired in the arms of Polytarus. Alexander coming up a few minutes after, bewailed his death, and caused his body to be in terred with the highest honours. The traitor Bessus being at last reduced to extreme difficulties, was delivered up by his own men naked and bound into the hands of the Macedonians; on which Alexander gave him up to Oeaxmes, the brother of Darius, to suffer what punishment he should think proper. Plutarch tells us, that he was executed in the following manner: Several trees being by main force bent down to the ground, and one of the traitor's limbs tied to each of them, the trees, as they were suffer'd to return to their natural position, flew back with such violence, that each carried with it the limb that was tied to it.

Thus ended the empire of Persia, 209 years after it had been founded by Cyrus. On the death of Alexander the Persian dominion became the object of Seleucus Nicator, and continued subject to him for 62 years, when the Parthians revolted, and conquered the greatest part of them. To the Parthians they continued subject for 475 years, when the sovereignty was again restored to the Persians, as related under the article PARTHIA.

The reforer of the Persian monarchy was Artaxerxes, or Artaxares, who was not only a private person, but of spurious birth. However, he possessed great abilities, by which means he executed his ambitious projects. He was no sooner feated on the throne than he took the pompous title of king of kings, and formed a design of reforing the empire to its ancient glory. He therefore gave notice to the Roman governors of the provinces bordering on his dominions, that he had a just right, as the successor of Cyrus, to all the Left. As; which he there commanded them immediately to quit, as well as the provinces on the frontiers of the ancient Persian kingdom, which were already his. The consequence of this was a war with Alexander. Severus the Roman emperor. Concerning the event of this war there are very different accounts. It is certain, however, that, on account of his exploits against Artaxerxes, Alexander took the titles of Par-
and having an army superior to them in numbers, employed them continually in skirmishes, which were sometimes favourable to him and sometimes otherwise. But Sâd, perceiving that this lingering war would destroy his army, determined to halt forward, and force the enemy to a general engagement. The Periâns declined this for a long time; but at length, finding a convenient plain where all their forces might act, they drew up in order of battle and resolved to wait for the Arabs. Sâd having disposed his men in the belt order he could, attacked the Periâns with the utmost fury. The battle lasted three days and three nights; the Periâns retiring continually from one point to another, till at last they were entirely defeated; and thus the capital city, and the greatest part of the dominions of Periâ, fell into the hands of the Arabs. The conquerors seized the treasures of the king; which were formidable, that, according to a Mahometan tradition, their prophet gave the Saracen army a miraculous view of those treasures before the engagement, in order to encourage them to fight.

After the loss of this battle, Jezdegerd retired into Chorâfan, where he maintained himself as king, having under his subjection two other provinces, named Kerman and Seyffian. But after he had reigned in this limited manner for 19 years, one of the governors of the few towns he had left, betrayed it, and called in the Turks. This place was called Merv, seated on the river Ghîn or Odus. Jezdegerd immediately marched against the rebels and their allies. The Periâns were defeated; and the unfortunate monarch, having with much difficulty reached the river, found there a little boat, and a fisherman to whom it belonged. The king offered him a bracelet of precious stones; but the fellow, equally brutal and stupid, told him that his fare was five farthings, and that he would neither take more nor less. While they disputed, a party of the rebel horse came up, and knowing Jezdegerd, killed him in the year 652.

Jezdegerd left behind him a son named Firouz, and a daughter named Dara. The latter espoused Bolesnay, whom the rabbinical writers have dignified with the title of the har of the capityary; and who, in fact, was the prince of the Jews settled in Chaldea. As for Firouz, he still preferred a little principality; and when he died, left a daughter named Mab Afiir, who married Wâlid the son of the caliph Abdalm-lek, by whom she had a son named Tâzid, who became caliph, and consequently sovereign of Periâ; and so far was this prince from thinking himself above claiming the title derived from his mother, that he contemptuously styled himself the son of Khoufou, king of Periâ, the descendant of the caliph Manouen, and among whose ancestors on the side of the mother were the Roman emperor and the khâcan.

Periâ continued to be subject to the Arabs till the decline of the Saracen empire, when it was seized by various usurpers, till the time of Jenghiz Khan, who conquered it as well as almost all the rest of Asia. After his death, which happened in the year 1227, Periâ, together with the neighbouring countries, were governed by officers appointed by his successors, who reigned at Karakorom, in the eastern parts of Tartary, till the year 1253, when it became once more the seat of a mighty empire under Hulaku the Mogul, who in 1256 abolished the khalifate, by taking the city of Bâdad, as related under that article. After the death of Hulaku, his son Abaka succeeded to his extensive dominions; and his first care was to shut up all the avenues of his empire against the other princes of the race of Jenghiz Khan, who reigned in different parts of Tartary. His precautions, however, were of little avail; for in the very beginning of his reign he was invaded by Burkan Khan, of the race of Jagatay the son of Jenghiz Khan, from Great Bakhuria, with an army of 300,000 men. Abaka was but indifferently prepared to oppose such a formidable power; but, happily for him, his antagonist died before the armies came to an engagement, and the invaders disappeared and returned to Tartary. In the year 1264, Armenia and Anatolia were ravaged by the Mamlûks from Egypt, but they were obliged to fly from Abaka, who thus seemed to be established in the possession of an empire almost as extensive as that of the ancient Persian kings.

His tranquillity, however, was of short duration; for in 1268 his dominions were invaded by Borak Khan, a prince likewise of the race of Jagatay, with an army of 100,000 men. He quickly reduced the province of Chorâfan, where he met with little opposition, and in 1269 advanced as far as Aderbijan, where Abaka had the bulk of his forces. A bloody battle ensued; in which Abaka was victorious, and Borak obliged to fly into Tartary, with the loss of all his baggage and great part of his army. Abaka died in 1282, after a reign of 17 years, not without suspicion of being poisoned; and was succeeded by his brother Ahmed Khan. He was the first of the family of Jenghiz Khan who embraced Mahometanism; but neither he nor his successors appear to have been in the least verified in the arts of government; for the Periân history, from this period, becomes only an account of insurrections, murders, rebellions, and poisonings, till the year 1335, when it split all to pieces, and was possessed by a great number of petty princes; all of whom were at perpetual war with each other till the period of Timur Beg, or Tamerlane, who once more reduced them all under one jurisdiction.

After the death of Tamerlane, Periâ continued to be governed by his son Shah Rukh, a wife and valiant prince: but immediately after his death fell into the same confusion as before; being held by a great number of petty tyrants, till the beginning of the 16th century, when it was conquered by Shah Ismael Safi, or Sefi; of whose family we have the following account. His father was Sheykh Hayder or Hayder Safi, the son of Sultan Juneyd, the son of Sheykh Ibrahim, the son of Sheykh Ali, the son of Sheykh Mufti, the son of Sheykh Sefi; who was the 13th in a direct line from Ali the fon-in-law of the prophet MahOMET. When Tamerlane returned from the defeat of Bajazet the Turkish sultan, he carried with him a great number of captives out of Karamania and Anatolia, all of whom he intended to put to death on some remarkable occasion; and with this resolution he entered Ardebil, or Ardevil, a city of Aderbijan, about 25 miles to the east of Taurus, where he continued for some days. At this time lived in that city the Sheykh Safi or Sefi abovementioned, reputed by the inhabitants to be a saint; and, as such, much revered by them. The fame of Sefi's sanctity so much moved Tamerlane, that he paid him frequent visits; and, when he was about to depart, promised to grant whatever favour he should ask. Sheykh Safi, who had been informed of Tamerlan's
The reigns of the succeeding princes afford nothing remarkable till the time of Shah Abbas I. surnamed the Great. He ascended the throne in the year 1584; and his first care was to recover from the Turks and Tartars the large provinces they had seized which formerly belonged to the Persian empire. He began with declaring war against the latter, who had seized the finest part of Chorassan. Accordingly, having raised a powerful army, he entered that province, where he was met by Abdallah Khan the chief of the Ubeek Tartars. The two armies lay in fight of each other for six months; but at length Abbas attacked and defeated his enemies, forcing them, for that time, to abandon Chorassan. Here he continued for three years; and on his leaving that place, fixed the seat of government at Isfaham, where it has continued ever since.

His next expedition was against the Turks. Understanding that the garrison of Tauris was in no expectation of an enemy, he formed a design of surprizing the place; and having privately assembled a few forces, he marched with such celerity, that he reached a pass called Shihk, very near Tauris, in six days, though it is usually 18 or 20 days journey for the caravans. Here the Turks had posted a few soldiers, rather for the purpose of collecting the customs on such commodities as were brought that way, than of defending the pass against an enemy. Before they came in fight of this pass, Abbas and some of his officers left the rest of the army, and rode briskly up to the turnpike. Here the secretary of the customhouse, taking them for merchants, demanded the usual duties. Abbas replied, that the person who had the purfe was behind, but at the same time ordered some money to be given him. But while the secretary was counting it, he was suddenly robbed by the Shah's order; and the officers who were with him suddenly falling upon the few soldiers who were there, obliged them to submit; after which he entered the pass with his army. The governor of Tauris marched out with all the troops he could collect on so short a warning: but being inferior to the Persians, he was utterly defeated, and himself taken prisoner; after which the city was obliged to submit, as also a number of places in the neighbourhood. One city only, called Orumie, being very strongly fortified, refused all the efforts of Abbas; but was at last taken by the assistance of the Curds, who he gained over by promising to share the plunder of the place with them. But instead of this, he formed a design to cut them all off at once; fearing that they might at another time do the Turks a service of the same nature that they had done to him just now. For this reason he invited their chiefs to dine with him; and having brought them to a tent, the entrance to which had several turnings, he stationed on the inside two executioners, who cut off the head of the guests as soon as they entered.

After this Shah Abbas considerably enlarged his dominions, and repelled two dangerous invasions of the Turks. He attempted also to promote commerce, and civilize his subjects; but failed all his great actions by his abominable cruelties, which he practised on every one who gave him the least caufe of offence; nay, frequently without any caufe at all. He took the Isle of Ormus from the Portugese, who had kept it since 1507, by the assistance of some English ships in 1622; and died six years after, aged 70.

The princes who succeeded Shah Abbas the Great, were remarkable only for their cruelties and debaucheries, which occasioned a revolution in 1716, when the Shah Husein was dethroned by the Afghans, a people inhabiting the country between Perlia and India; who being oppressed by the mini fters, revolted under the conduct of one Merewell. The princes of the Afghan race continued to enjoy the sovereignty of Khoul Khan; and during this time, when Ashraf the reigning Shah was dethroned by one of his officers, the country continued to be governed by the Afghans, till the year 1760, when the Emperor of Perlia, taking advantage of the confusion among the Persians, sent an army to Chorassan, and compelled the Sultan of the Afghan race to acknowledge the suzerainty of Perlia. A few years after, he was murdered by the Afghans, on whom the empire of Perlia was seized. On this occasion, the Afghans made a league with the Ottoman and Persia, against the Turks; but the latter, as usual, forced their way into Chorassan, when Shah Shujah, the son of the late Sultan, fled to the Ottoman, and by their assistance recovered the provinces of Chorassan and Isfaham, and established Shah Shujah on the throne of Perlia. This Shah Shujah died in the year 1772, and was succeeded by his son Shah Jum-Ali Khan Shuja, who continued on the throne until 1777, when he was dethroned by his great uncle, the Shah Fathollah, who was assassinated the following year. Thus, after a reign of about 40 years, the throne of Perlia was restored to its legitimate owner. The next ruler of Perlia was a person named Hassam-Ala-ul-Mulk, who reigned 5 years, and was succeeded in 1783 by his son and successor, Afshar Khan, who reigned 9 years, and was followed by Shah Shujah II., grandson of the late Shah Shujah. This Shah Shujah was assassinated in 1798, and the throne was seized by his son, with the assistance of the Russians, who, in 1798, sent an army into Perlia. This army, however, was defeated by the forces of the British, and the Shah Shujah was restored to the throne by them. He reigned 2 years, and was succeeded by his son, who reigned 8 years, when he was succeeded by his cousin, the present Shah, named Shah Shujah III., who has reigned 25 years, and is considered as one of the most able and just rulers of Perlia.
Perfia.

Thamasp, otherwise called Prince Thamas, the only survivor of the family of Abbas, assembling an army, invited into his service Nadir Khan, who had obtained great reputation for his valor and conduct. He was the son of a Persian nobleman, on the frontiers of Ubeck Tartary; and his uncle who was his guardian, keeping him out of possession of the castle and estate, which was his inheritance, took to robbing the caravans; and, having increased his followers to upwards of 5,000 men, became the terror of that part of the country, and especially of his uncle, who had seized his estate. His uncle therefore resolved to make peace with him, and with that view invited him to the castle, where he entertained him in a splendid manner; but Nadir Khan ordered his troops to be cut next night, and all his people to be turned out of the castle. No sooner had Nadir Khan got the command of the Persian army, than he attacked and defeated the usurper Etriff, put him to death, as is supposed; after which, he seemed to be well treated, and had his life, or at least his freedom, restored to him. He was in the possession of immense wealth, and pretenders to the throne of Persia.

Nadir Khan, who had made themselfs masters of the country, and then prince Thamas seemed to be established on the throne; but Nadir Khan, to whom Thamas had given the name of Thama Kouti Khan, that is, the Slave of Thamas, thinking his services not sufficiently rewarded, and pretending that the king had a design against his life, or at least to fet him aside, confined against his will, and put him to death, as is supposed; after which, he usurped the throne, flying himself shab Nadir, or King Nadir.

He afterwards laid siege to Candabor, of which a son of Merewies had possesed himself. While he lay at this siege, the court of the Great Mogul being divided in factions, one of the parties invited Shah Nadir to come to their assistance, and betrayed the Mogul into his hands. He thereupon marched to Delhi, the capital of India, and summoned all the viceroys and governors of provinces to attend him, and bring with them all the treasures they could raise; and those that did not bring as much as he expected, he tortured and put to death. Having thus amassed the greatest treasure that ever prince was master of, he returned to Persia, giving the Mogul his liberty, on condition of his resigning the provinces on the west side of the Indus to the crown of Persia. He afterwards made a conquest of Ubeck Tartary, and plundered Bohara the capital city. Then he marched against the Dagillian Tartars; but left great part of his army in their mountains, without fighting. He defeated the Turks in several engagements; but lying siege to Bagdad, was twice compelled to raise the siege. He proceeded to change the religion of Persia to that of Oman, hanged up the chief priests, put his own son to death, and was guilty of such cruelty, that he was at length assassinated by his own relations, anno 1747. A contest upon this ensued between these relations for the crown, which has rendered Persia a scene of the most horrible confusions for upwards of 40 years.

The reader will form some notion of the troubles of this unhappy country from the following series of pretenders to the throne between the death of Nadir and the accession of Kerim Khan. We give it from Francklin's Observations. 1st, Adil Shah.—2d, Ibrahim Shah.—3d, Shah Rokh Shah.—4th, Suleeman Shah.—5th, Ismael Shah.—6th, Azad Khan Afghan.—7th, Hiffun Khan Kejar.—8th, Ali Merdan Khan Bakhteari.—9th, Kerim Khan Zund.

"Their reigns, or more properly the length of time they respectively governed with their party, were as follows: Adil Shah, nine months. Ibrahim Shah, six months. Shah Rokh Shah, after a variety of revolutions, at length regained the city of Meshid: he is now alive (1787), and above 80 years of age, reigning in Khorasan, under the direction of his son Nadir Ullah Meerza. Suleeman Shah and Ismael Shah in about forty days were both cut off, almost as soon as they were elevated. Azad Khan Afghan, one of Kerim Khan's most formidable rivals and competitors, was subdued by him, brought prisoner to Shiraz, and died there of a natural death. Hiffun Khan Kejar, another of Kerim Khan's competitors, was believing Shiraz, when his army suddenly mutinied and deserted him. Their mutiny was attributed to their want of pay. A party sent by Kerim Khan took him prisoner. His head was instantly cut off, and presented to Kerim Khan. His family were brought captives to Shiraz. They were well treated, and had their liberty given them soon after, under an obligation not to quit the city. Ali Merdan Khan was killed by a musket-shot as he was walking on the ramparts of Meshid encouraging his men. Kerim Khan Zund, by birth a Curdian, was a most favourite officer of Nadir Shah, and at the time of his death was in the southern provinces. Shiraz and other places had declared for him. He found means at last, after various encounters with doubtful success, completely to subdue all his rivals, and finally to establish himself as ruler of all Persia. He was in power about 50 years; the latter part of which he governed Persia under the appellation of vakeel or regent, for he never would receive the title of Shah. He made Shiraz the chief city of his residence, in gratitude for the assistance he had received from its inhabitants and those of the southern provinces. He died in the year 1779, regretted by all his subjects, who esteemed and honoured him as the glory of Persia.

"When the death of Kerim Khan was announced in Twenty-six, much confusion arose; two and twenty of the principal officers of the army, men of high rank and station, took possession of the ark, or citadel, with a resolution to acknowledge Abul Fittah Khan (the eldest son of the late Vakeel) as their sovereign, and to defend him against all other pretenders; whereupon Zikea Khan, a relation of the late Vakeel by the mother's side, who was possessed of immense wealth, enlisted a great part of the army into his pay, by giving them very considerable bounties. Zikea Khan was of the tribe of Zund (or the Lackeries); a man remarkably proud, cruel, and unrelenting. Having assembled a body of troops, he immediately marched them to the citadel, and laid close siege to it for the space of three days; at the expiration of which, finding he could not take it by force, he had recourse to treachery. To each of the principal khans he sent a written paper, employing treacherous means to entice the officers out, and was successful in taking them; and it appeared that they could not withstand many days longer, they agreed to
surrender themselves, firmly relying on the promises that had been made them. Zikea Khan, in the mean time, gave private orders for the khans to be seized, and brought separately before him as they came out of the citadel. His orders were strictly obeyed, and these deluded men were all massacred in his presence: he was seized in the meantime, feeding his eyes on the cruel spectacle.

"Zikea Khan's tyranny became soon intolerable, and he was cut off by his own body-guard, when Abul Futtah Khan, who was at the time in the camp, was proclaimed king by the unanimous voice of the troops, whom he immediately led back to Shiraz. On his arrival he was acknowledged as sovereign by all ranks of people, and took quiet possession of the government.

"Mahomed Sadick Khan, only brother of the late Kerim Khan, who had during that prince's life filled the high office of beglerbeg of Fars, and had been appointed guardian of his son Abul Futtah Khan, was at this period governor of the city of Busfora, which had been taken by the Persians, previous to the vakeel's venture. On the eve of the battle which he has fought with Sadick Khan, as in 1788, Mr. Franklin, from whose excellent Observations on a Tour made in the years 1786-7, these particulars are mostly extracted, says that Jaafar Khan is the most likely, in case of success against his opponent Akau Mahomed Khan; and for this purpose marched with his army towards Shiraz: the two armies met near Yezdekhail; when a battle ensued, and Akau Mahomed Khan's superior fortune again prevailing, Jaafar Khan was defeated, and retired to Shiraz, which he quitted on the 23rd of June 1787, and shortly after marched his army to the northward, but returned in October without having effected anything." Such was the state of Persia in 1788.

64
Murdered.

65
Mahomed Sadick Khan attempts to seize the government.

66
Which he effects.

67
Akau Mahomed Khan-collects troops, and is proclaimed at Mazanderan and Ghilan.

The news of Sadick Khan's approach threw the inhabitants of Shiraz into the greatest consternation: their minds were variously agitated on the occasion: some, from his known public character, expected he would honestly fulfill the commands of his deceased brother; others, who had been witnesses to the confusion of former times, on similar occasions, rightly imagined that he would set up for himself; and indeed this proved to be the case: for having entered Shiraz a very few days after, he caused Abul Futtah Khan to be seized and deprived of life, and put into close confinement.

"At this event, Sadick Khan openly assumed the government. As soon as the intelligence reached Ali Murad Khan, who was at Isphahan, that lord instantly rebelled: deeming himself to have an equal right to the government with Sadick Khan, as in fact he had, he could ill brook the thought of being obedient to him, and openly declared himself a competitor for the empire. Persia was by this means again involved in all the horrors of a civil war. Ali Murad Khan indeed took possession of Shiraz, assumed the government, and gave to the empire the flattering prospect of being settled under the government of one man; but this prospect was soon obscured by the power and credit acquired by Akau Mahomed Khan."

On the night following Kerim Khan's death, this man found means to make his escape from Shiraz, and fled to the northward, where, collecting some troops, he soon made himself master of Mazanderan and Ghilan, and was proclaimed nearly about the time that Ali Murad Khan had taken Shiraz. "It is remarkable (says our author), that from his first entering into competition for the government, he has been successful in every battle which he has fought. He is an eunuch, having been made so whilst an infant, by the command of Nadir Shah, and possesses great personal bravery."

Ali Murad Khan, hearing of the success of Akau Mahomed Khan, determined to go against him, but as he was previously proceeding to Isphahan to suppress a rebellion, he fell suddenly from his horse and expired on the spot.

"At this period Jaafar Khan, the eldest and only surviving son of Sadick Khan, was governor of Khums: he deemed this a favourable opportunity to assert his pretensions to the government, and immediately marched with what few troops he had to Isphahan; soon after his arrival he was joined by the greater part of the malcontents, who were then in arms. In this situation he remained some time; but Akau Mahomed Khan coming down upon him with his army, he was obliged to risk his fate in a battle, and being defeated, fled with the small remains of his troops, taking the road to Shiraz. Soon after finding himself strengthened by an increase of his army, he determined to venture a second engagement with his opponent Akau Mahomed Khan; and for this purpose marched with his army towards Isphahan: the two armies met near Yezdekhail, when a battle ensued, and Akau Mahomed Khan's superior fortune again prevailing, Jaafar Khan was defeated, and retired to Shiraz, which he quitted on the 25th of June 1787, and shortly after marched his army to the northward, but returned in October without having effected anything." Such was the state of Persia in 1788.

Mr. Franklin, from whose excellent Observations on a Tour made in the years 1786-7, these particulars are mostly extracted, says that Jaafar Khan is the most likely, in case of success against his opponent, to restore the country to a happy and reputable state; but it will require a long space of time to recover it from the calamities into which the different revolutions have brought it:—a country, if an oriental metaphor may be allowed, once blooming as the garden of Eden, fair and flourishing to the eye;—now, sad reverse! despoiled and leafless by the cruel ravages of war, and defolating contention."

As to the air and climate of this country, considering the great extent thereof, it cannot but be very different, according to the situation of its several parts; some being frozen with cold, whilst others are burnt, with heat at the same time of the year. The air, wherever it is cold, is dry; but while it is extremely hot, it is sometimes moist. All along the coast of the Persian Gulf, from west to east, to the very mouth of the river Indus, the heat of four months is so excessive, that even those who are born in this country, unable to bear it, are forced to quit their houses, and retire to the mountains; so that such as travel in these parts, at that season, find none in the villages but wretched poor creatures, left there to watch the effects of the rich, at the expense of their own health. The extreme heat of the air, as it is insupportable, so to it makes it prodigiously unwholesome; strangers frequently falling sick there, and seldom escaping. The eastern provinces of Persia, from the river Indus to the borders of Tartary, are subject to great heats, though not quite so unwholesome as on the coasts of the Indian Ocean and the Persian Gulf; but in the northern provinces, on the coast of the Caspian Sea, the
heat is full as great, and, though attended with moisture, as unwholesome as on the coast before mentioned. From October to May, there is no country in the world more pleasant than this; but the people carry indelible marks of the malign influence of their summers, looking all of them of a faint yellow, and having neither strength nor spirits; though, about the end of April, they abandon their houses, and retire to the mountains, which are 25 or 30 leagues from the sea. But this moistnes in the air is only in these parts; the rest of Persia enjoys a dry air, the sky being perfectly serene, and hardly so much as a cloud seen to fly therein.

Though it seldom rains, it does not follow that the heat admits of no mitigation: for in the night, notwithstanding there is not a cloud to be seen, and the sky is so clear, that the stars alone afforded a light sufficient to travel by, a brisk wind springs up, which lasts until within an hour of the morning, and gives such a coolness to the air, that a man can be attended with tolerable warm garments. The seasons in general, heat admits of no mitigation: for in the night, the heat is found as great, and though the sky is being perfectly serene, and hardly so much as a cloud seen to fly therein.

During the spring, the face of the country appears uncommonly beautiful. The flowers, of which they have a great variety, and of the brightest hues, the fragrant herbs, shrubs, and plants, the rose, the sweet basil, water-hyacinth, and the myrtle, all here contribute to refresh and perfume the natural mildness of the air. The nightingale of the garden (called by the Persians boodul bezar dafaars), the goldfinch, and the linnet, by their melodious warblings at this delightful season of the year, serve to add to the satisfaction of the mind, and to inspire it with the most pleasing ideas. The beauties of nature are here depicted in their fullest extent; the natural historian and the botanist would here meet with ample scope for pursuing their favourite investigations. With the great advantages of the salubrity of the air, how can it be wondered at that the inhabitants of Shiraz should so confidently assert the pre-eminence of their own city to any other in the world; or that such beauties should fail of calling forth the poetical exertions of a Hafiz, a Sadí, or a Jamí? Their mornings and evenings are cool, but the middle of the day is very pleasant. In summer the thermometer seldom rises above 7 in the day-time, and at night it generally sinks as low as 2.

The autumn is the worst season of the year, that being the time when the rains begin to fall, and during the autumnal months it is considered by natives as the most unhealthy; colds, fluxes, and fevers being very general. In winter a vast deal of snow falls, and very thick; but ice is rarely to be found, except on the summits of the mountains, or towards Ispahan, and the more northern parts of Persia. One thing which is most to be thanked in this country, and renders it preferable to any other part of the world, is the nights, which are always clear and bright; and the dew, that in moist places is so pernicious and dangerous a nature, is not of the least ill consequence here; there is none at all in summer, and in the other seasons it is of such a nature, that if the brightlest incimitar should be exposed to it all the night, it would not receive the least rust; a circumstance I have myself experienced. This dryness in the air causes their buildings to last a great while, and is undoubtedly one of the principal reasons that the celebrated ruins of Persepolis have endured for so many ages, and, comparatively speaking, in so perfect a state. The great dryness of the air exempts Persia from thunder and earthquakes. In the spring, indeed, there sometimes falls hail; and, as the harvest is then pretty far advanced, it does a great deal of mischief. The rain-bow is seldom seen in this country, because there rise not vapours sufficient to form it; but in the night there are seen rays of light flitting thro' the firmament, and followed as it were by a train of smoke. The winds, however brisk, seldom swell into storms or tempests; but, on the other hand, they are sometimes poisonous and infectious on the shores of the Gulf, as all travellers agree. Mr Tavernier says, that at Gombroon people often find themselves struck by a south wind, in such a manner that they cry, "I burn!" and immediately fall down dead. M. le Brun tells us, that he was affured while he was there, that the weather was sometimes so excessive as to melt the sheets of letters. At this time the people go in their shirts, and are continually sprinkled with cold water; and some even lie several hours naked in the water. Among the inconveniences consequent from this malign disposition of the air, one of the most terrible is the engendering, in the arms and legs, a kind of long small worms, which cannot be extracted without great danger of breaking them; upon which a mortification ensues.

The foil of Persia is in general stony, sandy, barren and everywhere so dry, that, if it be not watered, it produces nothing, not even grass; but, where they can turn the water into their plains and valleys, it is not Unfruitful. There is a great difference in point of fertility in the different provinces of the empire; and those of Media, Iberia, Hyrcania, and Bactria, are now in a great measure what they were formerly, and surpass most of the other parts of the world. All along the Perian Gulf, the soil is still more barren, cattle less plenty, and every thing in a worse condition than anywhere else.

Though there is scarce a province in Persia which produces, does not produce wine, yet the wine of some provinces is much more esteemed than that of others; but Shiraz, or, as it is written by Mr. Franklin, Shiravass, wine is universally allowed to be the very best in Persia; insomuch, that it is a common proverb there, That to live happy one must eat the bread of Yezd, and drink the wine of Shiraz.

The grain most common in Persia is wheat; which is wonderfully fair and clean. As for barley, rice, and millet, they only make bread of them in some places, as in Courdestan, when their wheat-bread is exhausted before the return of harvest. They do not cultivate in this country either oats or rye; except where the Armenians are settled, who make great use of the latter in Lent. Rice is the universal aliment of all sorts of people in Persia; for this reason they are extremely careful in its cultivation; for, after they have lown it...
in the same manner as other grain, they in three months time transplant it, root by root, into fields, which are well watered, otherwise it would never attain that perfection in which we find it there; since it is softer, sooner boiled, and more delicious, than the same grain in any other part of the world. Perhaps its taste is, in some measure heightened by a practice they make use of to give it a glossy whiteness, viz. by cleansing it, after it is beaten out of the husks, with a mixture of flour and salt. Corn ripens exceedingly in the country; so that in some parts they have threefold crop in the year. The Persian bread is generally very thin, white, and good; and commonly cheap enough. Though none can be carried out of the kingdom with a master, as cooing little or nothing to keep. They travel without halter or reins; grazing on the road from time to time, notwithstanding their load. They are managed entirely by the voice; those who direct them making use of a kind of song, and the camel moving bricker, or at its ordinary pace, as they keep a quicker or slower time. The camels shed their hair so quickly or slower time. The camels shed their hair so clean in the spring, that they look like seamed skin; but then they are pitched over, to keep the flies from biting them. The camel hair is the most profitable fleece of all the tame beasts: fine fluffs are made of it; and in Europe, hats, with a mixture of a little beaver.

As beef is little eaten in Persia, their oxen are generally employed in ploughing, and other sorts of labour. Hogs are nowhere bred in Persia, if we except in a province or two on the borders of the Caspian Sea. Sheep and deer are very common throughout all Persia.

Of wild beasts, the number is not great in that country, because there are few forests; but where there are any, as in Hyrcania, now called Tbrizian, abundance of lions, bears, tigers, leopards, porcupines, wild boars, and wolves, are to be found; but the last are not so numerous as any of the other species.

There are but few insects in this country; which may be ascribed to the dryness of the climate. In some provinces, however, there is an infinite number of locusts or grasshoppers, which fly about in such clouds as to darken the air. In certain parts of the Persian dominions they have large black scorpions, so venomous, that such as are stung by them die in a few hours. In others they have lizards, frightfully ugly, which are so long and as thick as a large toad, their skins being as hard and tough as that of the fea dog: they are said to attack and kill men sometimes; but that may be doubted. The southern provinces are infested with gnats; some with long legs, like those we call midges; and some white, and as small as fleas, which make no buzzing, but stung suddenly, and so mortally, that the sting is like the prick of a needle. Among the reptiles is a long square worm, called by the inhabitants hazar-pas, i.e. "thousand feet," because its whole body is covered with feet; it runs prodigiously fast; and its bite is dangerous, and even mortal, if it gets into the ear.

There are in Persia all the several sorts of fowls which we have in Europe, but not in such great plenty; excepting, however, wild and tame pigeons, of which vast numbers are kept all over the kingdom, chiefly on account of their dung, which is the best manure for melons. It is a great diversion among the lower order of people in town and country to catch pigeons, though it be forbidden: for this purpose they have pigeons taught, that, flying in one flock, they surround such wild ones as they find in the field, and bring them back with them to their masters. The partridges of this country are the largest and finest in the world, being generally of the size of our fowls. Geese, ducks, cranes, herons,
Perfia. beRNas, and many other forts of water-fowl, are common here; as are likewise nightingales which are heard all the year, but chiefly in the spring. martlets, which learn whatever words are taught them; and a bird called naura, which chatters incessantly, and repeats whatever it hears. Of birds of a larger size, the most remarkable is the pelican, by the Persians called t.ectal, i. e. “water-carrier” and also n. i. e. “sheep”, because it is as large as one of these animals *. There are in Persia various birds of prey. Some of their falcons are the largest and finest in the world: the people take great pains to teach them to fly at game; the Persian lords being great lovers of falconry, and the king having generally 800 of this sort of birds, each of which has a perfon to attend it.

There is perhaps no country in the world which, generally speaking, is more mountainous than Persia; but many of them yield neither springs nor metals, and but few of them are shaded with trees. It is true, some of the chief of them are situated on the frontiers, and serve as a kind of natural ramparts, or bulwarks, to this vast empire. Among the latter are the mountains of Caucasus and Ararat, sometimes called the mountains of Baghshan, which, with all the space between the Euxine and Caspian seas, is called Tartary, and the several branches thereof, run through Persia from Natolia to India, and fill all the middle of the country.

As to rivers, except the Araxes, which runs in the mountains of Armenia, and falls into the Kur or Cyrus before it reaches the Caspian Sea, there is not one navigable stream in this county. The Oxus divides Persia on the north-east from Usbeck Tartary. The Indus also may now be reckoned among the rivers of Persia, as the provinces lying to the west of that river are now in possession of that crown; this river is said to have a course of more than 1000 miles, and overflows all the low grounds in April, May, and June.

The seas on the south of Persia are, the Gulph of Persia or Baffora, the Gulph of Ormus, and the Indian Ocean. The only sea on the north is the Caspian, or Hyrcan Sea; which is more properly a lake, having no communication with any other sea. The Persians, together with the lakes and rivers, supply Persia with plenty of fish. The Caspian sea contains very fine fish on one side; and the Persian Gulph on the other is believed to have more fish than any other sea in the world. On the coasts of this gulph is taken a sort of fish, for which they have no particular name; its flesh is of a red colour, very delicious, and some of them weigh 200 or 300 pounds. The river fish are chiefly barbels; but far from being good. Those of the lakes are carps and flads. In the river at Spahuan are a great number of crabs, which crawl up the trees, and live night and day under the leaves, where they are taken; and are esteemed very delicious food.

In his voyage from Gombroon up the Persian Gulph, Mr. Ives makes mention of several islands, named Kifme, Poloor, Vey, Tiberabie, Shitewar, and Baffora. Some of these were quite barren; on others there were a few trees and bushes, with little fishing towns, and a few small vessels lying along shore. The date trees were thinly scattered among the hills; but the small portion of green might here and there be discovered, yet fish was the barrengest of these islands in general, that it was for some time a matter of surprise how sheep and goats could possibly subsist upon them. On closer examination, however, it was found, that the soil produced a kind of small-leaved juicy madows, on which these animals principally feed. The Persian could, as they fell along, afford a most romantic prospect, appearing at first to be one continued rock, rent and torn asunder by earthquakes; but it was afterwards discovered, that some part of it was only sand hardened by the rains and sun.

Narban Point terminates in a long and low piece of land, which runs off into the gulph from the foot of the Persian hills. Between this point and the main land is a channel, in which a ship of 600 tons burden might easily ride. The Portuguese had formerly a settlement here, the remains of which are still to be seen. A large river empties itself into the sea at this place; and Mr. Ives observes, that "Providence seems here to have allotted a spot of ground amidst inhospitable rocks and deserts, capable of affording the kind production of vegetables for man and beast."

Through all the Persian Gulph Mr. Ives remarks, that the spring-water on the islands is much better than that on the continent; and the water near the sea on the islands has greatly the advantage over that which is found in the middle parts. This holds good however, only in those parts which are near the sea; for about 12 miles up the country, both on the Persian and Arabian side of the gulph, the water is very good. At the island called Bareen or Bahren, divers go down to the bottom of the sea, at certain known depths, and come up again with their vessels filled with fresh water. This fresh water is found in holes or little natural wells, some fathoms below the surface of the sea. The Arabs have certain marks on the island to teach them where to dive for the fresh water. Mr. Ives was assured by an Arabian merchant, that he himself had discovered a spring upon the shore, by which one of those wells was served. He put into this spring a bit of a heavy flock; and in two or three days an Arabian diver brought it to him again from the bottom of one of these holes.

The English and other nations, trade with the Persians several ways, particularly by the gulph of Ormus at Gombroon, and by the way of Turkey. A trade also was not many years since opened by the English with Persia through Russia and the Caspian Sea; but that is now discontinued, having been prohibited by the court of Russia, who were apprehensive that the English would teach the Persians to build ships, and dispute the navigation of the Caspian Sea with them. The principal commodities and manufactures of Persia are, raw and wrought silk, mohair camels, carpets, leather; for which, and some others, the European merchants exchange chiefly woolen manufactures; but the trade is carried on altogether in European shipping, the Persians having scarce any ships of their own, and the Russians the sole navigation of the Caspian Sea. There is not a richer or more profitable trade in the world, than that which is carried on between Gombroon and Surat in the East Indies; and the English East India Company frequently let out their ships to transport the merchandise of the Banians and Armenians from Persia to India. The itah, or forage,
PER

Money.

The most current money of Persia are the abashees, worth about 1s. 4d. sterling; they are of the finest silver. An abass is worth two mahmoudes; a mahmoud, two fahees; and a fahee, ten single or five double casbehes; these last pieces are of brass, the others of silver; for gold is not current in trade. The fahees are not very common; but mahmoudes and casbehes are current everywhere. Horses, camels, houses, &c. are generally sold by the toman, which is an imaginary coin, worth 200 fahees, or 50 abassees; and they usually reckon their edates that way. Such a one, they say, is worth 200 many tormans, as we say pounds in this country.

Peria is an absolute monarchy, the lives and estates of the people being entirely at the disposal of their prince. The king has no council established, but is advised by such ministers as are most in favour; and the resolutions taken amongst the women of the harem frequently defeat the best laid designs. The crown is hereditary, excluding only the females. The sons of a daughter are allowed to inherit. The laws of Persia exclude the blind from the throne; which is the reason that the reigning prince usually orders the eyes of all the males of the royal family, of whom he has any jealousy, to be put out. The king has generally a great many wives, which it would be death for any one, besides the eminents, who have the superintendence of them, to look at, or even see by accident; wherefore, when he travels, notice is given to all men to quite the road, nay their very houses, and to retire to a great distance.

The prime minister is called attainat doulet, which signifies the director of the empire, and also visir iwan, or the great supporter of the empire; as he alone almost fulfils the whole weight of the administration. This minister's chief study is to please his master, to secure to himself an ascendancy over his mind, and to avoid whatever may give him any uneasiness or umbrage. With this view, he never fails to flatter him, to extol all above the princes upon earth, and to throw a thick veil over every thing that might help to open his eyes, or discover to him the weakness of the state. He even takes particular care to keep the king in utter ignorance, to hide from him, or at least to soften, all unwelcome news; and, above all, to exalt immediately every the least advantage he obtains over his enemies. As he takes these methods, which indeed are and must be taken, more or less, by the ministers of every despotic prince, to secure the favour and confidence of his master; so, for the inferior officers and governors of provinces are obliged to employ all the means in their power to secure the prime minister's, they depending no left upon him then he does upon the king. There is a gradation of despotism and flattery, down from the prime minister to the lowest retainer to the court, or dependent on the government. Children are sometimes in Persia required by the king to cut off the ears and nose, and even to cut the throats of their parents; and these orders cannot be objected to, without endangering their own lives. Indeed their baseness and mercenary is such, that they will perpetrate such atrocious deeds without the least scruple or difficulty, when they have a promise or expectation of poffessing their places.

The prime ministers, notwithstanding the precarious footing on which they stand, in effect of their abilities or good fortune, sometimes continue in their employments during life; or, if removed, are only banished to some city, where they are allowed to spend the remainder of their days in a private station.

Next to the prime minister are the nadirs, or grand masters of the household; the master, or groom of the chambers, who is always a white eunuch; the mir-akbar-balhe, or master of the helmet; the mir-shakar-balhe, or great huntsman and falconer; the divan-beggh, or chief justice, to whom there lies an appeal from the draga, or the lieutenant of police, in every town; the vakka-nuviez, or recorder of events, or first secretary of state; the musulauk-nulumaleck, or master of the accounts and finances of the kingdom; the numes hamhuses, or the king's chief physicians; the shickada-balhe, or inspector of the palace, and regulator of rank at court; and the khan, or governors of provinces, under whom are other governors, called ultans, appinted also by the king.

Civil matters are all determined by the cazi, and ecclesiastical ones (particularly divorces) by the sheick-elfaleum, or head of the faith; an officer answering to the multi among the Turks; under him are the sheick-elfeleum, and cadi, who decide in all matters of religion, and make all contracts, testaments, and other public deeds, being appointed by the king in all the principal towns; and next to these are the pachnams, or directors of the prayers; and the moullahs, or doctors of the law.

Justice is carried in Persia in a very summary manner; the sentence, whatever it may be, being always put into execution on the spot. Theft is generally punished with the loss of nose and ears; robbery on the road, by ripping up the belly of the criminal, in which situation he is exposed upon a gibbet in one of the most public parts of the city, and there left until he expires in torment.

There is no nobility in Persia, or any respect shown to a man on account of his family, except to those who are of the blood of their great prophet or patriarchs; but every man is esteemed according to the poll he pollutes; and when he is dismissed, he loses
With respect to the forces of Persia, these two bodies, called the Kortbies and Goulans, that serve on horseback, are well kept and paid, and may amount, the former to about 22,000, and the latter to about 18,000. The Kortbies are descended from an ancient but foreign race; and the Goulans are either Georgian renegades or slaves, or the children of slaves or all nations. The infantry, called Tangtches, are picked out from among the most robust and vigorous of the peasants, and compose a body of 40,000 or 50,000. The Persians have few fortified towns, and had no ships of war, till Koul Khan built a royal navy, and among them had a man of war of 80 guns; but since the death of that usurper, we hear no more of their all but foreign race; and all Mahometan nations, wine being prohibited; but of all Mahometan countries, wine being prohibited; but of all Mahometan nations, they pay the least regard to this prohibition. Many of them drink wine publicly, and almost all of them in private (excepting those who have performed the pilgrimage to Mecca, and men of religion); they also are very liable to be quarrelsome when intemperately exceeding their custom, which is often attended with fatal consequences. They eat opium, but in much less quantity than the Turks; and indeed in everything they say or do, eat or drink, they make a point to be as different from this nation as possible, whom they detest to a man, beyond measure; esteeming Jews and Christians superior to them, and much nearer to salvation.

Every one knows, that the religion of the Persians is Mahometan; and that they are of the sect of Ali, of their religious prejudices so very prevalent in every other Mahometan nation; they are fond of inquiring after the manners and customs of Europe, and in return very readily afford any information in respect of their own country. The practice of hospitality is with them so grand a point, that a man thinks himself highly honoured if you will enter his house and partake of what the family affords; whereas, going out of a house without making a calen, or taking any other refreshment, is deemed in Persia a high affront.

Their usual drink is water and sherbet, as in other Mahometan countries, wine being prohibited; but of all Mahometan nations, they pay the least regard to this prohibition. Many of them drink wine publicly, and almost all of them in private (excepting those who have performed the pilgrimage to Mecca, and men of religion); they also are very liable to be quarrelsome when intemperately exceeding their custom, which is often attended with fatal consequences. They eat opium, but in much less quantity than the Turks; and indeed in everything they say or do, eat or drink, they make a point to be as different from this nation as possible, whom they detest to a man, beyond measure; esteeming Jews and Christians superior to them, and much nearer to salvation.

The Persians, before the conquest of Alexander, are known to have been exceedingly voluptuous and effeminate. After that event, the Greek discipline and martial spirit being in part communicated to them, they became much more formidable; and hence the Parthians were found to be a match not only for the Syro-Macedonian princes, but even for the Romans. Of their manners we know little or nothing, but that to their valour and military skill they joined in a surprising degree all the luxury and dissipation of the ancient Persians.

The modern Persians, like the Turks, plundering all the adjacent nations for beauties to breed by, are noted for good nature, haud and complexion; but the Gouras, or ancient Persians, are homely, ill-hosped, and clumsy, with a rough skin, and olive complexion. In some provinces, not only the complexion but the constitutions of the inhabitants, suffer greatly by the extreme heat and unwholesomeness of the air. The Persian women, too, are generally handsome and well-shaped, but much inferior to those of Georgia and Circassia. The men wear large turbans on their heads, some of them very rich, interwoven with gold and silver; a vext, grit with a fait; and over it a loose garment, something shorter; with sandals, or flippers, on their feet. When they ride, which they do every day, if it be but to a house in the same town, they wear plant boots of yellow leather; the furniture of their horses is extremely rich, and the hussars generally of silver; whether on horseback or on foot they wear a broad sword and a dagger in their safr. The dress of the women does not differ much from that of the men; only their veils are longer, and they wear twilled caps on their heads, and their lining down.

With respect to outward behaviour, says an intelligent traveller, "The Persians are certainly the Persians of the East. Whilst a rude and insolent demeanour peculiarly marks the character of the Turkish nation towards foreigners and Christians, the behaviour of the Persians, on the contrary, is honour to the most civilized nations: they are kind, courteous, civil, and obliging, to all strangers, without being guided by those religious prejudices so prevalent in every other Mahometan nation; they are fond of inquiring after the manners and customs of Europe, and in return very readily afford any information in respect of their own country. The practice of hospitality is with them so grand a point, that a man thinks himself highly honoured if you will enter his house and partake of what the family affords; whereas, going out of a house without making a call, or taking any other refreshment, is deemed in Persia a high affront."
they then wash their hands, which is an invariable custom with the Persians both before and after eating. They eat very quick, conveying their food to their mouths with their fingers; the use of knives and forks being unknown in Persia. Sherbets of different sorts are introduced, and the meal concludes with a dessert of delicious fruit. The supper being finished, the family sit in a circle, and entertain each other by relating pleasant stories (of which they are excessively fond), and also by repeating passages from the works of their most favourite poets, and amusing themselves at various kinds of games. The fifth and last prayer is styled maw son akhir; the last prayer, or sometimes numah fith, or the night prayer, repeated about an hour after supper.

The most remarkable law among the Persians respecting marriage. A man may divorce his wife when he chooses, without assigning any other reason for the divorce than that it is his pleasure. If he should change his mind, he may again marry her, divorce her a second time, and a third time marry her; but here this privilege stops. No man is allowed to marry the woman whom he has thrice divorced. A widow is obliged to mourn four months for her deceased husband before she can be married to another; but a concubine may form a new connection the infant that her keeper expires.

At the naming of children in Persia, Mr. Francklin informs us that the following ceremony is observed: “The third or fourth day after the child is born, the friends and relations of the woman who has lain in at her house, attended by music, and dancing girls hired for the occasion; after playing and dancing some time, a mullah or priest is introduced, who, taking the child in his arms, demands of the mother what name she chooses the infant should be called by; being told, he begins praying, and after a short time applies his mouth close to the child’s ear, and tells him distinctly three times (calling him by name) to remember and be obedient to his father and mother, to venerate his Koran and his prophet, to abstain from those things which are unlawful, and to practice those things which are good and virtuous. Having repeated the Mahometan profession of faith, he then redeems the child to his mother; after which the company are entertained with sweet meats and other refreshments, a part of which the females present always take care to carry away in their pockets, believing it to be the invariable means of their having offspring themselves.”

The Persians excel more in poetry than in any other sort of literature; and allrologers are now in as great reputation in Persia as the magi were formerly. Their books are all manuscripts, the art of printing having not yet been introduced among them: they excel indeed in writing, and have eight different hands. They write from the right hand to the left, as the Arabs do. In their short hand, they use the letters of the alphabet; and the same letters, differently pointed, will have 20 different significations. In short, the Persians are here, with as good natural parts as any people in the East, but make a bad use of them; being great dummies, cheats, liars, and flatterers, and having a strong propensity to voluptuousness, luxury, idleness, and indolence; vices in general to which the Atlatics in general are much addicted.

PERSIAN WHEEL. See HYDROSTATICS.

PERSICA, the Peach, is by Linæus referred to the same class and genus with Amygdalus; however, as they are so commonly reckoned to be different genera, we have thought proper to distinguish them. There are a great variety of peach-trees planted in the gardens, some of which are preferred only for the beauty of their flowers, but most of them for the sake of the fruit. Of those remarkable for the beauty of their flowers, the principal are, 1. The vulgaris, or common peach-tree, with double flowers, which is a very great ornament in gardens, producing very large double flowers of a beautiful red or purple colour, and growing to a considerable size. 2. The humilis, or dwarf-almond. 3. The Africana, or double-flowing dwarf-almond. These two reach not above the height of three or four feet, though their flowers are of equal beauty with the former.

Of the peach-trees cultivated for the sake of their fruit there are a great number, to describe which particularly would exceed the proper bounds of this article. They are rained from the stones of the fruit, which should be planted in autumn on a bed of light dry earth, about three inches deep and four inches an under. In the winter the beds should be covered with much to protect them from the frost. In this bed they should remain for a year; when they are to be taken up and planted in a nursery, where they are to remain one or two years; after which they must be removed to the places where they are to continue.

PERSICANA, in botany. See POLYGONUM.

PERSICUS SINUS, in anc. geog. (Mela, Piny); a part of the sea which the Romans called Mare Rubrum, and the Greeks Mare Erythreum; waiting Aрабia Felix on the east, between which and Carmania, entering into the land, it washes Persis on the south. Its large mouth consists of straight sides, like a neck, and then the land retiring equally a vaat way, and the sea surrounding it in a large compass of shore, there is exhibited the figure of a human head (Mela). Theophratus calls this bay Great Persia, which name is equally claims with Periacus, only for distinction fake Periacus is appropriated to it by others.

PERSIMON. See Diospyros.—From the perimmon is made a very palatable liquor in the following manner: As soon as the fruit is ripe, a sufficient quantity is gathered, which is very easy, as each tree is well stocked with them. These perimmon apples are put into a dough of wheat or other flour, formed into cakes, and put into an oven, in which they continue till they are quite baked and sufficiently dry, when they are taken out again: then, in order to brew the liquor, a pot full of water is put on the fire, and some of the cakes are put in: these become soft by degrees as the water grows warm, and crumble in pieces at last; the pot is then taken from the fire, and the water in it well stirred about, that the cakes may mix with it; till all is then poured into another vessel, and they continue to steep and break as many cakes as are necessary for a brewing; the malt is then infused, and they proceed as usual with the brewing. Beer thus prepared is reckoned much preferable to other beer. They like-

81 Remarkable law respecting marriage.

82 Ceremony of naming their children.

83 Intellectual excellence.
Ternefs. He wrote but seldom; and it is evident that he was incalculably charmed with his verses, that he was insensibly affected by them in the judgments of which the critics are so justly pleased. Volterra; and afterwards continued his studies at Rome and all the labours of Horace; but after some time he was nothing left but to be underediting of the composition of his verses. He was a man of perfect rank. He was a most licentious, and full of lewdness. When the persimmon trees get once the cold, they are not fermented, but have a most agreeable and elegant smell. Some persons are ripe at the end of November and December, and are not before No-vember and December. The word Persius, or Persin, of a weak constitution, and all the labours of Phalaris, who has written a most learned and elaborate commentary upon him, cannot make him equal to either of them as a satirist, though in virtue of his learning he exceeded them both. He was a professor imitator of Horace; yet he had little of Horace's wiry, concise, and talent in ridicule. His style is grand, figurative, poetical, and suitable to the dignity of the Stoic philosophy; and hence he shines most in recommending virtue and integrity: here it is that satire begets him. He was too grace to court the muses with success; but he had a great soul, susceptible of noble sentiments, which gave a grace but to indifferent poetry. His cotemporaries thought highly of him. Quintilian allows, that Persius, although he wrote but one book of satires, acquired a great deal of true glory, Mul sum et vera gloria quamvis uno libro Persius meruit: and Martial says much the same thing, Sapientia in libros memorat Persius uno, etc.

Persis, a Roman lady, whom St Paul salutes in his epistle to the Romans (xvi. 12.), and whom he calls his beloved sister. He says she has laboured much for the Lord, and still labours. Nothing else of her life is come to our knowledge, nor do we know that she is honoured by any church; which is something singular.

Persius (Flaccus Aulus), a Latin poet in the reign of Nero, celebrated for his satires. He was born, according to some, at Volterra in Tuscany; and according to others, at Tignula, in the gulf of Della Specia, in the year 34. He was educated till 12 years old at Volterra; and afterwards continued his studies at Rome under Paëmon the grammarian, Virgil the rhetorician, and Cornutus the Stoic philosopher, who contracted a friendship for him. Persius confided that illustrious friend in the composing of his verses. Lucian also studied with him under Coratinus; and appeared to be charmed with his verses, that he was incessantly breaking out into exclamations at the beautiful passages in his satires: an example rarely seen in poets of equal rank. He was a steady friend, a good son, an affectionate brother and parent. He was chaste, meek, and modest: which shows how wrong it is to judge of a man's morals by his writings; for the satires of Persius are not only licentious, but sharp and full of bitterness. He wrote but seldom; and it was some time before he applied himself regularly to it.

Persius was of a weak constitution, and troubled with a bad stomach, which was the cause of his death in the 50th year of his age. Six of his satires remain; in their judgments of which the critics have been much divided, excepting as to their obscurity, Persius being indeed the most obscure of all the Latin poets. As a poet, he is certainly inferior to Horace and Juvenal; and all the labours of Irae Caelus, who has written a most learned and elaborate commentary upon him, cannot make him equal to either of them as a satirist, though in virtue and learning he exceeded them both. He was a professor imitator of Horace; yet had little of Horace's wiry, concise, and talent in ridicule. His style is grand, figurative, poetical, and suitable to the dignity of the Stoic philosophy; and hence he shines most in recommending virtue and integrity: here it is that satire begets him. He was too grace to court the muses with success; but he had a great soul, susceptible of noble sentiments, which gave a grace but to indifferent poetry. His cotemporaries thought highly of him. Quintilian allows, that Persius, although he wrote but one book of satires, acquired a great deal of true glory, Mul sum et vera gloria quamvis uno libro Persius meruit: and Martial says much the same thing, Sapientia in libros memorat Persius uno, etc.

Persia, an individual substantive of a rational nature. Thus we say, an ambassador represents the person of his prince; and that, in law, the father and son are reputed the same person.

The word person, persona, is thought to be borrowed from personando, from personating or counterfeiting; and is supposed to have first signified a mask; because, as Boethius informs us, in Tares concursus sonus voluptatir: and hence the actors who appeared mask'd on the stage were sometimes called pergamini, and sometimes persona. He likewise says, that as the several authors represented each a single individual person, sinum Celipus, or Chremes, or Hecuba, or Medea; for this reason, other people, who were at the same time distinguished by something in their form, character, &c. whereby they might be known, came likewise to be called by the Latin personae, and by the Greeks πρόσωποι. Again, as actors rarely represented any but great and illustrious characters, the word came at length to import the mind, as being that whole disposition constituting the character. And thus men, angels, and even God himself, were called personas. This is merely corporeal, as a stone, a plant, or a horse, were called ψυχα, or ψυχή, but never personas. Hence the learned suppose, that the same name persona came to be used to dignify some dignity, whereby a person is distinguished from another; as a father, husband, judge, magistrate, &c. In this sense we are to understand that of Cicero: "Cæsar, who speaks of Pompey but in terms of honour and respect; he does many hard and injurious things, however, against his person." Person we have already defined to mean an individual substantive of a reasonable nature. Now a thing may be individual in two ways: 1. Logically, because it cannot be predicated of any other; as Cicero, Plato, &c. 2. Physically; in which sense a drop of water, separated from the ocean, may be called an individual. Person is an individual nature in each of these senses: logically, according to Boethius, because persona is not spoken of universals, but only of singulars and individuals; we do not say the person of an animal or a man, but of Cicero and Plato; and physically, since Socrates's hand or foot are never considered as personas. This last kind of individual is denominated two ways: poëtically, when the person is said to be the whole principle of acting; for to whatever thing action is attributed, that the philosopher calls a persona: and negatively, when we say, with the Thomists, &c. that a person consists in this, that it does not consist in other as a more perfect being. Thus a man, though he consists of two different things, viz. body and spirit, is not two personas; because neither part of itself is a complete principle of action, but one persona, since the manner of his consisting of body and spirit is such as constitutes one whole principle of action; nor does he exist in any other as a more perfect being; as, for example,
example, Socrates's foot does in Socrates, or a drop of water in the ocean.

PERSON, in grammar, a term applied to such nouns or pronouns as, being either prefixed or underlaid, are the nominatives in all inflections of a verb; or it is the agent or patient in all finite or personal verbs. See GRAMMAR.

PERSONAL, any thing that concerns, or is referred to, the person: thus it is a maxim in ethics, that all faults are personal.

PERSONAL Action, in law, is an action levied directly and solely against the person; in opposition to a real or mixed action. See ACTION.

PERSONAL Goods, or Chattels, in law, signifies any moveable thing belonging to a person, whether alive or dead. See CHATTLES.

PERSONAL Identity. See METAPHYSICS, Part III.

PERSONAL Verb, in grammar, a verb conjugated in all the three persons; thus called in opposition to an impersonal verb, or that which has the third person only.

PERSONALITY, in the schools, is that which constitutes an individual a distinct person.

PERSONATE, is the name of the 40th order in Linnæus's Fragments of a Natural Method, consisting of a number of plants whose flowers are furnished with an irregular gaping or gnawing petal, which in figure somewhat resembles that of an animal. The bulk of the genera of this natural order range themselves under the clas's and order didynamia angiosperma of the Sexual Method.

The real, although they cannot enter into the artificial clas's just mentioned, for want of the classic character, the inequality of the stamens; yet, in a natural method, which admits of greater latitude, may be arranged with those plants which they resemble in their habit in general appearance, and particularly in the circumference expressed in that title.

PERSONIFYING, or PERSONALIZING, the giving an inanimate being the figure, sentiments, and language of a person.

Dr Blair, in his Lectures on Rhetoric, gives this account of personification. "It is a figure, the use of which is very extensive, and its foundation laid deep in human nature. At first view, and when considered abstrafly, it would appear to be a figure of the utmost boldness, and to border on the extravagant and ridiculous. For what can seem more remote from the track of reasonable thought, than to speak of ftones and trees, and fields and rivers, as if they were living creatures, and to attribute to them thought and feeling, affections and actions? One might imagine this to be no more than childish conceit, which no person of taste could relish. In fact, however, the case is very different. No such ridiculous effect is produced by personification when properly employed; on the contrary, it is found to be natural and agreeable, nor is any very uncommon degree of passion required in order to make us relish it. All poetry, even in its most gentle and humble forms, abounds with it. From profé it is far from being excluded; nay, in common conversation, very frequent approaches are made to it. When we say, the ground bleshis for rain, or the earth shrills with plenty; when we speak of ambition's being red, or a dicefe being deceitful; such expresfions show the facility with which the mind can accommodate the properties of living creatures to things that are inanimate, or to abstract conceptions of its own forming.

"Indeed, it is very remarkable, that there is a wonderful proneness in human nature to animate all objects. Whether this arises from a fort of assimilating principle, from a propension to spread a resemblance of ourselves over all other things, or from whatever other cause it arises, so it is, that almost every emotion which in the least agitates the mind belongs upon its object a momentary idea of life. Let a man, by an unwary step, forain his ankle, or hurt his foot upon a stone, and in the ruffled discomposed moment he will sometimes feel himself disposed to break the stone in pieces, or to utter passionat expressive against it, as if it had done him an injury. If one has been long accustomed to a certain set of objects, which have made a strong impression on his imagination; as to a house, where he has passed many agreeable years; or to fields, and trees, and mountains, among which he has often walked with the greatest delight; when he is obliged to part with them, especially if he has no prospect of ever seeing them again, he can scarce avoid having somewhat of the same feeling as when he is leaving old friends. They seem endowed with life. They become objects of his affection; and, in the moment of his parting, it scarce seems absurd to him to give vent to his feeling in words, and to take a formal adieu.

"So strong is that impression of life which is made upon us, by the more magnificent and striking objects of nature especially, that I doubt not in the least of this having been one cause of the multiplication of divinities in the heathen world. The belief of dryads and naiads, of the genius of the wood and the god of the river, among men of lively imaginations, in the early ages of the world, easily arose from this turn of mind. When their favourite rural objects had often been animated in their fancy, it was an easy transition to attribute to them some real divinity, some unseen power or genius which inhabited them, or in some peculiar manner belonged to them. Imagination was highly gratified, by thus gaining somewhat to rest upon with more stability; and when belief coincided so much with imagination, very light causes would be sufficient to establish it.

"From this deduction may be easily seen how it comes to pass that personification makes so great a figure in all compositions where imagination or passion have any concern. On innumerable occasions it is the very language of imagination and passion; and therefore deserves to be attended to, and examined with peculiar care. There are three different degrees of this figure, which it is necessary to remark and distinguish, in order to determine the propriety of its use. The first is, when some of the properties or qualities of living creatures are ascribed to inanimate objects; the second, when those inanimate objects are produced as acting like such as have life; and the third, when they are represented either as speaking to us, or as listening to what we say to them."

The ingenious professor goes on to investigate the nature of personification at considerable length. We shall
PERSPECTIVE

Perspective is the art of drawing on a plane surface true resemblances or pictures of objects, as the objects themselves appear to the eye from any distance and situation, real or imaginary.

It was in the 16th century that Perspective was revived, or rather reinvented. It owes its birth to painting and particularly to that branch which was employed in the decorations of the theatre, where landscapes were properly introduced, and which would have looked unnatural and horrid if the size of the objects had not been nearly proportioned to their distance from the eye. We learn from Vitruvius, that Agatharchus, instructed by Scopilus, was the first who wrote upon this subject, and that afterwards the principles of this art were more diligently taught by Democritus and Anaxagoras, the disciples of Agatharchus. Of the theory of this art, as described by them, we know nothing; since none of their writings have escaped the general wreck that was made of ancient literature in the dark ages of Europe. However, the revival of painting in Italy was accompanied with a revival of this art.

The first person who attempted to lay down the rules of perspective was Pietro del Borgo, an Italian. He supposed objects to be placed beyond a transparent tablet, and endeavoured to trace the images which rays of light, emitted from them, would make upon it. But we do not know what success he had in this attempt, because the book which he wrote upon this subject is not now extant. It is, however, very much commended by the famous Egnazio Dante; and, upon the principles of Borgo, Albert Durer contrived a machine, by which he could trace the perspective appearance of objects.

Baldazzar Purcell studied the writings of Borgo, and endeavoured to make them more intelligible. To him we owe the discovery of points of distance, to which all lines that make an angle of 45 degrees with the ground-line are drawn. A little time after, Guido Ubaldi, another Italian, found that all the lines that are parallel to one another, if they be inclined to the ground-line, converge to some point in the horizontal line; and that through this point also, a line drawn from the eye, parallel to them, will pass. These principles put together enabled him to make out a pretty complete theory of perspective.

Great improvements were made in the rules of perspective by subsequent geometers; particularly by professor Gravelpande, and still more by Dr Brook Taylor, whose principles are in a great measure our own, and far more general than any before him.

In order to understand the principles of perspective, it will be proper to consider the plane on which the representation is to be made as transparent, and interpolated between the eye of the spectator and the object to be represented. Thus, suppose a person at a window looks through an upright pane of glass at any object beyond it, and, keeping his head steady, draws the figure of the object upon the glass with a black lead pencil, as if the point of the pencil touched the object itself; he would then have a true representation of the object in perspective as it appears to his eye.

In order to this two things are necessary: first, that the glass be laid over with strong gum-water, which, when dry, will be fit for drawing upon, and will retain the traces of the pencil; and, secondly, that he looks through a small hole in the glass, fixed about a foot from the glass, between it and his eye, and that he keep his eye close to the hole; otherwise he might shift the position of his head, and consequently make a false delineation of the object.

Having traced out the figure of the object, he may go over it again with pen and ink; and when that is dry, put a sheet of paper upon it, and trace it thereon with a pencil; then taking away the paper and laying it on a table, he may finish the picture by giving it the colours, lights, and shades, as he sees them in the
PERSPECTIVE.

the object itself, and then he will have a true reference of the object.

To every person who has a general knowledge of the principles of this, must be self-evident: For as vision is occasioned by pencils of rays coming in straight lines to the eye from every point of the visible object, it is plain that, by joining the points in the transparent plane, through which all these pencils respectively pass, an exact representation must be formed of the object, as it appears to the eye in that particular position, and at that determined distance: and were pictures of things to be always drawn on transparent planes, this simple operation, with the principle on which it was founded, would compose the whole theory and practice of perspective. As this, however, is far from being the case, rules must be deduced from the sciences of optics and geometry for drawing representations of visible objects on opaque planes; and the application of these rules constitutes what is properly called the art of perspective.

Previously to our laying down the fundamental principles of this art, it may not be improper to observe, that when a person stands right against the middle of one end of a long avenue or walk, which is straight and equally broad throughout, the sides thereof seem to approach nearer and nearer to each other as they are further and further from his eye; or the angles, under which their different parts are seen, become less and less as the distance from his eye increases; and if the avenue be very long, the sides of it at the farther end will seem to meet: and there an object that would cover the whole breadth of the avenue, and be of a height equal to that breadth, would appear only to be a mere point. See Offices, §219, 220.

Having made these preliminary observations, we now proceed to the practice of perspective, which is built upon the following

(Fundamental) Theorem I.

Let a b c d (fig. 1, Plate CCCLXXXIII.) represent the ground-plan of the figure to be thrown into perspective, and e f g h the transparent plane through which it is viewed by the eye at E. Let these planes intersect in the straight line k l. If B be any point in the ground-plan, and B E a straight line, the path of a ray of light from that point to the eye. This will pass through the plane e f g h in some point b; or B will be seen through that point, and b will be the picture, image, or representation of B.

If B A be drawn in the ground-plan, making any angle B A K with the common intersection, and E V be drawn parallel to it, meeting the picture-plane or perspective plane in V, and V A be drawn, the point b is in the line V A so situated that B A is to E V as b A to V b.

For since E V and B A are parallel, the figure B A V E V B is in one plane, cutting the perspective-plane in the straight line V A; the triangles B A b, E V b, are similar, and B A : E V = b A : b b.

Cor. 1. If B be the point of the picture, its picture b is above the intersection b b; but if B be between the eye and the picture as at B', its picture b' is below b b.

2. If two parallel lines B A', E S, be drawn, and A', S, be joined, the picture of B is in the intersection of the lines A V and A S.

3. The line B A is represented by k A, or b A is the picture of B A; and if A B be infinitely extended, it will be represented by A V. V is therefore called the vanishing point of the line A B.

4. All lines parallel to A B are represented by lines converging to V from the points where these lines intersect the perspective plane; and therefore V is the vanishing point of all such parallel lines.

5. The pictures of all lines parallel to the perspective plane are parallel to the lines themselves.

6. If through V be drawn H V parallel to k l, the angle E V H is equal to B A K.

Remark. The proposition now demonstrated is not limited to any inclination of the picture-plane to the ground-plane; but it is usual to consider them as perpendicular to each other, and the ground-plane as horizontal. Hence the line k l is called the ground line, and O H the horizon line; and V K, perpendicular to both, is called the height of the eye.

If E S be drawn perpendicular to the picture-plane, it will cut it in a point S of the horizon line directly opposite to the eye. This is called the point of f S b, or principal point.

7. The pictures of all vertical lines are vertical, and the pictures of horizontal lines are horizontal, because these lines are parallel to the perspective plane.

8. The point of sight S is the vanishing point of all lines perpendicular to the perspective plane.

The above proposition is a sufficient foundation for the whole practice of perspective, whether on direct or inclined pictures, and serves to suggest all the various practical constructions, each of which has advantages which suit particular purposes. Writers on the subject have either confined themselves to one construction, from an affection of simplicity or fondness for symmetry; or have multiplied precepts, by giving every construction for every example, in order to make a great book, and give the subject an appearance of importance and difficulty. An ingenious practitioner will avoid both extremes, and avail himself of the advantage of each construction as it happens to suit his purpose. We shall now proceed to the practical rules, which require no consideration of intersecting planes, and are all performed on the perspective plane by means of certain substitutions for the plane of the eye and the original figure. The general substitution is as follows:

Let the plane of the paper be first supposed to be the ground-plan, and the spectator to stand at F (fig. 2.) Let it be proposed that the ground-plan is to be represented on a plane surface, standing perpendicularly on a line G K L of the plan, and that the point K is immediately opposite to the spectator, or that K F is perpendicular to G L; then K F is equal to the distance of the spectator's eye from the picture.

Now suppose a piece of paper laid on the plan with its straight edge lying on the line G L; draw on this paper K S perpendicular to G L, and make it equal to the height of the eye above the ground-plan. This may be much greater than the height of a man, because the spectator may be floating on a plane much raised above the ground-plan. Observe also that K S...
must be measured on the same scale on which the ground-plan and the distance FK were measured. Then draw HSO parallel to GL. This will be a horizontal line, and (when the picture is set upright on GL) will be on a level with the spectator's eye, and the point S will be directly opposite to his eye. It is therefore called the principal point, or point of sight. The distance of his eye from this point will be equal to FK. Therefore make SP (in the line SK) equal to FK, and P is the projecting point or substitute for the place of the eye. It is sometimes convenient to place P above S, sometimes to one side of it on the horizontal line, and in various other situations; and writers, ignorant of, or inattentive to, the theory, have given it different denominations, such as point of distance, point of view, &c. It is merely a substitute for the point E in fig. 1. and its most natural situation is below, as in this figure.

The art of perspective is conveniently divided into Ichnographia, which teaches how to make a perspective draught of figures on a plane, commonly called the ground-plan; and Scenography, which teaches how to draw solid figures, or such figures as are raised above this plan.

**Fundamental Prob. I. To put into perspective any given point of the ground-plan.**

First general construction.

Plate 

From B and P (fig. 2.) draw any two parallel lines A'C, and AV, cutting the ground-line and horizon-line in A and V, and draw BP, AV, cutting each other in b; b is the picture of B.

For it is evident that BA, PV, of this figure are analogous to BA and EV of fig. 1. and that BA: PV:: BA: bV.

If BA be drawn perpendicular to GL, PV will fall on PS, and need not be drawn. AV will be A'S. — This is the most easy construction, and is nearly the same with Ferguson's.

Second general construction.

Draw two lines BA, BA', and two lines PV, PD, parallel to them, and draw AV, A'D, cutting each other in b; b is the picture of B by Cor. 2. — This construction is the foundation of all the rules of perspective that are to be found in the books on this subject. They appear in a variety of forms, owing to the ignorance or inattention of the authors to the principles. The rule most generally adhered to is as follows:

Draw BA (fig. 3.) perpendicular to the ground-line, and AS to the point of sight, and let off A'S equal to BA. Set of SD equal to the distance of the eye in the opposite direction from S that S is from A, where B and E of fig. 1. are on opposite sides of the picture; otherwise they form the same way. D is called the point of distance. Draw D'S, cutting AS in B'. This is equivalently equivalent to drawing BA and PS perpendicular to the ground line and horizon-line, and BS and PD making an angle of 45° with these lines, with the additional puzzle about the way of setting of A'S and SD, which is avoided in the construction here given.

This usual construction, however, by a perpendicular and the point of distance, is extremely simple and convenient; and two points of distance, one on each side of S, serve for all points of the ground plan. But the first general construction requires still fewer lines, if BA be drawn perpendicular to GL, because PV will then coincide with PS.

Third general construction.

Draw BA from the given point B perpendicular to the ground-line, and AS to the point of sight. From the point of distance D set off D'E equal to BA, on the same or the contrary side as S, according as B is on the same or the contrary side of the picture as the eye. Join d A, and draw D'b parallel to DA. b is the picture of B. For SD, D's, are equal to the distances of the eye and given point from the picture, and SD: D's = b'S: bA.

This construction does not naturally arise from the original lines, but is a geometrical consequence from their position and magnitude; and it is of all others the most generally convenient; as the perpendicular distances of any number of points may be arranged along SD without confusion, and their direct situations transferred to the ground-line by perpendiculars such as BA; and nothing is easier than drawing parallel, either by a parallel ruler or a bevel-square, used by all who practice drawing.

**Prob. 2. To put any straight line BC (fig. 4.) of the ground plan in perspective.**

Find the points b, c, of its extreme points by any of the foregoing constructions, and join them by the straight line b c. Perhaps the following construction will be found very generally convenient.

Produce CB till it meet the ground-line in A, and draw PV parallel to it, and AV, and PB, PC, cutting AV in b, c. V is its vanishing point, by Cor. 3. of the fundamental theorem.

It must be left to the experience and sagacity of the draftsman to select such constructions as are most suitable to the multiplicity of the figures to be drawn.

**Prob. 3. To put any inclined figure of the ground-plan in perspective.**

Put the bounding lines in perspective, and the problem is solved.

The variety of constructions of this problem is very great, and it would fill a volume to give them all. The most generally convenient is to find the vanishing points of the bounding lines, and connect these with the points of their intersection with the ground-line. For example, to put the figure ABCD (fig. 5.) into perspective.

Draw from the projecting point PV, PW, parallel to AB, BC, and let AB, BC, CD, DA, meet the ground-line in a, s, b, c, and draw AV, aV, aW, bW, cutting each other in a b c d, the picture of the figure ABCD. The demonstration is evident.

This construction, however, runs the figure to great distances on each side of the middle line when any of the lines of the original figure are nearly parallel to the ground-line.

The following construction (fig. 6.) avoids this inconvenience.

Let D be the point of distance. Draw the perpendiculars A's, B's, C's, D's, and the lines A's, B's, C's, D's, parallel to PD. Draw S's, S, s, s, and D's, D's, D's, D's, cutting the former in a, b, c, d, the angles of the picture.

It is not necessary that D be the point of distance, only the lines A's, B's, C's, and D's must be parallel to PD.

**Remark.**
Perspective.

Remark. In all the foregoing constructions the necessary lines (and even the finished picture) are frequently confounded with the original figure. To avoid this great inconvenience, the writers on perspective direct us to transpose the figure; that is, to transfer it to the other side of the ground line, by producing the perpendiculars $A_{5}$, $B_{5}$, $C_{5}$, $D_{5}$, till $A_{5}$, $B_{5}$, $C_{5}$, $D_{5}$ are respectively equal to $A$, $B$, $C$, $D$, and instead of the original figure, to use only its transposed sublitude $A'B'C'D'$. This is an extremely proper method. But in this case the point $P$ must also be transposed to $P'$ above $S$, in order to retain the first or most natural and simple construction, as in fig. 7; where it is evident, than when $BA=AB$, and $bA=$ the height of the eye, and $b'd$ is the distance of the horizon-line from the point $b$, which is the picture of the foot of the line. Therefore (Theor. 2) $b'e$ is the required picture of the vertical line.

This problem occurs frequently in views of architecture; and a comprehensible method of solving it would be peculiarly convenient. For this purpose, draw a vertical line $XZ$ at the margin of the picture, or on a separate paper, and through any point $V$ of the horizon-line draw $VX$. Set off $XY$, the height of the vertical line, and draw $VY$. Then from any points $b$, $r$, on which it is required to have the pictures of lines equal to $XY$, draw $bS$, $rS$, parallel to the horizon line, and draw the verticals $S_m$, $r_v$, these have the lengths required, which may be transferred to $b$ and $r$. This, with the third general construction for the base points, will save all the confusion of lines which would arise from constructing each line apart.

Prob. 6. To put any sloping line in perspective.

From the extremities of this line, suppose perpendiculars making the ground plane in two points, which we shall call the base points of the sloping line. Put these base points in perspective, and draw, by last problem, the perpendiculars from the extremities. Join these by a straight line. It will be the picture required.

Prob. 7. To put a square in perspective, as seen by a person not standing right against the middle of either of its sides, but rather near with one of its corners.

In fig. 9. let $ABCD$ be a true square, viewed by an observer, not standing at $a$, directly against the middle of its side $AD$, but at $O$ almost even with its corner $D$, and viewing the side $AD$ under the angle $AOD$; the angle $AOD$ (under which he would have seen $AD$ from $a$) being 60 degrees.

Make $AD$ in fig. 10. equal to $AD$ in fig. 9, and draw $SP$ and $OP$ parallel to $AD$. Then, in fig. 10, let $O$ be the place of the observer's eye, and $SO$ be perpendicular to $SP$; then $S$ shall be the point of sight in the horizon $SP$.

Take $SO$ in your compasses, and set that extent from $S$ to $P$; then $P$ shall be the true point of distance, taken according to the foregoing rules.

From $A$ and $D$ draw the straight lines $AS$ and $DS$; draw also the straight line $AP$, intersecting $DS$ at $C$.

Lastly, to the point of intersecion $C$ draw $BC$ parallel to $AD$; and $ABCD$ in fig. 10, will be a true perspective representation of the square $ABCD$ in fig. 9. The point $M$ is the centre of each square, and $AMC$ and $BMD$ are the diagonals.

Prob. 8. To put a reticulated square in perspective, as seen by a person standing opposite to the middle of one of its sides.

A reticulated square is one that is divided into several little squares, like network, as fig. 11. Each side of which is divided into four equal parts, and the whole surface into four times four (or 16) equal figures.

Having divided this square into the given number of little squares, draw the two diagonals $AX$ and $BX$; through $AD$ in fig. 12. equal to $AD$ in fig. 11, and divide it into four equal parts, as $AE$, $EG$, $GI$, and $ID$. Draw $SP$ for the horizon, parallel to $AD$, and, through
through the middle point $g$ of $AD$, draw $OS$ perpendicular to $AD$ and $SP$.—Make $S$ the point of sight, and $O$ the place of the observer's eye.

Take $SP$ equal to $SO$, and $P$ shall be the true point of distance.—Draw $AS$ and $DS$ to the point of fight, and $AP$ to the point of distance, intersecting $DS$ in $C$; then draw $BC$ parallel to $AD$, and the outlines of the reticulated square $ABCD$ will be finished.

From the division points $e, f, g, i, k$, draw the straight lines $e, f, g, h, i, k$, tending towards the point of fight $S$; and draw $BD$ for one of the diagonals of the square, the other diagonal $AC$ being already drawn.

Through the points $r$ and $x$, where these diagonals cut $e, f, i, k$, draw $lm$ parallel to $AD$. Through the centre-point $x$, where the diagonals cut $g, l$, draw $no$ parallel to $AD$. Lastly, through the points $v$ and $w$, where the diagonals cut $e, f, i, k$, draw $pq$ parallel to $AD$; and the reticulated perspective square will be finished.

This square is truly represented, as if seen by an observer standing at $O$, and having his eye above the horizontal plane $ABCD$ on which it is drawn; as if $OS$ was the height of his eye above that plane; and the lines which form the small squares within it have the same letters of reference with those in fig. 11, which is drawn as it would appear to an eye placed perpendicularly above its centre $x$.

Prob. 9. To put a circle in perspective.

If a circle be viewed by an eye placed directly over its centre, it appears perfectly round, but if it be obliquely viewed, it appears of an elliptical shape. This is plain by looking at a common wine glass set upright on a table.

Make a true reticulated square, as fig. 11. Plate CCCLXXXIII. of the same diameter as you would have the circle; and setting one foot of your compasses in the centre $x$, describe as large a circle as the sides of the square will contain. Then, having put this reticulated square into perspective, as in fig. 12, observe through what points of the cross-lines and diagonals of fig. 11. the circle passes; and through the like points in fig. 12. draw the ellipsis, which will be as true a perspective representation of the circle, as the square in fig. 12. is of the square in fig. 11.

This is Mr. Ferguson's rule for putting a circle in perspective; but the following rules by Wolf are perhaps more universal.

If the circle to be put in perspective be small, describe a square about it. Draw first the diagonals of the square, and then the diameters $b, a$ and $d, e$ (fig. 1. Plate CCCLXXXIV.) cutting one another at right angles; draw the straight lines $f, g$ and $h, c$ parallel to the diameter $d, e$. Through $b$ and $f$ and likewise $c$ and $g$ draw straight lines meeting $DE$, the ground line of the picture in the points $3$ and $4$. To the principal point $V$ draw the straight lines $1V, 3V, 4V, 2V$, and to the points of distance $L$ and $K$, $2L$ and $1K$. Lastly, join the points of intersection $a, b, d, f, h, g, c, t$, by the arcs $a, b, d, f$, and $a, b, d, f, h, g, c, t$ will be the circle in perspective.

If the circle be large so as to make the foregoing practice inconvenient, bisect the ground line $AB$, describing, from the point of vision as a centre, the semicircle $AGB$ (fig. 2. Plate CCCLXXXIV.), and from any number of points in the circumference $C, F, G, H, I$, &c. draw to the ground line the perpendiculars $Cf, Fg, Gh, Hi$, &c. to the point of sight as a centre, the semicircle $AGB$. From the points $A, 1, 2, 3, 4, 5, B$, draw straight lines to the principal point or point of sight $V$, like wise straight lines from $B$ to $A$ to the points of distance $L$ and $K$. Through the common intersections draw straight lines as in the preceding case; and you will have the points $a, c, d, f, g, h, i, j$, &c. as formerly directed, and you have the perspective circle $a, c, d, f, g, h, i, j$.

Hence it is apparent how we may put not only a circle but also a pavement laid with stones of any form in perspective. It is likewise apparent how useful the square is in perspective; for, in the second case, a true square was described round the circle to be put in perspective, and divided into several smaller squares, so in this third case we make use of the semicircle only for the sake of brevity instead of that square and circle.

Prob. 10. To put a reticulated square in perspective, as seen by a person not standing right against the middle of either of its sides, but rather nearly even with one of its corners.

In fig. 13. Plate CCCLXXXIII, let $O$ be the place of an observer, viewing the square $ABCD$ almost even with its corner $D$.—Draw at pleasure $SP$ for the horizon, parallel to $AD$, and make $SO$ perpendicular to $SP$: then $S$ shall be the point of sight, and $P$ the true point of distance; if $SP$ be made equal to $SO$.

Draw $AS$ and $DS$ to the point of sight, and $AP$ to the point of distance, intersecting $DS$ in the point $C$; then draw $BC$ parallel to $AD$, and the outlines of the perspective square will be finished. This done draw the lines which form the letters squares, as taught in Prob. 8. and the work will be completed.—You may put a perspective circle in this square by the same rule as it was done in fig. 12.

Prob. 14. To put a cube in perspective, as if viewed by a person standing almost even with one of its edges, and seeing three of its sides.

In fig. 16. Plate CCCLXXXIII. let $AB$ be the breadth of either of the fix equal square sides of the cube $ABG$; $O$ the place of the observer, almost even with the edge $CD$ of the cube, $S$ the point of sight, $SP$ the horizon parallel to $AD$, and $P$ the point of distance taken as before.

Make $ABCD$ a true square; draw $BS$ and $CS$ to the point of sight, and $BP$ to the point of distance, intersecting $CS$ in $G$.—Then draw $FG$ parallel to $BC$, and the uppermost perspective square side $BFGC$ of the cube will be finished.

Draw $DS$ to the point of sight, and $AP$ to the point of distance, intersecting $DS$ in the point $I$; then draw $GI$ parallel to $CD$; and, if the cube be an opaque one, as of wood or metal, all the outlines of it will be finished; and then it may be shaded as in the figure.

But if you want a perspective view of a transparent glass cube, all the sides of which will be seen, draw $AH$ toward the point of sight, $FH$ parallel to $BA$, and $HI$ parallel to $AD$; then $AHID$ will be the square base of the cube, perpendicularly parallel to the top $BFGC$; $ABFH$ will be the square side of the cube, parallel to $CGID$, and $FGIH$ will be the square side parallel to $ABCD$.

As to the shading part of the work, it is such mere children's play, in comparison of drawing the lines

A a
which form the shape of any object, that no rules need be given for it. Let a person sit with his left side toward a window, and he knows full well, that if any solid body be placed on a table before him, the light will fall on the left-hand side of the body, and the right-hand side will be in the shade.

**Prob. 15.** To put any solid in perspective.

Put the base of the solid, whatever it be, in perspective by the preceding rules. From each bounding point of the base, raise lines representing in perspective the altitude of the object; by joining these lines and shading the figure according to the directions in the preceding problem, you will have a scenographic representation of the object. This rule is general; but as its application to particular cases may not be apparent, it will be proper to give the following example of it.

**Prob. 16.** To put a cube in perspective as seen from one of its angles.

Since the base of a cube standing on a geometrical plane, and seen from one of its angles, is a square seen from one of its sides, draw first such a perspective square: then raise from any point of the ground-line DE (Fig. 3, Plate CCCLXXXIV.) the perpendicular HI equal to the side of the square, and draw to any point V in the horizontal line HR the straight lines VI and VH. From the angles db and c draw the dotted lines d 2 and e 1 parallel to the ground line DE. Perpendicular to these dotted lines, and from the points 1 and 2, draw the straight lines L 1 and M 2. Lastly, since HI is the altitude of the intended cube in a, L 1 in c, and b, M 2 in d, draw from the point a the straight line fa perpendicular to a E, and from the points b and c, bg and ce, perpendicular to b c 1, and a b d c being according to rule, make a f = HI, b g = e c = L 1, and b d = M 2. Then, if the points g, b, e, f, be joined, the whole cube will be in perspective.

**Prob. 17.** To put a square pyramid in perspective, as standing upright on its base, and viewed obliquely.

In fig. 4, no. 1, of Plate CCCLXXXIV. let AB be the breadth of either of the four sides of the pyramid ATCD at its base ABCD; and MT its perpendicular height. Let O be the place of the observer, S his point of sight, SE his horizon, parallel to AD and perpendicular to OS; and let the proper point of distance be taken in SE produced toward the left hand, as far from S as OS is from S.

Draw AS and DS to the point of sight, and DL to the point of distance, intersecting AS in the point B. Then, from B, draw BC parallel to AD; and ABCD shall be the perspective square base of the pyramid.

Draw the diagonal AC, intersecting the other diagonal BD at M, and this point of intersection shall be the centre of the square base.

Draw MT perpendicular to AD, and of a length equal to the intended height of the pyramid; then draw the straight lines AT, CT, and DT; and the outlines of the pyramid (as viewed from O) will be finished; which being done, the whole may be so shaded as to give it the appearance of a solid body.

If the observer had stood at e, he could have only seen the side ATD of the pyramid; and two is the greatest number of sides that he could see from any other place of the ground. But if he were at any height above the pyramid, and had his eye directly over its top, it would then appear as in No. 2, and he would see all its four sides E, F, G, H, with its top just over the centre of its square base ABCD; which would be a true geometrical and not a perspective figure.

**Prob. 18.** To put two equal figures in perspective, one of which shall be directly over the other, at any given distance from it, and both of them parallel to the plane of the horizon.

In fig. 5, Plate CCCLXXXIV. let ABCD be a perspective square on a horizontal plane, drawn according to the foregoing rules, S being the point of sight, SP the horizon (parallel to AD), and P the point of distance.

Suppose AD, the breadth of this square, to be three feet; and that it is required to place just such another square EFGH directly above it, parallel to it and two feet from it.

Make AE and DH perpendicular to AD, and two thirds of its length: draw EH, which will be equal and parallel to AD; then draw ES and HS to the point of sight, S, and EP to the point of distance P, intersecting HS in the point G: this done, draw FG parallel to EH; and you will have two perspective squares ABCD and EFGH, equal and parallel to one another, the latter directly above the former, and two feet distant from it; as was required.

By this method shelves may be drawn parallel to one another, at any distance from each other in proportion to their length.

**Prob. 19.** To put a truncated pyramid in perspective.

Let the pyramid to be put in perspective be quinquangular. If from each angle of the surface whence the top is cut off, a perpendicular be supposed to fall upon the base, these perpendiculars will mark the bounding points of a pentagon, of which the sides will be parallel to the sides of the base of the pyramid, within which it is inscribed. Join these points, and the interior pentagon will be formed with its longest side parallel to the longest side of the base of the pyramid. From the ground-line EH (Fig. 6, Plate CCCLXXXIV.) raise the perpendicular IH, and make it equal to the altitude of the intended pyramid. To any point V draw the straight lines IV and HV, and by a process similar to that in Problem 16 determine the scenographic altitudes a, b, c, d, e. Connect the upper points j, g, i, k, by straight lines; and draw 1k, f, m, g, n, and the perspective of the truncated pyramid will be completed.

Cor. If in a geometrical plane two concentric circles be described, a truncated cone may be put in perspective in the same manner as a truncated pyramid.

**Prob. 20.** To put in perspective a hollow prism lying on one of its sides.

Let ABDEC (Fig. 7, no. 1) be a section of such a prism. Draw HI parallel to AB, and distant from it the breadth of the side on which the prism rests; and from each angle internal and external of the prism let fall perpendiculars to HI. The parallelogram will be thus divided by the ichnographical process below the ground-line, so as that the side AB of the real prism will be parallel to the corresponding side of the ichnographic view of it.—To determine the altitude of the internal and external angles. From H (no. 2.) raise HI perpendicular to the ground-line, and on it mark
mark off the true altitudes $H_1$, $H_2$, $H_3$, $H_4$, and $H_5$. Then if from any point $V$ in the horizon be drawn the straight lines $VH_1$, $V_1$, $V_2$, $V_3$, $V_4$, $V_5$ or $V_1$; by a process similar to that of the preceding problem, will be determined the height of the internal angles, viz. $1 = a$, $2 = b$, $3 = c$, $4 = d$; and of the external angles, $3 = e$, and $5 = r$; and when these angles are formed and put in their proper places, the figure of the prism is complete.

**Prob. 21.** To put a square table in perspective, standing on four upright square legs of any given length with respect to the breadth of the table.

In fig. 5, Plate CCCLXXXIV. let $ABCD$ be the square part of the floor on which the table is to stand, and $EFGH$ the surface of the square table, parallel to the floor.

Suppose the table to be three feet in breadth, and its height from the floor to be two feet; then two thirds of $AD$ or $EH$ will be the length of the legs $i$ and $m$ of the other two ($l$ and $n$) being of the same length in perspective.

Having drawn the two equal and parallel squares $ABCD$ and $EFGH$, as shown in Prob. 10, let the legs be square in form, and fixed in the table at a distance from its edges equal to their thickness. Take $Aa$ and $Dd$ equal to the intended thickness of the legs, and $a$ and $d$ also equal thereto. Draw the diagonals $AC$ and $BD$, and draw straight lines from the points $a$, $b$, $c$, $d$, toward the points of sight $S$, and terminating at the side $BC$. Then, through the points where these lines cut the diagonals, draw the straight lines $n$ and $p$, $q$, parallel to $AD$; and you will have formed four perspective squares (like $ABCD$ in fig. 4 no. 1.) for the bases of the four legs of the table: and then it is easy to draw the four upright legs by parallel lines, all perpendicular to $AD$; and to have them as in the figure.

To represent the intended thickness of the table-board, draw $e$, $f$, parallel to $EH$, and $HG$ toward the point of sight $S$; then shade the spaces between these lines, and the perspective figure of the table will be finished.

**Prob. 22.** To put five square pyramids in perspective, standing upright on a square pavement composed of the surfaces of 81 cubes.

In fig. 8, Plate CCCLXXXIV. let $ABCD$ be a perspective square drawn according to the foregoing rules; $S$ the point of sight, $P$ the point of distance in the horizon $PS$, and $AC$ and $BD$ the two diagonals of the square.

Divide the side $AD$ into 9 equal parts (because 9 times 9 is 81), as $Aa$, $ab$, $bc$, etc., and from these points of division, $a$, $b$, $c$, $d$, etc., draw lines toward the point of sight $S$, terminating at the furthest part of $BC$ of the square. Then, through the points where these lines cut the diagonals, draw straight lines parallel to $AD$, and the perspective square $ABCD$ will be subdivided into 81 smaller squares, representing the upper surfaces of 81 cubes, laid close to one another, $a^2$ in a square form.

Draw $AK$ and $DL$, each equal to $Aa$, and perpendicular to $AD$; and draw $LN$ toward the point of sight $S$: then draw $KL$ parallel to $AD$, and its distance from $AD$ will be equal to $Aa$.—This done, draw $a$, $b$, $c$, $d$, etc., $e$, $f$, $g$, $h$, and $i$; all parallel to $AK$; and the space $ADLK$ will be subdivided into nine equal squares, which are the upper outward surfaces of the nine cubes in the side $AD$ of the square $ABCD$.

Draw $LN$ toward the point of sight $S$; and from the points where the lines, which are parallel to $AD$ in this square, meet the side $CD$ thereof, draw short lines to $LN$, all parallel to $DL$, and they will divide that side into the outer upward surfaces of the nine cubes which compose it; and then the outsides of all the cubes that can be visible to an observer, placed at a proper distance from the corner $D$ of the square, will be finished.

As taught in Prob. 17, place the pyramid $AE$ upright on its square base $Aa$, making it as high as you please; and the pyramid $DH$ on its square base $b$, equal to $AD$, of equal height with $AE$.

Draw $EH$ from the top of one of these pyramids to the top of the other; and $EH$ will be parallel to the other.

Draw $ES$ and $HS$ to the point of sight $S$, and $HP$ to the point of distance $P$, intersecting $ES$ in $F$.

From the point $F$, draw $FG$ parallel to $EH$; then draw $EG$, and you will have a perspective square $EFGH$ (parallel to $ABCD$) with its two diagonals $EG$ and $FH$, intersecting one another in the centre of the square at $I$. The four corners of this square, $E$, $F$, $G$, $H$, give the perspective heights of the four pyramids $AE$, $BF$, $CG$, and $DH$; and the intersection of the diagonals gives the height of the pyramid $MI$, the centre of whose base is the centre of the perspective square $ABCD$.

Lastly, place the three pyramids $BF$, $CG$, $MI$, upright on their respective bases at $B$, $C$, and $M$; and the required perspective representation will be finished, as in the figure.

**Prob. 23.** To put upright pyramids in perspective, on the side of an oblong square or parallelogram; so that their distances from one another shall be equal to the breadth of the parallelogram.

In most of the foregoing operations we have considered the observer to be so placed, as to have an oblique view of the perspective objects; in this, we shall suppose him to have a direct view of fig. 8. Plate CCCLXXXIV. that is, standing right against the middle of the end $AD$, which is nearest to his eye, and viewing $AD$ under an angle of 60 degrees.

Having cut $AD$ in the middle, by the perpendicular line $S$, take $S$, therein at pleasure, for the point of sight, and draw $ES$ for the horizon, parallel to $AD$.

Here $S$, must be supposed to be produced downward, below the limits of the plate, to the place of the observer; and $SE$ to be produced towards the left hand beyond $E$, far enough to take a proper point of distance therein, according to the foregoing rules.

Take $Aa$ at pleasure, and $DG$ equal to $Aa$, for the breadths of the square bases of the two pyramids $AE$ and $DF$ next the eye; then draw $AS$ and $DS$, and likewise $DS$ and $SS$, to the point of sight $S$; and $DG$ on to the point of distance, intersecting $AS$ in $G$; then, from $G$ draw $GI$ parallel to $AD$, and you will have the first perspective square AGID of the parallelogram $ABCD$.

From I draw $IH$ (or toward) the point of distance, intersecting $AS$ in $H$; then, from $H$ draw $Aa$.
Perspective.

HK parallel to AD, and you will have the second perspective square GHKL of the parallelogram.—Go on in this manner till you have drawn as many perspective squares up towards S as you please.

Through the point e, where DG intersects g S, draw k f parallel to AD; and you will have formed the two perspective squares A b c d and e f D g of the two pyramids at A and D.

From the point f (the upper outward corner of e f D g) draw f b toward the point of distance, till it meets AS in h; then, from this point of meeting, draw b m parallel to GI, and you will have formed the two perspective squares G h i k and l m n o for the square bases of the two pyramids at G and I.

Proceed in the same manner to find the bases of all the other pyramids, at the corners of the ret of the perspective squares in the parallelogram ABCD, as shown by the figure.—Then

Having placed the first two pyramids at A and D upright on their square bases, as shown in Prob. 9, and made them of any equal heights at pleasure, draw ES and FS from the tops of these pyramids to the point of sight S; place all the rest of the pyramids upright on their respective bases, making their tops touch the straight lines ES and FS; and all the work, except the shading part, will be finished.

Prob. 24. To put a square pyramid of equal sized cubes in perspective.

Fig. 2. Plate CCCLXXXV. represents a pyramid of this kind: confinishing as it were of square tables of cubes, one table above another; 8 t in the lowest, 49 in the next, 25 in the third, 9 in the fourth, and 1 in the fifth or uppermost. These are the square numbers of 9, 7, 5, 3, and 1.

If the artist is already master of all the preceding operations, he will find less difficulty in this than in attending to the following description of it; for it cannot be described in a few words, but may be executed in a very short time.

In fig. 1, having drawn PS for the horizon, and taken S for the point of sight therein (the observer being at O) draw AD parallel to PS for the side (next the eye) of the first or lowermost table of cubes. Draw AS and DS to the point of sight S, and DP to the point of distance P, intersecting AS in the point B. Then, from B, draw BC parallel to AD, and you will have the surface ABCD of the first table.

Divide AD into nine equal parts, as A a, a b, b c, c d, &c. and make AK and DL equal to A a, and perpendicular to AD. Draw KL parallel to AD, and from the points of equal division at a, b, c, &c. draw lines to KL, all parallel to AK. Then draw b S to the point of sight S, and from the division-points a, b, c, &c. draw lines with a black lead pencil, all tending toward the point of sight, till they meet the diagonal BD of the square.

From these points of meeting draw black lead lines to DC, all parallel to AD; then draw the parts of these lines with black ink which are marked 1, 2, 3, 4, &c. between E and D. Then draw DC parallel to DL; and all the visible lines between the cubes in the first table will be finished.

Make IC equal and perpendicular to p 5, and q M equal and parallel to IC; then draw GM, which will be equal and parallel to q. From the points k, l, m, n, &c. draw k n, l o, m p, &c. all parallel to IC, and the outsides of the seven cubes in the side G o of the second table will be finished.

Draw GS and MS to the point of sight S, and MP to the point of distance P, intersecting GS in H; then, from the point of intersection H, draw HI parallel to AD; and you will have the surface GHIM of the second table of cubes.

From the points n, o, p, q, &c. draw black lead lines towards the point of sight S, till they meet the diagonal MH of the perspective square surface GHIM; and draw JM, with black ink, toward the point of sight.

From those points where the lines drawn from n, o, p, q, &c. meet the diagonal MH, draw black lead lines to MJ, all parallel to AD; only draw the whole first line q 1 with black ink, and the parts 2, 3, 4, &c. and n t, o u, v, &c. of the other lines between N and M, and GM and q 1, with the same; and rub out all the rest of the black lead lines, to avoid further confusion. Then, from the points where the short lines 1, 2, 3, &c. meet the line MI, draw lines down to q E, all parallel to MQ, and the outer surfaces of the seven cubes in the side ME will be finished; and all these left lines will meet the former parallels 2, 3, 4, &c. in the line q E.

Make IO equal and perpendicular to q 1, and P equal and parallel to IO; then draw OP, which will be equal and parallel to q y.—This done, draw OS and PS to the point of sight S, and PP to the point of distance P in the horizon. Lastly, from the point Q, where PP intersects OS, draw QR parallel to OP, and you will have the outlines QQRP of the surface of the third perspective table of cubes.

From the points w, v, w, n, s, take up the points of sight, and draw up the outlines of the five cubes in the side O Y of this third table.

From the points where these upright lines meet OP, draw lines toward the point of sight S, till they meet the diagonal PQ 1; and from these points of meeting draw lines to PR, all parallel to OP, making the parts 2, 3, 4, 5, of these lines with black ink which lie between ZY and PR. Then, from the points where these lines meet PR, draw lines down to y N 1, which will bound the outer surface of the five cubes in the side PN of the third table.

Draw the line y 1 with black ink; and, at a fourth part of its length between y and Z, draw an upright line to S, equal in length to that fourth part, and another equal and parallel thereto from Z to V; then draw SV parallel to ZZ, and draw the two upright and equidistant lines between ZZ and SV, and you will have the outer surfaces of the three cubes in the side SZ of the fourth table.

Draw SS and VS to the point of sight S in the horizon, and VP to the point of distance therein, intersecting
Perspective

To represent a double crofs in perspective.

In fig. 3, Plate CCCCLXXXV, let ABCD and EF GH be two perspective squares, equal and parallel to one another, the uppermost part of the cross; made figure. — From R, draw MO, and RS, and when the whole is properly laid down, and as far asunder as is equal to the given height of the upright part of the cross; S being the point of fight, and P the point of distance, in the horizon PS taken parallel to AD.

Draw AE, DH, and CG; then AE HD and DH GC shall be the two visible sides of the upright part of the cross; of which, the length, AE, is here made equal to three times the breadth EH.

Divide DH into three equal parts, HI, IK, and KD. Through these points of division, at I and K, draw MN, and MN parallel to AD; and make the parts MN, IO, PQ, KR, each equal to HI; then draw MP and OR parallel to DH.

From M, draw MS, and OS to the point of fight S; and from the point of distance D, P, draw PN cutting MS in T: from T draw TU parallel to MO, and meeting OS in U; and you will have the uppermost surface MTUO of one of the crosf pieces of the figure. — From R, draw RS to the point of fight S; and from U draw UV parallel to OR; and OUVR shall be the perspective square end next the eye of that crosf part.

Draw PM (as long as you please) from the point of distance P, through the corner M: lay a ruler to N and S, and draw XN from the line PX:—then lay the ruler to I and S, and draw YZS. — Draw XY parallel to MO, and make XW and YB equal and perpendicular to XY: then draw WB parallel to XY, and WX YB shall be the square visible end of the other crosf-part of the figure.

Draw BK towards the point of sight S; and from U draw US to the point of distance D, interfacing YS in Z; then, from the Interference Z, draw ZA parallel to MO, and ZB parallel to HD, and the whole delineation will be finished.

This done, shade the whole, as in fig. 4, and you will have a true perspective representation of a double crosf.

PROB. 26. To put three rows of upright squares in perspective, equal in size, and at equal distances from each other, on an oblong plane, the breadth of which shall be of any assigned proportion to the length thereof.

Fig. 5. Plate CCCCLXXXV, is a perspective representation of an oblong plane, three times as long as it is broad, having a row of nine upright squares on each side, and one of the same number in the middle; all equally high, and at equal distances from one another, both long and crosswise, on the same plane.

In fig. 6, PS is the horizon, S the point of sight, P the point of distance, and AD (parallel to PS) the breadth of the plane.

Draw AS, NS, and DS, to the point of sight S; the point N being in the middle of the line AD; and draw DP to the point of distance P, interfacing AS in the point B: then, from B draw BC parallel to AD, and you have the perspective square ABCD.

Through the point i, where DB interfices NS, draw a B parallel to AD; and you will have subdivided the perspective square ABCD into four lesser squares, as A i N, N i D, a B k i, and i k C. From the point C (at the top of the perspective square ABCD) draw CP to the point of distance P, interfacing AS in E; then, from the point E draw EF parallel to AD; and you will have the second perspective square BEFC.

Through the point l, where CE interfices NS, draw b f parallel to AD; and you will have subdivided the square BEFC into four lesser squares, b f k l, k l f c, b e m l, and I m F f.

From the point F (at the top of the perspective square BEFG) draw EP to the point of distance P, interfacing AS in I; then from the point I draw IK parallel to AD; and you will have the third perspective square EIKF.

Through the point n, where FI interfices NS, draw e g parallel to AD; and you will have subdivided the square EIKF into four lesser squares, E c n m, m n g F, c e m, and n e K g.

From the point K (at the top of the third perspective square EIKF) draw KP to the point of distance P, interfacing AS in I; then from the point L draw LM parallel to AD; and you will have the fourth perspective square IL MK.

Through the point p, where KL interfices NS, draw d b parallel to AD; and you will have subdivided the square IL MK into the four lesser squares, I d p o, o p b K, d L q p, and p q M b.

Thus we have formed an oblong square ALMD, whose perspective length is equal to four times its breadth, and it contains 16 equal perspective squares.

If greater length was still wanted, we might proceed further on toward S.

Take A 3, equal to the intended breadth of the side of the upright square objects AQ (all the other sides being of the same breadth), and AO for the intended height. Draw O 1 8 parallel to AD, and make D 8 and 4 7 equal to A 3; then draw g S, 4 S, 7 S, and 8 to the point of sight S; and among them we shall have the perspective square bases of all the 27 upright objects on the plane.

Through the point q, where DB interfices 8 S, draw 1 10 parallel to AD, and you have the three perspective square bases A 1 2 3, 4 5 6 7, 8 9 10 D, of the three upright square objects at A, N, and D.

Through the point 21, where e B interfices 8 S, draw 1 4, 11 parallel to AD; and you will have the three perspective squares a 1 4 15 16 17 18 19 20, and 21 1 2 22, for the bases of the second cross row of objects; namely, the next beyond the first three at A, N, and D.

Through the point s, where CE interfices 8 S, draw a line parallel to BC; and you will have three perspective squares, at B, A, and C, for the bases of the third row of objects; one of which is set up at B.

Through the point x, where f e interfices 8 S, draw a line parallel to P's f; and you will have three perspective squares, at A, k, and x, for the bases of the fourth cross row of objects.

Go on in this manner, as you see in the figure, to find:
find the reft of the fquare bafes, up to LM; and you
will have 27 upon the whole oblong fquare plane, on
which you are to place the like number of obje¢ts, as in
fig. 6.

Having affumed AO for the perpective height of
the three obje¢ts at A, N, and D (fig. 6.) next the
observer's eye, and drawn O 18 parallel to AD, in
order to make the obje¢ts at N and D of the fame
height as that at O; and having drawn the upright
lines 4, 15, 7 W, 8 X, and D 22, for the heights N
and D; draw OS and RS, 15 S and WS, XS and
22 S, all to the point of fight S: and these lines will
determine the perpective equal heights of all the
reft of the upright obje¢ts, as shown by the two placed
at a and B.

To draw the fquare tops of these obje¢ts, equal and
parallel to their bafes, we need only give one example,
which will serve for all.

Draw 9 R and 2 Q parallel to AO, and up to the
line RS; then draw PQ parallel to OR, and OPQR
shall be the top of the obje¢t at A, equal and parallel
to its fquare bafe A 3. In the fame easy way the
tops of all the other obje¢ts are formed.

When all the reft of the obje¢ts are delineated, shade
them properly, and the whole perpective fcheme will
have the appearance of fig. 5.

Prob. 27. To put a fquare box in perpective, containing
a given number of fquare boxes of a depth equal
to their width.

Let the given number of little fquare boxes or cells
be 16, then 4 of them make the length of each fide
of the four outer fides ab, bc, cd, da, as in fig. 7.
and the depth a is equal to the width ab. Whoever
can draw the reft of the fquare box, by the rules laid down
towards the beginning of this article, will be at no
loss about putting this perpective fcheme in pradice.

Prob. 28. To put stairs with equal and parallel fides
in perpective.

In fig. 1. of Plate CCCLXXXVII. let ab be the
given breadth of each ftep, and a the height thereof.
Make 5, 6, 7, 8, &c. each equal to a b; and draw
all the upright lines a, b, l, c, d, &e. perpendicular
to a b (to which the horizon S is parallel); and
from the points i, l, n, p, r, &c. draw the equidistant
lines i B, J C, n D, &c. parallel to a b; these distances
being equal to that of i B fr m a.

Draw $x$ touching all the corner points $i$, $l$, $p$, $r$
de &c. from it as far as you want the length of the fteps to be.

Towards the point of fight S draw the lines a 1, i 2,
k 3, l 4, &c. and draw 16 15, 14 13, 12 11, 10 9,
8 7, 6 5, 4 3, and 2 1, all parallel to Ab, and meeting
the lines $v 15, u 14, t 13, i 12, &c. in the points 15,
14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, and 2 1,
all parallel to a b; a and the outlines of the fteps will
be finated. From the point 16 draw 16 A parallel
to b a, and A x 16 will be part of the flat at the top of
the upper ftep. This done, shade the work as
in fig. 2. and the whole will be finated.

Prob. 29. To put fairs with flats and openings in perpective,
standing on a horizontal pavement of fquares.

In fig. 3. of Plate CCCLXXXVII. having made S the
point of fight, and drawn a reticulated pavement AB
with black lead lines, which may be rubbed out again,
at any distance from the fide AB of the pavement
which is nearest to the eye, and at any point where
you choose to begin the fair at that distance, as a,
draw Ga parallel to BA, and take a b at pleafure for
the height of each ftep.

Take a b in your compaffes, and set that extent as
many times upward from F to E as is equal to the
fift required number of fteps O, N, M, L, K; and
from there points of division in EF draw b d, e f,
and Ek all equidistant from one another, and
parallel to Fa: then draw the equidistant upright lines
a b, t d, u f, v h, w k, and I m, all perpendicular to
Fa: then draw m b, touching the outer corners of
these fteps at m, n, o, d, and b; and draw n parallel
to m b, as far from it as you want the length of the
fteps K, L, M, N, O to be.

Towards the point of fight S draw m n, l 5, k, i 6,
b, f, g, d, and v 8. Then (parallel to the bottom
line BA) through the points m, n, p, q, r, s, draw
e, f, g, d, and h, &c. as in the figure. Whoever
can draw the upright lines 29, 30, 31, &c. in the
points where these short fteps meet CD draw lines
parallel to GE, and the short lines marked
32, 33, &c. just even with the parallel lines 1, 2, &c.
From the points where these short fteps meet CD
draw lines toward the point of fight S till they meet
DE; then from the points where the lines 58, 39, 40,
&c. of the pavement meet C, draw upright lines
parallel to CD, and the lines which form the opening
will be finated.

The fteps P, Q, R, S, T, and the flat U above
the arch V are done in the fame manner with thofe
in fig. 1. as taught in Prob. 28 and the equidistant
parallel lines marked 18, 19, &c. are directly even
with thofe on the left-hand fide of the arch V, and
the upright lines on the right hand fide are equidistant
with thofe on the left.

From the points where the lines 18, 19, 20, &c.
meet the right-hand fide of the arch, draw lines toward
the point of fight S; and from the points where the
pavement lines 29, 30, 31, &c. meet the line drawn
from A towards the point of fight, draw upright lines
toward the top of the arch.

Having done the top of the arch, as in the figure,
and the few fteps to the right hand thereof, shade the
whole as in fig. 4. and the work will be finated.

Prob. 30. To put upright conical obje¢ts in perpective,
as if standing on the fides of an oblong square, at diftan-
ces from one anor her equal to the breadth of the oblong.

In fig. 5. of Plate CCCLXXXVI. the bases of the
upright cones are perpective circles inscribed in fquares
of the fame diameter; and the cones are fet upright
Fig. 1. Horizon

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Perspective Plate CCCXXXV
on their bases by the same rules as are given for pyramids, which we need not repeat here.

In most of the foregoing operations we have considered the observer's eye to be above the level of the tops of all the objects, as if he viewed them when standing on high ground. In this figure, and the first and second of the next plate, we shall suppose him to be standing on low ground, and the tops of the objects to be above the level of his eye.

In fig. 5, let AD be the perspective breadth of the oblong square ABCD; and let AA and DD (equal to Aa) be taken for the diameters of the circular bases of the two cones next the eye, whose intended equal heights shall be AE and DF.

Having made S the point of sight in the horizon parallel to AD, and found the proper point of distance therein, draw AS and aS to contain the bases of the cones on the left-hand side, and DS and dS for those on the right.

Having made the two first cones at A and D of equal height at pleasure, draw ES and ES from their tops to the point of sight, for limiting the perspective heights of all the rest of the cones. Then divide the parallelogram ABCD into as many equal perspective squares as you please; find the bases of the cones at the corners of these squares, and make the cones thereon, as in the figure.

If you would represent a ceiling equal and parallel to ABCD, supported on the tops of these cones, draw EF, then EFGH shall be the ceiling; and by drawing ef parallel to EF, you will have the thickness of the floor-boards and beams, which may be what you please.

This shows how any number of equidistant pillars may be drawn of equal heights to support the ceiling of a long room, and how the walls of such a room may be represented in perspective at the backs of these pillars. It also shows how a street of houses may be drawn in perspective.

Para. 31. To put a square hollow in perspective, the depth of which shall bear any assigned proportion to its width.

Fig. 1. of Plate CCCLXXXVII. is the representation of a square hollow, of which the depth AG is equal to three times its width AD; and S is the point of sight over which the observer's eye is supposed to be placed, looking perpendicularly down into it, but not directly over the middle.

Draw AS and DS to the point of sight S; make ST the horizon parallel to AD, and produce it to such a length beyond T that you may find a point of distance therein not nearer S than if AD was seen under an angle of 60 degrees.

Draw DU to the point of distance, intersecting AS in B; then from the point D draw DC parallel to AD; and you shall have the first perspective square ABD, equal to a third part of the intended depth.

Draw CV to the point of distance, intersecting AS in E; then from the point E draw EF parallel to AD; and you will have the second perspective square BEFC, which, added to the former one, makes two-thirds of the intended depth.

Draw FW to the point of distance, intersecting AS in G; then from the point G draw GH parallel to AD; and you will have the third perspective square EGHF, which, with the former two, makes the whole depth AGHD three times as great as the width AD, in a perspective view.

Divide AD into any number of equal parts, as suppose 8; and from the division-points a, b, c, d, &c. draw lines toward the point of sight S, and ending at GH; then through the points where the diagonals BD, EC, GF, cut these lines, draw lines parallel to AD; and you will have the parallelogram AGHD reticulated, or divided into 192 small and equal perspective squares.

Make AI and DM equal and perpendicular to AD; then draw IM, which shall be equal and parallel to AD; and draw IS and MS to the point of sight S.

Divide AI, IM, and MD, into the same number of equal parts as AD is divided; and from these points of division draw lines toward the point of sight S, ending respectively at GK, KL, and LH.

From those points where the lines parallel to AD meet AG and DH draw upright lines parallel to AI and DM; and from the points where these lines meet IK and LM draw lines parallel to IM; then shade the work, as in the figure.

Para. 32. To represent a semicircular arch in perspective, as it were standing on two upright walls, equal in height to the height of the observer's eye.

After having gone through the preceding operation, this will be more easy by a bare view of fig. 2. in Plate CCCLXXXVII. than it could be made by any description; the method being so much like that of drawing and shading the square hollow.—We need only mention, that ALBEA and DFST are the upright walls on which the semicircular arch is built; that S is the point of sight in the horizon T, taken in the centre of the arch; that d in fig. 1. is the point of distance; and that the two perspective squares ABCD and BEFC make the parallelogram AEFD of a length equal to twice its breadth AD.

Para. 33. To represent a square in perspective, as viewed by an observer standing directly even with one of its corners.

In fig. 3. of Plate CCCLXXXVII. let AG BC be a true square, viewed by an observer standing at some distance from the corner C, and just even with the diagonal C G.

Let RS be the horizon, parallel to the diagonal AB; and S the point of sight, even with the diagonal C G. Here it will be proper to have two points of distance p and P, equidistant from the point of sight S.

Draw the straight line 17 parallel to AB, and draw A 8 and B 10 parallel to CS: Take the distance between 8 and 9 in your compasis, and set it off all the way in equal parts from 8 to 1, and from 10 to 17. The line 17 should be produced a good way further both to right and left hand from 9, and divided all the way in the same manner.

From these points of equal division, 8, 9, 10, &c. draw lines to the point of sight S, and also to the two points of distance p and P, as in the figure.

Now it is plain, that a c b 9 is the perspective representation of A9BC, viewed by an observer even with the corner C and diagonal C G.—But if there are other such squares lying even with this, and having the same position with respect to the line 17, it is evident that the observer, who stands directly even with the corner,
corner C of the first square, will not be even with the like corners G and K of the others; but will have an oblique view of them, over the sides FG and IK, which are nearest his eye: and their perspective representations will be g f 6 and b k i 3, drawn along the lines in the figure; of which, the spaces taken up by each side lie between three of the lines drawn toward the point of distance p, and three drawn to the other point of distance P.

Prob. 34. To represent a common chair, in an oblique in perspective.

The original lines to the point of sight S, and points of distance p and P, being drawn as in the preceding operation, choose any part of the plane, as l m n 13, on which you would have the chair L to stand.—There are just as many lines (namely two) between 1 and m or 13 and n, drawn toward the point of distance p, at the left hand, as between l and 13, or m and n, drawn to the point of distance P on the right: so that l m, m n, n 13, and 13 l, form a perspective square.

From the four corners l, m, n, 13, of this square raise the four legs of the chair to the perspective perpendicular height you would have them: then make the seat of the chair a square equal and parallel to l m n 13, as taught in Prob. 18, which will make the two sides of the seat in the direction of the lines drawn toward the point of distance p, and the fore and back part of the seat in direction of the lines drawn to the other point of distance P. This done, draw the back of the chair leaning a little backward, and the cross bars therein tending toward the point of distance P. Then shade the work as in the figure; and the perspective chair will be finished.

Prob. 35. To present an oblong square table in an oblique perspective view.

In fig. 3. of Plate CCCXXXVII. M is an oblong square table, as seen by an observer standing directly even with C 9 (see Prob. 33.) the side next the eye being perspective parallel to the sides a c of the square a b c d. The forementioned lines drawn from the line 1 7 to the two points of distance p and P, form equal perspective squares on the ground plane.

Choose any part of this plane of squares for the feet of the table to stand upon; as at p, q, r, and s, in direction of the lines o p and r s for the two long sides, and t and q r for the two ends; and you will have the oblong square or parallelogram q r and t for the part of the floor or ground-plane whereon the table is to stand: and the breadth of this plane is here taken in proportion to the length as 6 to 10, so that, if the length of the table be ten feet, its breadth will be six.

On the four little perspective squares at q r, s t, and t, place the four upright legs of the table, of what height you please, so that the height of the two next the eye, at o and p, shall be terminated by a straight line w o drawn to the point of distance P. This done, make the leaf of the table an oblong square, perspective equal and parallel to the oblong square q r s t on which the feet of the table stands. Then shade the whole, as in the figure, and the work will be finished.

If the line 1 7 was prolonged to the right and left hand, and equally divided throughout (as it is from 1 to 17), and if the lines which a d drawn from p and to the right and left hand sides of the plate were prolonged till they came to the extended line 1 7, they would meet it in equal points of division. In forming large plans of this fort, the ends of slips of paper may be pasted to the right and left edges of the sheet on which the plan is to be formed.

of the Anamorphosis, or reformation of distorted images.

By this means pictures that are so mithapen, as to exhibit no regular appearance of any thing to the naked eye, shall, when viewed by reflection, present a regular and beautiful image. The inventor of this ingenious device is not known. Simon Stevin, who was the first that wrote upon it, does not inform us from whom he learned it. The principles of it are laid down by S. Vauzelard in his Perspectiva Conique et Cycloides, and Gaifer Schott professes to copy Marius Bettinus in his description of this piece of artificial magic.

It will be sufficient for our purpose to copy one of the simplest figures of this writer, as by this means the mystery of this art will be sufficiently unfolded. Upon the cylinder of paper, or palteboard, ABCD, draw whatever is intended to be exhibited, as the letters IHS. Then with a needle make perforations along the whole outline; and placing a candle, G, behind this cylinder, mark upon the ground plane the shadow of them, which will be distorted more or less, according to the position of the candle plane or the plane, &c. This being done, let the picture be an exact copy of this distorted image, let a metallic speculum be substituted in the place of the cylinder, and let the eye of the spectator have the same position before the cylinder that the candle had behind it. Then looking upon the speculum, he will see the distorted image restored to its proper shape. The reformation of the image, he affirms, will not easily be made exact in this method, but it will be sufficiently so to answer the purpose.

Other methods, more exact and geometrical than this, were found out afterwards: so that these pictures could be drawn by certain rules, without the use of a candle. Schott quotes one of these methods from Bettinus, another from Heironius, and another from Kircher, which may be seen in his Magia, vol i. p. 162, &c. He also gives an account of the methods of reforming pictures by speculums of conical and other figures.

Instead of copying any of these methods from Schott or Bettinus, we shall present our readers with that which Dr Smith hath given us in his Optics, vol i. p. 250, &c. He there gives an account of the more simple methods of reformation of distorted images. He speaks of two mirrors, one of which, fig. 7, is convex, and the other, fig. 8, is concave. In order to paint upon a plane a deformed copy ABCDEKIGHF of an original picture, which shall appear regular, when seen from a given point O, elevated above the plane, by rays reflected from a polished cylinder, placed upon the circle l p, equal to its given base; from the point R, which must be supposed to lie perpendicularly under O, the place of the eye, draw two lines R a R e, which shall either touch the base of the cylinder, or else cut off two small equal segments from the sides of its, according as the copy is intended to be more or less deformed. Then, taking the eye, raised above R, to the given height RO, and...
somewhat greater than that of the cylinder for a luminous point, describe the shadow $a e k f$ (of a square $a e k e$, fig. 36. or parallelogram standing upright upon its base $a e$, and containing the picture required) anywhere behind the arch $l n p$. Let the lines drawn from $R$ to the extremities and divisions of the base $a, b, c, d, e$ cut the remotest part of the shadow in the points $f, g, h, i, k$, and the arch of the base in $l, m, n, o, p$; from which points draw the lines $l A F, m B G, n C H, o D I, p E K$, as if they were rays of light that came from a focus, $K,$ and were reflected from the base $l n p$; so that each couple, as $l A, l R,$ produced, may cut off equal segments from the circle. Lastly, transfer the lines $l a f, m b g, o c i, a l n, b m r,$ and all their parts, in the same order, upon the respective lines $l A F, m B G, n C H, o D I, p E K,$ and having drawn regular curves, by elimination, through the points $A, B, C, D, E,$ through $F, G, H, I, K,$ and through every intermediate order of points; the figure $A C E K H F,$ so divided, will be the deformed copy of the square, drawn and divided upon the original picture, and will appear similar to it, when seen in the polished cylinder, placed upon the base $l n p,$ by the eye in its given place $O$.

The practical methods of drawing these images seem to have been carried to the greatest perfection by J. Leopold, who, in the Acta Lipsiensia for the year 1712, has described two machines, one for the images to be viewed with a cylindrical, and the other with a conical mirror. The person possessed of this instrument has nothing to do but to take any print he pleases, and while he goes over the outlines of it with one pen, another traces the anamorphosis. The merit of the invention has nothing to do but to take any print he pleases, and while he goes over the outlines of it with one pen, another traces the anamorphosis.

By methods of this kind, groves of trees may be cut, so as to represent the appearance of men, horses, and other objects from some one point of view, which are not at all discernible in any other. This might easily be effected by one person placing himself in any particular place, and having directed a person what trees to plant, and in what manner. In the same method it has been contrived, that buildings of circular and other forms, and also whole groups of buildings, consisting of walls at different distances, and with different positions to one another, should be painted so as to exhibit the exact representation of particular objects, which could only be perceived in one situation. Bettinus has illustrated this method by drawings in his Apiaria.

It may appear a bold assertion to say, that the very short sketch now given of the art of perspective is a sufficient foundation for the whole practice, and includes all the expeditious rules peculiar to the problems which most generally occur. It is, however, true, and the intelligent reader will see, that the two theorems on which the whole rests, include every possible cafe, and apply with equal facility to pictures and originals in any position, although the examples are selected of perpendicular pictures, and of originals referred to horizontal planes, as being the most frequent. The scientific foundation being so simple, the structure need not be complex, nor swell into volumes which, by their size deter from the perusal, and give the simple art the appearance of intricate mystery; and,

by their prices, defeat the design of their authors, viz. the dissemination of knowledge among the practitioners. The treatises on perspective acquire their bulk by long and tedious discourses, minute explanations of common things, or by great numbers of examples; which indeed do make some of these books valuable by the variety of curious cuts, but do not at all instruct the reader by any improvements made in the art itself. For it is evident, that most of those who have treated this subject have been more conversant in the practice of designing than in the principles of geometry; and therefore when, in their practice, the cafcs which have offered have put them on trying particular expedients, they have thought them worth communicating to the public as improvements of the art; and each author, fond of his own little expedient (which a scientific person would have known for an easy corollary from the general theorem), have made it the principle of a practical system—and in this manner narrowing instead of enlarging the knowledge of the art; and the practitioner, tired of the bulk of the volume, in which a single maxim is tedioufly spread out, and the principle on which it is founded kept out of his sight, contents himself with a remembrance of the maxim (not understood), and keeps it slightly in his eye, to avoid gross errors. We can appeal to the whole body of painters and draughtsmen for the truth of this assertion; and it must not be considered as an imputation on them of remissness or negligence, but as a necessary consequence of the ignorance of the authors from whom they have taken their information. This is a strong term, but it is not the least just. Several mathematicians of eminence have written on perspective, treating it as the subject of pure geometry, as it really is; and the performances of Dr Brook Taylor, Gravevande, Wolf, De la Caille, Emerson, are truly valuable, by prefenting the art in all its perpicious simplicity and universality. The works of Taylor and Emerson are more valuable, on account of the very ingenious and expeditious constructions which they have given, suited to every possible cafe. The merit of the first author has been universally acknowledged by all the British writers on the subject, who never fail to declare that their own works are composed on the principle of Dr Brook Taylor: but any man of science will see that these authors have either not understood them, or aimed at pleasing the public by fine cuts and uncommon effects; for, without exception, they have omitted his favourite constructions, which had gained his predilection by their universality, and attached themselves to inferior methods, more usually expeditious perhaps, or inventions (as they thought) of their own. What has been given in this article is not professed to be according to the principles of Dr Brook Taylor, because the principles are not peculiar to him, but the necessary results of the theory itself, and incorporated by every mathematician who has taken the trouble to consider the subject. They are sufficient not only for directing the ordinary practice, but also for fogging modes of construction for every case out of the common track. And a person of ingenuity will have a laudable enjoyment in thus, without much stretch of thought, inventing rules for himself; and will be better pleased with fruit's of his own ingenuity, than in reading the tedious explanations of examples devised...
PERSPECTIVE.

The art of painting, taken in its full extent, consists of two parts; the inventive, and the executive. The inventive part is common with poetry, and belongs more properly and immediately to the original design (which it invents and divides in the most proper and agreeable manner) than to the picture, which is only a copy of that design already formed in the imagination of the artist. The perfection of this art of painting depends upon the thorough knowledge the artist has of all the parts of his subject; and the beauty of it consists in the happy choice and disposition that he makes of it: And it is in this that the genius of the artist discovers and shows itself, while he indulges and humour his fancy, which here is not confined. But the other, the executive part of painting, is wholly confined and strictly tied to the rules of art, which cannot be dispensed with on any account; and therefore in this the artist ought to govern himself entirely by the rules of art, and not to take any liberties whatever. For any thing that is not truly drawn according to the rules of perspective, or not truly coloured or truly shaded, does not appear to be what the artist intended, but something else. Therefore, if at any time the artist happens to imagine that his picture would look the better, if he should twice a little from these rules, he may assure himself, that the fault belongs to his original design, and not to the strictness of the rules; for what is perfectly agreeable and just in the real original objects themselves, can never appear defective in a picture where those objects are exactly copied.

Therefore to offer a short hint of thoughts we have some time had upon the method which ought to be followed in instructing a scholar in the executive part of painting; we would first have him learn the most common effects of practical geometry, and the first elements of plain geometry and common arithmetic. When he is sufficiently perfect in these, we would have him learn perspective. And when he has made some progress in this, so as to have prepared his judgment with the right notions of the alterations that figures must undergo when they come to be drawn on a flat, he may then be put to drawing by view, and be exercised in this along with perspective, till he come to be sufficiently perfect in both. Nothing ought to be more familiar to a painter than perspective; for it is the only thing that can make the judgment correct, and will help the fancy to invent with nine times the ease that it could do without it.

We earnestly recommend to our readers the careful perusal of Dr Taylor's Treatise, as published by Colson in 1749, and Emerson's published along with his Optics. They will be surprised and delighted with the instruction they will receive; and will then truly estimate the splendid volumes of other authors and see their frivolity.

Perspective is also used for a kind of picture or painting, frequently seen in gardens, and at the ends of galleries; designed expressly to deceive the sight by representing the continuation of an alley, a building, landscape, or the like.

Aerial PERSPECTIVE, is sometimes used as a general deno-
denomination for that which mere restrictedly is called _aerial perspective_, or the art of giving a due diminution or degradation to the strength of light, shade, and colours of objects, according to their different distances, the quantity of light which falls upon them, and the medium through which they are seen; the _chiare obscuro_, or _clair obscur_, which consists in expressing the different degrees of light, shade, and colour of bodies, arising from their own shape, and the position of their parts with respect to the eye and neighbouring objects, whereby their light or colours are affected; and keeping, which is the observance of a due proportion in the general light and colouring of the whole picture, so that no light or colour in one part may be too bright or strong for another. A painter, who could succeed in _aerial perspective_, ought carefully to study the effects which distance, or different degrees or colours of light, have on each particular original colour, to know how its hue or strength is changed into the several colours of the picture, to which all the same colours at several distances must have a proportional degradation in like circumstances.

_Bird's eye view in Perspective_, is that which supposes the eye to be placed above any building, etc. as in the air at a considerable distance from it. This is applied in drawing the representations of fortifications, when it is necessary not only to exhibit one view as seen from the ground, but so much of the several buildings as the eye can possibly take in at one time from any situation. In order to this, we must suppose the eye to be removed a considerable height above the ground, and to be placed as it were in the air, so as to look down into the building like a bird that is flying. In representations of this kind, the higher the horizontal line is placed, the more of the fortification will be seen, and vice versa.

_Perceptive Machine_ is an instrument by which any person, without the help of the rules of art, may delineate the true perspective figures of objects. Mr Fergusson has described a machine of this sort of which he ascribes the invention to Dr Bevis.

Fig. 4. of Plate CCCLXXXVII. is a plane of this machine, and fig. 5. is a representation of it when made use of in drawing distant objects in perspective.

In fig. 4. _a b e f_ is a oblong square board, represented by _ABEF_ in fig. 5. _x y_ and _X Y_ are two hinges on which the part _c l d_ (CLD) is moveable. This parts consists of two arches or portions of circles _c m l_ (CML) and _d n l_ (DNL) joined together at the top _l_ (L), and at bottom to the cross bar _d e_ (DC), to which one part of each hinge is fixed, and the other part to a flat board, half the length of the board _a b e f_ (ABEF), and glued to its uppermost side. The centre of the arch _c m l_ is at _d_, and the centre of the arch _d n l_ is at _e_.

On the outer side of the arch _d n l_ is a sliding piece _n_ (much like the nut of the quadrant of altitude belonging to a common globe), which may be moved to any part of the arch between _d_ and _l_; and there is such another slider _o_ on the arch _c m l_, which may be fitted to any part between _e_ and _l_. A thread _e p n_ (CPN) is stretched tight from the centre _c_ (C) to the slider _n_ (N), and such another thread _e q_ is stretched from the centre _d_ (D) to the slider _o_ (O); the ends of the threads being fastened to these centres and sliders.

Now it is plain, that by moving these sliders on their respective arches, the intersecion _p_ (P) of the threads may be brought to any point of the open space within the arches.—In the groove _k_ (K) is a straight sliding bar _l_ (1), which may be drawn further out, or pushed further in at pleasure.

To the outer end of this bar _l_ (fig. 5.) is fixed the upright piece _H Z_, in which is a groove for receiving the sliding piece _Q_. In this slider is a small hole _r_ for the eye to look through, in using the machine; and there is a long slit in _H Z_, to let the hole _r_ be seen through when the eye is placed behind it at any height of the hole above the level of the bar _l_.

_How to delineate the perspective figure of any distant objects, or objects, by means of this machine._

Suppose you wanted to delineate a perspective representation of the house _g r p_ (which we must imagine to be a great way off without the limits of the plate), place the machine on a ready flat board, with the end _E F_ of the horizontal board _ABEF_ toward the house, so that when the Gothic-like arch _ABEF_ is set upright, the middle part of the open space (about _P_ within it may be even with the house when you place your eye at _Z_ and look at the house through the small hole _r_. Then fix the corners of a square piece of paper with four wafers on the surface of that half of the horizontal board which is near to the house; and all is ready for drawing.

Set the arch upright, as in the figure; which it will be when it comes to the perpendicular side _r_ of the upright piece _l_ fixed to the horizontal board behind _D_. Then place your eye at _Z_, and look through the hole _r_ at any point of the house, as _q_, and move the sliders _N_ and _O_ till you bring the intersection of the threads at _P_ directly between your eye and the point _q_; then put down the arch flat upon the paper on the board, as at _ST_, and the intersection of the threads will be at _W_. Mark the point _W_ on the paper with the dot of a black lead pencil, and set the arch upright again as before: then look through the hole _r_, and move the sliders _N_ and _O_ till the intersection of the threads comes between your eye and any other point of the house, as _a_; then put down the arch again to the paper, and make a pencil mark thereon at the intersection of the threads, and draw a line from that mark to the former one at _W_; which line will be a true perspective representation of the corner _p q_ of the house.

Proceed in the same manner, by bringing the intersection of the threads successively between your eye and other points of the outlines of the house, as _r s_ &c. and put down the arch to mark the like points on the paper, at the intersection of the threads: then connect these points by straight lines, which will be the perspective outlines of the house. In like manner find points for the corners of the door and windows, top of the house, chimneys, &c. and draw the finishing lines from point to point; then shade the whole, making the lights and shades as you see them on the house itself, and you will have a true perspective figure of it.—

_Great care must be taken, during the whole time, that_
Perspicuity, properly signifies the property which any thing has of being easily seen; hence it is generally applied to such writings or discourses as are easily understood.

Perspicuity, in composition. See Oratory, p. 43.

Perth, a county of Scotland, including Montech, Braithibin, Athol, Stratherne, part of Gowrie, and Perth Proper; is bounded by Badenoch and Lochabar on the north and north west; by Mar on the north-east; by Argyle and Lennox on the west and south-west; having Clackmannanshire, part of Stirling-shire, and the Forth to the south; the shires of Kinroofs and Fife to the south east, and Angus to the east. It extends above 70 miles in length, and near 60 at its greatest breadth, exhibiting a variety of Highlands and Lowlands; mountains, hills, dales, and straths, diversified with pasture-grounds, corn fields, and meadows; rivers, lakes, thores, waterfalls, plantations, and closeries, towns, villages, and a great number of elegant feats, beautifully situate, belonging to noblemen and gentlemen. The chief rivers of Perthshire are the Tay, the Teith, and the Erne, besides a great number of subordinate streams. The river Teith is famous for its salmon-fishery, and its steep cataract, near the Blair of Drummond, the noise of which is so loud, as to deafen those who approach it. The river Erne rises from Loch Erne, a lake seven miles long, in the mountainous country of Stratherne; this river, after a course of 34 miles from west to east, during which it receives many streams and rivulets, falls into the Tay at Abernethy.

Freetone, lead, iron, and copper ores, with some lapis calaminaris, are found in different parts of Perthshire. The soil, being generally rich and well manured, produces excellent wheat, and all kinds of grain. The hilly country abounds with pasture for the black cattle, horses, sheep, goats, and deer. The heaths, woods, and forests, are stored with variety of game; the rivers teem with salmon and trout; the gardens and orchards, are stored with all kinds of herbs, roots, apples, pears, cherries, plums, and almost every species of fruit found in South Britain. The houses and towns, even of the commonalty, are neat and decent; and every peasant can produce a good quantity of linen, and great store of blankets, made in his own family. Indeed, this is the case through all the Lowlands of Scotland. Flax is reared by every husbandman; and being dressed at home, is spun by the females of his family into thread for linen; this is woven by country weavers, of whom there is a great number through all the Low Country, and afterwards bleached or whitened by the good-wife and her servants; so that the whole is made fit for use at a very small expense. They likewise wash, card, spin, and weave their wool into tartan for plaids, kerseys, and coarse stuff-cloth, for common wearing, besides great part of which is knitt into caps, stockings, and mitts. Plaids, made of the finest worsted, are worn either plain or variegated, as veils, by women of the lower, and even of the middle rank; nay, some years ago, ladies of fashion wore flikken plaids with an undress; this

**PERSPIRATION, in medicine, the evacuation of the juices of the body through the pores of the skin. Perpiration is distinguished into sensible and insensible; and here sensible perpiration is the name with sweating, and insensible perpiration that which Perspicuity escapes the notice of the senses; and this last is the idea affixed to the word perspiration when used alone.**
Mr Camden was too good a courtier to speak.

The Lowlanders of Perthshire are civilized, hospitable, and industrious: the commerce of the country consists chiefly in corn, linen, and black cattle; there are, moreover, some merchants who trade to foreign countries.—For an account of the different divisions of this country above-mentioned, see the articles as they occur in the order of the alphabet.

PERTH, the capital of the county of that name, is an agreeable, populous town, situated 20 miles within land, on the south bank of the river Tay. It was otherwise called St John’s, from a church dedicated to St John, as the patron of the place. It is a royal borough, second in dignity to the metropolis, the seat of a large prebendary, and gave the title of Earl to the family of Drummond, which is now forfeited. James Drummond, 4th Earl, was created Duke of Perth by James II. for adhering to whose interests he was outlawed. His two grandsons were attainted 1651, created Lord Ruthven: but the honour, on the death of his son David in 1659, was restored to his family. By James’s known hatred to the Lowings, towards the southern end of the town of Perth by James II. for adhering to the family of Lyon.

North-eastward from Perth to Bridge of Strathmore, one of the most fertile districts in Scotland, which gives the title of Earl to the noble family of Lyon.

The castle of Perth stood on the red bridge, which terminated the narrow street called Skinner-gate. At the end of the Castle-street another narrow street leads west to the Blak-friers called Cowper-row, where the Curfew bell was. The streets of Perth before James II. were crown’d at Scone, and refited at Perth as the metropolis of the nation. James refited and was educated in the castle of Edinburgh, and was crowned there 1437. The parliaments and courts of justice were removed from Perth to Edinburgh, but Perth kept its priority till 1742.

The church in which John Knox harangued is still standing, and is now divided into three; named the east, the middle, and the west kirk. The east kirk was lately very handomely modernized within. There is an old hospital, a considerable building, the foundling of which is ascribed to James VI. The town is thus vis., the eastern end of the High-street. A monastery of Carthusians was here established by King James I. of Scotland, who left his life on the very spot by the treachery of Athol and his accomplices. The king was buried in a very stately monument in this place, which was called monasterium valtis virtutis, one of the most magnificent buildings in the kingdom, which with the rest was destroyed by the populace. James VI. created George Hay commenda-
The city of Perth was once the capital of the kingdom, and was completed at the expense of King Robert. It is built, now greatly decayed. The royal boroughs of Perth, St. Andrews, and the city of Dunkeld, are truly a noble river. It flows through the large river of Tummel. Here it bends to the north, and its waters are diffused into the famous Loch Tay, which flows hither by a more direct line, and receives several small rills. Soon after, it discharges itself into the ocean, Perth is advantageously situated. A person acquainted with the general character of great rivers, and with their influence in determining the aspect and fertility of the districts through which they pass, might readily without farther knowledge of the local circumstances than what is conveyed in this account of the course of the Tay, and of the situation of Perth upon it, conclude the city to be amid delightful scenery, and to enjoy all the advantages which natural circumstances afford, for the promotion of trade and industry.”

For Pertinax, the emperor after the death of Commodus, he was descended of a mean family; and like his father, who was either a slave or the son of a manumitted slave, he for some time followed the employment of drying wood and making charcoal. His poverty did not, however, prevent him from receiving a liberal education.

The trade of Perth is considerable. It exports annually 150,000 L. worth of linen, from 24,000 to 30,000 bolls of wheat and barley to London and Edinburgh, and a very large quantity of cured salmon. That fish is taken there in vast abundance; 30,000 have been caught in one morning; weighing one with another, 16 pounds; the whole capture 48,000 pounds. The fisheries amount to considerably upwards of 3000 L. per annum. Salmon come up this river in May and June. See Pear's W. Long. 3. 27. N. Lat. 56. 22.

Pertinax, the emperor after the death of Commodus, was an illustrious Roman emperor after the death of Commodus. He was descended of a mean family; and like his father, who was either a slave or the son of a manumitted slave, he for some time followed the employment of drying wood and making charcoal. His poverty did not, however, prevent him from receiving a liberal education. For some time he was employed in teaching a number of pupils the Greek and the Roman languages in Egypt.

The rents of the fisheries amount to considerably upwards of 3000 L. per annum. Smelts come up this river in May and June. See Pear's W. Long. 3. 27. N. Lat. 56. 22.
Pertinax was taken prisoner on the plea of old age and increasing infirmities, did not prevent his being called an emperor and Augustus. He complied with reluctance; but his meekness, his economy, and popularity, convinced the Senate and the people of the prudence and the justice of their choice. He forbade his name to be inscribed on such places or effigies as were part of the imperial domains, and affirmed that they belonged not to him but to the public. He melted all the silver statues which had been raised to his predecessor, and he exposed to sale all his conculines, horses, arms, and all the instruments of his pleasure and extravagance. With the money raised from these relics he enriched the empire, and was enabled to subsidize all the taxes which Commodus had laid on the rivers, ports, and highways, throughout the empire. These patriotic actions gained him the affection of the worthy and most discerning of his subjects; but the extravagant, luxurious, and vicious, raised their clamour against him; and when the emperor attempted to introduce among the praetorian guards such discipline as was absolutely necessary, to preserve the peace and tranquility of Rome, the flames of rebellion were kindled, and the minds of the soldiers totally alienated. Pertinax was apprized of their mutinying, but he refused to fly at the hour of danger. He learned the advice of such of his friends as wished him to withdraw from the impending storm: and he unexpectedly appeared before the ferous troops, and without fear or concern boldly asked them, whether they were bound by duty to defend the person of their prince and emperor, or come to betray him and to shed his blood? His undaunted courage and intrepidity would have had the defined effect, and the soldiers had begun to retire when one of the most ferious of them advanced and darted his javelin at the emperor's breast, exclaiming, The soldiers fend you this. The respect instantly followed the example; and Pertinax muffi: g up his head, and calling upon Jupiter to avenge his death, remained unmoved, and was immediately dispatched. His head was cut off and carried upon the point of a spear in triumph to the camp. This abominable murder happened in the 103d year of the Christian era.

It was no sooner known that Pertinax had been murdered, than the enraged populace flockt from all quarters of the city; and uttering dreadful menaces against the authors of his death, ran up and down the streets in quest of them. The senators were more less concerned for his death than the people; the more, because they were now convinced, that the soldiers would suffer none to reign but tyrants. However, as they had more to lose than the common people, they did not offer to revenge his death; but either shut themselves up in their own houses, or in those of the followers of their acquaintance, thinking themselves the more safe. Such was the unfortuate and much-lamented end of Publius Helvius Pertinax, after he had lived 66 years 7 months and 26 or 28 days: and reigned, according to Dio Cassius, 87 days, that is, from the 1st of January to the 28th of Mar.h. His body, together with his head, was interred with great pomp by Didius Julianus, his successor, in the burying place of his wife's family. The emperor Septimius Severus, with the title of emperor, assumed the name of Pertinax, which he knew would above any thing else recommend him to the army in Illyricum; and to the Roman people. He punished with great severity all those who had been accessory to his death, disband ed the praetorian guards, honoured his memory with a most magnificent funeral, at which was carried the effigies of the deceased prince, pronounced his panegyric, and caused him to be ranked in the number of the gods, appointing the son chief-priest to his father. The day of his accension to the empire was yearly celebrated with the Circensian games; and his birth-day for many years after, with other sports. He performed great things, says Herodian, during his short administration, and would have restored the empire to its former lustre, had he been indulged with a longer reign.

PERTINENT OF LANDS, in Scots law. See Law, No. clvii. 6 p. 670.

PERU, a country of South America, is bounded on the north by Popayan, on the east by Amazonia, on the south by Chili, and on the west by the Pacific ocean; extending from 1° 40' north to 26° 10' south latitude, and between 56° and 81° west longitude from Greenwich; being about 1800 miles in length, but its greatest breadth does not much exceed 390.

This country was discovered by the Spaniards; and the first intelligence they had of it was on the following occasion. Nunez de Balboa having sailed to the government of the small colony at Santa Maria in Darien by the suffrages of his companions, was very defirous of having that authority confirmed by the court of Spain. For this purpose he endeavoured to recommend himself to the Spanish ministry by some important service; that is, by extorting from the Indians as much gold and silver as he could. He therefore made frequent inroads into the adjacent country, subdued several of the caciques or pretty princes, and collected a considerable quantity of gold. In one of these expeditions, the Spaniards contended so violently about the division of some gold which they had taken, that they were on the point of coming to blows with one another. A young cacique who was present, astonished at such contention about a thing of which he knew not the value, tumbled the gold out of the balance with indignation, and turning to the Spaniards, told them, that since they valued gold so highly, he would conduct them to a country where the most common utensils were made of that metal. The Spaniards eagerly caught at this hint; and upon further questioning the cacique, were informed, that at the distance of six days' journey, towards the south, from the place where they were at that time, they should discover another ocean, near which this desirable country was situated; but if they intended to attack that powerful state, they must assemble a much greater number of forces than had hitherto appeared on the continent.

Balboa was transported at the news. He immediately concluded, that the ocean mentioned by the cacique was that which Columbus had so long sought for in vain, and that the rich territory described to him must be part of the East Indies. He was therefore impatient till he should arrive at that happy country, in comparison with the discovery of which all former exploits almost vanished into nothing. In order therefore to procure a force sufficient to ensure face of
in his enterprise, he first secured the friendship of the neighbouring caciques, and then dispatched some of his officers to Hispaniola, with a large quantity of gold as a proof of his pacific intentions, and an earnest of what he expected. By this means he secured the friendship of the governor, and procured a considerable reinforcement. But though he now imagined himself sufficiently strong to attempt the discovery, there were still prodigious difficulties to be surmounted.

This isthmus of Darien, though not above 60 miles in breadth, has a chain of lofty mountains running through its whole extent. Being situated between two vast oceans, the Atlantic and Pacific, the climate is excessively moist, in some places; that it rains for two thirds of the year. In consequence of this the valleys are marshy, and so frequently overflowed, that the inhabitants find it necessary in some places to build their houses upon trees, in order to be elevated from the damp soil, and the odious reptiles engendered in the waters. There are also many large rivers very difficult to be crossed; and as the country at that time was only inhabited by a few wandering savages, the enterprise of Balboa was looked upon as the most difficult that had been undertaken by any Spanish adventurer.

On this arduous task Balboa set out on the 1st day of September 1513, at the time that the periodical rains began to abate. He had only 190 Spaniards along with him; but all of them were hardy veterans, inured to the climate of America, and very much attached to their leader. A thousand Indians attended in order to carry their provvisions and other necessaries; and they had along with them some fierce dogs to terrify the natives of America.

Balboa proceeded by sea, and without difficulty, to the territories of a cacique whose friendship he had gained; but as soon as he began to advance into the interior parts of the country, he met with all the difficulties above-mentioned. Some of the caciques also, at his approach, fled with all their people to the mountains, carrying off or destroying whatever could afford subsistence to an army. Others collected their force in order to oppose him; however, Balboa continued unmoved in spite of all difficulties; and at last, after a most painful journey of 25 days, he arrived at the South Sea, when with the most extravagant transports of joy, he went into it up to the middle, and took possession of the ocean in his master's name, vowing to defend it against all the enemies of Spain.

That part of the South Sea which Balboa now discovered, he called the Gulf of St Michael; which name it still retains, and is situated to the east of Panama. From some of the neighbouring caciques he extorted provisions and gold by force; others sent him presents voluntarily; and he had the satisfaction to hear, that the adjacent coasts abounded with pearl-oysters. The inhabitants were also unanimous in declaring, that there was to the southward a very rich and populous country where the people had tame animals, which they endeavoured to describe to him, meaning the Peruvian sheep. But however impatient he might be to visit this empire, he considered it as highly improper to venture thither with a handful of men exhausted by labour and disease. He therefore led back his followers to Santa Maria, in order to refresh them after their fatigues; and from thence he sent an account to the court of Spain of the important discovery he had made, demanding a reinforcement of 1000 men in order to conquer the country he had newly discovered. But here his hopes were all blasted at once.

The king indeed determined to prosecute the discovery, but refused to continue Balboa in his government, appointing Pedrarias Davila in his stead, and giving him the command of 15 stout vessels, with 1200 soldiers, to ensure his success.

Balboa, though much mortified by his disgrace, submitted to the king's pleasure without repining. It was not long, however, before he met with an additional misfortune; the new governor tried him for some pretended irregularities committed before his arrival, and fined him of almost all he was worth. In the mean time the Spaniards, paying no regard to the treaties concluded by Balboa with the Indians, plundered and destroyed all indiscriminately, infomuch that the whole country, from the gulf of Darien to the like Nicaragua, was desolated. The new comers had also arrived at the most unlucky time of the year, namely, about the middle of the wet season, when the excessive rains produced the most violent and fatal diseases. To this was joined an extreme scarcity of provisions; so that in the space of a month above 600 Spaniards perished in the utmost misery.

Balboa failed not to send violent remonstrances to Spain against the conduct of the new governor; and he, on the other hand, accused his antagonist of having deceived the king by false accounts of the country, and magnifying his own exploits beyond measure. At last the king, sensible of his error in superfluously promoting Balboa, appointed him adelantado, or lieutenant-governor of the countries on the South Sea, with very extensive privileges and authority; enjoining Pedrarias to support him in all his enterprises, and to confide with him in everything which he himself undertook. It was impossible however, to extinguish the envy of Pedrarias; and therefore, though a reconciliation took place in appearance, even to far, that Pedrarias agreed to give his daughter in marriage to Balboa, yet he soon after had him condemned and executed on preference of disloyalty, and an intention to revolt from the to death.

On the death of Balboa, the thoughts of conquering Peru were for a time laid aside; however, it still remained an object of desire to all the Spanish adventurers in America. Accordingly, several armaments were fitted out with a design to explore and take possession of the countries to the east of Panama; but, either through the difficulties which attended the undertaking itself, or the bad conduct of the adventurers, all of them proved unsuccessful, until at last it became a general opinion, that Balboa's scheme had been entirely visionary.

Still, however, there were three persons settled at A new enterprise of Spain on the common opinion made no little impression, that they determined to go in quest of this country, looked upon to be chimerical by the generality of their neighbours. Their names were Francisco Pizarro, Diego de Almagro, and Hernando Luque. Pizarro and Almagro were soldiers of fortune, and Luque was an ecclesiastic, who acted both as priest and schoolmaster at Panama. Their confederacy was authorized by
by Pedrarius governor of Panama; and each engaged to employ his whole fortune in the adventure. Pizarro, being the least wealthy of the three, engaged to take upon himself the greatest share of the fatigue and danger, and to command in person the armament which was to go first upon the discovery. Almagro offered to conduct the supplies of provisions and reinforcement of troops which might be necessary; and Luque was to remain at Panama, in order to negotiate with the governor, and to superintend whatever was carrying on for the general interest.

In 1524, Pizarro set sail from Panama with a single vessel of small burden, and 12 men; and so little was he or his countrymen at that time acquainted with the climate of America, that the most improper season of the whole year was chosen for his departure; the periodical winds, which were then set in, being directly opposite to the course which he proposed to steer. The consequence of this was, that after beating about for 70 days, with much danger and fatigue, he had advanced scarce as far to the south-east as a skillful navigator will now make in three days. He touched at several places of Terra Firma; but finding that country exceedingly inhospitable and unhealthy, he was obliged to retire to Chuchama, opposite to the Pearl Islands, where he hoped to receive some reinforcements from Panama. Here he was found by Almagro, who had set out in quest of him with a reinforcement of 70 men, and had suffered difficulties very much resembling those of Pizarro himself. In particular, he had lost an eye in a combat with the Indians. However, he had advanced as far as the river of St Juan in the province of Popayan, where the country showing a better aspect, and the inhabitants more friendly, our projector again began to indulge themselves in hopes, and determined by no means to abandon their scheme.

Almagro returned to Panama, in hopes of recruiting their scattered troops. But the bad accounts of the service gave his countrymen such an unfavourable idea of it, that Almagro could levy no more than 80 men, and these with great difficulty. slender as this reinforcement was, however, the adventurers felt happy in renewing their enterprise. The difficulties and disappointments they met with in this new attempt, were scarcely inferior to those they had already experienced, when part of the armament at last reached the bay of St Matthew on the coast of Quiro, and landed at Tacames, to the south of the river of Emeralds, where they met with a more fertile and campagna country than any they had yet seen; the natives also were more civilized, and clothed in garments of cotton or woolen stuff, adorned with trinkets of gold and silver. But notwithstanding these favourable appearances, Pizarro did not think fit to attack such a powerful empire with a handful of followers already exhausted; and therefore retired to a small island called Gallo, with part of the troops; from whence he dispatched Almagro to Panama, in hopes of obtaining a reinforcement.

The reception which Almagro met with was by no means agreeable. Some of the adventurers had informed their friends of the many dangers and losses which they had sustained; which not only disheartened people from engaging in the service, but weighed so much with Pedro de los Ruis, the succesor of Pedra-
not only in honour of the sun, but of their first Inca, Manco Capac, and Coya Mama Oclolo, his wife and sister, whom the Incas considered as their first parents, descended immediately from the sun, and sent by him into the world to reform and polt his kind. At this festival, all the viceroys, generals, governors, and nobility, were assembled at the capital city of Cuzco; and the emperor, or Inca, officiated in person as high-priest; though on other occasions the erlic-dotal function was discharged by the regular pontiff, who was usually either the uncle or brother of the Inca.

The morning of the festival being come, the Inca, accompanied by his near relations, drawn up in order according to their seniority, went barefoot in procession, at break of day, to the market-place, where they remained looking attentively towards the east in expectation of the rising sun. The luminary no sooner appeared, than they fell prostrate on their faces in the most profound veneration, and universally acknowledged it to be their god and father.

The vassal princes, and nobility, that were not of the blood royal, assembled in another square, and performed the like ceremony. Out of a large flock of sheep the priests then chose a black lamb, which they offered in sacrifice, first turning its head towards the east. From the entrails of the victim, on this occasion, they superstitiously drew prognostics relating to peace and war, and other public events.

That the Peruvians believed in the immortality of the soul, appears from the practice of the Incas, who constantly inclosed to the people, that on leaving this world, they should enter into a state of happiness provided for them by their god and father the sun.

Before the arrival of the Spaniards in America, the Peruvians were acquainted with some points of astronomy. They had observed the various motions of the planet Venus, and the different phases of the moon. The common people divided the year only by the seasons; but the Incas who had discovered the annual revolution of the sun, marked out the summer and winter solstices by high towers, which they erected on the east and west of the city of Cuzco. When the sun came to rise directly opposite to four of those towers, on the east side of the city, and to set against the west of the city, it was then the summer and winter solstices; and in like manner, when it rose and set against the other towers, it was the winter solstice. They had also erected marble pillars in the great square before the temple of the sun, by which they observed the equinoxes. This observation was made under the equinox, when the sun being directly vertical, the pillars cast no shade. At these times they crowned the pillars with garlands of flowers and adorifere herbs, and celebrating a festival, offered to their adored luminary rich presents of gold and precious stones.

They distinguished the months by the moon, and their weeks were called quarters of the moon; but the days of the week they marked only by the ordinal numbers, as first, second, &c. They were also informed at the eclipses of the sun and moon. When the former hid his face, they concluded it was on account of their sins, imagining that this phenomenon...
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non pretended famine, war, and pestilence, or some other terrible calamity. In a similar fate of the moon, they apprehended that she was sick, and when totally obscured, that she was dying. At this alarming crisis they sounded their trumpets, and endeavoured by every kind of noise to rouse the lunar planet from her supposed lethargy; teaching their children to cry out, and call upon mama quilla, or "mother moon," that she would not die and leave them to perish.

They made no predictions from any of the stars, but considered dreams, and the entrails of beasts which they offered in sacrifice, as instructive objects of divination. When they saw the fun set, they imagined that he plunged into the ocean, to appear next morning in the east.

Amidst a people wholly void of letters, the speculative essays of the understanding must have been very rude and imperfect. They had, however, among them amenas, or philosophers, who delivered moral precepts, and likewise cultivated poetry. Comedies and tragedies composed by those bards were acted on their festivals before the king and the royal family, the performers being the great men of the court, and the principal officers of the army. The amenas also composed songs and ballads; but if we may judge from the rudeness of the music with which they are said to have been accompanied, they were far from being agreeable to a polished ear.

That the Peruvians were not acquainted with painting and statuary, appears from the furniture and ornaments of their temples and palaces; but in all the implements of mechanic arts they were extremely deficient. Though many goldsmiths were constantly employed, they had never invented an anvil of any metal, but in its head made use of a hard flone. They beat their plate with round pieces of copper in place of hammers; neither had they any files or graving tools. Instead of bellows for melting their metals, they used copper pipes, of a yard long, almost of the form of a trumpet. Having no tongues to take their heated metal out of the fire, they made use of a flick or copper bar. The carpenters had no other tools than hatchets made of copper or flint; nor had they learned the use of iron; though the country affords mines of that metal. Instead of nails, they fastened their timber with cords or the rough twigs of trees. A thorn, or a small bone, served them for a needle; and instead of thread, the finewool of animals, or the spines of some plant. Their knives were made of flint or copper.

When the Spaniards first visited this country, they found it agitated by a civil war. Huana Capac, the 12th monarch from the founder of the state, was feated on the throne; who is represented as a prince no less conspicuous for his abilities in war than for his pacific virtues. By him the kingdom of Quito was subdued, which almost doubled the extent of the dominions and power of the Peruvian empire. Notwithstanding the ancient and fundamental law against polluting the blood of the Inca with any foreign alliance, Huana married the daughter of the conquered monarch, by whom he had a son named Atabalipa, commonly written Achibalipa, to whom, at his death in 1529, he left the kingdom of Quito, beseeving the rest of his dominions upon Huascar his eldest son by a mother of the royal race. This produced a civil war, in which Atabalipa proved victorious, and afterwards attempted to secure himself on the throne by putting to death all the descendants of Manco Capac, styled the children of the Sun, whom he could seize either by force or stratagem; however, from a political motive, he spared the life of his rival Huascar, who had the misfortune to be taken prisoner in an engagement, that, by suffering out orders in his name, he might more easily establish his own authority, and cover the illegality of his birth.

This contest had so much engaged the attention of the Peruvians, that they never once attempted to check the progress of the Spaniards. It was some time, however, before Pizarro was informed of this contest, so much in his favour. The first intelligence which he received of it was a message from Huascar, asking his assistance against Atabalipa, whom he represented as a rebel and an usurper. Pizarro perceived the importance of the intelligence, and therefore determined to push forward, while intelligence discord put it out of the power of the Peruvians to attack him with their whole force. Being obliged to divide his troops, in order to leave a garrison in St Michael, which might serve for a place of retreat in case of a disaster, he began his march with only 62 horsemen and 102 foot-soldiers, 20 of whom were armed with cross-bows, and only three with muskets. He directed his course towards Caxamala, a small town at the distance of 12 days' march from St Michael, where Atabalipa was encamped with a considerable body of troops. Before he had proceeded far, an officer dispatched by the Inca met him with a valuable present from that prince, accompanied with a promise of his alliance, and his assurance of a friendly reception at Caxamala. Pizarro, according to the usual artifice of his countrymen in America, pretended to come as the ambassador of a very powerful monarch and declared that he was now advancing with intention to offer Atabalipa his aid against those enemies who disputed his title to the throne.

As the object of the Spaniards in entering their country was altogether incomprehensible to the Peruvians, they had formed various conjectures concerning it, without being able to decide whether they should consider their new guests as beings of a superior nature, who had visited them from some beneficent motive, or as formidable avengers of their crimes, and enemies to their repose and liberty. The continual professions of the Spaniards, that they came to enlighten them with the knowledge of truth, and lead them in the way of happiness, favoured the former opinion; the outrages which they committed, their rapaciousness and cruelty, were awful confirmations of the latter. While in this state of uncertainty, Pizarro's declaration of his pacific intentions to far removed all the Inca's fears, that he determined to give him a friendly reception. In consequence of this resolution, the Spaniards were allowed to march in tranquility across the sandy desert between St Michael and Motupé, where the most feasible effort of an enemy, added to the unavoidable difficulties which they suffered in passing through that uncomfortable region, must have proved fatal to them. From Motupé they advanced towards the mountains which encompass the low country of Peru, and passed
ed through a defile so narrow and inaccessible, that a few men might have defended it against a numerous army. But were likewise, from the fame inconsiderate credulity of the Incas, the Spaniards met with no opposition, and took quiet possession of a fort erected for the security of that important station. As they now approached near to Caxamalca, Atabali pa renewed his professions of friendship; and, as an evidence of his sincerity, sent them presents of greater value than the former.

On entering Caxamalca, Pizarro took possession of a large court, on one side of which was a house which the Spanish historians call a palace of the Incas, and on the other a temple of the sun, the whole surrounded with a strong rampart or wall of earth. When he had posted his troops in this advantageous station, he dispatched Hernando Soto, and his brother Ferdinand, to the camp of Atabali pa, which was about a league distant from the town. He instructed them to confirm the declaration which he had formerly made of his pacific disposition, and to deliberate an interview with the Inca, that he might explain more fully the intention of the Spaniards in visiting their country. They were treated with all the respectful hospitality usual among the Peruvians in the reception of their most cordial friends, and Atabali pa promised to visit the Spanish commander next day in his quarters. The decent deportment of the Peruvian monarch, the order of his court, and the reverence with which his subjects approached his person and obeyed his commands, all united to excite the Spaniards, who had never met in America with anything more dignified than the petty caciques of a barbarous tribe. But their eyes were still more powerfully attracted by the vast profusion of wealth which they observed in the Inca's camp. The rich ornaments worn by him and his attendants, the vessels of gold and silver in which the repast offered to them was served up, the multitude of utensils of every kind formed of those precious metals, opened prospects far exceeding any idea of opulence that a European of the 16th century could form.

On their return to Caxamalca, while their minds were yet warm with admiration and desire of the wealth which they had beheld, they gave such a description of it to their countrymen, as confirmed Pizarro in a resolution which he had already taken. From his own observation of American manners during his long services in the New World, as well as from the advantages which Cortes had derived from showing Montezuma, he knew of what consequence it was to have the Inca in his power. For this purpose, he formed a plan as daring as it was pernicious. Notwithstanding the character he had assumed of an ambassador from a powerful monarch, who courted an alliance with the Inca, and in violation of the repeated offers which he had made to him of his own friendship and affiance, he determined to avail himself of the unsuspicious simplicity with which Atabali pa relied on his professions, and to seize his person during the interview to which he had invited him. He prepared for the execution of his scheme with the same deliberate arrangement, and with as little compunction, as if it had reflected no disgrace on himself or his country. He divided his cavalry into three small squadrons, under the command of his brothers Ferdi-
he reigned by hereditary succession; and added, that he could not conceive how a foreign priest should pretend to dispose of territories which did not belong to him; that if such a preposterous grant had been made, he, who was the rightful possessor, refused to consent to it; that he had no inclination to renounce the religious institutions established by his ancestors; nor would he forsake the service of the sun, the immortal divinity whom he and his people revered, in order to worship the God of the Spaniards, who was subject to death; that with respect to other matters contained in his discourse, as he had never heard of them before, and did not now understand their meaning, he defined to know where he had learned things so extraordinary. "In this book," answered Valverde, reaching out to him his breviary. The Inca opened it eagerly; and turning over the leaves, lifted it to his ear: "This," says he, "is a silent; it tells me nothing," and threw it with disdain to the ground. The enraged monk, running towards his countrymen, cried out, "To arms, Chullians, to arms; the word of God is insulted; avenge this profanation on these impious dogs."

Pizarro, who during this long conference had with difficulty restrained his soldiers, eager to seize the rich spoils of which they had so far seen a view, immediately gave the signal of assault. At once the martial music struck up, the cannon and muskets began to thunder, the horse fell out fiercely to the charge; the infantry rushed on sword in hand. The Peruvians, astonished at the suddenness of an attack which they did not expect, and dismayed by the destructive effects of the fire-arms, and the irresistible impulsion of the cavalry, fled with universal consternation on every side, without attempting either to annoy the enemy or to defend themselves. Pizarro, at the head of his chosen band, advanced directly towards the Inca; and though his nobles crowded around him with efficacious zeal, and fell in numbers at his feet, while they cried one with another in facilitating their own lives, that they might cover the sacred person of their sovereign, the Spaniards soon penetrated to the royal seat; and Pizarro seizing the Inca by the arm dragged him to the ground, and carried him as a prisoner to his quarters. The view of the monarch increased the galling frowns of his followers. The Spaniards purified them towards every quarter, and, with deliberate and unrelenting barbarity, continued to slaughter wretched fugitives, who never once offered at resistance. The carnage did not cease until the close of day. Above 4000 Peruvians were killed. Not a single Spaniard fell, nor was one wounded but Pizarro himself, whose hand was slightly hurt by one of his own followers, while struggling eagerly to lay hold on the Inca.

The plunder taken on this occasion was immense, but the Spaniards were still unsatisfied; which being observed by the Inca, he endeavoured to apply himself to their ruling passion, avarice, in order to obtain his liberty; and therefore offered such a ransom as astonished them, even after all they knew concerning the opulence of the country. The apartment in which he was confined was 22 feet in length and 16 in breadth; and all this space he engaged to fill with vessels of gold as high as he could reach. This proposal was eagerly caught by Pizarro, and a line was drawn upon the walls to mark the stipulated height.

Atabalipa, charmed with the thoughts of liberty, immediately set about performing his part of the agreement, and dispatched messengers into all parts of the empire, in order to collect the immense quantity of gold which he had promised; and though the unfortunate monarch was now in the hands of his enemies, such was the veneration which his subjects had for him, that his orders were obeyed with as great alacrity as though he had been at full liberty; while he, in the mean time flattering himself with the hopes of being soon released, made no preparations for expelling the invaders from his dominions.

In a short time Pizarro received intelligence that Almagro was arrived at St. Michael with a reinforcement equal to the force he had with him. This was a matter of great joy to the Spaniards, and no small vexation to Atabalipa, who now considered his kingdom as in danger of being totally over-run by these strangers, whose force he neither knew, nor the means they had of transporting themselves. For this reason he determined to put his brother Huascar to death, lest he should join the strangers against him. To this he was the rather inclined, as he had got information that the captive prince had been making applications to them and had offered them, a much larger sum than what was stipulated for the Inca's ransom; and in consequence of this determination the unfortunate prince lost his life.

In the mean time the Indians daily arrived at Casamalca with vast quantities of treasure; the fight of which so much inflamed the Spaniards, that they insisted upon an immediate division; and this being complied with, there fell to the share of each horseman 8000 pesos, at that time not inferior to the value of as many pounds of silver in the present century, and half as much to each foot-soldier, Pizarro and his officers receiving shares proportional to their dignity. A fifth part was reserved for the emperor, together with some vessels of curious workmanship as a present. In consequence of this immense acquisition of wealth, many of the Spaniards became clamorous for their discharge; which was readily granted by their general, as well knowing that the display of their riches would not fail to allure adventurers more hardly, though less opulent, to his standard.

After this division of the spoil, Atabalipa was very importunate with Pizarro in order to recover his liberty; but the Spaniard, with unparalleled treachery and cruelty, had now determined to put him to death. To this he was urged by Almagro's soldiers, who thought they had received an equal share with the rest, were still unsatisfied. The Inca's ransom had not been completed; and they were apprehensive, that whatever sums might afterwards be brought in, the troops of Pizarro would appropriate them to themselves as part of that ransom. They insulted with Pizarro, therefore, to put him to death, that all the adventurers might for the future be on an equal footing. Accounts were likewise received that troops were assembling in the remote provinces of the empire, which Pizarro suspected to be done by the Inca's orders. These accounts were heightened by one Philippo an Indian interpreter, who had conceived a passion for one of the unhappy monarch's wives; and for that reason wished to have him put to death. Atabalipa himself,
two, had the misfortune to hasten his own ruin by his conceiving a contemptuous notion of Pizarro, which he had not the precaution to conceal. He had, since they were first discovered by him, admired the European arts of reading and writing, and wished much to know whether he should regard it as a natural or acquired talent. In order to determine this, he defined one of the folders who guarded him to write the name of God upon the nail of his thumb. This he showed to several Spaniards successively, asking its meaning; and, to his surprise, they all returned the same answer. At length Pizarro entered; and, on presenting it to him, he blushed, and was obliged to own his ignorance, which inspired the Inca with the contemptuous notion of him above mentioned.

In order, however, to give some show of justice to such a detestable action, and that he might be exempted from standing singly as the perpetrator, Pizarro resolved to accuse the Inca of some capital crime, and institute a court of judicature for the purpose of trying him. For this purpose, he appointed himself and Almagro, with two assistants, as judges, with full powers to acquit or condemn; an attorney-general was named to carry on the prosecution in the king's name; counsellors were chosen to assist the prisoner in his defence; and clerks were ordained to record the proceedings of court. Before this strange tribunal a charge was exhibited still more amazing. It consisted of various articles: that Atahalipa, though a bafillard, had dispossessed the lawful owner of the throne, and usurped the regal power; that he had put his brother and lawful sovereign to death; that he was an idolater, and had not only permitted, but commanded the offering up of human sacrifices; that he had a great number of concubines; that since his imprisonment, he had waited and embezzled the royal treasures, which now belonged of right to the conquerors; and that he had excited his subjects to take up arms against the Spaniards. On these heads of accusation they proceeded to try the sovereign of a great empire; over whom they had no jurisdiction. To all these charges the Inca pleaded not guilty. With respect to the death of his brother, he alleged, that the Spaniards could take no cognizance of the fact. With regard to the taxes which he had levied, and the wars he had carried on, they were nothing to the Spaniards; and as to the conspiracy against the Spaniards, he utterly denied it. He called heaven and earth to witness the integrity of his conduct, and how faithfully he had performed his engagements, and the perjury of his accusers. He desired to be sent over to Spain to take his trial before the emperor; but no regard was paid to his intreaties. He was condemned to be burnt alive; which cruel sentence was mitigated, as a great favour, to strangling; and the unhappy monarch was executed without mercy.

The death of the Inca was followed by a revolution in the Spanish affairs, who now became generally called. HIDEOUS cries were set up by his women as the funeral procession passed by their apartment; many offered to bury themselves alive with him; and on being hindered, strangled themselves out of grief and vexation. The whole town of Caxamalca was filled with lamentation, which quickly extended itself over the whole kingdom. Friends and enemies accused the Spaniards of inhumanity and treachery. Loads of gold that were coming to Caxamalca by order of the deceased Inca were now stopped; and the loss of the treasure was the first unfortunate consequence which the Spaniards felt from their late iniquitous conduct. The two factions of Indians united against Pizarro; and many of the Spaniards not only excused against the cruelty of the judges, but would even have mutilated, had not a sense of the impending danger kept them quiet. At Cuzco the friends of the emperor Huascar proclaimed Manco Capac the legitimate brother of the late Inca, determining to support him to the last against all the machinations of his enemies. Pizarro, in the mean time, set up Tapatapa, the son of Atahalipa, causing him to be treated with all the honours due to an emperor. Immediately he set out for Cuzco, the gaining of which was absolutely necessary for his design. An army of Indians occupied the pales, and refused to dispute his progress. The council, however, was soon decided; the Spanish cavalry bore down everything before them, and great numbers of Indians were slain. The conquerors gained a considerable booty; and Pizarro dispatched Almagro to reduce Cuzco, while he himself founded a new colony in the fruitful valley of Xaua; which, however, was not permanent, being afterwards removed to the place where Lima now stands.

While Pizarro was thus employed, another commander, named Ferdinand de Soto, was detached with 60 horse to make the best of his way to Cuzco, and clear the road for the march of the remainder of the army. He was opposed by a formidable collection of Indians, who had fortified themselves in order to defend a pass against him; for which reason, fearing lest his strength might be unequal, he sent a message to Pizarro, desiring that the Inca might join him, thinking that his presence would awe the Peruvians, and prevent the further effusion of blood; but his expectations were frustrated by the death of the Inca, which happened about this time; so that there was now a necessity for having recourse to arms; for as the Spaniards set up no person in his room, the title of Manco Capac was universally acknowledged.

In the mean time, a new supply of soldiers arriving from Spain, Benalcazar, governor of St Michael, undertook an expedition against Quito, where, according to the report of the natives, Atahalipa had left the greatest part of his treasure. He accomplished his purpose with very great difficulty, having a country covered with rocks and mountains to pass, and being opposed by large bodies of the natives. But when he got possession of the city, to his extreme mortification he found that the inhabitants had carried off all their gold and silver; for they were now acquainted with the ruling passion of the Spaniards, had taken care to disappoint it, by removing the treasures which they knew very well had been the cause of the expedition.

About the same time Alvarado governor of Guatimotoca invaded the province of Chile. In this expedition his troops endured such hardships, and suffered so much from the cold among the Andes, that a fifth of the men and all the horses died, and at the same time the rest were so much dispirited and emaciated, that they became quite unfit for service. What
was worth of all, when they had arrived at the end of their journey, they met with a body of Spaniards drawn up in hostile array to oppose them. There had been sent against him by Pizarro, who claimed Chili as part of his jurisdiction, and were now joined by Benalcazar, with the troops under his command. Alvarado, however, advanced boldly to attack them, on the interpolation of five moderate men in each party, the difference was accommodated. Alvarado engaged to return to his government, upon his being paid 100,000 pesos to depray the essence of his armament. However, most of his followers remained in the country, and enlisted in the service of Pizarro.

In the meantime Ferdinand Pizarro, the brother of the general, had landed in Spain, where he produced such immense quantities of gold and silver as astonished the court, even after all they had been of the wealth of their new discovered territories. The general's authority was confirmed to him with new powers and privileges, and the addition of 70 leagues extending along the coast, to the southward of the territory granted in his former patent. Almagro had the title of adelantado or governor conferred upon him, with jurisdiction over 200 leagues of country lying southward from the province allotted to Pizarro; he himself was made a knight of the order of St. Jago.

Of these transactions some accounts were received at Peru before the arrival of Ferdinand Pizarro himself; and no sooner did Almagro hear that he had obtained the royal grant of an independent government, than, pretending that Cuzco, the capital of all Peru, lay within his jurisdiction, he attempted to seize it. Pizarro was not less ready to oppose him, and a very dangerous civil war was about to take place, when the quarrel, was made up, on condition that Almagro should attempt the conquest of Chili; and if he did not find there an establishment equivalent to his expectations, Pizarro should yield up to him part of Peru.

By this reconciliation Pizarro was left at liberty to settle the internal policy of his province, which, though little qualified for a legislator, he accomplished, by dividing the country into various districts, appointing magistrates to preside in each, and establishing such regulations concerning the administration of justice, the royal revenue, &c., as occurred to him. The fact of government he removed from Cuzco to Lima, which he named Ciudad de los Reyes, and which name it still retains among the Spaniards in all legal and formal deeds. Its other name, Lima, is a corruption of Rima, the name of the valley in which the city stands.

In the mean time Almagro had set out on his expedition to Chili; the event of which has been related under the article Chili; and while he was thus employed, Pizarro encouraged some of his most distinguished officers to invade those provinces of the empire which had not yet been visited by the Spaniards. This he did with a view to keep them employed, and prevent tumults; but it was attended with very terrible consequences. No sooner did Manco Capac the Inca perceive the fecurity of the Spaniards in thus dividing their forces, than he seized the opportunity of making a vigorous effort to redress the wrongs of himself and his countrymen, and expel the invaders, who had tyrannized in such a cruel manner. Though strictly guarded by the Spaniards, he found means to communicate his intentions to the chief men of his nation, whom he joined in the year 1536, under pretence of celebrating a festival which he had obtained liberty from Pizarro to attend. Upon this the standard of war was immediately erected, and a most formidable army, according to the Spanish historians, of 200,000 men, collected. Many Spaniards were massacred in their habitations, and several detachments entirely cut off; and while this vast army laid siege to Cuzco, another formidable body invested Lima, and kept the governor closely shut up. The greatest effort, however, was made against Cuzco, which was defended by Pizarro and his two brothers, with only 170 men. The siege lasted nine months; many of the Spaniards were killed; among whom was Juan Pizarro, the general's brother, and the best beloved of them all. The remnant were reduced to the most desperate situation, when Almagro appeared suddenly in the neighborhood of Cuzco. He had received such accounts of the insurrection in Peru, as would at any rate have determined him to return to the assistance of Pizarro; but besides this, he had now received the royal patent, creating him governor of Chili, and deemed it certain beyond all contradiction, that Cuzco lay within his jurisdiction; for which reason he had hastened to prevent it from falling into the hands of the Peruvians. On his arrival his assistance was solicited by both parties. The Inca made many advantageous proposals, but at length despairing of obtaining any cordial union with a Spaniard, he attacked him in the night by surprise with a great body of chosen troops. But the Spanish soldiers and discipline prevailed against all the numbers of defeated their enemies; and the Peruvians were repulsed with such slaughter, that a great part of the remainder dispersed, and Almagro advanced to the gates of Cuzco without opposition. Pizarro's brothers took measures to oppose his entrance; but prudence for the present restrained both parties from entering into a civil war while they were surrounded with enemies; and therefore each leader endeavored to corrupt the followers of his antagonist. In this Almagro had the advantage, and so many of Pizarro's troops deserted the night, that Almagro was able to march towards the city, where he surprised the capitales and investing the houses where the two brothers were lodged, he compelled them, after an obstinate defence, to surrender at discretion; and Almagro's authority over Cuzco was immediately recognized as authentic.

In this fray only two or three persons were killed.

Civil war but matters soon began to wear a more serious aspect, between Francisco Pizarro, having dispersed the Peruvians who invested Lima, and received considerable reinforcements from other provinces, ordered 500 men, under the command of Alonso de Alvarado to march to Cuzco, in hopes of relieving his brothers, if they were not already cut off. They advanced to a small distance from the capital, before they knew that they had a more formidable enemy than the Indians to encounter. When they saw the Indians drawn up on the banks of a river to oppose them, they were greatly surprised; however, Alvarado, who wished rather to gain them than to fight, began with attempting to induce their leader. Alvarado could not by any means be gained over.
over; but being inferior in military skill, Almagro attacked him by surprise, entirely defeated and dispersed his army, taking himself and some of his principal officers prisoners.

This victory seemed decisive; and Almagro was advised to make it so by putting to death Gonzalo and Ferdinand Pizarro, Alvarado, and some others whom he could not hope to gain. This advice, however, he declined from motives of humanity, and a desire of making his adversary appear the aggressor. For these reasons, instead of marching directly against Pizarro, he retired quietly to Cuzco; which gave his adversary time to recollect himself from the disorder into which the news of so many disasters had thrown him. He began again to practise upon Almagro those arts which had before proved successful; and Almagro again suffered himself to be deceived by pretended offers of pacification. The negotiations for this purpose were protracted for several months; and while Almagro was employed in detecting and elucidating the fraudulent intentions of the governor, Gonzalo Pizarro and Alvarado found means to corrupt the soldiers who guarded them, and not only made their own escape, but persuaded 60 of Almagro's men to accompany them. There now remained only Ferdinand Pizarro in the hands of Almagro; and he was delivered by another act of treachery. The general proposed that all points of controversy should be submitted to the decision of their sovereign; and that Ferdinand Pizarro should be instantly set at liberty, and return to Spain, together with some other officers whom the general proposed to send over to show the justice of his claims. Though the intention of Pizarro by making this proposal was evident, Almagro was deceived by it, and released those whom Pizarro wanted: which he had no sooner done, than the latter threw off all disguises, and openly declared, that arms alone must now decide the matter between them. He therefore immediately set out for Cuzco with an army of 700 men, to which Almagro had only 500 to oppose. From the weakness of his forces, probably, Almagro did not attempt to guard some strong passes, through which Pizarro had to march, but waited patiently for his adversary in a plain open country.

In the meantime, Pizarro advanced without any obstruction from his enemy; and an engagement soon happened, in which Almagro was defeated and taken prisoner. The conquerors behaved with great cruelty, massacring a great number of officers, and treating Almagro himself with great severity. The Indians had assembled in great numbers to see the battle, with an intention to join the vanquished party; but were so much overawed by the Spaniards, that they retired quietly after the battle was over, and thus lost the only opportunity they ever had of expelling their tyrants.—Almagro, after having for some months languished in prison, was at length formally tried, and condemned to die by Pizarro. Notwithstanding his confummate bravery, for which he was remarkable, this hardy veteran could not bear the deliberate approach of death, but confounded to use intimacies to save his life. The Pizarrs, however, continued inflexible; and he was first strangled in prison, and then publicly beheaded. He left one son by an Indian woman, whom he appointed his successor, by virtue of a power granted him by the emperor.

As during these divisions all intercourse with Spain ceased, it was some time before the accounts of the civil war were received at court. The first intelligence was given by some of Almagro's soldiers, who had left America on the ruin of their cause; and they did not fail to represent the injustice and violence of Pizarro in the strongest colours, which strongly prejudiced the emperor against him. In a short time, however, Ferdinand Pizarro arrived, and endeavoured to give matter a new turn. The emperor was uncertain which of them he ought to believe; and therefore thought it necessary to send over some person with ample powers to inquire into the merits of the case, and to determine certainly who was in the wrong. If he found the governor still alive, he was to assume only the title of judge, in order to have the appearance of acting in concert with him; but if he was dead, the viceroy might then produce his commission appointing him Pizarro's successor in the government. This complaisance to Pizarro, however, proceeded more from a dread of his power than from any other thing; for in the mean time, his brother Ferdinand was arrested at Madrid, and confined to a prison, where he remained above 20 years. The person nominated to this important trust was Chiribogo Vaca de Castro.

While this gentleman was preparing for his voyage, Peru, now Pizarro, considering himself as the unrivalled master of the kingdom of Peru, proceeded to parcel out its territories among the conquerors, and had this division been made with any degree of impartiality, the extent of country which he had to bestow was sufficient to have gratified his friends, and to have gained his enemies. But Pizarro conducted this transaction, not with the equity and candour of a judge attentive to discover and to reward merit, but with the illiberal spirit of a party leader. Large districts, in parts of the country most cultivated and populous, were set apart as his own property, or granted to his brothers, his adherents, and favourites. To others, lots less valuable and inviting were allotted. The followers of Almagro, amongst whom were many of the original adventurers, to whose valour and perseverance Pizarro was indebted for his success, were totally excluded from any portion in those lands, towards the acquisition of which they had contributed so largely. As the vanity of every individual sets an immoderate value upon his own services, and the idea of each, concerning the remuneration due to them, rose gradually to a more exorbitant height, in proportion as their conquests extended; all who were disappointed in their expectations exclaimed loudly against the rapaciousness and partiality of the governor. The partisans of Almagro murmured in secret, and meditated revenge.

Rapid as the progress of the Spaniards in South America had been since Pizarro landed in Peru, their avidity of dominion was not yet satisfied. The officers to whom Ferdinand Pizarro gave the command of different detachments, penetrated into several new provinces; and though some of them were exposed to great hardships in the cold and barren regions of the Andes, and others suffered ditfrefs not inferior amid the woods and marshes of the plains, they made disco-
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Expedition of Gonzales Pizarro.

E. Peru.

planes and conquests which extended their knowledge of the country, as well as added to their power. Pedro de Valdivia re-affumed Almagro's scheme of invading Chili; and, notwithstanding the fortitude of the natives in defending their possessions, made such progress in the conquest of the country, that he founded the city of St Jago, and gave a beginning to the establishment of the Spanish dominion there. But of all the enterprises undertaken about this period, that of Gonzales Pizarro was the most remarkable. The governor, who seems to have resolved that no peril in Peru should possess any station of distinguished eminence or authority but those of his own family, had deprived Benalcazar, the conqueror of Quito, of his command in that kingdom, and appointed his brother Gonzales to take the government of it. He instructed him to attempt the discovery and conquest of the country to the eait of the Andes; which, according to the information of the Indians, abounded with cinnamon and other valuable spices. Gonzales, not inferior to any of his brothers in courage, and no less ambitious of acquiring distinction, eagerly engaged in this difficult service. He set out from Quito at the head of 340 soldiers, near one half of whom were horsemen, with 4000 Indians to carry their provisions. In forcing their way through the defiles, or over the ridges of the Andes, excelsof cold and fatigue, to neither of which they were accustomed, proved fatal to the greater part of the wretched attendants. The Spaniards, tho' more robust, and imured to a variety of climates, suffered considerably, and lost some men; but when they defended into the low country, their distress increased. During two months it rained incessantly, without any interval of fair weather long enough to dry their clothes. The vah plains upon which they were now entering, either altogether without inhabitants, or occupied by the rudest and least industrious tribes in the New World, yielded little subsistence. They could not advance a step but as they cut a road through woods, or made it through marshes. Such incessant toil, and continual scarcity of food, seem more than sufficient to have exhausted and dispirited any troops. But the fortitude and perseverance of the Spaniards in the 16th century were innumerable. Allured by frequent but false accounts of rich countries before them, they perished in struggling on, until they reached the banks of the Coca or Napo, one of the larger rivers whose waters pour into the Maragnon, and contribute to its grandeur. There, with infinite labour, they built a bark, which they expected would prove of great utility, both in conveying them over rivers, in procuring provisions, and in exploring the country. This was manned with 50 soldiers, under the command of Francis Orellana, the eldest in rank to Pizarro. The stream carried them down with such rapidity, that they were soon far ahead of their countrymen, who followed slowly and with difficulty by land.

At this distance from his commander, Orellana, a young man of an aspiring mind, began to fancy himself independent; and, transported with the predominant passion of the age, he formed the scheme of distinguishing himself as a discoverer, by following the course of the Maragnon until it joined the ocean, and by surveying the vah regions through which it flows. This scheme of Orellana's was as bold as it was treacherous. For, if he be chargeable with the guilt of having vio-

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Orellana fails down the river Maragnon and defeats Pizarro.

lated his duty to his commander, and with having abandoned his fellow-soldiers in a pathless desert, where they had hardly any hopes of success, or even of safety, but what were founded on the service which they expected from the bark, his crime is, in some measure, balanced by the glory of having ventured upon a navigation of near 2000 leagues, through unknown nations, in a vessel halfly contructed with green timber, and by very unskilful hands, without provisions, without a compass, or a pilot. But his courage and alacrity supplied every defect. Committing himself fearlessly to the guidance of the stream, the Napo bore him along to the south, until he reached the great channel of the Maragnon. Turning with it towards the coast, he held on his course in that direction. He made frequent descents on both sides the river, sometimes leading by force of arms the provisions of the fierce savages seated on its banks, and sometimes procuring a supply of food by a friendly intercourse with more gentle tribes. After a long series of dangers, which he encountered with amazing fortitude, and of distresses which he supported with no less magnanimity, he reached the ocean, where new perils awaited him. These likewise surprised, and got safe to the Spanish settlement in the island Cubagua; from thence he failed to Spain. The vanity natural to travellers who visit regions unknown to the rest of mankind, and the art of an adventurer, solicitous to magnify his own merits, concurred in prompting him to mingle an extraordinary proportion of the marvellous in the narrative of his voyage. He pretended to have discovered nations so rich, that the roofs of their temples were covered with plates of gold; and described a republic of women so warlike and powerful, as to have extended their dominion over a considerable tract of the fertile plains which he had visited. Extravagant as those tales were, they gave rise to an opinion, that a region abounding with gold, distinguished by the name of El Dorado, and a community of Amazons, were to be found in this part of the New World; and such is the propensity of mankind to believe what is wonderful, that it has been flowly, and with difficulty, that reason and observation have exploded those fables. The voyage, however, even when stripped of every romantic embellishment, deserves to be recorded, not only as one of the most memorable occurrences in that adventurous age, but as the first event that led to any certain knowledge of those immense regions that stretch eastward from the Andes to the ocean.

No words can describe the confederation of Pizarro, when he did not find the bark at the confuence of the Napo and Maragnon, where he had ordered Orellana to wait for him. He would not allow himself to suffer that a man, whom he had entrusted with such an important command, should be so base and so unfeeling as to defeat him at such a juncture. But imputing his absence from the place of rendezvous to some unknown accident, he advanced above 50 leagues along the banks of the Maragnon, expecting every moment to see the bark appear with a supply of provisions. At length he came up with an officer whom Orellana had left to perish in the desert, because he had the courage, to renounce against his peridy. From him he learned the extent of Orellana's crime; and his followers perceived at once their own desperate situation, when deprived of their only resource. The spirit of the flout-
But, of heart veteran sunk within him; and all demanded to be led back instantly. Pizarro, though he affirmed an appearance of tranquility, did not oppose their inclination. But he was now 1200 miles from Quito; and in that long march the Spaniards encountered hardships greater than those they had endured in their progress outward, without the alluring hopes which then foothered and animated them under their sufferings. Hunger compelled them to feed on roots and berries, to eat all their dogs and horses, to devour the most loathsome reptiles, and even to gnaw the leather of their saddles and sword belts. Four thousand Indians, and 210 Spaniards, perished in this wild and disfurbous expedition, which continued near two years; and as 30 men were aboard the bark with Orellana, only 80 got back to Quito. These were naked like savages, and fo emaciated with famine, or worn out with fatigue, that they had more the appearance of spears than of men.

But, instead of returning to enjoy the repose which his condition required, Pizarro, on entering Quito, received accounts of a fatal event that threatened calamities more dreadful to him than those through which he had passed. From the time that his brother made that partial division of his conquests which has been mentioned, the adherents of Almagro, considering themselves as proscribed by the party in power, no longer entertained any hope of bettering their condition. Great numbers in despair, referred to Lima, where the house of young Almagro was always open to them; and the flender portion of his father's fortune, which the governor allowed him to enjoy, was spent in affording them subsistence. The warm attachment with which every person who served under him as their incitement; and the affections of all the qualities which captivate the affections of soldiers. Of a graceful appearance, dexterous at all martial exercises, bold, open, generous, he seemed to be formed for command; and as his father, conscious of his own inferiority from the total want of education, had been extremenotative to have him instructed in every science becoming a gentleman, the accomplishments which he had acquired heightened the respect of his followers, as they gave him distinction and eminence among illiterate adventurers. In this young man the Almagrians found a point of union which they wanted; and looking up to him as their head, were ready to undertake any thing for his advancement. Nor was affection for Almagro their only incitement; they were urged on by their own diftresses. Many of them, delirium of common necessities, and weary of lottering away life, a burden to their chief, or to such of their associates as had faved some remnant of their fortune from pillage and confiscation, longed impatiently for an occasion to exert their activity and courage, and began to deliberate how they might be avenged on the author of all their misery. Their frequent cabals did not pass unobserved; and the governor was warned to be on his guard against men who meditated some desperate deed, and had resolution to execute it. But, either from the native intrepidity of his mind, or from contempt of persons whose poverty rendered their machinations of little consequence, he disregarded the admonitions of his friends. “Be in no pain (said he carelessly) about my life; it is perfectly safe, as long as every man in Peru knows that I can in a moment put him to death who dares to harbour a thought against it.” This security gave the Almagrians full leisure to digest and ripen every part of their scheme; and Juan de Herrera, an officer of great abilities, who had the charge of Almagro’s education, took the lead in their consultations, with all the zeal which that connection inspired, and with all the authority which the attendant that he was known to have over the mind of his pupil gave him.

On Sunday, the 26th of June, at mid-day, the sensation of tranquillity and repose in all sultry climates, Herrera, at the head of 18 of the most determined conspirators, fell out of Almagro’s house in complete armour; and drawing their swords, as they advanced hastily towards the governor’s palace, cried out, “Long live the king, but let the tyrant die.” Their associates, warned of their motions by a signal, were in arms at different stations ready to support them. Though Pizarro was usually surrounded by such a numerous train of attendants as suited the magnificence of Peru, all was known to have over the progress of the palace unobserved. They were at the bottom of the stair case, before a page in waiting could give the alarm to his master, who was convering with a few friends in a large hall. The governor, whose steady mind no form of danger could appall, started up, called for arms, and commanded Francisco de Chaves to make fast the door. But that officer, who did not retain so much prefeice of mind as to obey this prudent order, running to the top of the staircase, wildly asked the conspirators what they meant, and whither they were going? Instead of anfvering, they flabb’d him to the heart, and buried into the hall. Some of the perons who were there threw themselves from the windows; others attempted to fly; and a few drawing their swords, followed their leader into an inner apartment. The conspirators, animated with having the object of their vengeance now in view, rushed forward after them. Pizarro, with no other arms than his sword and buckler, defended the entry, and supported by his half-brother Alcantara and his little knot of friends, maintained the unequal contest with intrepidity worthy of his past exploits, and with the vigour of a youthful combatant. “Courage (cried he), companions, we are yet enow to make these traitors repent of their audacity.” But the armour of the conspirators protected them, while every thrill they made took effect. Alcantara fell dead at his brother’s feet; his other defenders were mortally wounded. The governor, so weary that he could hardly wield his sword, and no longer able to parry the many weapons furiously aimed at him, received a deadly thrust full in his throat, sunk to the ground, and expired.

As soon as he was slain, the assailants ran out into the streets, and waving their bloody swords, proclaimed the death of the tyrant. Above 200 of their associates having joined them, they conducted young Almagro in solemn procession through the city; and assembling the magistrates and principal citizens, compelled
Young Almagro heads the rebels.

The licentiate Vaca di Castro, who had been sent from Europe to try the murderers of old Almagro, arrived at Peru. As he was appointed to assume the government in place of Pizarro it was more to all who had not folded themselves to the tyrant hastened to acknowledge him. Uncertainty and jealousy, which had for too long a time kept them dispersed, were no longer an obstacle to their re-union. Castro, who was as resolute as if he had grown old in the service, did not suffer their impatience to languish, but instantly led them against the enemy. The two armies engaged at Chapas on the 16th of September 1542, and fought with inexplicable obstinacy. Victory, after having wavered a long time, at the close of the day decided in favour of that party whose cause was the most just. Those among the rebels who were most guilty dreadful to languish under disgraceful provocation, provoked the conquerors to murder them, crying out, like men in despair, if we are not Relief Pizarro. Their chief was taken prisoner, and died on the scaffold.

While these scenes of horror were transpiring in America, the Spaniards in Europe were employed in finding out expedients to terminate them; though no measures had been taken to prevent them. Peru had only been made subject to the audience of Panama, which was too remote to superintend the maintenance of good order, and had too little influence to make its decrees respected. A supreme tribunal was then established at Lima for the dispensation of justice, which was to be invested with authority sufficient to enforce and to reward a due obedience to the laws. Blasco Nunez Vela, who professed in it as viceroy, arrived in 1544 attended by his subordinates in office, and found every thing in the most dreadful disorder.

To put an end to these tumults which now subsisted, would have required a profound genius, and many other qualities which are seldom united. Nunez had none of these advantages. Nature had only given him probity, firmness, and arduous; and he had taken no pains to improve these gifts. With these virtues, which were almost defects in his situation, he began to fulfil his commission, without regard to places, persons, or circumstances.

Contrary to the opinion of all intelligent persons who wished that he should wait for fresh instructions from Europe, he published ordinances, which declared that the lands the conquerors had seized should not pass to their descendants, and which disfranchised those who had taken part in the civil commotions. All the Peruvians who had been enflaved by monks, bishops, and persons belonging to the government, were declared free. Those who belonged to other matters were to be freed from their shackles at the death of their oppressors. They could no longer be compelled to bury themselves in the mines, nor could any kind of labour be exacted from them without payment. Their tribute was fixed. The Spaniards who travelled on foot were deprived of the right of taking three Indians to carry their baggage; and those who travelled on horseback, of the right of taking five. The caciques were drenched from the obligation of furnishing the traveller and his retinue with provisions gratis. Other tyrannical establishments also would soon have been prohibited; and the conquered people were on the eve of being sheltered under the protection of laws, which would at least have tempered the rigours of the right of conquest, if even they had not entirely repaired the injustice of them; but it should seem that the Spanish government was only to be unfortunate in the good it attempted to effect.

A change so unexpected filled those with confirmation who saw their fortunes wrested from them, or who left the flattering hope of transmitting them to their posterity. Even those who were not affected by these interrelated views, being accustomed to look upon the Indians as the instruments and victims of their avarice, had no conception that any other ideas could prevail concerning them. From altercation they proceeded to indignation, murmuring, and sedition. The viceroy was degraded, put in irons, and banished to a desert island, till he could be conveyed to Spain.

Gonzales Pizarro was then returned from his hazardous expedition, which had employed him long enough to prevent him from taking a part in those revolutions which had so rapidly succeeded each other. The anarchy he found prevailing at his return, inspired him with the idea of seizing the supreme authority. His fame and his forces made it impossible that this should be refused him; but his usurpation was marked with so many enormities, that Nunez was regretted. He was recalled from exile, and soon collected a sufficient number of forces to enable him to take the field. Civil commotions were then renewed with extreme fury by both parties. No quarter was asked or given on either side. The Indians took part in this as they had done in the preceding wars; some ranged themselves under the standard of the viceroy, others under the banners of Gonzales. From 15,000 to 20,000 of these unhappy wretches, who were scattered about in each army, dragged up the artillery, levelled the roads, carried the baggage, and destroyed one another. Their conquerors had taught them to be frugal. After a variety of advantages for a long time alternately obtained, fortune at length favoured the rebellion under Gonzales. Pizarro.
the walls of Quito in the month of January, in the year 1545; and Nunez with the greatest part of his men were killed.

Pizarro took the road of Lima, where they were deliberating on the ceremonies with which they should receive him. Some officers wished that a canopy should be carried for him to march under, after the manner of kings. Others, with adulation still more extravagant, pretended that part of the walls of the town, and even some houses, must be pulled down; as was the custom at Rome, when a general obtained the honours of a triumph. Gonzales contented himself with making his entrance on horseback, preceded by his lieutenant, who marched on foot. Four bishops accompanied him, and he was followed by the magistrates. The streets were filled with flowers, and the air resounded with the noise of bells and various musical instruments. This homage totally turned the head of a man naturally haughty, and of confined ideas. He spoke and acted in the most despotic manner.

Had Gonzales possessed judgment and the appearance of moderation, it would have been possible for him to render himself independent. The principal persons of his party wished it. The majority would have beheld this event with indifference, and the rest would have been obliged to conform to it. Blind cruelties, infatiable avarice, and unbounded pride, altered these dispositions. Even those, whose interests were connected with those of the tyrant, wished for a deliverer.

Such a deliverer arrived from Europe in the person of the licentiate Pedro di la Gafea. The squadron and the provinces of the mountains immediately declared for a person who was invested with a lawful authority to govern them. Those who lived concealed in deferts, caverns, and forests, quitted their retreats to join him. Gonzales, who saw no resource left to support him but in some great achievement, took the road of Cuzco, with a resolution to give battle. At some leagues distance from this place he met the royal army, and attacked it on the 9th of June 1548. One of his lieutenants, seeing him abandoned at the first charge by his belted soldiers, advised him to throw himself into the enemy's battalions, and perish like a Roman; but this weak man chose rather to surrender, and end his life on a scaffold. Carvajal, a more able warrior, and more ferocious than himself, was quartered. This man, when he was expiring, boasted that he had massacred with his own hand 1400 Spaniards and 20,000 Indians.

Such was the last scene of a tragedy, of which every act has been marked with blood. The government was moderate enough not to continue the proscriptions; and the remembrance of the horrid calamities they had suffered kept the Spaniards in the bounds of submission. What still remained of that commotion that had been raised in their minds, intolerably sunk into a calm; and the country hath remained in quiet ever since.

With regard to the Peruvians, the most cruel measures were taken to render it impossible for them to rebel. Tupac Amaru, the heir of their late king, had taken refuge in some remote mountains, where he lived in peace. There he was so closely surrounded by the troops which had been sent out against him, that he was forced to surrender. The viceroy Francis de Toledo caused him to be accused of several crimes that he had not committed, and for which he was beheaded in 1571. All the other defenders of the Incas shared the same fate, under pretence that they had conspired against their conquerors. The horror of these enormities excited so universal an indignation both in the Old and the New World, that Philip II thought himself obliged to disapprove them; but the infamous policy of this prince was so notorious, that no credit was given to this appearance of his justice and humanity.

The empire of Peru, at the time it was subdued, extended along the South Sea, from the river of the empire, Emeralda to Chili, and on the land side to Popayan, according to some geographers. It contained within its extent that famous chain of mountains which rises in the Terra Magica; and the greatest part of Mexico, in order to unite, as it should seem, the southern parts of America with the northern.

It is now divided into three grand divisions or audiences; Quito, Lima, or Los Reyes, and Los Charcos. As to its climate, mines, soil, and produce, they differ greatly in different parts of the country.

The extensive province of Quito is bounded on the north by Popayan, and includes a part of that government, also by Santa Fe de Bogota; on the south by the governments of Piura and Chachapoyas; on the east it extends over the whole government of Maynas and the river of the Amazons to the meridian, which divides the Spanish from the Portuguese dominions; and on the west it is bounded by the South Sea, extending, according to Antonio de Ulloa, 600 leagues in length, and about 200 in its greatest breadth; but this greatly exceeds the computation of all other geographers. He however observes, that it must be owned a great part of these vast dominions are either inhabited by nations of Indians, or have not hitherto been sufficiently peopled by the Spaniards, if indeed they have been thoroughly known; and that all the parts that can properly be said to be peopled, and actually subject to the Spanish government, are those intercepted by the two Cordilleras of the Andes, which, in comparison to the extent of the country, may be termed a street or lane, 15 leagues, or sometimes more, from east to west; to this must be added several detached governments, separated by the very extensive tracts inhabited by free Indians.

The climate of Quito differs from all others in the Climate the same parallel, since even in the centre of the torrid zone, or although under the equinoctial, this government is very tolerable, but even in some places the cold is painful; while others enjoy all the advantages of a perpetual spring, the fields being constantly covered with verdure, and enamelled with flowers of the most lively colours. The mildness of the climate, free from the extremes of heat and cold, and the constant equality of the day and night, render this country, which from its situation might be thought to be parched by the constant heat of the sun, and strongly inhabited, both pleasant and fertile; for nature has here dispersed her bounties with so liberal a hand, that this country in several respects surpasses those of the temperate zones, where the vicissitudes of winter and summer, and the change
change from heat to cold, cause the extremes of both to be more feebly felt. However, in different parts of the country, the air is very different; in one part are mountains of a stupendous height and magnitude, with their summits covered with snow. The plains are temperate, the valleys hot, and, according to the high or low situation of the country, are found all the variety of gradations in temperature possible to be conceived between the extremes of heat and cold.

Quito, the capital, in 0° 13' south latitude, and 77° 50' west longitude from Greenwich, is so happily situated, that neither heat nor cold are troublesome, though both may be felt in its neighbourhood; and what renders this equality more delightful is that it is constant throughout the whole year, the difference between the feasons being scarce perceptible. Indeed the mornings are cool, the remainder of the day warm, and the nights of an agreeable temperature. See Quito.

The winds, which are pure and balmy, blow for the most part from north to south, but never with any violence, though they sometimes shift their quarters, but without any regard to the season of the year. Such signal advantages resulting from the climate, soil, and aspect of this country, would be sufficient to render it the most enviable spot upon earth, as it is supposed to be the most elevated, if, whilst enjoying these delights, the inhabitants were not harassed by terror, and exposed to continual danger; for here tremendous tempests of thunder and lightning prevail, which are sufficient to appall the stoutest heart; whilst earthquakes frequently spread universal apprehensions, and sometimes bury cities in ruins.

The distinction of winter and summer consists in a very minute difference; the interval between the month of September and that of April, May, or June, is here called the winter season, and the other months compose the summer. In the former season the rains chiefly prevail, and in the latter the inhabitants frequently enjoy whole days of fine weather; but whenever the rains are discontinued for above fortnight, the inhabitants are in the utmost confusion, and public prayers are offered up for their return. On the other hand, when they continue a short time without intermission, the like fears prevail, and the churches are again crowded with supplicants to obtain fine weather; for a long drought produces dangerous diseases, and a continual rain, without intervals of sunshine, destroys the fruits of the earth. The city of Quito, however, enjoys one peculiar advantage in being free from musketoes and other troublesome insects, such as flies and venomous reptiles, except the sigua, or pique, which is a very small insect shaped like a fly, but hardly visible to the sight. See Chagas.

The fertility of the soil here is incredible, for the fruits and beauties of the several seasons are visible at the same time; and the curious European observer with a pleasing admiration, that whilst some herbs of the field are fading, others of the same kind are springing up; while some flowers lose their beauty, others blow to continue the enamelled profuse; thus, when the fruits of the trees have attained their maturity, and the leaves begin to change their colour, fresh leaves blossom, and fruits are seen in their proper gradations in size and ripeness on the same tree. The same incessant fertility is conspicuous in the corn, both reaping and fowing being carried on at the same time; so that the declivities of the neighbouring hills exhibit all the beauties of the four seasons in one assemblage. Though all this is generally seen, yet there is a settled time for the grand harvest; yet sometimes the most favourable season for fowing in one place is a month or two after that of another, though their distance does not exceed three or four leagues. Thus in different spots, and sometimes in one and the same place, fowing and reaping are performed throughout the whole year, the forwardness or retardment naturally arising from the different situations, such as mountains, rivulets, plains, and valleys; and the temperature being different in each, the best times for performing the several operations of husbandry must also differ.

The chirimoya is considered as one of the most delicious fruits of the world. Its dimensions are various, being from one to five inches in diameter. Its figure is imperfectly round, flattened towards the flanks, where it forms a kind of navel; but all the other parts are nearly circular. It is covered with a thin soft shell, which adheres so closely to the pulp as not to be separated from it without a knife. The outward coat is green, variegated with prominent veins, forming all over it a kind of net-work. The pulp is white, and contains a large quantity of juice resembling honey, of a sweet taste, mixed with a gentle acid of a most exquisite flavour. The seeds are formed in several parts of the pulp, and are somewhat flat. The tree is high and tufted, the stem large and round, but with some inequalities, full of elliptic leaves, terminating in a point. The blossom differs little from the colour of the leaves, which is a darkish green; and though far from being beautiful, is remarkable for its incomparable fragrance. The granadilla in its shape resembles an hen's egg, but is larger. The outside of the shell is smooth, glossy, and of a faint carnation colour, and the inside white and soft. The shell contains a viscid liquid substance full of very small and delicate grains, left behind on the outside of the pomegranate. This medullary substance is separated from the shell by a fine and transparent membrane. Its fruit has a delightful sweetness blended with acidity, very cordial and refreshing, and so wholesome, that there is no danger of eating to excess.

The frutilla, or Peruvian strawberry, is very different from that of Europe in size; for though they are here generally not above an inch in length, they are much larger in other parts of Peru; but their taste, though juicy, and not unpalatable, is not equal to those in Europe.

The country is observed to abound more in women inhabiting than in men, which is the more remarkable, as those taints cause which induce men to leave their country, as travelling, commerce, and war, naturally bring over more men from Europe than women. But there are many families in which there are a number of daughters, without one son among them. The women enjoy a better state of health than the men, which may be owing in some measure to the climate, and more particularly to the early intemperance and voluptuousness of the other sex.

The Creoles are well made, of a proper stature and of a lively and agreeable countenance. The Mestizos are also in general well made, often taller than the ordinary
Another liquor much needed in this country is mate, for though they will not venture to attack Tl1emeaner Peru.,

Indians, both men and women, are commonly low of

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The common people, the Indians, and even the do-

which IS a serge cloak, with a hole in the middle for The common people, the Indians, and even the do-

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The fumptuous manner of performmg the
habit is capable of prevailing over reason and prudence; for their obstinacy is so great in this particular, that many families of credit are ruined by preposterously endeavouring to excite others; and the people here may be said to till and scheme to lay up wealth, to enable their successors to lavish honours upon a body infensible of all pageantry.

The commerce of the province of Quito is chiefly carried on by Europeans settled here, and others who occasionally arrive. The manufactures of this province are only cottons, some white and striped batiks, and cloths, which meet with a good market at Lima, for supplying the inward provinces of Peru. The returns are made partly in silver, and partly in fringes made of gold and silver thread, and wine, brandy, oil, copper, tin, lead, and quicksilver. On the arrival of the galleons at Cartagena, these traders resort thither to purchase European goods, which, at their return, they confign to their correspondents all over the province. The coasts of New Spain supply this province with indigo, of which there is a very considerable consumption at the manufactures, blue being universally the colour which this people adopt for their apparel. They also import, by way of Guayaquil, iron and steel both from Europe and the coast of Guatemala.

The disposition of the Indians in the province of Quito is extremely remarkable, and they appear to have no resemblance to the people found there by those who first discovered the country. They are prudent, peaceable, and not to be disturbed either by fortunate or unfortunate events. In their mean state and condition they are as contented as a prince clothed in the most splendid robes. They show the fame disregard to riches; and even the authority and grandeur within their reach is little the object of their ambition, that to all appearances it seems to be the fame to an Indian whether he be created an alcalde or obliged to perform the office of a common executioner. Their sloth is so great, that scarcely any thing can induce them to work. Whatever therefore is necessary to be done is left to the Indian women, who are much more active; they spin and make the half shirts and drawers which form the only apparel of their husbands; they cook the provisions, grind barley, and brew the beer called chicha; while the husband sits squatting on his hams, the usual posture of the Indians, looking at his busy wife. The only domestic service they do is to plough their little spot of land, which is fowed by the wife. When they are once seated on their hams, no reward can induce them to stir; so that if a traveller has lost his way, and happens to come to one of their cottages, they charge their wives to lay that they are not at home. Should the passenger alight and enter the cottage, the Indian would fill be safe; for having no light but what comes through a hole in the door, he could not be discovered; and should the stranger even see the Indian, neither entreaties nor rewards would prevail on him to flee a step with him.

They are lively only in parties of pleasure, rejoicings, entertainments, and especially dancing; but in all these the liquor must circulate briskly, and they continue drinking till they are entirely deprived both of sense and motion.

It is remarkable that the Indian women, whether maid's or married, and Indian young men before they are of an age to contract matrimony, are never guilty of this vice: it being a maxim among them, that drunkenness is the privilege of none but masters of families, who, when they are unable to take care of themselves, have others to take care of them.

The women present the chicha (a) to their husbands in calabashes, till their spirits are raised; then one plays on a pipe and tabor, while others dance. Some of the bell voices among the Indian women sing songs in their own language, and those who do not dance, squat down in the usual posture till it comes to their turn. When tired with intemperance, they all lie down together, without regarding whether they are near the wife of another or their own sister or daughter. These festivities sometimes continue three or four days, till the priest coming among them, throws away all the chicha, and disperses the Indians, lest they should procure more.

Their funerals are likewise solemnized with excessive drinking. The house is filled with jugs of chicha, for the solace of the mourners and other visitors; the latter even go out into the streets, and invite all the nation who happen to pass by to come in and drink to the honour of the deceased. This ceremony lasts four or five days, and sometimes more, strong liquor being their supreme enjoyment.

The Indians in the audience of Quito are said to act contrary to all other nations in their marriages; for they never make choice of a woman who has not been first enjoyed by others, which they consider as a certain indication of her personal attractions. After a young man has made choice of a woman, he asks her of her father, and having obtained his consent, they begin to cohabit together as man and wife, and assist the father in law in cultivating the land. At the end of three or four months, and frequently of a year, the husband leaves his bride or wife without any ceremony; and perhaps expostulates with his father-in-law for endeavouring to deceive him, by imposing upon him his daughter, whom nobody else had thought worthy of making a bedfellow. But if no dissuasions arise in the man on this account or any other, after passing three or four months in this commerce, which they call amansatas, or to habituate one's self, they then marry. This custom is still very common, though the whole body of the clergy have used all their endeavours to put a stop to it. Accordingly they always

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(a) This is a liquor made from maize by the following process. The maize, after being soaked in water till it begin to grow, is dried in the sun, then parched a little, and at last ground. The flour, after it has been well kneaded, is put with water into a large vessel, and left for two or three days to ferment. Its tincture is nearly that of the most indifferent kind of cider. It is a refreshing, nourishing, and aperitive liquor, but it will not keep above eight days without turning four.
It has been observed, that the dependencies of the summit of Cotopaxi, and that of Sangay, which is of a prodigious height, and the far greater part of it covered with snow; yet from its summit issue a continental fire, attended with explosions which are plainly heard at 40 leagues distance. The country adjacent to this volcano is entirely barren, being covered with cinders ejected from its mouth. In this mountain rises the river Sangay, which being joined by the Upano, forms the Paya, a large river which discharges itself into the Maranon.

Pichincha, though famous for its great height, is 1778 yards lower than the perpendicular height of Cotopaxi, and was formerly a volcano, but the mouth or crater on one of its sides is now covered with sand and calcined matter; so that at present neither smoke nor fire issue from it. When Don George Juan and Don Antonio de Ulloa were stationed on it for the purpose of making astronomical observations, they found the cold on the top of this mountain extremely intense, the wind violent, and they were frequently involved in a thick fog, or, in other words, a cloud, that an object at six or eight paces distance was scarcely discernible. The air grew clear, by the clouds moving nearer to the earth, and on all sides surrounding the mountain to a vast distance, representing the sea with the mountain: looking like an island in the centre. When this happened, they heard the dreadful noise of the tempests that discharged themselves on Quito and the neighbouring country. They saw the lightning issue from the clouds, and heard the thunder roll far beneath them. While the lower parts were involved in tempests of thunder and rain, they enjoyed a delightful serenity; the wind was abated, the sky clear, and the evening rays of the sun moderated the severity of the cold. But when the clouds rose, their thickness rendered respiration difficult, snow and hail fell continually, and the wind returned with all its violence; so that it was impossible entirely to overcome the fear of being, together with their hut, blown down the precipice on whose edge it was built, or of being buried in it by the constant accumulations of ice and snow. Their fears were likewise increased by the fall of enormous fragments of rocks. Though the smallest crevice visible in its hut was stopped, the wind was so piercing that it penetrated through; and though the hut was small, crowded with inhabitants, and had several lamps constantly burning, the cold was so great, that each individual was obliged to have achaing-dish of coals, and several men were constantly employed every morning to remove the snow which fell in the night. By the severities of such a climate their feet were swelled, and fat tender that walking was attended with extreme pain, their hands covered with chilblains, and their lips so swelled and chapped that every motion in speaking drew blood.

The next division of Peru is the audience of Lima, province of which is bounded on the north by Quito, on the east by Lima, the Cordilleras of the Andes on the south by the audience of Los Charcos, and on the west by the Pacific Ocean, it being about 770 miles in length from north to south, but of an unequal breadth.

The climate and soil of this country is uncommonly various; in some places it is exceedingly hot, in others cool, and insupportably cold, and in the city of Lima, where in this present age all rains never falls, it is always temperate. The seasons vary within the compass of a few miles, and in certain parts of the audience all the vicissitudes of weather are experienced in 24 hours. It is extremely remarkable that no rains fall or rivers flow on the sea coasts, tho'...
the country is refreshed by thick fogs, and the heat abated by dense clouds that never condense into flowers. This phenomenon, has drawn the attention of many naturally, without their being able satisfactorily to account for it.

Spring begins toward the close of the year, that is about the end of November or the beginning of December, when the vapours which fill the atmosphere during the winter fables, and the sun, to the great joy of the inhabitants, again appears, and the country then begins to revive, which, during the absence of his rays, had continued in a state of languor. This is succeeded by summer, which, though hot from the perpendicular direction of the sun's rays, is far from being insufferable; the heat, which indeed would otherwise be excessive, being moderated by the fourth winds, which always blow at this season, though with no great force. Winter begins at the latter end of June or the beginning of July, and continues till November or December, when the fourth winds begin to blow stronger, and to produce a certain degree of cold, not indeed equal to that in countries where ice and snow are known, but so keen that the light dresses are laid by, and cloth or other warm fluffs worn. During the winter the earth is covered with so thick a fog, as totally to intercept the rays of the sun; and the winds, by blowing under the shelter of this fog, retain the particles they contracted in the frozen zone. In this season only the vapours dissolve into a very small dew, which everywhere equally moistens the earth; by which means all the hills, which during the other parts of the year offer nothing to the traveler, are clothed with verdure and enamelled with flowers of the most beautiful colours. These dews never fall in such quantities as to impair the roads or incommodate the traveler; a very thin stuff will not soon be wet through; but the continuance of the mists during the whole winter, without being exhaled by the sun, fertilizes every part of the country.

Lima is as free from tempests as from rain; so that those of the inhabitants who have withstood the mountains nor travelled into other parts, are absolute strangers to thunder and lightning, and are therefore extremely terrified when they first hear the former or see the latter. But it is very remarkable, that what is here entirely unknown should be so common 30 leagues to the east of Lima; it being no farther to the mountains, where violent rains and tempests of thunder and lightning are frequent as at Quito.

But though the capital is freed from the terror of these tempests, it is subject to what is much more dreadful. Earthquakes happen here so frequently, that the inhabitants are under continual apprehensions of being, from their suddenness and violence, buried in the ruins of their own houses: yet they earthquakes, though so sudden, have their prefaces, one of the principal of which is a rumbling noise in the bowels of the earth about a minute before the shocks are felt, that seems to pervade all the adjacent subterraneous part; this is followed by dismal howlings of the dogs, who seem to prefigure the approaching danger. The breasts of burden pulling the freets stop, and by a natural instinct spread upon their legs, the better to secure themselves from falling. On these portents the terrified inhabitants fly from their houses into the freets with such precipitation, that if it happens in the night they appear quite naked; the urgency of the danger, once begun, all sense of delicacy or shame. Thus the freets exhibit such odd and singular figures as might afford matter of diversion, were it possible to be diverted in so terrible a moment. This sudden concourse is accompanied with the cries of children waked out of their sleep, blended with the lamentations of the women, whose agonizing prayers to the saints increases the common fear and confusion. The men are also too much afflicted to refrain from giving vent to their terror; so that the whole city exhibits a dreadful scene of confusion and horror.

The earthquakes that have happened at the capital are very numerous. The first since the establishment of the Spaniards was in 1582; but the damage was much less considerable than in some of the succeeding.

Six years after Lima was again visited by another earthquake, so dreadful, that it is still fearfully commemorated every year. In 1609 another happened, which overturned many houses. On the 27th of November 1630, such prodigious damage was done in the city by an earthquake, that, in acknowledgment of its not having been entirely demolished, a festival on that day is annually celebrated. Twenty-four years after, on the 3d of November, the most lately edifices in the city, and a great number of houses, were destroyed by an earthquake; but the inhabitants retiring, few of them perished. Another dreadful one happened in 1783; but one of the most terrible was on the 28th of October 1687. It began at four in the morning, and destroyed many of the finest public buildings and houses, in which a great number of the inhabitants perished: but this was little more than a prelude to what followed; for two hours after the shock returned with such impetuous concussions, that all was laid in ruins, and the inhabitants felt themselves happy in being only spectators of the general devastation, by having saved their lives, though with the loss of all their property. During this second shock, the sea retiring unconsiderably, and then returning in mountainous waves, entirely overwhelmed Callao, which is only nine miles distant from Lima, and all the adjacent country, together with the miserable inhabitants. From that time six earthquakes have happened at Lima previous to that of 1746. This last was on the 28th of October, at half an hour after ten at night, when the concussions began with such violence, that in little more than three minutes the greatest part, if not all the buildings in the city, were destroyed, burying under their ruins those inhabitants who had not made sufficient haste into the freets and squares, the only places of safety. At length the horrible effects of the first shock ceased; but the tranquillity was of short duration, the concussions swiftly succeeding each other. The sea of Callao also sunk into ruins; but what it suffered from the earthquake in its building was inconsiderable, when compared to the dreadful catastrophe which followed; for the sea as is usual on such occasions, receding to a considerable distance, returned in mountainous waves, foaming with the violence of the agitation, and suddenly buried Callao and the neighbouring country under its flood. This, however, was not entirely effected by the first swell of the waves; for the sea retiring farther, returned with still greater impetuosity, and covered both
In this bishopric are several mines of gold and silver, that are extremely rich.

The fourth diocese of the audience of Lima is Arequipa, which contains the city of the same name, one of the largest in all Peru. It is delightfully situated in a plain, the houses are well built of stone, and are generally lofty, commodious, finely decorated on the outside, and neatly furnished within. The temperature of the air is extremely agreeable, the cold being never excessive, nor the heat troublesome; so that the fields are always clothed with verdure, and enamelled with flowers, as in a perpetual spring. But these advantages are alloyed by its being frequently exposed to dreadful earthquakes; for by these convulsions of nature it has been four times laid in ruins. The city is, however, very populous, and among its inhabitants are many noble families.

In this bishopric are several gold and silver mines, and in some parts are large vineyards, from which considerable quantities of wine and brandy are made. Among the other productions is Guinea pepper, in which the jurisdiction of Africa in this diocese carries on a very advantageous trade, the annual produce of these plantations bringing in no less than 60,000 dollars per annum. The pods of this pepper are about a quarter of a yard in length, and when gathered are dried in the sun and packed up in bags of rushes, each bag containing an aroba or a quarter of a hundred weight, and thus they are exported to all parts. Other places of this jurisdiction are famous for vast quantities of large and excellent olives, far exceeding the finest produced in Europe, they being nearly the size of a hen's egg.

The audience of Charcas, the last diocese of Peru, is equal in extent to that of Lima; but many of its parts are not so well inhabited, some being full of vall valleys, deserts and impenetrable forests, whilst others have extensive plains intercepted by the stupendous height of the Cordilleras; the country is inhabited only in such parts as are free from those inconveniences. It is bounded on the north by the diocese of Cusco, and reaches southward to Buenos Ayres; on the east it extends to Brazil; and on the west it reaches to the Pacific Ocean, particularly at Atacama. The remainder of the province borders on the kingdom of Chili.

This audience is divided into the archbishopric of Plata, and five bishoprics. We shall begin with the first.

The famous mountain of Potosi is known all over the commercial world for the immense quantity of silver it has produced. The discovery of this amazing treasure happened at the commencement of the year 1545, by a mere accident, which we shall mention afterwards. At a small distance from it are the hot medicinal baths, called Don Diego, whether some resort for health and others for diversion.

At the time when the first conquests were made, when emigrations were most frequent, the country of the Incas had a much greater reputation for riches than New Spain; and, in reality, for a long time much settled by more considerable treasuries were brought away from it, the Spanish the desire of partaking of them must necessarily draw towards thither, as was really the case, a greater number of Castilians. Though almost all of them went over thither with the hope of returning to their country to enjoy
Fewer errors have been committed in the means of Manner of living of the natives. Procuring provisi

This infatiable thirst of gold, which neither tended to subsistence, safety, nor policy, was the only motive for establishing new settlements, some of which have been kept up, while several have decayed, and others have been formed in their stead. The fate of them all has corresponded with the discovery, progress, or declension, of the mines to which they were subordinate.

Fewer errors have been committed in the means of: 1. To fublime, etc. 2. To the barbarous and bloody manners of the conquerors. They were induced to expect so much independence as a land infinitely more remote from the mother-country.

Cuzco attracted the conquerors in multitudes. They found this capital built on a ground that was very irregular, and divided into as many quarters as there were provinces in the empire. Each of the inhabitants might follow the uffages of his native country; but every body was obliged to conform to the worship established by the founder of the monarchy. There was no edifice that had any grandeur, elegance, or convenience; because the people were ignorant of the first elements of architecture. The magnificence of what they called the palace of the foreign, of the princes of the blood, and of the great men of his empire, consisted in the profusion of the metals that were lavished in decorating them. The temple of the Sun was distinguished above all other edifices; its walls were incrusted or feathered with gold and silver, ornamented with divers figures, and loaded with the idols of all the nations whom the Incas had enlightened and subdued.

As it was not a solicitude for their own preservation which occupied the Spaniards at first, they had no sooner pillaged the immense riches which had been amassed at Cuzco for four centuries, than they went in great numbers in 1534, under the order of Sebastian de Benalcazar, to undertake the destruction of Quito. The other towns and boroughs of the empire were overrun with the same spirit of rapine; and the citizens and the temples were plundered in all parts.

Those of the conquerors, who did not take up their residence in the settlements which they found already formed, built towns on the sea-coasts, where before there were none: for the fertility of the soil had not permitted the Peruvians to multiply much there, and they had not been induced to remove thither from the extremity of their country, because they failed very little. Patia, Truxillo, Callao, Pica, and Arica, were the roads which the Spaniards deemed most convenient for the communication they intended to establish among themselves and with the mother-country. The different positions of these new cities determined the degree of their prosperity.

Those which were afterwards built in the inland parts of the country were not erected in regions which presented a fertile soil, copious harvests, excellent pastures, a mild and salubrious climate, and all the conveniences of life. These places, which had hitherto been so well cultivated by a numerous and flourishing population, were now totally disregarded. Very soon they exhibited only a deplorable picture of a horrid desert; and this wildness must have been more melancholy and hideous than the dreary aspect of the earth before the origin of societies. The traveller, who was led by accident or curiosity into these desolate plains, could not forbear abhorring the barbarous and bloody authors of such devastations, while he reflected that it was not owing even to the cruel illusions of glory, but to the stupid and abject desire of gold, that they had sacrificed so much more real treasure, and to numerous populations.

This is a considerable step; but there still remained much more to be done. After the invasions in which they groaned did not allow them to exercise their former industry, they contented themselves with the coarse clothes of Europe, for which they were made to pay an exorbitant price. When the gold and silver which had escaped the rapacity of the conquerors were exhausted, they thought of re-establishing their national manufactures. These were some time after prohibited, on account of the deficiency which they occasioned in the exports of the mother-country. The impossibility which the Peruvians found of purchasing foreign fluffs and paying their taxes, occasioned permission to be given at the end of ten years for their re-establishment. They have not been discontinued since that time; and have been brought to so great a degree of perfection as was possible they could be under a continual tyranny.

With the wool of the vicuna, a species of wild pasture, they make, at Cuzco and in its territory, flocks, handkerchiefs, and fcars. These manufactures would have been multiplied, if the frightful destruc

64 Manufactures, &c.

Thee wool, mixed with that of the sheep imported thither from Europe, which have E e z been exceedingly regenerated,
The manufactures subservient to luxury are established at Arequipa, Cuzco, and Lima. In these three towns is made a prodigious number of gold toys and plate, for the use of private persons, and also for the churches. All these manufactures are but coarsely wrought, and mixed with a great deal of copper. We seldom discover more taffetas in their gold and silver laces and embroideries which their manufactures also produce. This is not altogether the case in regard to their lace, which, when mixed with that of Europe, looks very beautiful. This last manufacture is commonly in the hands of the nuns, who employ in it the Peruvian girls, and the young Meflees of the towns, who for the most part before marriage pass some years in the convent.

Other hands are employed in painting and gilding leather for rooms, in making with wood and ivory pieces of inlaid work and sculpture, and in drawing figures on the marble that is found at Cuzco, or on linen imported from Europe. These different works, which are almost all manufactured at Cuzco, serve for ornaments for houses, palaces, and temples: the drawing of them is not bad, but the colours are neither exact nor permanent. If the Indians, who invent nothing, but are excellent imitators, had able masters and excellent models, they would at least make good copies. At the close of the last century, some works of a Peruvian painter, named Michael de St Jacques, were brought to Rome; and the connoisseurs discovered marks of genius in them.

Though the Peruvians were unacquainted with coin, they knew the use of gold and silver; for they employed them in different kinds of ornaments. Independent of what the torrents and accident procured them of these metals, some mines had been opened of little depth. The Spaniards have not transmuted to us of the manner in which these rich productions were drawn from the bosom of the earth. Their pride, which has deprived us of so much useful knowledge, undoubtedly made them think, that, in the inventions of a people whom they called barbarous, there was nothing worthy to be recorded.

The difference as to the manner in which the Peruvians worked their mines, did not extend to the miners themselves. The conquerors opened them on all sides. At first the gold mines tempted the avarice of the greater number. Fatal experience discouraged those whom passion had not blinded. They clearly saw, that, for some enormous fortunes nailed in this manner, great numbers, who had only moderate fortunes, were totally ruined. These mines sunk into such discredit, that, in order to prevent them from being abandoned, the government was obliged to take the 20th part of their produce, instead of the fifth which it at first received.

The mines of silver were more common, more equal, and richer. They even produced silver of a singular species, rarely found elsewhere. Towards the sea-coast, great lumps of this metal are found in the rocks, and on the mountains. Several of them gave false hopes. Such, in particular, was that of Ucuntuya, discovered in 1713. This was only an incrustation of almost malleable silver, which at first yielded several millions, but was soon exhausted.

Others which were deeper have been alike deserted. Their produce, though equal to what it originally was, was not sufficient to support the expense of working them, which augmented every day. The mines of Quivito, Cuzco, and Arequipa, have experienced that revolution which awaits many of the rest.

There are greater numbers of very rich mines which the waters have invaded. The disposition of the ground, which from the summit of the Cordilleras goes continually shelving to the South Sea, must necessarily render these events more common at Peru than in other places. This inconvenience, which with greater care and skill might often have been prevented or diminished, has been in some instances remedied.

Joseph Salcedo, about the year 1660, had discovered, not far from the town of Puna, the mine of Laycanota. It was so rich, that they often cut the silver with a chisel. Prosperity had so elevated the mind of the proprietor, that he permitted all the Spaniards who came to seek their fortune in this part of the New World, to work some days on their own account, without weighting or taking any account of the presents he made them. This generosity drew around him an infinite number of people, whose avidity made them quarrel with each other, and the love of money made them take up arms and fall upon one another; and their benefactor, who had neglected no expedient to prevent and extinguish their fiaguary contentions, was hang’d as being the author of them. Whilst he was in prison, the water got possession of his mine. Superfluity soon made it imagined that this was a punishment for the horrid act they had perpetrated against him. This idea of divine vengeance was revered for a long time; but at last, in 1740, Diego de Bina associated with other opulent people to avert the springs which had deluged so much treasure. The labours which this difficult undertaking required, were not finished till 1754. The mine yields as much now as it did at first. But mines still richer than this have been discovered. Such, for example, is that of Potosi, which was found in the same country where the Indians worked that of Porco.

An Indian, named Hualpa, in 1545, pursuing some deer, in order to climb certain steep rocks and hold off a bull, the roots of which loosened from the earth, and brought to view an ingot of silver. The Indian had recourse to it for his own use; and never failed to return to his treasure every time that his wants or his desires solicited him to it. The change that had happened in his fortune was remarked by one of his countrymen, and he discovered to him the secret. The two friends could not keep their counsel and enjoy their good fortune. They quarrelled; on which the indi­creeft confidential discovered the whole to his master, Villaricell, a Spaniard who was settled in the neigh­bourhood. Upon this the mine became known, and was worked; and a great number of them were found in its vicinity, the principal of which are in the northern part of the mountain, and their depth is from north to south. The most intelligent people of Peru have observed,
observed, that this is in general the direction of the richest mines.

The fame of what was passing at Potosi soon spread abroad; and there was quickly built at the foot of the mountain a town, confiding of 60,000 Indians and 10,000 Spaniards. The fertility of the soil did not prevent its being immediately peopled. Corn, fruit, flocks, American fluffs, European luxuries, arrived there from every quarter. Industry, which every where follows the current of money, could not search for it with fo much success as at its source. It evidently appeared that in 1738 these mines produced annually near 978,000 (sterling, without reckoning the silver which was not registered, and what had been carried off by fraud. From that time the produce has been so much diminished, that no more than one-eighth part of the coin which was formerly struck is now made.

At the mines of Potosi, and all the mines of South America, the Spaniards, in purifying their gold and silver, use mercury, with which they are supplied from Guanca Velica. The common opinion is, that this mine was discovered in 1564. The trade of mercury was then still free; it became an exclusive trade in 1571. At this period all the mines of mercury were shut; and that of Guanca Velica alone was worked, the property of which the king reserved to himself. It is not found to diminish. This mine is dug in a prodigiously large mountain, 60 leagues from Lima. In its profound abysses are seen streets, squares, and a chapel, where the mysteries of religion on all festivals are celebrated. Multitudes of flambeaux are continually kept to enlighten it.

Private people at their own expense work the mine of Guanca Velica. They are obliged to deliver to government at a stipulated price, all the mercury they extract from it. As soon as they have procured the quantity which the demands of one year require, the work is suspended. Part of the mercury is sold on the spot, and the rest is sent to the royal magazines throughout all Peru; from whence it is delivered out at the same price it is sold for in Mexico. This arrangement, which has occasioned many of the mines to drop, and prevented others from being opened, is inexcusable in the Spanish system. The court of Madrid, in this respect, merits the fame reproaches as a ministry in other countries would incur, that would be blind enough to lay a duty on the implements of agriculture.

The mine of Guanca Velica generally affects those who work in it with convulsions; this and the other mines, which are not less unhealthy, are all worked by the Peruvians. The unfortunate victims of an insupportable avarice are crowded all together and plunged into those abysses, the greatest part of which are deep, and all excessively cold. Tyranny has invented this refinement of cruelty, to render it impossible for any thing to escape its ruthless vigilance. If there are any wretches who long survive such barbarity, it is the use of cocoa that preserves them.

In the Cordilleras, near the city of Paz, is a mountain of remarkable height, called Illimani, which doubtless contains immense riches; for a crag of it being some years ago covered by a flusk of lightning, and falling on a neighbouring mountain, such a quantity of gold was found in the fragments; that for some time that metal was sold at Paz for eight pieces of eight per ounce; but its summit being perpetually covered with ice and snow, no mine has been opened in the mountain.

The city of La Paz is of a middling size, and from its situation among the breaches of the Cordilleras, the ground on which it stands is unequal, and it is also surrounded by mountains. When the river Titicaca is increased, either by the rains, or the melting of the snow on the mountains, it current forces along large masses of rocks with some grains of gold, which are found after the flood has subsided. Hence some idea may be formed of the riches inclosed in the bowels of these mountains; a remarkable proof of which appeared in the year 1730, when an Indian, washing his feet in the river, discovered a large lump of gold, that the marquis de Castile Fuerte gave twelve thousand pieces of eight for it, and sent it as a present to the king of Spain.

Balban of Peru. See Myroxilon.

PERUGIA, a town of Italy, in the pope's territories, and capital of Perugino. It is an ancient, handomé, populous, and large city, with a strong citadel, an university and a bishop's fee. The churches, and many other buildings as well public as private, are very handomé. It is seated on a hill, in E. Long. 12° 30', N. Lat. 43° 6'.

PERUGINO, a province of Italy, in the territory of the church, bounded on the west by Tuscany, on the south by Orvietano, on the east by the duchies of Spoletto and Urdino, and on the north by the county of Citta Cassellana. It is one of the smallest provinces in the territory of the church. The air is very pure, and the soil fertile in corn and good wine; besides, the lake Perugia supplies them with plenty of fish. The capital town is Perugia. The lake is eight miles from the city, and is almost round, being about five miles in diameter; in it there are three islands. This province is about 25 miles in length, and near as much in breadth.

PERUVIAN BARK. See Cinchona, and Peruvia Bark.

PERUVIAN BARK. See Perusa.

PERUVIAN, a general name given to that vast peninsula, extending itself from the isthmus of Darien to Cape Horn, in the form of a triangle, of which the Terre Magellania and the Cape form the vertex. It includes the whole of South America, although, as is well known, all the countries included within these limits do not acknowledge the dominion of the crown of Spain. See Terza Firm.

PESCARO, a town of Italy, in the territory of the pope, and duchy of Urbino, with a bishop's fee. It is a large place, whose streets are paved with bricks. The castle is very well fortified, the harbour excellent, and the cathedral church magnificent. The environs are remarkable for producing good figs, of which they send large quantities to Venice. It is seated on an eminence at the mouth of the river Fogha, on the Gulph of Venice. E. Long. 13° 0', N. Lat. 43° 56'.

PESSARA, a very strong town in the kingdom of Naples, and in the Hither Abruzzo; seated at the mouth of a river of the same name, which falls into
PETAGUEL, a territory of South America, in Brazil, bounded on the north by Del; on the east by the sea; on the south by the captainship of Rio Grande; and on the west by Tupys. It contains mines of silver.

PETAL, in botany, one of the coloured leaves which compose the flower.

PETALISM, a mode of deciding on the guilt of citizens similar to the Athenian OSTRACISM. It was introduced in Syracuse about the year before Christ 460, in order to prevent the tyranny of the richer citizens, who had often about that time aimed at the diadem. To prevent, therefore, the evils daily arising from thence, and to bring down the aspiring minds of the wealthy citizens, the Syracusans were forced to make a law not unlike that of the Athenian otracism; for as at Athens every citizen was to write on a leaf the name of the person whom they conceived to be the most likely, on account of his wealth and adherents, to aspire to the crown; so at Syracuse they used to write on a leaf the names of such as they apprehended powerful enough to usurp the sovereignty. When the leaves were counted, he who had the most suffrages against him was, without any further inquiry, banished for five years. This new-contrived method of impairing the elates, and weakening the interest of the overgrown citizens, was called petalism, from the Greek word petalon, which signifies "a leaf." This law was attended with many evil consequences; for those who were most capable of governing the commonwealth were driven out, and the administration of public affairs committed to the meanest of the people; nay, many of the chief citizens, who were able to render their country great service, fearing to fall under penalties of this law, withdrew from the city, and lived private in the country, not concerning themselves with public affairs: whence all the employments being filled with men of no merit or experience, the republic was on the brink of ruin, and ready to fall into a state of anarchy and confusion. The law therefore of petalism, upon more mature deliberation, was repealed soon after it had been first enacted, and the reins of government were again put into the hands of men who knew how to manage them.

PETARD, in the art of war. See GUNNERY, n° 36, and Plate CCXXIV.

PETAL (Denis), or Dionysius Petauius, a French Jesuit of great erudition, born at Orleans in 1583. His father was a man of literature, and observing strong parts and an excellent genius for letters in his son, he took every means in his power to improve them. He used to tell his son, that he ought to qualify himself so, as to be able to attack and confound "the giant of the Allophylæ;" meaning that most eminent scholar Joseph Scaliger, whose abilities and learning were allowed to have done great honour and much service to the reformed. Young Petavius seems to have entered readily into his father's views; for he studied most intensively, and afterwards水准 much of his erudition against Scaliger. He joined the study of the mathematics to that of the latter letters, and afterwards applied himself to a course of philosophy which he began in the college of Orleans, and finished at Paris. He afterwards maintained theses in Greek, which was as familiar to him as Latin; and the Latin, it is said, he understood better than he did his own native language. When he was pretty well advanced, he had free access to the king's library, which he often visited on account of the Latin and Greek manuscripts. Among other advantages which accompanied his literary pursuits, was the friendship of Isaac Casaubon, whom Henry IV. called to Paris in 1600. It was at Casaubon's instigation, that Petavius, though then but very young, undertook an edition of The Works of Syenestus. In this edition he corrected the Greek from the manuscripts, translated that part which yet remained to be translated into Latin, and wrote notes upon the whole. He was but 19 years of age when he was made professor of philosophy in the university of Bourges; and he spent the two following years in studying the ancient philosophers and mathematicians. In 1604, when Morel, professor of Greek at Paris, published The Works of Chryfotom, some part of Petavius's labours on Syenestus were added to them: from the title of which we learn, that he then took the name of Petus, which he afterwards changed into Petavius. His own edition of The Works of Syenestus did not appear till 1612.

He entered into the society of the Jesuits in 1605, and did great credit to it by his vast and profound erudition. He became a zealous advocate for the church of Rome; and there was no way of serving it more agreeable to him than that of criticizing and abusing its adversaries. He was most bitter against Scaliger; nor did he even spare his friend Casaubon whenever he came in his way.—Petavius excelled particularly in the dark science of chronology; the learned world in general being obliged to him for some exact and nice disquisitions on this subject. His chief work, which is in great repute to this day, he intitled, Rationarum Temporum. It is an abridgment of universal history, from the earliest times to 1632, in chronological order, with references to proper authorities. It was improved and several additions made to it, by Perizonius, and others after his death. This eminent father, after a very laborious life, died at Paris in the end of the
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Petcheli

Peters.

... greedily devour, notwithstanding filth and all the inconveniences resulting from low, damp, and crowded lodgings, where all the individuals of the same family are, as it were, heaped one upon another, the plague never makes its appearance: in Petcheli; and the people are seldom attacked by any of those epidemical distempers which are so common in Europe. daily. Providences of every kind may be kept at Peking a long while, without being subject to corruption. Rains are there fresh even in May, apples and pears till midsummer; wild boars, fads, deer, redbucks, rabbits, hare, pheasants, ducks, geese, and all kinds of game brought from Tartary to Peking after the commencement of winter, fish of every species, transported from the rivers of Leutong—will keep without the assistance of salt, in their state of congelation, for two or three months, although they are exposed every day in the markets, carried from the markets to private houses, and from private houses brought back to the markets until they are all sold, which does not happen before the end of March. It is certain, that these facts announce an antiseptic quality in the air, which must undoubtedly proceed from the great quantity of nitre contained in it.

And daily, the earth which forms the soil of Petcheli abounds no less with nitre; whole fields may be seen in the neighborhood of Peking which are covered with it. Every morning at sunrife the country in certain canons appears as white as if sprinkled by a gentle fall of snow. If a quantity of this substance be swept together, a great deal of kien, nitre, and salt, may be extracted from it. The chineses pretend, that this salt may be substituted for common salt; however this may be, it is certain, that, in the extremity of the province towards Suin-hoa-fon, poor people and the greater part of the peasants make use of no other. With regard to the kien procured from the earth, they use it for washing linen, as we do soap. Although the land of Petcheli is replete with nitrous particles, it does not, however, form dry deposits; it is cultivated with care, and becomes fruitful by incessant labour. The earth is frozen in winter to the depth of two or three feet, and does not become soft before the end of March. This may sufficiently explain why the fruit kills plants in the neighborhood of Peking, which Mr. Linnaeus raised in Sweden, although it is 20 degrees farther north than the capital of the Chinesse empire.

PETECHIA, in medicine, a name given to those spots, whether red or of any other colour, which appear in the malignant fevers.

PETELIA. See STRONGOLI.

PETER (St), the apostle, born at Bethsaida, was son of John, Jona, or Joanna, and brother of St Andrew (John i. 42, 43). His first name was Simon or Simeon: but when our Saviour called him to the apostleship, he changed his name into Cephas, that is, Peter. He was a married man; and had his house, his mother-in-law, and his wife, at Capernaum, upon the lake of Genesareth (Mark i. 29, Mat. viii. 14, Luke iv. 38.) St Andrew, having been first called by Jesus Christ, met his brother Simon, and told him (John i. 41.) we have found the Messiah, and then brought him to Jesus. Jesus beholding him, said to him, thou art Simon son of Jona; henceforth thou shalt be called Cephas, that is, stone or rock. After having passed one day with our Saviour, they returned to their ordinary occupation, which was fishing. Yet it is thought they were present with him at the marriage of Cana in Galilee. This happened in the 30th year of the vulgar Christian era.

Towards the end of the same year, Jesus Christ being on the shore of the lake of Genezareth, saw Peter and Andrew busy about their fishery, and washing their nets (Luke v. 1, 2, 3.) He entered into their boat, and bid Peter throw out his nets into the sea, in order to fill. Peter obeyed him, though he had already filled the whole night without catching anything. They took so many fishes at this draught, that their own vessels, and that of James and John sons of Zebedee, were filled with them. Then Peter threw himself at the feet of Jesus, and said to him, Depart from me, Lord, for I am a sinner. Then Jesus said to them, Follow me, and I will make you fishers of men. He said the same thing to James and John; and immediately they quitted their boats and nets, and followed our Saviour.

Some time after, Jesus coming to Capernaum entered into the house of St Peter, where his mother-in-law lay sick of a fever. He immediately healed her, and the began to minister to him (Luke iv. 38, and Mat. viii. 14.) A little while before the ascent of the passover of the following year, being the 32d of the vulgar era, after Jesus returned into Galilee, he made choice of twelve apostles, among which St Peter has always the first place (Mat. x. 2. Luke vi. 13.) One night that Jesus Christ walked upon the waters of the lake of Genezareth, St Peter asked him leave to come and meet him (Mat. xiv. 28, 29.) Jesus gave him leave; but he seeing a great wave coming, was afraid, and therefore began to sink. Then Jesus held him up, and said, O man of little faith why wouldest thou fear? Afterwards landing on the other side of the lake, and the multitude that he had fed the day before beyond the lake being come to him at Capernaum, he spoke to them of his body and of his blood which he was to give to his disciples to eat and drink. This fo offended the multitude, that fever 1 of them quitted him thereupon. He therefore asked his apostles if they also would leave him; to which Peter replied, To whom shall we go, Lord? for thou hast the words of eternal life (John vi. 53, 54, &c.) One day, as our Saviour was near Cafarea Philippi, he asked his apostles whom the world took him for? they answered, that some said he was John the Baptist; others, Elias; and others Jeremiah, or one of the prophets. But whom do ye say I am? says Jesus Christ. Simon Peter answered, Thou art Christ, the son of the living God. Jesus then said unto Peter, Blessed art thou, Simon Barjona; for flesh and blood hath not revealed it unto thee, but my Father which is in heaven (Mat. xvi. 13, 14, &c.) And I say unto thee, that, as thou art Peter, so upon this rock will I build my church, and the gates of hell shall not prevail against it; and I will give unto thee the keys of the kingdom of heaven, and whatsoever thou shalt bind on earth shall be bound in heaven, and whatsoever thou shalt loose upon earth shall be loosed in heaven. About six eight days after this, our Saviour taking Peter, James, and John, up
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up a high mountain, apart from the other disciples, showed them a glimpse of his glory, and was transfigured before them (Mat. xvii. 1, 2, &c. and Luke ix. 28.) Whereupon Peter, seeing Moses and Elias, together with Jesus, cried out to them in an ecstasy, Lord, it is good for us to be here! if you please, we will make three tents; one for you, one for Moses, and one for Elias.

Jesus, returning thence to Capernaum, showed that gathered the tribute money came to Peter, and said, Does not your matter pay tribute? Whereupon Jesus ordered Peter to throw his line into the sea, and that he should find wherewith to pay the toll for them two in the mouth of the first fish he should take. Peter obeyed; and finding a piece of money in the mouth of the fish, he gave it to the tribute-gatherers, as he was directed. One day, as Jesus was discourse concerning the forgiveness of injuries (Mat. xix. 13-15), St Peter asked him how often they must forgive, and whether it was sufficient to pardon an offender seven times? Jesus told him, I say, you must pardon not only as far as seven times, but even seventy times seven. Upon another occasion (Mat. xix. 27, 28.), as our Saviour was speaking of the danger of riches, Peter said to him, Lord, we have left all to follow you. Jesus answered him, Tell you in truth, that you who have left all things to follow me shall receive an hundred fold even in this world, and in the other eternal life; and at the last day when the son of man shall come to judge the world, you shall sit upon twelve thrones to judge the twelve tribes of Israel.

On the Thursday before our Saviour's passion, Peter showed him the fig-tree he had cursed the evening before, which was now dried up and withered (Mark xi. 21-23); and the day following, as they sat upon the mountain of Olives, he, with the other apostles, asked Jesus when the temple was to be destroyed (Mat. xxiv. 1, 2, &c. Mark xiii. 1, 2, &c. Luke xiv.) On Thursday he was sent with St John to prepare all things for the passover; and at evening, when Jesus was come into the city with his apostles, and being set down at table, began to speak of him that should betray him, Peter made signs to John to ask him who this should be (John xiii. 24). After supper, the disciples entered into a dispute which should be the greatest among them: whereupon Jesus Christ, laying aside his garments bestowed himself to wash their feet, to give them an example of humility in his own person. St Peter at first made some difficulty, and would not suffer his master to wash his feet: but Jesus telling him, that if he did not wash his feet, he could have no part in him; St Peter replied, Lord, wash not only my feet, but my hands and head also (John xiii. 6-10).

Some time after, Jesus said to him (Luke xxii. 31, 32, &c.), Peter, Satan has desired to lift you as a man's head; but I have prayed for you, that your faith may not fail: and when you are converted, confirm your brethren. By this he warned St Peter of his fall, that was just at hand, and of his renouncing him; from which, by the affliction of God, he was afterwards to recover. St Peter then asked him, where he was going? and said, he was ready to follow him everywhere, not only to prison, but to death itself. But Christ declared to him, that he would be far from following him to death that he would abjure him three times that very night before the cock should crow, or before break of day. When supper was ended, he went to the garden of olives, where, taking Peter, James, and John, he went with them apart, that they might be witnesses of his agony. Peter, though before he had flowed to much resolution, yet fell asleep with the rest; which occasioned Jesus to say to him, Do you sleep, Simon? Could not you watch with me one hour? (Mark iv. 37. Mat. xxvi. 40, &c.)

Judas being come with the soldiers to seize Jesus, Peter drew his sword, and cut off the right ear of one called Malchus, who was servant to the high priest: but Jesus bid him put up his sword into the scabbard; and told him, that all those that fought with the sword should perish by the sword; and at the same time healed Malchus's ear (John xviii. 10, &c.). Peter followed Jesus afar off, as far as the house of Caiphas, and was let in by means of another disciple who was known in the family. The soldiers and servants that had brought Jesus, having lighted a fire in the middle of the hall, Peter mingled among them to warm himself; when a maid servant, having looked earnestly upon him, said, Surely this man was with Jesus of Nazareth. But Peter made answer, I know not what you say, for I do not so much as know the man. Presently after he went out into the porch, when immediately the cock crew. A little while after another maid said to those that were present, This man was with Jesus of Nazareth. But Peter denied it with an oath. About an hour after one of the company affirmed that Peter was a disciple of Jesus. Others insisted upon the same thing; and said, that surely he was one of them, for his very speech betrayed him to be a Galilean. Lastly, one of them, being a kinsman of Malchus whose ear Peter had cut off, affirmed the same thing; and asked him, Did not I see you with him in the garden? Peter again denied it with an oath, protesting that he did not know the man. And at the same time the cock crowed the second time. Then Jesus, being in the same hall, and not far from Peter, looked upon him; and Peter then remembering what Jesus had said to him, that before cock-crow he should deny him thrice, went out of Caiphas's house, and wept bitterly (Mat xxvi. 73, 75. Mark xiv. 34, 72.).

Very probably he remained in secret, and in tears, all the time of our Saviour's passion, that is, all Friday and Saturday following; but on Sunday morning, Jesus being risen, and Mary having been at the tomb, and not finding the body of Jesus, she came in haste into the city, to tell Peter and John that they had taken away their master, and that she could not find where they had put him. Peter and John made haste thither, and John coming first, did not go into the sepulchre. Peter then coming up to him, presently flopped down, and faw the linen clothes wherein the body had been wrapped. He went then into the sepulchre, and John with him; after which they returned to Jerusalem, not knowing what had come to pass. But soon after Jesus appeared to the holy women who had come first to the sepulchre, and bid them give his apostles notice of his resurrection. And the same day Ff
Some days after St Peter being returned into Galilee as Jesus had commanded him, and going to fish in the sea of Galilee, or in the lake of Gennefaath, with some other of the apostles, Jesus appeared to them on the shore, and bid them throw out their nets on the right side of the vessel. They threw them out, and took such a multitude of fishes that they could not draw up their nets again. Then St John said to Peter, It is the Lord, Peter immediately girded himself, for he was naked, and swimming to shore he came to Jesus: then drawing their nets to shore, Jesus dined with them. After dinner, Jesus said to Peter, Simon, son of Jonas, do you love me more than these? He answered, Yea, Lord, you know that I love you. Jesus said to him, Then feed my lambs. He put the same question to him again; and Peter making the same answer, our Lord said to him again, Feed my sheep. This he repeated a third time; at which St Peter was troubled, and said, You know, Lord, that I love you. Jesus replied to him, If you love me, follow me. I tell you for a truth, that when you were young, you girded yourself and went where you pleased; but now you are old, another shall gird you, and lead you where you would not go.” This he said to let him know what death he was to die. At the same time, Peter seeing St John the Evangelist, said to our Saviour, Lord, what must become of him? Jesus answered, If I will that he tarry till I come, what does that concern you; Do you follow me.” Thus he refused to declare in what manner St John should end his life.

After that Jesus Christ had ascended into heaven, and that the apostles had been witness of his ascension they returned to Jerusalem, to wait there for the Holy Ghost, whom our Saviour had promised to send them; and being assembled together in a house, they continued there in prayer, and in the union of charity, till the time that the Holy Ghost descended upon them, in the form of tongues of fire. During this interval, St Peter propounded to the apostles, and to the rest of the assembly to fill up the place that the traitor Judas had left vacant in the apostleship. The proposal was agreed to by all; and two persons were propounded, Joseph Barsabas and Matthias: upon this last the lot fell; and from that time he was admitted one of the apostles. The tenth day after the ascension of our Saviour, being the day of Pentecost, the Holy Ghost having descended upon the apostles, and upon all the faithful that were assembled with them, and having replenished them with supernatural gifts, and especially with the gift of tongues, all those who were witnesses of this miracle expressed their admiration at it; and there being upon that day in Jerusalem a great many Jews from several provinces of the earth, they could not comprehend by what means these men, who were Galileans, should speak the languages of all these pagan nations (Acts ii. 1, 2, &c.). Some of them said, that the apostles were full of new wine. But St Peter standing up, told them, that what they heard and saw was not the effect of drunkenness, but was the completion of the promise that the Holy Ghost had made by the prophet Joel (ii. 28.), to send his spirit upon all flesh, and to give the spirit of prophecy to young and old, to men and women. He afterwards spake to them of Jesus Christ, and told them that he was the true Messiah, that he was risen from the dead as the scripture had foretold he should; declaring that himself and the other apostles were witnesses of his resurrection; of his ascension into heaven, and of the filling of the Holy Ghost, the visible effects of which they saw with their own eyes in the gifts of languages wherewith they had been replenished.

Then those that heard him were touched with compassion, and asked the apostles, Brethren, what shall we do? Peter answered them, Repent and be baptized, and you shall receive the Holy Ghost. Then he instructed them, baptized them, and that very day three thousand persons were added to the church (Acts iii. 1, 2, &c.). Some days after, St Peter and John, going to the temple at the hour of prayers, met at a gate of the temple a man who had been lame from his birth, so that he was carried about. This man seeing Peter and John, asked alms of them: upon which Peter said to him, Silver or gold I have not; but such as I have I give thee; in the name of Jesus of Nazareth, rise up and walk. Presently the man got up, and went into the temple along with them; lifting up his voice and glorifying God. He held St Peter, telling the people that assembled all that happened unto him. Then Peter, taking this occasion, told the people, that it was not by his own power that he had performed the miracle they so much wondered at, but that it was by the power of Jesus Christ that this man was healed. He then laid before them the great crime they had committed, in putting Jesus Christ to death, who was the Saviour of the world, and of the Messiah; and after he had shown them by all the prophecies that Christ was to die thus, he exhorted them to repentance, and to make a proper use of the death of Christ.

He was thus speaking to the people, when the priests and Sadducees coming upon them, laid hold on Peter and John, and put them in prison, until the day following, it being now late (Acts iv. 1, 2, &c.) But the number of those that were converted this day at the second preaching of St Peter was about five thousand. The day following, the rulers, magistrates, and chief priests being assembled on this occasion, ordered the apostles to be brought before them: and then asked them, by whose authority they performed the miracle of healing the lame man? St Peter answered, that it was in the name of Jesus of Nazareth, whom they had crucified, and whom God raised again from the dead. The assembly were surprised at the boldness of the apostles upon this occasion: but came to a resolution to dismay them, charging them at the same time to teach no more in the name of Jesus; and threatening them if they should persist in disobedience to their orders. The two apostles returned to their brethren, and related to them all that had passed; which having heard, the brethren raised their voices to heaven, begging God to give them strength and courage to declare his word with perfect liberty; and having finished their prayers, the place shook where they were assembled, and they were again filled with the Holy Ghost.

At this time many of the faithful fold their estates, and brought the money to the apostles (id. v. 1, 2, &c.) Of this number was a man called Ananias, with his
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By a private agreement between themselves, Sapphira, who had concealed a part of the money for which they had sold their land, and brought the rest, to St Peter, it was the whole sum. Ananias came first; and St Peter said to him, Ananias, how came Satan to seduce you, and to prevail with you to lie to the Holy Ghost, by concealing part of the price of your land? It is not men that you thought to impose on, but God. Immediately Ananias fell down dead, and carried him out and buried him. About three hours after his wife Sapphira came in, and St Peter said to her almost the same things he had before said to her husband, and immediately the fell down also, and gave up the ghost. This affured a great awe into the whole church, and amongst all those that heard of it. (See Acts v.)

The number of believers considerably increased every day; so that they even brought out the sick into the streets, and laid them where Peter was to pass, that at least his shadow might cover some of them, by which means they were healed of their distempers. Then the high-priest and his associates, that is, the Pharisees, caused the apostles to be apprehended and put into prison. But an angel brought them forth, and bid them go into the temple, and there boldly declare all the words of life which God had taught them. This they performed; upon which the princes and priests caused them to be brought before them; and having demanded why they had disobeyed their orders, in continuing to speak in the name of Jesus Christ, Peter and the apostles answered, that it was more necessary to obey God than man. This answer provoked them very much, and they were going to condemn them to death, when Gamaliel prevailed with them to change their resolution, by representing to them, that if this matter proceeded from God, every one of them, by which means they were healed of their distempers. Then the faithful of these provinces. From thence he went to Rome, in the 42d year of the Christian era; and it is thought that at his leaving Antioch he there fixed St Ignatius in his place. Eusebius thinks, that the chief occasion of his going to Rome was to oppose Simon Magnus, who by his deceits had perverted a great number of persons. However, the presence of St Peter, and the true miracles that he opposed to the tricks
of Simon, ruined, or much diminished, the reputation of this impostor.

St Peter, leaving Rome, came to Jerusalem at the passover, in the 44th year of the Christian era, when Herod Agrippa began to persecute the church. That prince put St James the Greater, brother of John, to the sword (Acts xii. 1, &c.) and perceiving that his death was agreeable to the Jews, he moreover caused Peter to be apprehended and put in prison, with a design of executing him publicly after the passover. But the very night that Herod thought of putting him to death, as Peter, loaded with chains, was asleep between two soldiers, the angel of the Lord awakened him, broke of his chains, opened the prison door and brought him out the length of a street. Then the angel leaving him, he came to the house of Mary the mother of John, where many of the faithful were assembled at prayers; and having knocked at the door, a damsel named Rhoda came to open it; but when the heard Peter's voice, instead of opening the door, she ran in a transport of joy to acquaint the family that Peter was at the door. Tho' that heard she could not believe it, and said, it was his angel, and not himself: but continuing to knock, and being let in, he informed them of what had happened to him.

He then left Jerusalem; but we are not told what became of him till the time of the council held at Jerusalem in the year 51. It is thought that before this time he made his second journey to Rome, from whence he wrote his first epistle.

St Peter was obliged to leave Rome in the year 51 by order of the emperor Claudius, who had banished all Jews from thence because of the tumults they continually raised there, excited by one Chrestus, as Suetonius says, meaning probably by this name Jesus Christ. The apostle then returned to Judea, where he held the council of Jerusalem; in which, after a strict examination of the matter proposed to Peter and the apostles, he spoke to them with much wisdom, saying (Acts xx. 7, 8, &c.), that God having given his Holy Ghost and the gift of faith to the Gentiles as well as to the Jews, they ought not to impose the yoke of the legal observances on the new converts, which (as he says) neither we nor our fathers have been able to bear. But we believe, that it is through the grace of Jesus Christ that both we and they shall be saved. St James the Less, bishop of Jerusalem, seconded this opinion of St Peter; and the council came to this conclusion, that no new obligation should be imposed on the Gentiles, but only that they should be required to abstain from fornication, from the use of blood, and from meats offered to idols. The resolution of this council was written to the faithful of Antioch, because it was there this question was first flourished.

Some time after, St Peter coming to Antioch (Gal. ii. 11, &c.), he eat and drank with the Gentiles, without regarding that distinction of meats enjoined by the law. But after that, when some of the faithful of Jerusalem came to Antioch, being converted Jews, St Peter, out of fear to offend them, separated himself from the converted Gentiles, and would no longer eat with them as before. St Paul, fearing that what St Peter did might be interpreted as if he had a desire to oblige the Gentiles to judaize, and to submit themselves to the yoke of the law, and so to revoke and annul what he himself had determined in the council of Jerusalem, he withstood Peter to his face, and openly expostulated with him, telling him, he was much in the wrong to endeavour to oblige the Gentiles, at least tacitly by his own manner of acting, to live as the Jews do; and St Peter received this reprehension with silence and humility.

The particulars of St Peter's life are little known from the 51st year of the vulgar era, in which the council of Jerusalem was held, till his last journey to Rome, which was some time before his death. Then being acquainted by revelation that the time of his death was not far off (2 Pet. i. 14.), he had a mind to write to the faithful that had been converted by him, to put them in mind of the truths he had before taught them. He sent them therefore his second epistle.

St Peter and St Paul came to Rome about the same time, in the year of Christ 65, where they performed many miracles, and made many converts. Simon Magus by his tricks continued here to deceive the people, pretending himself to be the Messiah, and attempting to ascend into heaven: for having caused himself to be carried up into the air by his demons, in a fiery chariot, St Peter and St Paul betook themselves to their prayers; and then the impostor, being for­ taken by his demons, fell down upon the ground, which fell some time afterwards occasioned his death.

See Simon Magus.

Soon after this, St Peter was taken up and thrown into prison, where it is said he continued for nine months; at last he was crucified at Rome in the Via Oliva; with his head downwards, as he himself had desired of his executioners. This he did out of a sense of humility, for fear it should be thought, as St Am­ brose says, that he affected the glory of Jesus Christ, and the more to augment the pain of his execution.

It is said, that the body of St Peter was at first buried in the catacombs, two miles from Rome, from whence it was afterwards transported to the Vatican, where it has lain ever since. His festival is celebrated on the 29th of June. St Peter died in the 66th year of the vulgar era, after having been bishop of Rome for about 24 or 25 years. His age might be about 74 or 75 years. It is generally agreed, that St Linus was his successor. The following is the portraiture that Nicephorus gives us of Peter, which he has probably taken from the ancient pictures that were preferred of this apostle. He was not fat, but pretty tall and upright, having a countenance. The hair of his head was thick, frizzled, and not long. His eyes were black, and blood-shot; his eye-brows protruberant and lofty; his nose something long, and rather flat than sharp.

The two epistles of St Peter are addressed to those Jewish converts who were scattered throughout Pontus, Galatia, &c., not only upon the persecution raised at Jerusalem, but upon former dispersions of the Jews, into those places on several other occasions. The first epistle is principally designed to comfort and confirm them under those fiery trials and manifold temptations they were then subject to, and to direct and in­ struct them how to behave in the several states and relations both of the civil and the Christian life, that
they might not be engaged in those rebellions against Cæsar and his officers, then somented among the Jews; and that they might stop the mouths of those who spoke against them as evil doers. In the second epistle, he prosecutes the same subject, to prevent their apostacy from the faith, on account of any perfections they were liable to. He likewise guards them against the corrupt principles of the gnostics, and those who scoffed at the promulg of Christ's coming, as it would never be verified.

St Peter's style, says a modern author, expresses the noble vehemence and fervour of his spirit, the full knowledge he had of Christiannity, and the strong assurance he had of the truth and certainty of his doctrine: and he writes with the authority of the first man in the college of the apostles. He writes with that quickness and rapidity of style, with that noble neglect of some of the formal consequences and niceties of grammar, still preferring its true reason, and natural analogy (which are always marks of a sublime genius), that you can scarce perceive the pauses of his discourse and disjunction of his periods. The great Joseph Scaliger calls St Peter's first epistle majestic; and we hope he was more judicious than to exclude the second, though he did not name it.

A noble majesty, and becoming freedom, is what distinguishes St Peter; a devout and judicious person cannot read him without solemn attention and awful concern. The conflagration of this lower world, and future judgment of angels and men, in the third chapter of the second, is described in such strong and terrible terms, such awful circumstances, that in the description we see the planetary heavens and this our earth wrapped up with devouring flames, hear the groans of an expiring world, and the cruelties of nature tumbling into universal ruin.

The authority of this second epistle of St Peter was for some time doubted of, as Origen, EuthUS, St Jerome, and others have observed. What made the ancients call it in question, is the difference of its style from the first. The third chapter, which describes the catastrophe of the visible world, made Grotius think this epistle was written after the taking of Jerusalem; because that was not to happen till after the destruction of that city; upon which he conjectures, that Simeon bishop of Jerusalem is the author of this epistle, and that the inscription which carries St Peter's name is corrupted. But the best critics admit this epistle to be the genuine work of St Peter, who discovers himself, where he says that he was present at our Lord's transfiguration; and where he tells the Jews, this was the second letter he had written to them. The reader may see this question fully discussed, and the authority of this epistle established beyond all doubt, by the learned Dr Sherlock, in his Dissertation on the authority of the Second Epistle of St Peter.

St Peter has not been the author of several books; such were his Acts, his Gospel, his Revelation, his work about preaching, and another about judgment. There is extant a large history of St Peter, called the Recognitions, attributed to St Clement.

Peter of Blois, a learned man of the 12th century, was born about the year 1120, at the city of Blois in France, from whence he derived his name. His parents being opulent gave him a learned education. In his youth, when he studied in the university of Paris, he was excessively fond of poetry; and when he was a little further advanced in life, he became no less fond of rhetoric, to the study of which he applied with the greatest ardour. From Paris he removed to Bononia in Italy, to acquire the civil and canon law; in the knowledge of both which he very much excelled. He appears from his writings to have cultivated medicine, and several branches of the mathematics, with no little care and success. The study of theology was the chief delight and business of his life, in which he spent the greatest part of his time, and made the greatest progress. But unfortunately it was that scholastic theology, which confuted in vain attempts to prove and explain the many absurd opinions which then prevailed in the church, by the subtleties of Aristotelian logic. In attempting to explain in this manner the most absurd of all opinions that ever existed amongst mankind, he was said to be the first person who employed the famous word transferred classification, which was soon after adopted by the church of Rome, and hath ever since made so great a noise, though others contend that it was used in the fourth and fifth centuries. Being appointed preceptor to William II. king of Sicily in 1167, he obtained the custody of the privy seal; and, next to the archbishop of Palermo, the prime minister, had the greatest influence in all affairs. But his power was not of long duration; for the archbishop being banished in 1168, our author soon after left the court of Sicily, and returned into France. He was not long, however, without a royal patron, being invited into England by Henry II. who employed him as his private secretary, made him archdeacon of Bath, and gave him some other benefits. When he had spent a few years at court, he conceived a disgust at that way of life (of which he hath drawn a very unpleasing picture in one of his letters), and retired into the family of Richard archbishop of Canterbury, who had made him his chancellor about the year 1176. In this station he continued to the death of the archbishop in 1183, enjoying the highest degree of favour with that prelate. Our author remained in the same station in the family of archbishop Baldwin, who succeeded Richard, acting both as his secretary and chancellor. He was also sent by that prelate on an embassy to Rome in 1187, to plead his cause before Pope Urban III. in the famous controversy between him and the monks of Canterbury about the church of Hackington. After the departure of his friend and patron Baldwin for the Holy Land in 1190, our author was involved in various troubles in his old age, the causes of which are not distinctly known; and died about the end of the 13th century. He appears from his works, which may be justly reckoned among the most valuable monuments of the age in which he flourished, to have been a man of sound judgment, and sincere piety, as well as of a lively inventive genius and uncommon erudition. His printed works consist of 134 letters, which he collected together at the desire of Henry II.; of 65 sermons, delivered on various occasions; and of 17 tracts on different subjects.
Peter, afterwards emperor, of Russia, founder of the Russian empire; for though the country was well known, and of great antiquity, yet it had no extent of power, of political influence, or of general commerce, in Europe, till his time. He was born in 1672; and was proclaimed czar when but ten years of age, in exclusion of John his elder brother, who, being of a fickle constitution, was at the same time very weak in his understanding. The princes Sophia, his half-sister, made an insurrection in favour of John: and to put an end to the civil war, it was at last agreed that the two brothers should jointly share the imperial dignity, Peter had been very ill brought up, not only through the general defects of the Russian education, but like-wis through the arts of the princes Sophia, who surrounded him with every thing that might sully his natural desire of knowledge, deprave his mind, and enervate it with pleasure. Notwithstanding this, his inclination for military exercise discovered itself in his tenderest years. He formed a company of 50 men, commanded by foreign officers, clothed and exercised after the German manner. He entered himself into the lowest part, that of a drummer; and never rose otherwise than as a soldier of fortune. Herein his design was to teach his nobility, that merit, not birth was the only title to military employments. He re-inforced his company with several others, till at last he had got together a considerable body of soldiers. As he then had no war on his hands, he exercised them in all sorts of mock-engagements, and by this means fecured to himself a body of well-disciplined troops. The fight of a Dutch vessel, which he had met with on a lake belonging to one of his pleasure-houses, made such an impression on his mind, that he conceived the almo impracticable design of forming a navy. His first care was to get some Hollander to build some small vessels at Moscou; and he paid two successive sums on board English or Dutch ships, which set out from Archangel, that he might instruct himself in every branch of naval affairs (a). In 1696 czar John died, and Peter was now sole master of the empire. In 1698 he sent an embassy to Holland; and went in群岛 in the retinue, and visited England as well as Holland in order to inform himself fully in the art of ship-building. At Amsterdam he worked in the yard as a private ship-carpenter, under the name of Peter Michaelof; but he has been often heard to say, that if he had never gone to England, he had still remained ignorant of that art. In 1700 he had got together a body of standing forces, consisting of 50,000 foot; and now the vast project he had formed displayed itself in all its parts. He opened his dominions, which till then had been shut up, first having sent the chief nobility of his empire into foreign countries to improve themselves in knowledge and learning. He invited into Russia all the foreigners he could meet with, who were capable of instructing his subjects in any manner, and offered them great encouragement to settle in his dominions. This raised many discontent; and the despotic authority he exerted on that occasion was fiercely powerful enough to suppress them. In 1700, being strengthened by the alliance of Augustus king of Poland, he made war on Charles XII. king of Sweden. His first ill success did not deter him; for he used to say, I know that my armies must be overcome for a great while; but even this will at last teach them to conquer. He afterwards gained considerable advantages; and founded Peterburg in 1703. In 1709 he gained a complete victory over the Swedes at Pultowa. In 1712 he was inclosed by the Turks on the banks of the Pruth; and seemed inevitably lost, had not the czarina Catharine bribed the grand vizir, and the czar's prudence completed his deliverance. In 1716 he made a tour through Germany and Holland, and visited the royal academy of sciences at Paris. It would be endless to enumerate all the various establishments for which the Russians are obliged to him. He formed an army according to the manner of the politest and most experienced nations: he fitted out fleets in all the four seas which border upon Russia; he caused many strong fortresses to be raised after the best plans; and made convenient harbours: he introduced arts and sciences into his dominions, and freed religion from many superfluous abuses: he made laws, built cities, cut canals, &c.; was generous in rewarding, impartial in punishing; faithful, laborious, and humble; yet was not free from a certain roughness of temper natural to his nation. He had indeed cured himself of excess in drinking; but he has been branded with several other vices, particularly cruelty. He published the unfortunate history of his son Prince Alexis (b); towards whom some blame his severity, while others think

(a) The following circumstance, it is said, in some measure determined Peter to attempt these reformations which he afterwards accomplished. Great events have been sometimes the effect of little causes: and it is at least possible that without the occurrence we are going to relate, Russia might still have been in a state of barbarism. A young Genevefe, called Le Fort, about 1695, went to Moscou with the Danish ambassador. The czar Peter, who was then 19 years old, fell into company with this Genevefe, who had soon learnt the Russian tongue, and spoke almost all the tongues of Europe. Le Fort ingratiated himself with the prince, entered into his service, and soon afterwards into his familiarity. He made him comprehend that there was a different manner of living and reigning from what he had unhappily obtained throughout his vall and miserable empire. A prince must be born with an uncommon greatness of soul to be then readily to a stranger, and to be able to divest himself of the prejudices of a theocracies and of his country. The czar was sensible that neither himself nor his people were yet to be reckoned among men; and that he had an empire to form, but could have no asistance at home. From that time he took a resolution to leave his dominions; and set out, like another Prometheus, to borrow celestial fire for animating his countrymen.

(b) Alexis, like his father, is said to have married a slave, and, like him, quitied Moscovy secretly, but had not the same success in his undertakings; and the being but a bad imitator of his father, coil him his life. He became an example of the most terrible severity that ever was given from the tribunal of the throne: but, what is
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think it no more then was necessary. He perfectly knew the honours due to persons of merit; and not only heaped honours upon them during their life, but gave them marks of esteem even after their death. He died of the iranthropy in 1725, and left the world with the magnanimity of a hero and the piety of a Christian.

Peter was tall of stature, and of a bold and majestic aspect, though sometimes disfigured by convulsions, which altered his features. This deformity was ascribed to poison, given him, as it is said, by his sister Sophia; but it was indeed no other than wine and brandy, which he often drank to excess, relying too much on the strength of his constitution. He converted with persons in all stations, from the mechanic to the general of an army; and his conversation was neither like that of a barbarian who makes no distinction between men, nor of a popular prince who seeks to please all the world, but that of a person who aims at instruction. He loved women as much as the king of Sweden, his rival, dreaded them, and all were equally agreeable to him as well in bed as at board; he valued himself on drinking large draughts, rather than sipping delicious wines. We are told that kings and legislators should never suffer themselves to be transported by passion; but never was any man more passionate than Peter the Great, nor more merciful. In a king this is more than an infirmity for which we make amends by confiding it; but it was generally remarked of Peter, and he himself said to a magistrate of Holland, at his second voyage, "I have reformed my nation, and have not been able to reform myself." It is true, the cruelties with which he is reproached were not novelties at the court of Moscow, any more than at that of Morocco; it was not uncommon to see a czar, with his own royal hand inflict 100 lashes of a bull’s pizzle on the naked shoulders of a prime officer of the crown, or of a lady of the palace, for failing in their duty, by getting drunk; or to try the goodness of his fabric, by trying off the head of a criminal. Peter had himself performed some of those ceremonies of his country; Le

is much to the honour of the empress Catherine, she had no hand in the misfortunes of that prince, who was born of another woman, and loved nothing that his father loved. Catherine was not in the leaf suspected of acting the cruel stepmother. The great crime of the unfortunate Alexis was his being too much a Russian, and his disapproving every thing that was grand and immortal, and projected by his father for the glory of the nation. One day, hearing some Moscovites lamenting the inexpressible fatigue they were to undergo in the building of Peterburg, he said, “Take courage, this city will not stand long.” When he was called to attend his father in a journey of 600, or 700 leagues, which the czar often made, he feigned sickness. He took violent purges for a dilatement which he had not; and such quantities of medicines, with excessive drinking of brandy, impaired his health and his wits. At first he had an inclination to learning, was acquainted with geometry and history, and had learnt the German tongue: but he hated war, and would never learn it; for which he was most reproached by his father. They had married him in 1711 to the princess of Wolfenbuttle, sister of the empress; comfort to Charles VI. This marriage was unfortunate; the princess was often abandoned for a debauch in brandy, and for Afrofina, a Finland wench, of a large nature, well made, and very agreeable. It is reported that the princess died of chagrin, if it be possible for chagrin to prove mortal; and that afterwards the czarowitz secretly espoused Afrofina in 1713, when the empress Catherine had just brought him a brother, at which he had no reason to be uneasy.

The misunderstandings between the father and the son became every day more serious; till at length the father, about the year 1716, threatened the prince to disfigure him; and the prince told him that he intended to go into a monastery.

The czar, in 1717, renewed his journeys, as well with a view to politics as curiosity. He came at last into France. If the son had entertained an inclination to revolt, if he had actually had a party formed in his favour, now was the time to declare himself; but instead of remaining in Russia, making himself popular, and encouraging his dependents, he took a journey in his turn, having with much difficulty Fleaped together some thousands of ducats, which he had secretly borrowed. He threw himself under the protection of the emperor Charles VI, brother of his deceased wife. They kept him for some time incognito at Venice, from whence he passed to Naples, where he resided almost a year, while neither his father nor any person in Russia knew the place of his retreat.

While the son kept himself thus concealed, the father was at Paris, where he was received with all the respect paid him in other places, but with a gallantry nowhere to be found but in France. If he went to visit a manufactory, and one piece of work attracted his sight more than another, he was presented with it the next day. He went to dine at the Duke d'Antin's at Petitbourg, where the first thing he saw was his own picture, at full length, in the same habit that he wore. When he was at the royal mint of medals, they struck all kinds before him, and presented him with; at last they struck one which they let drop on purpose at his feet, and left him to take it up. He there saw himself perfectly engraved with these words, Peter the Great. The reverve was a Fame, and round her in letters Vibe acquisit eundo; an allusion no less than flattering to a prince who really acquired new merit by travelling.

After he had seen this country, where every thing disposes men to gentleness and indulgence, he returned to his own, and returned his severity. He had engaged his son to return from Naples to Peterburg, from whence that young prince was conducted to Moscow before the czar his father; who began with depriving him of his succession to the throne, by making him sign a solemn act of renunciation at the end of January 1718, in consideration of which act the father promised the son to spare his life.
It was not altogether improbable that such an act would have been some time or other annulled. The czar, therefore, in order to give it more force, forgetting that he was a father, and only remembering that he was the founder of an empire, which his son might overturn, and involve in its ancient barbarity, ordered a public process to be drawn up against that unfortunate prince, for some concealment, with which he was charged, in the confection that they had exacted of him.

An assembly was held of the bishops, inferior ecclesiastics, and professors; who found in the Old Testament that those who curst their father or their mother should be put to death; that David indeed had pardoned Absalom who rebelled against him, but that Absalom was never pardoned by God. Such was their opinion, without drawing any conclusion; but it was in effect signing a warrant for his death. Alexis had not in fact curst his father, either had he ever revoluted like Absalom; he had never lain publickly with the king's concubines, but he had left the kingdom without his father's permission, and had written letters to his friends, in which he only signified that he hoped they would one day be mindful of him in Russia. But whatever might be his cafe, of 124 lay judges, who were appointed to sit on him, there was not one that judged his offences less than capital; and those who could not write, made others sign for them. It is reported in Europe that the czar had got translated from Spanish into Russian the criminal process against Don Carlos, that unfortunate prince whom his father Philip II. had confined in a prifon, where the heir of that great monarchy ended his days. But there was nothing like a process carried on against Don Carlos, nor was it ever known whether that prince died a natural or a violent death.

Peter, the most despotick of princes, wanted not an example. Certain it is that the prince died the day after the sentence, and that the czar had at Moscow one of the bleft apothecary shops in Europe. It is probable, however, that the prince Alexis, the heir of the most extensive empire in the world, being condemned unanimously by his father's subjecks, which were one day to be his own, might die of the sudden shock and change given to the body at the apprehension of so strange and difmal a sentence. The father went to fee his fon in his last agonies; and it is said he flied tears, I infernus utcunque feren et fata nepotes. These tears however, did not prevent the wheels from being covered with the broken limbs of his fon's friends. He beheaded his own brother-in-law Count Lapuchin, brother to his wife Ottokofla Lapuchin whom he had divorced, and uncle to prince Alexis. The prince's confecfors had also his head cut off. If Moscovy has been civilized, he has, it must be confessed, paid dear for her politeness.

The remainder of the czar's life was nothing but a series of grand projects, labour, and exploits, that seemed to efface the memory, of his excessive severities, which were perhaps necessary. He made frequent speeches to his court and to his council. In one he told them that he had sacrificed his fon to the welfare of his dominions.
was transferred to the care of his brother Peter.

The czar, satisfied of their sincerity, ordered great search to be made for her, with the offer of a considerable reward to the perfid who should discover what became of her, but to no purpose: the parents and relations, apprehending she was no more, went into mourning for her.

Above a year after she was discovered by an accident. A colonel who had come from the army to see his friends, going a hunting into that wood, and following his game through the morass, he came to the hut, and looking into it saw a pretty young woman in a mean dress. After inquiring of her who she was, and how she came to live in so solitary a place, he found out that at last she was honestly whole disappearance had made so great a noise in the utmost confusion, and with the most ferventéré, she prayed him on her knees that he would not betray her; to which he replied, that he thought her danger was now past, as the czar was then otherwise engaged, and that she might with safety discover herself, at least to her parents, with whom he would consult how matters should be managed. The lady agreed to this proposal; and he set out immediately, and overjoyed her parents with the happy discovery: the issue of their deliberations was to consult Madame Catherine (as she was then called) in what manner the affair should be opened to the czar. The colonel went also upon this busines, and was advised by Madame to come next morning and she would introduce him to his majesty, when he might make the discovery and claim the promised reward. He went according to appointment; and being introduced, told the accident by which he had discovered the lady, and represented his misfortune to the queen; she was tenderly moved on the occasion of his having suffered by being so long shut up in such a dismal place, from the delicacy of her sex. The czar showed a great deal of concern that she should have been the cause of all her sufferings, declaring that he would endeavour to make her amends. Here Madame Catherine suggested, that she thought the best amends his majesty could make, was to give her a handsome fortune and the colonel for a husband, who had the best right, having caught her in pursuit of his game. The czar, agreeing perfectly with Madame Catherine's sentiments, ordered one of his favourites to go with the colonel, and bring the young lady home; where the arrived to the inexpressible joy of her family and relations, who had all been in mourning for her. The marriage was under the direction and at the expense of the czar, who himself gave the bride to the bridegroom, saying, that he presented him with one of the most virtuous of women; and accompanied his declaration with very valuable presents, besides settling on her and her heirs three thousand rubles a-year. This lady lived highly esteemed by the czar, and every one who knew her. Besides the concurring reports of other people, I had the story from her own mouth.

On the whole, that Peter I. was a great man, few

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Peter was well made, and of the middle size. His countenance had not the appearance of an idiot, nor was there anything particular in his form, except that two of the fingers of his left hand were united by a web up to the middle joint. He had a natural ear for music, and was so delighted with it, that if he heard any musical instrument played upon him, he would immediately dance and caper about till he was almost quite exhausted with fatigue: and though he could never be taught the difficult utterance of any word, yet he could easily learn to hum a tune. All those idle tales which have been published to the world about his climbing up trees like a squirrel, running upon all fours like a wild bea
t, &c. are entirely without foundation; for he was so exceedingly timid and gentle in his nature, that he would suffer himself to be seized by a child. There have been also many false stories propagated of his incontinence; but, from the minute inquiries among those who constantly lived with him, it does not appear that he ever discovered any natural passion for women, though he was subject to the other passions of human nature, such as anger, joy, &c. Upon the approach of bad weather he always appeared ill and uneasy. At particular feasons of the year he showed a strange fondness for stealing away into the woods, where he would feed eagerly upon leaves, beechnut, acorns, and the green bark of trees, which proves evidently that he had cultivated in that manner for a considerable length of time before he was first taken. His keeper therefore at such seasons generally kept a look after him, and sometimes even confined him, because if he ever rambled to any distance from his home he could not find his way back again; and once in particular, having gone beyond his knowledge, he wandered as far as Norfolk, where he was taken up, and being carried before a magistrate, was committed to the house of correction in Norwich, and punished as a sturdy and obdurate vagrant, who would not (for indeed he could not) give any account of himself: but Mr. Fenn, having advertised him in the public papers, he was released from his confinement and brought back to his usual place of abode.

Notwithstanding the extraordinary and savage state in which Peter was first found, greatly excited the attention and curiosity of the public; but, after all that has been said of him, he was certainly nothing more than a common idiot without the appearance of one. But as men of some eminence in the literary world have in their works published strange opinions and ill-founded conjectures about him, which may seem to stamp a credit upon what they have advanced; that perversity may not through their authority be hereafter misled upon the subject, this short and true account of Peter is recorded in the parish-register by one who constantly resided above 30 years in his neighbourhood, and had daily opportunities of seeing and observing him."

Perhaps it may not be disagreeable to our readers if we present them with Lord Monboddo's account of this extraordinary creature (A). "It was in the beginning of June 1782 (says his Lordship) that I saw him in a farm-house called Broadway, within about a mile of Berkhamsted, kept there upon a pension which the king pays. He is but low of stature, not exceeding five feet three inches; and although hemult now be about 70 years of age, has a fresh healthy look. He wears his beard; his face is not at all ugly or disagreeable; and he has a look that may be called feminine and sagacious for a savage. About 20 years ago he was in life tolerable, and to be missing for several days; and once, I was told, he wandered as far as Norfolk; but of late he has been quite tame, and either keeps in the house or saunters about the farm. He has been the 13 last years where he lives at present; and before that he was 12 years with another farmer, whom I saw and conversed with. This farmer told me, that he had been put to school somewhere in Hertfordshire, but had only learned to articulate his own name Peter, and the name of King George, both which I heard him pronounce very distinctly. But the woman of the house where he now is (for the man happened not to be at home) told me, that he understood every thing that was said to him concerning the common affairs of life; and I saw that he readily understood several things that the said to him while I was present. Among other things, she desired him to sing Nancy Dawson; which he did, and another tune which she named. He never was mischievous, but had always that gentleness of nature which I hold to be characteristic of our nature, at least till we became carnivorous, and hunters or warriors. He feeds at present as the farmer and his wife do; but, as I was told by an old woman (one Mrs. Collop, living at a village in the neighbourhood called Hempstead, who remembered to have seen him when he first came to Hertfordshire, which he computed to be 55 years before the time I saw her), he then fed very much upon leaves, and particularly upon the leaves of cabbages, which he eat raw. He was then, as the thought, about 15 years of age, walked upright, but could climb trees like a squirrel. At present he not only eats flesh, but has also got the taste of beer, and even of spirits, of which he inclines to drink more than he can get. And the old farmer abovementioned, with whom he lived 12 years before he came to this last farmer, told me, that he had acquired that taste before he came to him, which is about 25 years ago. He has also become very fond of fire, but has not yet acquired a liking for money; for though he takes it, he does not keep it, but gives it to his landlord or landlady, which I suppose is a lesson that they have taught him.

(A) This eccentric writer, in support of his hypothesis, that man in a state of nature is a mere animal, without clothes, houses, the use of fire, or even speech, adduces the orang-outang, or man in the woods, and this Peter the wild man and others, as examples. He denies the want of the organs of speech as an objection, and infers they only want the artificial use of them.
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him. He retains so much of his natural instinct, that he has a fore-feeling of bad weather, growling and howling, and showing great disorder, before it comes.

"These are the particulars concerning him which I observed myself, or could learn by information from the neighbourhood." From all these facts put together his lordship makes the following observations:

"1st. Whatever doubts there may be concerning the humanity of the orang-outang, it was never made a question but that Peter was a man.

"2dly. That he was, as the Dean [Swift] says, of a father and mother like one of us. This, as I have said, was the case of two savages found in the dismal swamps in Virginia, of the one found in the island of Diego Garcia, and of him that was discovered by M. le Roy in the Pyrenees, and in general of all the savages that have been found in Europe within these last 300 years; for I do not believe, that for these 2000 years past there has been a race of such savages in Europe.

"3dly. I think there can be no reason to doubt of what was written from Hanover, and published in the newspapers, that he was found afoot all fours, as well as other solitary savages that have been found in Europe. It is true that others have been found erect; which was the case of the two found in the dismal swamp of Virginia, like wife of the man of the Pyrenees, and of him in the island of Diego Garcia: but these I suppose were not exposed till they had learned to walk upright; whereas Peter appears to have been abandoned by his parents before he had learned that lesson, but walked as we know children do at first.

"4thly. I think it is evident that he is not an idiot, not only from his appearance, as I have described it, and from his actions, but from all the accounts that we have of him, both those printed and those attain'd by per sons yet living; for as to the printed accounts, there is not the least information of that kind in any of them, except one, viz. Wye's letter, No 8, wherein is said, that some imputed his not learning to speak to want of understanding; which I should think showed a want of understanding in those who thought so, when it is considered that at this time he had not been a year out of the woods, and I suppose but a month or two under the care of Dr Arbuthnot, who had taken the charge of his education. The Dean indeed tells us, that he suspected he was a pretender, and no genuine wild man, but not a word of his being an idiot. And as to the per sons living, not one with whom I have conversed appeared to have the least suspicion of that kind; though it is natural that men who were not philosophers, and knew nothing of the progress of man from the mere animal to the intellectual creature, nor of the improvement of our understanding by social intercourse and the arts of life, but believed that man when he came to a certain age has from nature all the faculties which we see him exert, and particularly the faculty of speech, should think him an idiot, and wanting even the capacity of acquiring understanding. I knew an officer of dragoons, a man of very good sense, who was quartered where Peter then lived for some months, and saw him almost every day, and who assured me that he was not an idiot, but showed common understanding, which was all that could be expected from one no better educated than he.

"5thly. Lastly, those who have considered what I have said (a) of the difficulty of articulation, will not be surprised that a man who had lived a savage for the first 14 or 15 years of his life, should have made so little progress in that art. I cannot, however, have the least doubt, that if he had been under the care of Mr Braidwood of Edinburgh, he would have learned to speak, though with much more difficulty than a man who had been brought up tame among people who had the use of speech, and who consequently must know the advantage of it. And I can have as little doubt that Mr Braidwood could have taught the orang-outang in Sir Aliston Lever's collection, who learned to articulate a few words, so as to speak plainly enough."

St Peter's Le Port, a market-town of England, in the south-east part of Guernsey, in Hampshire, in the British channel, consisting of only one long and narrow street. The mouth of the harbour is well fit with rocks, and is on each side defended by a castle, one called the old castle, and the other castle corner. The governor of the island generally resides here, who has the command of the garrison in this and all the other castles. The harbour has a good road, from whence ships may fall with any wind, and from the road pass under the guns of the castle to the pier, close up to the town. The pier is a noble work, formed of valet stones, joined together with great art and regularity; it is not only a security to the ships, but, being contiguous to the town, is hallowed paved at the top with large smooth flag-stones, guarded with parapets, and being of a great length and breadth, forms a pleasant walk, affording a fine prospect of the sea and the neighbouring islands. Cormorant-castle, which commands both the town and the harbour, stands on a rock, separated from the land by an arm of the sea, not less than 600 yards wide, and not fordable but at low water in great spring tides.

St Peter's Island, in the lake of Bienne in Switzerland, remarkable for being one of the retreats of Rouffiez; whence it has also got the name of Rouffiez's Island. It lies towards the south side of the lake, and produces a great variety of shrubs and trees, particularly large oaks, beech, and Spanish chestnut. The southern shore slopes gradually to the lake, and is covered with herbage; the remaining borders are steep and rocky; their summits in a few places thinly covered with shrubs; in others their perpendicular sides are clothed to the water's edge with hanging woods. The views from the different parts of the island are beau-

(a) Lord Monboddo, far from thinking speech or articulation natural to man, rather wonders how he can by any teaching or imitation attain to the ready performance of such various and complicated operations. Add to this, when the organs are completely formed to one language, how hard it is to make them answer another.
beautiful and diversified; that to the north being the most extensive and pleasing. It commands the prospect of the lake, which is of an oval form; its cultivated borders, interspersed with villages and cailleys, with the towns of Nidan and Biene standing upon the farther extremity. Agreeable walks are carried through the woods, and terminate in a circular pavilion placed in the centre of the island. Before the bridge, is navigable dancing in the circular pavilion. How

There is a town in Scotland, in the county of Aberdeen, lies about 30 miles north-east of that city. It stands on the most easterly point in Scotland, and from thence due west that kingdom is broadest.

Peterhead is the nearest land to the northern continent of Europe, and lies within 300 miles of the Cape, which is called the Name of Norway. Through this channel the grand body of the herrings pass in their annual migrations from Shetland and the north seas to the more southern latitudes, attended with the all-devouring cod and ling; on which account Peterhead, or as it is sometimes called, Buchanens, hath always been the second port of the Dutch in the Shetland islands. Tradition says that some hundred years ago the Dutch offered Lord Mareschal, then the proprietor of the coast, to cover a small island called Inch-Keith with silver for the property of it to carry on their fisheries, which for obvious reasons could not be accepted. Be that as it may, the Dutch still frequent the coast in July and August, and sometimes 100 sail are seen within the sight of land, busily employed in the herring and white fisheries. The natives, to whom this fishery properly belongs, have lately made some attempts towards the white fishery, of which they are expert and vend chiefly at the London market 4000 barrels of delicate small cod and ling annually. They also fit out some vessels for the Hebridean fishery off Barrahead for the Barcelona market and they claim the merit of having taught the islanders how to take and cure the large fish which abound on their coasts. They have often gained the highest premiums allowed by government for curing white fishes.

Few harbours in Great Britain are of more importance to navigation than this of Peterhead, as in case of violent storms from the easterly points, large vessels embayed betwixt this and the mouth of the Forth have not a port that they can safely take at every time of the tide, that of Aberdeen excepted. If therefore they cannot make their way to sea in the teeth of a strong easterly wind, or dare this headland that they may gain the Murray firth, they must inevitably come
Peterhead, on shore. This harbour lies on a spacious bar, where vessels of any burden may ride in all other winds, and is therefore the general rendezvous of the shipping which frequent the northern seas, where they call anchor on clean ground, and ride safely till the storms have abated. Though nature hath done so much for the benefit of navigation, something is left for the exercise of human art. The harbour can at present contain in perfect safety 40 or 50 sail of vessels drawing 12 feet water, and is capable of being extended so as to admit a greater number of ships drawing 20 feet; by which means not only casual merchantmen but small ships of war with their convoys, would find this a most defensible refuge when pursued by superior force. The harbour is defended by a good battery. A considerable trade is carried on from this place directly to the Baltic for deals, iron, hemp, tar, and other articles. There is also a manufacture of fishing thread, which employs many young girls. A mineral well in the summer-months gives great gouty to the place; its saline virtues have long, and we believe very justly, been celebrated. The waters of this spring are powerfully diuretic, and are thought to be efficacious in removing complaints in the bowels. There are here many elegant houses for the accommodation of strangers. There is also a ball room, under which there are two salt-water baths. These baths are much frequented in nervous disorders; their effect in strengthening the constitution is often surprising. Owing to the open panfluinated situation, the air of this place is peculiarly pure and healthful; even the saggings from the sea are thought to be medicinal: the town is therefore much enlivened by the concourse of company who frequent it on these accounts. Upon the whole, the town is neat and well built, the houses are handsome, and the streets tolerably spacious and very clean; and it has every appearance of a thriving, plentiful, and happy place.

PETERHOFF, in Russia, is situated about 50 miles from Petersburg, and is distinguished for its palace and gardens. The palace was begun by Peter I. and finished by Elizabeth. As it is placed upon an eminence, it commands a most superb view of the island, Peterbourg, the intervening gulf, and the opposite coast of Carelia. The palace is most magnificently furnished, and the saloon of apartments is truly princely. The presence-chamber is richly ornamented with portraits of the sovereigns of the house of Romanoff, who have reigned in Russia since 1613.

"The gardens of Peterhof (says an intelligent traveller) have been celebrated for their taste and elegance; and from the number of jet d’eaux, fountains, basins, cascades, parterres, &c., they have been compared to those of Versailles: and indeed in one respect they are far superior; for the water-works of the Latter only play upon particular occasions, while those of Peterhof are perennial. These gardens, which at the time of their formation were greatly admired in this country, though not congenial to the taste of the emperors, are far from falling in their present state; as during summer her majesty principly resides at Tsarsko-Setl, where the grounds are disposed in a more modern and pleasing manner." A vast number of live dolphins and gilded statues are scattered through them; but the most remarkable figure are those of two gladiators placed in a basin of water. These are represented, not with the sword and buckler, the ancient implements of war, but with a brace of pistols. These they point to each other in a threatening posture, while the water gushes impetuously from the barrel. In that part of the garden which lies between the palace and the gulf, close to the water, is a building which was the favourite retreat of Peter I. It is presented, together with its furniture, entirely in its original state with a kind of religious veneration. Its plainness shows the frugal simplicity in which this monarch was accustomed to live. In the same celebrated gardens there is a remarkable building called the mountain for fedges, and often by travellers the flying mountain. "It stands (says Mr. Cox) in the middle of an oblong area, inclosed by an open colonnade, with a flat roof, which is raised for the convenience of holding spectators. The circumference of this colonnade is at least half a mile. In the middle of the area stands the flying mountain, stretching nearly from one end to the other. It is a wooden building, supported upon pillars, representing an uneven surface of ground, or a mountain composed of three principal rocks, gradually diminishing in height, with an intermediate space to resemble valleys; from top to bottom is a floored way, in which three parallel grooves are formed. It is thus used; a small carriage containing a person being placed in the centre grove upon the highest point, goes with great rapidity down one hill; the velocity which it acquires in its descent carries it up a second; and it continues to move in a similar manner until it arrives at the bottom of the area, where it rolls for a considerable way on the level surface, and stops before it attains the boundary: it is then placed in one of the side grooves, and drawn up by means of a cord fixed to a windlass. To a person unacquainted with the mechanism, this amusement would appear tremendous; but as the grooves always keep the carriage in its right direction, there is not the least danger of being overturned. At the top of the mountain there is a handsome apartment in which the court and principal nobility there is also a room for many thunderspectators within the colonnade and upon its roof. Near the flying mountain is a spacious amphitheatre, in which tournaments are usually exhibited.

PETERS (Father), a Jesuit, was confessor and counsellor to James II. king of England. This prince dethroned him in 1688, because he was considered as the author of those troubles in which the kingdom was then involved. "He was (says Bishop Burnet) the most violent of the king’s advisers, and the person most listened to. Though he had the honour of being nobly defended, he was a man of extensive erudition, and was eminent only for his bigotry and forwardness." Though Burnet is not always to be believed, yet certain it is, from the testimony of other historians, that Father Peters was by no means a person properly qualified to direct King James in the critical situation in which he then found himself.

PETERSBURG (St.), a city of the province of Ingria in Russia, and capital of the whole empire. It is situated in N. Lat. 59°, 26', 25, and E. Long. 25°, 25', from the first meridian of Greenwich. It was founded in the year 1703 by Czar Peter the Great, whose

ambit-
The spot he pitched upon was a low, fenney, uncultivated island, formed by the branches of the river Neva, before they fall into the gulf of Finland. In the summer this island was covered with mud; and in winter became a frozen pool, rendered almost inaccessible by dreary winter. The spot became a frozen pool, rendered almost inaccessible by dreary winter. The spot upon which Peter, the conqueror assembled in Ingria above 300,000 men, Russians, Tartars, Cossacks, Livonians, and others, even from the most distant parts of his empire, and laid the foundation of the citadel and fortifications, which were finished in four months, almost in defiance of nature. He was obliged to open ways through forests, drain bogs, raise dykes, and lay caissons, before he could pretend to found the new city. To workmen were all provided with necessary tools and implements, such as spades, pick-axes, shovels, planks, and wheel-barrows; they were even obliged to fetch the earth from a great distance in the skirts of their garments, or in little bags made of old mats and rags sewed together. They had neither huts nor houses to shelter them from the severity of the weather; the country, which had been desolated by war, could not accommodate such a multitude with provisions; and the supplies by the lake Ladoga were often retarded by contrary winds. In consequence of these hardships, above 100,000 men are said to have perished; nevertheless the work proceeded with incredible vigour and expedition; while Peter, for the security of his workmen, formed a great camp, in such a manner, that his infantry continued in Finland, and his cavalry were quartered in Ingria. Some Swedish cruisers being delayed in the neighbourhood, the Czar posted a body of troops in the Isle of Rutzari, by whom the Swedes were repulsed, and the work met with no farther interruption. The buildings of the city kept pace with the fortresses, which is the centre of the town, surrounded on all sides by the Neva; and in little more than a year, above 30,000 houses were erected. At present there may be about double that number in Petersburg, though many of them are paltry and inconvenient. In order to people this city, Peter invited other merchants, artificers, mechanics, and lemen, from all the different countries of Europe: he demolished the town of Neuchantz, and brought hither not only the materials of the houses, but the inhabitants themselves. A thousand families were drawn from Moscow; he obliged his nobility to quit their palaces and their villas in and about Moscow, and take up their residence at Petersburg, in a much more cold and comfortable climate. Finally, resolving to remove hither the trade of Archangel, he issued an ordnance, imposing that all such merchandise as had been conveyed to Archangel, in order to be sold to foreigners, should now be sent to Petersburg, where they should pay no more than the usual duties. These endeavours and regulations have rendered this one of the greatest and most flourishing cities in Europe. The Russian boyars and nobility have built magnificent palaces, and are now reconciled to their situation. At first many houses were built of timber; but these being subject to sudden conflagrations in spite of all the precautions that could be taken, the Czar, in the year 1714, issued an order, that all new houses should be walled with brick and covered with tiles. The fort is an irregular hexagon, with opposite bastions. This, together with all the rest of the fortifications, was in the beginning formed of earth only; but in the sequel they were faced with strong walls, and provided with cæsates, which are bomb-proof. In the curtain of the fort, on the right hand side, is a noble dispensary, well supplied with excellent medicines, and enriched with a great number of porcelain vases from China and Japan. From one of the gates of the fort a drawbridge is thrown over an arm of the river, in which the Czar's galleys and other small vessels are sheltered in the winter. The most remarkable building within the fort is the cathedral, built by the direction of an Italian architect. Petersburg is partly built on little islands, some of which are connected by bridges; and partly on the continent. In the highest part, on the bank of the Neva, the Czar fixed his habitation, or ordinary residence, built of freestone, and situated so as to command a prospect of the greater part of the city. Here likewise is a royal foundery; together with the superb houses of many noblemen. The marshy ground on which the city is built, being found extremely slippery, dirty, and incommodious, the Czar ordered every inhabitant to pave a certain space before his own door. In the year 1716, Peter taking a fancy to the island Wafilk-Olterno, which he had given as a present to prince Menzikoff, refused the grant and ordered the city to be extended into this quarter. He even obliged the boyars, or nobles, to build stone-houses on this spot, though they were already in possession of others on the side of Ingria: accordingly this is now the most magnificent part of the city. On the other side of a branch of the Neva stands the Czar's country or summer palace, provided with a fine garden and orangery. On the bank of the same river is the laboda, or suburbs, in which the Germans generally choose their habitation. Petersburg is very much subject to dangerous inundations. In the year 1715, all the battlements and drawbridges were either overwhelmed or carried away. The breadth, depth and rapidity of the Neva, have rendered it extremely difficult, if not impracticable, to join the islands and the continent by bridges. Besides, Peter was averse to this expedient for another reason; resolved to accustom his subjects to navigation, he not only rejected the project of a bridge, but also ordered that no boat should pass between the islands and continent, except by the help of oars only. In consequence of this strange regulation, many lives were lost; but at length he gained his point; and by habituating his flagni Moucovites to the dangers of the sea, in a little time produced a breed of hardy sailors. The adjacent country is so barren, that the town must be supplied with provisions from a great distance; consequently they are extremely dear. Here are woods in plenty, consisting of pine, fir, alder, birch, poplar, and elm; but the oak and the beech are generally brought from Casan. In winter the weather is extremely cold, and hot in the summer. In June the length of the night does not exceed three hours, during which the natives...
improvements, which the passing century has given Peterburg birth to, but in the annals of history; and Russia would again, in all probability, relapse into her original barbarism.

The erection of such a city as Peterburg in so short a time is truly wonderful. Mr. Coxe says his mind was filled with astonishment, when he reflected that so late as the beginning of this century the ground on which it stands was one vast morass, occupied by a very few fishermen's huts. The present divisions of the town, some of which we have already mentioned, are called, 1. The Admiralty quarter; 2. The Valfill O-firo or Island; 3. The Fortress; 4. The Island of St Peterburg; and, 5. The various suburbs of Livonia, of Moscows, of Alexander Nevski, and Wilburgh.

The present Empress has done so much for this city, that the may not improperly be called her second hundred. It is, nevertheless, still an infant place, and, as Mr. Wraxall observes, "only an immense outline, which will require future emperors, and almost future ages, to complete."

"The streets in general, says a late traveller, are Coxe's broad and spacious; and three of the principal ones, Travels, which meet in a point at the Admiralty, and reach to the extremities of the suburbs, are at least two miles in length. Most of them are paved; but a few are still covered to remain floored with planks. Several parts of the metropolis, particularly in the Valfill O-firo, wooden houses and habitations, fearfully superior to common cottages, are blended with the public buildings; but this motley mixture is far less common than at Moscow, where alone can be formed any idea of an ancient Russian city. The brick houses are ornamented with a white stucco, which has led several travellers to say that they are built with stone; whereas, unless I am greatly mistaken, there are only two stone structures in all Peterburg. The one is a palace, building by the empress upon the banks of the Neva, called the marble palace; its vast marble columns, with marble statues and ornaments; the other is the church of St Isaac, constructed with the same materials, but not yet finished.

"The mansions of the nobility are many of them vast piles of buildings, but are not in general upon so large and magnificent a scale as several I observed at Moscow; they are furnished with great cellof, and in the same elegant style as at Paris or London. They are situated chiefly on the south side of the Neva, either in the Admiralty quarter, or in the suburbs of Livonia and Moscow, which are the finest parts of the city."

See Nева.

"Peterburgh, although it is more compact than the other Russian cities, and has the houses in many streets contiguous to each other, yet still bears a resemblance to the towns of this country, and is built in a very fragrancing manner. By an order lately issued from government, the city has been inclosed within a rampart, the circumference whereof is 21 versts, or 14 English miles."

The same accurate observer calculates the number of inhabitants at Peterburg, and makes the medium number 130,000.

We have already said that Peterburg is very liable to inundation. An inundation of a very alarming nature took place when Mr. Coxe was there in Sep-
The inundation of 1777 was accompanied, or instantaneously succeeded, by a south-westerly wind in that sea and the gulf of Finland. All these circumstances concurred at the inundation of 1777; it happened two days before the autumnal equinox, four before the full moon, two after her setting through the perigeeum, and by a storm at south-west, which was preceded by strong south-west winds in the northern ocean, and strong north winds at the mouth of the Baltic."

See *Notices et Remarques sur les débordements de la Neva à St Peterbourg*, accompagnées d'une carte représentant la crue et la diminution des eaux, &c. in Nov. Acad. Pet. for 1777, P. II. p. 47, to which excellent treatise we would refer the curious reader for farther information.

All our readers have unquestionably heard of the equerrian statue of Peter I. in bronze. We shall give an account of that extraordinary monument in Mr Coxe's own words. "It is (of br) of a colossal size, and is the work of M. de Falconet, the celebrated French flautry, caft at the expense of Catharine II., in honour of her great predecessor, whom she reveres and admires. It represents that monarch in the attitude of mounting a precipice, the summit of which he has nearly attained. He appears crowned with laurel, in a loose Asiatic veil, and sitting on a housing of bear-skin: his right hand is stretched out as in the act of giving benediction to his people; and his left holds the reins. The design is masterly, and the attitude is bold and spirited. If there be any defect in the figure, it consists in the flat position of the right hand; and for this reason, the view of the left side is the most striking, where the whole appearance is graceful and animated. The horse is rearing upon its hind legs; and its tail, which is full and flowing, slightly touches a bronze serpent, artfully contrived to afford in supporting the vaft weight of the statue in due equilibrium. The artist has, in this noble effay of his genius, represented Peter as the legislator of his country, without any allusion to conquest and bloodshed; wisely preferring his civil qualities to his military exploits. The contrail between the composed tranquility of Peter (though perhaps not absolutely characteristic) and the fire of the horse, eager to press forward, is very striking. The simplicity of the inscription corresponds to the sublimity of the design, and is far preferable to a pompous detail of exalted virtues, which the voice of flattery applies to every sovereign without distinction. It is elegantly finished in brass characters, on one side in Latin, and on the oppofite in Russian.*

The statue, when I was at Peterourg, was not erected, but fixed under a large wooden shed near the Neva, within a few yards of its enormous pedestal. When Falconet had conceived the design of his statue, the base of which was to be formed by a huge rock, he carefully examined the environs of Peterbourgh, if, among the detached pieces of granite which are scattered about these parts, one could be found of magnitude correspondent to the dimensions of the equerrian figure. After a confiderable research, he discovered a stupendous mass half buried in the midst of the morass. The expanse and difficulty of transporting it were no obstacles to Catharine II. By her order the
Petersburg, the morass was immediately drained, a road was cut through a forest, and carried over the marshy ground; and the flume, which after it had been somewhat reduced weighed at least 1500 tons, was removed to Petersburg. This more than Roman work was, in less than six months from the time of its first discovery, accomplished by a windlass, and by means of large friction-balls alternately placed and removed in grooves fixed on each side of the road. In this manner it was drawn, with forty men seated upon its top, about four miles to the banks of the Neva; there it was embarked in a vessel constructed on purpose to receive it, and thus conveyed by the same distance by water to the spot where it now stands. When landed at Petersburg, it was 42 feet long at the base, 39 at the top, 21 thick, and 17 high; a bulk greatly surpassing in weight the most boasted monuments of Roman grandeur, which, according to the fond admirers of antiquity, would have baffled the skill of modern mechanics, and were alone sufficient to render conspicuous the reign of the most degenerate emperors. "The pedestal, however, though half of prodigious magnitude, is far from retaining its original dimensions, as, in order to form a proper station for the statue, and to represent an aspect, the summit whereof the horse is endeavouring to attain, its bulk has been necessarily diminished. But I could not observe, without regret, that the artist has been deficient to improve upon nature; and in order to produce a resemblance of an abrupt broken precipice, has been too lavish of the chisel. Near it was a model in platter, to the shape of which the workmen were fashioning the pedestal. It appeared to me, that in this model the art was too conspicuous; and that the effect would have been far more sublime, if the flume had been left as much as possible in its rude state, a vail unwieldy stupendous mass. And indeed, unless I am greatly mistaken, the pedestal, when finished according to this plan, will have scarcely breadth sufficient to afford a proper base for a statue of such colossal size."

"The statue was erected on the pedestal on the 27th of August 1782. The ceremony was performed with great solemnity, and was accompanied with a solemn inauguration. At the same time the empress issued a proclamation, in which, among other instances of her clemency, she pardons all criminals under sentence of death; all deserters, who would return on duty, having no boards, which are of great use to protect the glands of the throat, generally tie handkerchiefs under their chins, and cover their ears with small cases of flannel."

Petersburg, in America, is a sea-port town in Virginia, 25 miles southward of Richmond, seated on the south side of the Appamatox river, about 15 miles above its junction with James River, and contained nearly 300 houses in 1787, in two divisions; one is upon a clay, cold soil, and is very dirty; the other upon a plain of sand or loam. There is no regularity, and very little elegance in Petersburg. It is merely a place of business. The Free Masons have a hall tolerably elegant; and the seat of the Bowling family is pleasant and well built. It is very unhealthy. About 2200 hogheads of tobacco are imported here annually. Like Richmond, Williamsburg, Alexandria, and Norfolk, it is a corporation; and what is singular, Petersburg city comprehends part of three counties. The celebrated Indian queen, Pocahontas, from whom descended the Randolph and Bowling families, formerly resided at this place.

PETERSFIELD, is a handsome town in Hampshire in England, and sends two members to parliament. It is seated in W. Long. 1° 5' N. Lat. 51° 5'.

PETERWARADIN, a fortified town in Scania, and one of the strongest frontier places the house of Austria has against the Turks, seated on the Danube between the Drave and the Save. E. Long. 20° 0'. N. Lat. 45° 20'.

PETIOLE, in botany, the slender flanks that support the leaves of a plant.

PETIT, or PETIT, a French word signifying little or small.

PETITE GUERRE, denotes the operations of detached parties and the war of polks. See War, Part III.

PETIT SERGEANT. See SERGEANT.

PETIT TRESOR. See TREASURE.

PETIT (John), a doctor of the Sorbonne, very early gained to himself a character by his knowledge, and those eloquent orations which he pronounced before the university of Paris. He was employed in the famous embassy which was sent from France to Rome, for the purpose of healing the schism in 1407; but he soon lost all the honour which he had acquired. John Sans
Sans Peur, duke of Burgundy, having treacherously contrived to affranchise Louis of France, duke of Orleans, only brother to Charles VI. John Petit, entirely devoted to the views of the murderer, maintained in a public disputation, at Paris, the 8th of March 1408, that the murder was lawful. He had the effrontery to asert, that it is allowable to employ fraud, treason, and every other method, however base, in order to get rid of a tyrant; and that no oath ought to be kept with him." He dared to add further, that "the man who should commit such an action, not only deferred to be exempted from punishment, but to receive a reward." This singular doctrine was loudly exclaimed against; but the duke of Burgundy’s powerful influence sheltered Petit for some time. Some eminent writers, however, of that period, with Germain at their head, denounced the doctrine to John de Montigu, bishop of Paris, who condemned it as heretical, the 3rd of November 1414. It was likewise condemned by the council of Constance the year following at the instigation of Germain; but no notice was taken of either of Petit’s name or his writings. In fine, the king, on the 16th of September 1416, ordered the parliament of Paris to pronounce a severe decree against this dangerous performance; and it was also cenured by the university. But the duke of Burgundy, in 1418, had interest enough to compel the grand vicars of the bishop of Paris, who then lay sick at St Omer’s, to retract the sentence which that prelate had passed in 1414. Petit died three years before, i.e. in 1411, at Heidelberg; and his apology in favour of the duke of Burgundy, with all the particulars of that infamous translation, may be seen in the fifth volume of the last edition of Germain’s works.

Father Pinchon, of the order of St Francis, and author of the Dictionary of Heresies, in 1410, has endeavoured to vindicate his order from a charge brought by some writers who have called Petit a Cordelier or Franciscan friar. "He proves very clearly (says Abbé Prevot) that he was a secular priest; and adds, that upon the same evidence, Father Mercier, a Cordelier, had a warm dispute in 1717 with M. Dupin, who had given this title to Petit in his Collection of Censures. He represented to him (says he), before a meeting of the Faculty, the falsity of such a claim, and the injury which he offered to the order of St Francis. Dupin, convinced of his error, candidly owned that he was led into it by following some infidel writers, and promised to retract it in the new edition of the Censures, which was published in 1720. M. Fleury, who had committed the same mistake, promised also to make amendments for it by a solemn reparation; but dying before he had an opportunity of doing that piece of justice to the Cordeliers, the continuator of his Ecclesiastical History, who had not such opportunities of information, fell into the same fault."

Petit (John Lewis), an eminent surgeon, born at Paris in 1674. He had so early an inclination to surgery, that Mr Littre, a celebrated anatomist, being in his Father’s house, he regularly attended that gentleman’s lectures, from his being seven years of age. He was received master in surgery in the year 1700; and acquired such reputation in the practice of that art, that in 1726 the king of Poland sent for him to his court, and in 1734 the king of Spain prevailed on him to go into that kingdom. He restored the health of those princes; and they endeavoured to detain him by offering him great advantages, but he chose rather to return to France. He was received into the academy of sciences in 1715; became director of the royal academy of surgery; made several important discoveries; and invented new instruments for the improvement of surgery. He died at Paris in 1750. He wrote an excellent Treatise on the Difficulties of the Bones, the best edition of which is that of 1731; and many learned Disquisitions in the Memoirs of the Academy of Sciences, and in the first volume of the Memoirs of Surgery.

PETITIO PRINCIPII, in logic, the taking a thing for true, and drawing conclusions from it as such, when it is really false; or at least wants to be proved before any inferences can be drawn from it.

PETITION, a supplication made by an inferior to a superior, and especially to one having jurisdiction. It is used for that remedy which the subject hath to help a wrong done by the king, who hath a prerogative not to be sued by writ: In which case it is either general, that the king do him right; whereupon follows a general endorsement upon the same, Let right be done the party: Or it is special, when the conclusion and indorsement are special, for this or that to be done, &c.

By statute, the soliciting, labouring, or procuring the putting the hands or content of above twenty persons to any petition to the king or either house of parliament, for alterations in church or state, unless by assent of three or more justices of the peace of the county, or a majority of the grand jury in the affizes or sessions &c. and repairing it to the king or parliament to deliver such petition with above the number of ten persons, is subject to a fine of 100l. and three months imprisonment, being proved by two witnesses within six months, in the court of B. R. or at the affizes, &c. And if what is required by this statute be observed, care must be taken that petitions to the king contain nothing which may be interpreted to reflect on the administration; for, if they do, it may come under the denomination of a libel: and it is remarkable, that the petition of the city of London for the sitting of a parliament was deemed libellous, because it suggested that the king’s disolving a late parliament was an obstruction of justice; also the petition of the seven bishops, sent to the tower by James II. was called a libel, &c. To subscribe a petition to the king, to fright him into a change of his measures, intimating that if it be denied many thousands of his subjects will be discontents, &c. is included among the contents against the king’s person and government, tending to weaken the same, and is punishable by fine and imprisonment.
PET

Petitot was born at Geneva in 1609. He studied the art with such application, that he arrived at a degree of perfection that may almost be accounted miraculous. He was wonderfully patient in finishing his works, though he had the address to conceal his labour; however, he only painted the heads and hands of the figures; the hair, grounds, and drapery being executed by Border his brother-in-law. These two artists had the credit of associating and labouring together for fifty years, without the least misunderstanding happening between them. It is attested by an ingenious French writer, that Petitot and Border derived the knowledge of the most curious and durable colours proper for enamelling, from Sir Theodore Mayerne at London, who recommended Petitot to Charles I. He had the honour to paint the portraits of that monarch and the whole royal family, and continued in England until Charles’s unhappy end: he then went to Paris, where he was highly favoured by Louis XIV. and acquired an ample fortune. Being a Protestant, the revocation of the edict of Nantes obliged him to retire to Geneva; but settling soon after at Veray in the canton of Berne, he passed the remainder of his life in peace and affluence. He died in 1691; and had 17 children: of whom one took to painting, and settled at London, where he gained good reputation; but was much inferior to his father.

Petitot may be called the inventor of painting portraits in enamel. Though his friend Border made several attempts before him, and Sir Theodore Mayerne had facilitated the means of employing the most beautiful colours; yet Petitot completed the works, which under his hand acquired a softness and liveliness of colouring that will never change, and will ever render his works valuable. He made use of gold and silver plates, and seldom enamelled on copper. When he had the address to conceal his labour; however, he soon railed to 40. It was his custom to take a painter with him, who painted the picture in oil; after which Petitot sketched out his work, which he always finished after the life. When he painted the king of France, he took those pictures for his copies that most resembled him; and the king afterwards gave him a sitting or two to finish his work.

PETIVERIA, in botany: A genus of the tetragyna order, belonging to the hexandria clafs of plants; and in the natural method ranking under the Holoracete.

PETRA (Cæsar, Lucian), a town of Greece, on the coast of Illyricum, near Dyrrhachium, and not far from the mouth of the river Panyas. Another PETRA, (Livy) ; a town of the river Medea, a district of Thrace, lying towards Macedonia; but in what part of Macedonia he does not say.

PETRA (Ptolemy). PETRAS, (Silius Italicus), PETRINA (Italicus); in both which last art is understood; an inland town of Sicily, towards the south-west of Ennygium, now Petra Phasis (Cheruisus).

PETRA (Teckiel (2 Kings xiv.), a town of the Amalekites; near the Advenius Scorpionis (Judges i.) and the valley of Salt in the south of Judæa; afterwards in the possession of the Edomites, after the destroying the Amalekites.

PETRA ruin or Rekui, so called from Rekam, king of the Midianites, this by the Israelites (Num. xxxi.) Formerly called Arcas, now Petra, the capital of Arabia Petra (Josephus). Petreum places it in Long. 66, 45, from the Fortunate Island, and Lat. 30. 20. It declines therefore 80 miles to the south of Jerusalem; and 156 miles, more or less, from its meridian to the calf. Josephus says, that the mountain on which Aaron died stood near Petra; which Strabo calls the capital of the Nabataeans; at the distance of three or four days journey from Jericho. This Petra seems to be the Sela of Isaiah xvi. 1. and xlii. 11. the Hebrew name of Petra “a rock.” Though some imagine Petra to be no older than the time of the Macedonians.

PETRARCH (Francis), a celebrated Italian poet, was born at Arezzo in 1304, and was the son of Petrarco di Parenzo. He studied grammar, rhetoric, and philosophy, for four years at Carpentras; from whence he went to Montpellier, where he studied the law under John Andreas and Cino of Pilota, and probably from the latter received a taste for Italian poetry. As Petrarch only studied the law out of complaisance to his father, who on his wishing him at Bologna had thrown into the fire all the Latin poets and orators except Virgil and Cicero; he, at 22 years of age, hearing that his father and mother were dead of the plague at Avignon, returned to that city to settle his domestic affairs, and purchased a country-house in a very solitary but agreeable situation, called Vauculs; where he first knew the beautiful Laura, with whom he fell in love, and whom he has immortalized in his poems. He at length travelled into France, the Netherlands, and Germany; and at his return to Avignon entered into the service of Pope John XXII., who employed him in several important affairs. Petrarch was in hopes of being raised to some considerable post; but being disappointed, he applied himself entirely to poetry; in which he met with such applause, that in one and the same day he received letters from Rome and the chancellor of the university of Paris, by which they invited him to receive the poetic crown. By the advice of his friends, he preferred Rome to Paris, and received that crown from the senate and people on the 8th of April 1341. "The ceremony of his coronation (says Gibbon) was performed in the Capitol by his friend and patron the supreme magistrate of the republic. Twelve patrician youths were arrayed in scarlet; fix representatives of the most illustrious families, in green robes, with garlands of flowers, accompanied the procession; in the midst of the princes and nobles, the senator, count of Anguillara, a kinman of the Colonna, affirmed his throne; and at the voice of an herald Petrarch aetate. After discharging on a text of Virgil, and thrice repeating his vows for the prosperity of Rome, he knelt before the throne, and received from the senates a laurel crown, with a more precious declaration, 'This is the reward of merit.' The people shouted, "Long life to the Capitol and the poet!” A fanet in praise of Rome was accepted as the effusion of genius and gratitude; and after the whole procession had visited the Vatican, the prelatic wreath was suspended before the shrine of St. Peter. In the act or diploma which was presented to Petrarch, the title
Petrarch

Petrarch, the title and prerogatives of poet-laureate are revived in the Capitol after the lapse 1300 years; and he receives the perpetual privilege of wearing, as his choice, a crown of laurel, ivy, or myrtle; of assuming the poetic habit; and of teaching, disputing, interpreting, and composing, in all places whatever, and on all subjects of literature. The grant was ratified by the authority of the senate and people; and the character of citizen was the recompense of his affection for the Roman name. They did him honour, but they did him justice. In the familiar society of Serafino Dobson, in 2 volumes folio. His life has been written by several authors. Amongst these there was one by Mrs Susanna Dobson, in 2 volumes 8vo, collected and abridged from the French. In this work we have the following elegant and just character of Petrarch.

"Few characters, perhaps, have in a stronger light the advantage of well-regulated dispositions than that of Petrarch, from the contrast we behold in one particular of his life, and the extreme misery he suffered from the indulgence of an affection, which, though noble and delightful when justly placed, becomes a reproach and a torment to its possessor when once directed to an improper object. For, let us not deceive ourselves or others; though (from the character of Laura) they are acquitted of all guilt in their personal intercourse, yet as she was a married woman, it is not possible, on the principles of religion and morality, to clear them from that just censure which is due to every delusion of the mind from those laws which are the foundation of order and peace in civil society, and which are flamped with the sacred mark of divine authority."

In this particular of his character, therefore, it is finely hoped that Petrarch will serve as a warning to those unhappy minds, who, partaking of the same feelings under the like circumstances, but not yet suffering his misery, may be led by the contemplation of it, by a generous regard to the honour of human nature, and by a view to the approbation of that all-seeming Judge who penetrates the most secret recesses of the heart, to check every unhappy inclination in its birth, and destroy, while yet in their power the feds of those passions which may otherwise destroy them.

"As to the cavils or cenures of those who, incapable of tenderness themselves, can neither enjoy the view of it when presented in its most perfect form, nor pity its sufferings when, as in this work, they appear unhappily indulged beyond the bounds of judgment and tranquility; to such minds I make no address, well convinced, that no callous heart can enjoy, neither will it ever be in danger of being misled by the example of Petrarch in this tender but unfortunate circumstance of his character."

To susceptible and feeling minds alone Petrarch will be ever dear. Such, while they regret his failings, and consider them as warnings to themselves will love his virtues; and touched by the growing piety and heart-feel contrition which often impressed his soul, will ardently desire to partake with him in those pathetic and sublime reflections which are produced in grateful and affectionate hearts, on reviewing their own lives, and contemplating the works of God.

"Petrarch had received from nature a very dangerous present. His figure was so distinguished as to attract universal admiration. He appears, in his portraits, with large and manly features, eyes full of fire, a blooming complexion, and a countenance that bespoke all the genius and fancy which shone forth in his works. In the flower of his youth, the beauty of his person was so very striking, that wherever he appeared, he was the object of attention. He possessed an understanding active and penetrating, a brilliant wit, and a fine imagination. His heart was candid and benevolent, susceptible of the most lively affections, and inspired with the noblest sentiments of liberty."

"But his failings must not be concealed. His temper was, on some occasions, violent, and his passions headstrong and unruly. A warmth of conflagration hurried him into irregularities, which were followed with repentance and remorse.—No essential vice, however, could be cast on his manners, till after the 25th year of his age. The fear of God, the thoughts of death, the love of virtue, and these principles of religion which were inculcated by his mother, preserved him from the surrounding temptations of his earlier life."

A resemblance has been traced, in several infancies, between this admired poet and our late famous Yorick.—Both, we know, had great wit and genius, and no less imprudence than eccentricity; both were canonics, or prebendaries, the Italian of Padua, &c. and the Englishman of York; they both ran over France, without any business there. If the bishop of Lombe's patronized and corresponded with the one, a prelate of the English church now deceased, defired Dr Gilpin in a letter, to forward the other. In their attachments to Laura and Eliza, both married women, these two prebendaries were equally warm and equally innocent. And even after death, a most remarkable circumstance has attended them both; some persons, prelom....we are told, stole Petrarch's bones, in order to sell them; and, in like manner, Yorick's body, it is confidently affirmed, was also stolen, and his skull has been exhibited at Oxford.

PETRE,
PETRE, of SALTPETRE, in chemistry. See CHEMISTRY, § 724, &c.

PETREA, in botany: A genus of the angiospermae order, belonging to the didynamia class of plants; and in the natural method of arranging under the order Pericarya. The calyx is quincuncipartite, very large, and coloured; the corolla rotundaceous; the capsule bicollare, and situated in the bottom of the calyx; and the seeds solitary. There is only one species, a native of New Spain. It rises to the height of 15 or 16 feet, with a woody stalk covered with grey bark, sending out several long branches. These have a white bark than the stem, and are garnished with leaves at each joint, which, on the lower part of the branches, are placed by three round them; but, higher up, they are rough, and have a rough surface. The flowers are produced at the ends of the branches, in loose bunches nine or ten inches long, each flower standing on a slender flower-stalk about an inch long: the emplacement of the flower is composed of five narrow obtuse leaves about an inch long, which are of a fine blue colour, and much more conspicuous than the petals, which are white, and not more than half the length of the emplacement. The plant is propagated by seeds procured from the places where they are natives, and of which very few are good; for though Dr Houfton, the discoverer of the plant, sent parcels of seeds to several persons in England, only two plants were produced from the whole. The seeds must be sown in a good hot-bed, and when the plants come up, they should all be planted in a separate small pot filled with light loamy earth, and plunged into a hot-bed of tanners' bark, where they should afterwards constantly remain.

PETRELA, in ornithology. See PROCÉLLARIA.

PETRIDIA, in natural history, a genus of scrupula, of a plain uniform texture; of so great variety of colours, and emulating the external form of pebbles.

PETRIFICATION, in phytology, denotes the conversion of wood, bones, and other substances, principally animal or vegetable, into stone. These bodies are more or less altered from their original state, according to the different substances they have lain buried among in the earth; some of them having suffered very little change, and others being so highly impregnated with crystaline, sparly, pyritic, or other extraneous matter, as to appear mere masses of stone or lumps of the matter of the common pyrites; but they are generally of the external dimensions, and retain more or less of the internal figure, of the bodies into the pores of which this matter has made its way. The animal substances thus found petrified are chiefly shells; the teeth, bony palates, and bones of fish, the bones of land animals, &c. These are found variously altered, by the infusion of limy and mineral matter into their pores; and the substance of some or them is now wholly gone, there being only flaky, sparry, or other mineral matter remaining in the shape and form.

Reflecting the manner in which petrification is accomplished, we know but little. It has been thought by many philosophers, that this was one of the rare processes of nature; and accordingly such places as afforded a view of it, have been looked upon as great curiosities. However, it is now discovered, that petrification is exceedingly common; and that every kind of water carries in it some earthly particles, which being precipitated from it, become stone of a greater or lesser degree of hardness; and this quality is mostly remarkable in those waters which are much impregnated with selenitic matter. Of late, it has also been found, vide Phil. Trans. p. 35. by some observations on a petrification in East Lothian in Scotland, that iron contributes greatly to the process: and this it may do by its precipitation of any aluminous earth which happens to be disolved in the water by means of an acid; for iron has the property of precipitating this earth, though it cannot precipitate the calcareous kind. The calcareous kinds of earth, however, by being soluble in water without any acid, must contribute very much to the process of petrification, as they are capable of a great degree of hardness; by means only of being joined with fixed air, on which depends the solidity of our common cement or mortar used in building houses.

The name petrification belongs only, as we have seen, to bodies of vegetable or animal origin; and in order to determine their class and genus, or even species, it is necessary that their texture, their primitive form, and in some measure their organization, be fully discernible. Thus we ought not to place the foamy kernels, moulded in the cavity of some shell, or rather organized body, in the rank of petrification properly so called.

Petrifications of the vegetable kingdom are almost all either gravelly or siliceous; and are found in gullies, trenches, &c. Those which strike fire with a shell are principally found in sandy situations; those which effervesce in acids are generally of animal origin, and are found in the horizontal beds of calcareous earth, and sometimes in beds of clay or gravel; in which case the nature of the petrification is different. As to the substances which are found in gypsum, they seldom undergo any alteration, either with respect to figure or composition, and they are very rare.

Organized bodies, in a state of petrification, generally acquire a degree of solidity of which they were not possessed before they were buried in the earth, and some of them are often fully as hard as the stones or matrices in which they are enclosed. When the stones are broken, the fragments of petrifications are easily found, and easily distinguished. There are some organized bodies, however so changed by petrification, as to render it impossible to discover their origin. That there is a matter more or less agitated, and adapted for penetrating bodies, which crumbles and separates their parts, draws them along with it, and disperses them here and there in the fluid which surrounds them, is a fact of which nobody seems to entertain any doubt. Indeed we see almost every substance, whether solid or liquid, infensibly change, diminish in bulk, and at last, in the lapse of time, vanish altogether.

A petrified substance, strictly speaking, is nothing more than the skeleton, or perhaps image, of a body which has once had life, either animal or vegetable, combined with some mineral. Thus petrified wood is not in that state wood alone. One part of the compound or mass of wood having been destroyed by local causes, has been compensated by earthy and sandy substances diluted and extremely minute, which the
The waters surrounding them had deposited while they themselves evaporated. These earthy substancess, being then moulded in the skeleton, will be more or less indurated, and will appear to have its figure, its structure, its size, in a word the same general characters, the same specific attributes, and the same individual differences. Further, in petrified wood, no veigite of ligneous matter appears to exist. We know that common wood is a body in which the volume of solid parts is greatly exceeded by that of the pores. When wood is buried in certain places, lapidific fluids, extremely divided and sometimes coloured, infinate themselves into its pores and fill them up. These fluids are afterwards moulded and condensed. The solid part of the wood is decomposed and reduced into powder, which is expelled without the malis by aqueous filtrations. In this manner, the places which were formerly occupied by the wood are now left empty in the form of pores. This operation of nature produces no apparent difference either of the size or of the shape; but it occasions both at the surface and in the inside, a change of sublance, in the ligneous texture is inverted; that is to say, that which was pore in the natural wood, becomes solid in that which is petrified; and that which was solid or full in the first state, becomes porous in the second. In this way, says M. Mufard, petrified wood is much less extended in pores than solid parts, and at the same time forms a body much more denfe and heavy than the firft. As the pores communicate from the circumference to the centre, the petrifaction ought to begin at the centre, and end with the circumference of the organic body subjected to the action of the lapidific fluids. Such is the origin of petrifications. They are organized bodies which have undergone changes at the bottom of the sea or the surface of the earth, and which have been buried by various accidents at different depths under ground.

In order to understand properly the detail of the formation of petrified bodies, it is necessary to be well acquainted with all their constituent parts. Let us take wood for an example. Wood is partly solid and partly porous. The solid parts consist of a sublance, hard, ligneous, and compact, which forms the support of the vegetable; the porous parts consist of vessels or interfaces which run vertically and horizontally across the ligneous fibres, and which serve for conducting air, lymph, and other fluids. Among these vessels the trachie which rise in spiral forms, and which contain only air, are easily distinguished. The cylindric vessels, some of which contain lymph, and others the ficac propius, are full only during the life of the vegetable. After its death they become vacant by the evaporation and abfence of the fluids with which they were formerly filled. All these vessels whether ascending or descending, unite with one another, and form great cavities in the wood and in the bark. According to Malpigii and Duhamel, the ligneous fibres are themselves tubular, and afford a passage to certain liqours; in short, the wood and bark are intersected with utriculi of different sizes and figures. The augmentation of the trunk in thickness, according to Malpigii, is accomplished by the annual addition of a new exterior covering of fibres and of trachie. Others think that a concentric layer of sapwood is every year hardened, while a new one is forming from the bark. But it is on all sides agreed that the concentric layers of wood are distinct from one another, because at the point of contact between any two of them, the new vessels, as well as new fibres, are more apparent and perceptible than they are in any other place. Having made these preliminary remarks on the structure of vegetables, we shall now proceed to give an abridged account of the manner in which M. Mongez explains their petrifcation.

In proportion to the tendereness and bad quality of wood, it imbibes the greater quantity of water; therefore this sort will unquestionably petrify more easily than that which is hard. It is thought that all the petrified wood so often found in Hungary has been originally soft, such as firs or poplars. Suppose a piece of wood buried in the earth; if it be very dry, it will suck up the moisture which surrounds it like a sponge. This moisture, by penetrating it, will dilate all the parts of which it is composed. The trachie, or air-vessels will be filled first, and then the lymphatic vessels and those which contain the ficac propius, as they are likewise empty. The water which forms this moisture keeps in dissolution a greater or a less quantity of earth; and this earth, detached, and carried along in its course, is reduced to such an attenuated state, that it escapes our eyes and keeps itself suspended, whether by the medium of fixed air or by the motion of the water. Such is the lapidific fluid. Upon evaporation, or the departure of the menhirum, this earth, sand or metal, again appears in the form of precipitate or sediment in the cavities of the vessels, which by degrees are filled with it. This earth is there moulded with exactness; there is a little larger, and consequently makes the vessels adhere to one another; the lateral fiction of the surrounding fibres, the obstruction of the moulds, and the hardening of the moulded earth, become general; and there confits nothing but an earthy sublance which prevents the sinking of the neighbouring parts. If the deposit is formed of a matter in general pretty pure, it preserves a whiter and clearer colour than the rest of the wood; and as the concentric layers are only perceptible and distinct in the wood, because the vessels are there more apparent on account of their size, the little earthy cylinders, in the state of petrified wood, must be there a little larger, and consequently must represent exactly the turnings and separations of these layers. At the place of the utriculi, globules are observed, of which the figures are various as the moulds wherein they are formed. The annelomodes of the proper and lymphatic vessels, form besides points of support or reunion for this earthy sublance.

With regard to holes formed by worms in any bits of wood, before they had been buried in the earth, the lapidific fluid, in penetrating these great cavities, deposits there as easily the earthy sediment, which is exactly moulded in them. These vermiform cylinders, are somewhat less in bulk than the holes in which they are found, which is owing to the retreat of the more refined earth and to its drying up.

Let any one represent to himself this collection of little cylinders, vertical, horizontal, inclined in different directions, the fony masses of utriculi and of annelomodes,
tomofes, and he will have an idea of the flony substance which forms the ground work of petrifaction. Hitherto not a single ligneous part is destroyed; they are all existing, but surrounded on every side with earthly deposits; and that body which, during life, was composed of solid and of empty parts, is now entirely solid: its destruction and decomposition do not take place till after the formation of these little deposits. In proportion as the water abandons them, it penetrates the ligneous substance, and destroys it by an insensible fermentation. The woody fibres being decomposed, form in their turn voids and interstices, and there remains in the whole piece nothing but little flony cylinders. But in proportion as these woody fibres disappear the surrounding moisture, loaded with earth in the state of dissolution, does not fail to penetrate the piece of wood, and to remain in its new cavities. The new deposit assumes exactly the form of decomposed fibres; it envelopes in its turn the little cylinders which were formed in their cavities, and ends by incorporating with them. We may suppose here, that in proportion as it decomposes, there is a reaction of the ligneous part against the lapidific fluid: from this reaction a colour arises which stains more or less the new deposit; and this colour will make it easily distinguishable from that which has been laid in the inside of the vessels. In all petrified wood this shade is generally perceptible.

We have then, says M. Mongez, four distinct epochs in the processes by which nature converts a piece of wood into flone; or, to speak more truly, by which she substitutes a flony deposit in its place: 1. Perfect vegetable wood, that is to say, wood composed of solid and of empty parts, of ligneous fibres, and of vessels. 2. Wood having its vessels obstructed and choked up by an earthly deposit, while its solid parts remain unaltered. 3. The solid parts attacked and decomposed, forming new cavities between the flony cylinders, which remain in the same state, and which support the whole mass. 4. These new cavities filled with new deposits, which incorporate with the cylinders, and compose nothing else but one general earthy mass representing exactly the piece of wood.

Among the petrifactions of vegetables called dendrites, are found parts of shrubs, ferns, roots, portions of the trunk, some fruits, &c. We must not, however, confound the impressions of mosses, ferns, and leaves, nor incrustations, with petrifactions.

Among the petrifactions of animals, we find shells, crustaceous animals, polyparii, some worms, the bony parts of fishes, and of amphibia, fow or no real insects, rarely birds and quadrupeds, together with the bony portions of the human body. The cornas amonis are petrified serpents; and with regard to figured and accidental bodies, there are fylla nature.

In order, says M. Bertrand, in his Dictionnaire des Fossilites, that a body should become petrified, it is necessary that it be, 1. Capable of preservation under ground: 2. That it be sheltered from the air and running water (the ruins of Herculaneum prove that bodies which have no connection with free air, preserve themselves untouched and entire). 3. That it be secured from corrosive exhalations. 4. That it be in a place where there are vapours or liquids, loaded either with metallic or flony particles in a state of dissolution, and which, without destroying the body, penetrate it, impregnate it, and unite with it in proportion as its parts are dissipated by evaporation.

It is a question of great importance among naturalists, to know the time which Nature employs in petrifying bodies of an ordinary size.—It was the wish of the late emperor, Duke of Lorraine, that some means should be taken for determining this question. M. le Chevalier de Baillu, director of the cabinet of natural history of his imperial majesty, and some other naturalists, had several years ago, the idea of making a research which might throw some light upon it. His imperial majesty being informed by the unanimous observations of modern historians and geographers, that certain pillars which are actually seen in the Danube in Gervia, near Belgrade, are remains of the bridge which Trajan constructed over that river, presumed that these pillars having been preferred for so many ages belonged to be petrified, and that they would furnish some information with regard to the time which Nature employs in changing wood into flone. The emperor thinking this hope well founded, and wishing to satisfy his curiosity, ordered his ambidator at the court of Constantinople to ask permission to take up from the Danube one of the pillars of Trajan's bridge. The petition was granted, and one of the pillars was accordingly taken up; from which it appeared that the petrifaction had only advanced three fourths of an inch in the space of 1500 years. There are, however, certain waters in which this transformation is more readily accomplished.—Petrifications appear to be formed more slowly in earths that are porous and in a slight degree moister than water itself.

When the foundations of the city of Quebec in Canada were dug up, a petrified sawage was found among the left boulders which they proceeded. Although there was no idea of the time at which that man had been buried under the ruins, it is however, true, that his quiver and arrows were still well preserved. In digging a lead mine in Derbyshire in 1744, a human skeleton was found among flag's horns. It is impossible to say how many ages this carcass had lain there. In 1695 the entire skeleton of an elephant was dug up near Tonna in Thuringia. Some time before this epoch the petrified skeleton of a crocodile was found in the mines of that country. We might cite another fact equally curious which happened at the beginning of the last century. John Munte, curate of Sigarp in Scania, and several of his parishioners, willing to procure turf from a drained marshy soil, found, some feet below ground, an entire cart with the skeletons of the horses and carter. It is presumed that there had formerly been a lake in that place, and that the carters attempting to pass over on the ice, had by that means probably perished. In fine, wood partly fossil and partly coaly has been found at a great depth, in the clay of which tile was made for the Abbey of Fontenay. It is but very lately that fossil wood was discovered at the depth of 75 feet in a well between Iff and Vauvres near Paris. This wood was in sand between a bed of clay and pyrites, and water was found four feet lower than the pyrites. M. de Lamont, inspector general of the mines, says (Journal de Physique, Mai 1736), that in the lead mine at Pontpéan near Rennes, is a figure, perhaps the only one of its kind. In that figure, feashells,
petrifactions. They are found 240 feet deep. This beech was laid horizontally in the direction of the fissure. Its bark was converted into pyrites, the sap-wood into jet, and the centre into coal.

A great many pieces of petrified wood are found in different countries of France and Savoy. In Cobourg in Saxony, and in the mountains of Mindana, trees of a considerable thickness have been taken from the earth which were entirely changed into a very fine agate, as also their branches and their roots. In sawing them, the annual circles of their growth have been distinguished. Pieces have been taken up, on which it was difficultly seen that they had been gnawed by worms; others bear visible marks of the animals themselves could not have made. The different species of petrifactions, according to Cronstedt, are,

I. Terra Larvatus; extraneous bodies changed into a limy sub stance or calcareous changes. These are, 1. Loosé or friable. 2. Indurated. The former are of a limy or chalky nature, neither do they decay in the air.

2. Thofe found in flate or clay are compreffed and flattened. The different species of petrifactions, according to Cronstedt, are,

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II. Larva Argillacea; where the bodies appear to be changed into clay. Thefe are found either loose and friable, or indurated. Of the former kind is a piece of porcelain clay met with in a certain collection, with all the marks of the root of the tree upon it. Of the latter kind is the oitecolla; which is said to be the roots of the poplar- tree changed, and not to confift of any calcareous sub stance. A fort of fossil ivory, with all the properties of clay, is said likewise to be found in some places.

III. Larva Infinita; where the sub stances are impregnated with great quantities of salts. Human bodies have been twice found impregnated with vitriol of iron in the mine of Falun, in the province of Dalarne in Sweden. One of them was kept for several years in a glass cabinet, but at last began to moulder and fall to pieces. Turf and roots of trees are likewise found in water strongly impregnated with vitriol. They do not flame, but look like a coal in a long fire; neither do they decay in the air.

IV. Bodies penetrated by mineral inflammable sub stances. 1. By pit-coal, such as wood; whence some have imagined coal to have been originally produced from wood. Some of the substances are fully saturated with the coal-y matter; others not. Among the former Cronstedt reckons jet; among the latter the substance called mumiavegetabilis, which is of a loose texture resembling amber, and may be used as such. 2. Thofe penetrated by asphaltum, or rock-oil. The only example of these given by our author is a kind of turf in the province of Skone in Sweden. The Egyptian mummiies, he observes, cannot have any place among this species, as they are impregnated artificially with asphaltum, in a manner similar to what happens naturally with the wood and coal-y matter in the last species. 3. Thofe impregnated with sulphur which has dissolved iron, or with pyrites. Human bodies, bivalve and univalve shells and insects, have been all found in this state; and the latter are found in the alum flate at Andrarum, in the province of Skone in Sweden.

V. Larva Metalifer; where the bodies are impregnated with metals. These are, 1. Covered with native silver; which is found on the surface of shells
The Peppermint Tree.

Plate CCCLXXXVIII.
In England. 2. Where the metal is mineralised with copper and sulphur. Of this kind is the fabulifer or grey silver ore, in the shape of ears of corn, and supposed to be vegetables found in argillaceous slate at Frankenberg and Tabitteren in Hesse. 3. Larvæ capriformis, where the bodies are impregnated with copper. To this species principally belong the Turquois or Turkey stones, improperly so called; being ivory and bones of the elephant or other animals impregnated with copper. See Turchois. At Simore in Languedoc there are bones of animals dug up, which, during calcination, assume a blue colour; but according to Cordier it is not probable that these owe their colour to copper. 3. With mineralised copper. Of these our author gives two examples. One is where the copper is mineralised with sulphur and iron, forming a yellow marcasitical ore. With this some shells are impregnated which lie upon a bed of leadstone in Norway. Other petrifications of this kind are found in the form of fish in different parts of Germany. The other kind is where the copper is impregnated with sulphur and silver. Of this kind is the grey silver ore like ears of corn, found in the slate quarries at Hesse. 4. Larvæ ferriferæ, with iron in form of a cals, which has attached the place or shape of extraneous bodies. These are either loose or indurated. Of the latter kind are some roots of trees found at the lake Langelma in Finland. The indurated kinds are exemplified in some wood found at Orbifian in Bohemia. 5. Where the iron is mineralised, as in the pyriticous larve, already described.

VII. Where the bodies are tending to decomposition, or in a way of destruction. Among these, our author enumerates Mould and Turf, which see; also Cement, Mortar, Rock, Sand, Selinite, Stone, and Water. See likewise the article Fossil, Plates CC and CCI, and Mountain.

We shall add the following description of a very curious animal petrifaction. The Abbé de Sauvages, celebrated for his refined taste and knowledge in natural history, in a tour through Languedoc, between Alais and Uzes, met with a narrow vein of no more than two toises wide, which crosses the road, and is bordered on one side by a grey dirty soil, and on the other by a dry sandy earth, each of a vast expanse, and on a level with a narrow vein which separates them. In this narrow vein only are contained petrified shells, cemented together by a whitish marl. They are in prodigious plenty; among which there is one species which the Abbé does not remember to have known to have been any where described, and may probably be a new acquisition to natural history.

This shell has the shape of a horn, somewhat incurved towards the base. (See figure 9. Plate CCCLXXXVIII.) It seems composed of several cups, let into each other, which are sometimes found separate. They have all deep channels, which extend, as in many other shells, from the base to the aperture; the projecting ribs which form these channels are mostly worn away, being rarely found entire. Sometimes several are grouped together; and a proof that they are not a fortuitous assemblage caused by the petrifaction, they are fixed together through their whole length, in such fort, that their base and aperture are regularly turned the same way. The Abbé should have referred this to the genus which Linnaeus and the Marquis d'Argenville named Centilia, had they not been let into each other. He found some of them whose aperture or hollow was not stopped up by the petrifaction, and seemed as cones adapted to another (fig ii.), forming a row of narrow cells, separated by a very thin partition; this row occupied not more than one half of the cavity of the shell.

Our article has already extended to such a length as to preclude any further additions; we cannot, however, finish it without observing, that fossil bones, are very common in Dalmatia. They are of various kinds, and in their nature, apparently very extraordinary; but we have found no tolerable account or probable conjecture of their origin. Vitaliano Donati of Padua, in his Saggio sopra la naturale dell' Adriatico, was the first who took notice of them; and Fortis, in his travels into Dalmatia, has given a copious account of them. They are most common in the islands of Corfu and Olera. See Fortis's Travels into Dalmatia, page 440—460, and our article Vitaliano.

PETRIFIED CITY. The story of a petrified city is well known all over Africa, and has been believed by many considerable persons even in Europe. Louis XIV. was so fully persuaded of its reality, that he ordered his ambassador to procure the body of a man petrified from it at any price. Dr Shaw's account of this affair it as follows: "About 40 years ago (now more than 70), when M. le Maire was the French consul at Tripoli, he made great inquiries, by order of the French court, into the truth of the report concerning a petrified city at Ras Sem; and amongst other very curious accounts relating to this place, he told me a remarkable circumstance, to the great discredit, and even constutation, of all that had been so positively advanced with regard to the petrified bodies of men, children, and other animals.

Some of the Janizaries, who in collecting tribute traverse the district of Ras Sem, promised him that as an adult person would be too cumbersome, they would undertake, for a certain number of dollars, to bring him from thence the body of a little child. After a great many pretended difficulties, delays, and disappointments, they produced at last a little child, petrified, which they had found, as he learned afterwards, among the ruins of Leptis; and, to conceal the deceit, they broke off the quiver, and some other of the distinguishing characteristics of that deity. However, he paid them for it according to promise, 1000 dollars, which is about 150l. sterling, as a reward for their faithful service and hazardous undertaking; having run the risk, as they pretended, of being stung if they should have been discovered in thus delivering up to an infidel one of those unfortunate Mohtemans, as they take them originally to have been.

But notwithstanding this cheat and impostion had made the consul defist from searching after the petrified bodies of men and other animals; yet there was one matter of fact, as he told me, which still very strongly embarrased him, and even strongly engaged him in favour of the current report and tradition. This was some little loaves of bread, which he called a Tom, which had been brought to him from that place. His reasoning, indeed, thereupon, provided the pretended matter of fact had been clear and evident, was just and satisfactory.
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PETRIFIED
City.

satisfactory: for where we find loaves of bread, there, as he urged, some persons must have been employed in making them, as well as others for whom they were prepared. One of these loaves, he had, among other petrifications, very fortunately brought with him to Cairo, where I saw it, and found it to be an escultura of the difcoid kind, of the same fashion with one I had lately found and brought with me from the defects of Marah. We may therefore reasonably conclude, that there is nothing to be found at Ras Sem, unless it be the trunks of trees, echinites, and such petrifications as have been discovered at other places.

M. le Maire, inquirys, which we find were supported by the premise and performance of great rewards, have brought nothing further to light. He could never learn that any traces of walls, or buildings, or animals, or utensils, were ever to be seen within the verge of these pretended petrifications. The like account I had from a Sicilian renegado, who was the janizary that attended me whilst I was in Egypt; and as in his earlier years he had been a foldier of Tripoli, he assured me that he had been several times at Ras Sem. This I had confirmed again in my return from the Levant by the interpreter of the British factory at Tunis, who was likewise a Sicilian renegado; and being the libertus or freedman of the Bath of Tripoli, was preferred by him to be the bey or viceroy of the province of Darna, where Ras Sem was immediately under his jurisdiction. His account was likewise the same: neither had he ever seen, in his frequent journeys over this district, any other petrification than what are above-mentioned. So that the petrified city, with its walls, caleis, freets, shops, cattle, inhabitants, and utensils, were all of them at first the mere inventions of the Arabs, and afterwards propagated by such persons, who, like the Tripoli ambassador, and his friend above-mentioned, were credulous enough to believe them.

However, there is one remarkable circumstance relating to Ras Sem that deserves well to be recorded. When the winds have blown away the billows of sand which frequently cover and conceal these petrifications, they discover, in some of the lower and more depHessed places of this district, several little pools of water, which is usually of fo ponderous a nature, that, upon drinking it, it passes through the body like quicksilver. This perhaps may be that petrifying fluid which has all along contributed to the conversion of the palm-trees and the echinites into stones; for the formation not only of these, but of petrifications of all kinds, may be entirely owing to their having first of all lodged in a bed of loam, clay, sand, or some other proper nidus or matrix and afterward gradually been acted upon and pervaded by such a petrifying fluid as we may suppose this to be.

To this account it may not be amis to subjoin the memorial of Caffem Aga, the Tripoli ambassador at the court of Britain. The city, he says, is situated two days journey south from Ounguela, and 17 days journey from Tripoli by carava; and he writes: "As one of my friends (says the ambassador) desired me to give him in writing an account of what I know touching the petrified city, I told him what I had heard from different persons, and particularly from the mouth of one of credit who had been on the spot that is to say, that it was a very spacious city, of a round form, having great and small streets there in furnished with shops, with a vast cattle magnificently built; that he has seen there several forts of trees, the most part olives and palms, all of stone, and of a blue or rather lead colour: that he saw also figures of men in a posture of exercising their different employments, some holding in their hands staffs, others bread, every one doing something, even women suckling their children, and in the embraces of their husbands, all of stone; that he went into the cattle by three different gates, though there were many more where he saw a man lying upon a bed of stone: that there were guards at the gates with pikes and javelins in their hands; in short, that he saw in this wonderfully city many forts of animals, as camels, oxen, horses, asses, sheep, and birds, all of stone, and the colour above mentioned."

We have subjoined this account, because it shows in striking colours the amazing credulity of mankind, and the avidity with which they swallow the marvellous, and the difficulty of discovering the truth respecting places or things at a distance from us.

PETROBRUSSIANS, a religious sect, which had its rise in France and the Netherlands about the year 1150. The name is derived from Peter Bruys, a Provençal, who made the most laudable attempt to reform the abuses and remove the superstitious that disgraced the beautiful simplicity of the gospel. His followers were numerous; and for 20 years his labour in the ministry was exemplary and unremitting. He was, however, burnt in the year 1190 by an enraged populace set on by the clergy.

The chief of Bruys' followers was a monk named Henry; from whom the Petrobrussians are also called Henricians. Peter the Venerable, abbot of Cluny, has an express treatise against the Petrobrussians; in the preface to which he reduces their opinions to five heads. 1. They denied that child:en before the age of reason can be justified by baptism, in regard it is our own faith that saves by baptism. 2. They held that no churches should be built, but that those that already are should be pulled down; an inn being as proper for prayers as a temple, and a stable as an altar. 3. That the cross ought to be pulled down and burnt, because we ought to abhor the instruments of our Saviour's passion. 4. That the real body and blood of Christ are not exhibited in the eucharist, but merely represented by their figures and symbols. 5. That sacrifices, alms, prayers, &c. do not avail the dead.

F. Langlois objects Manichæism to the Petrobrussians; and says, they maintained two gods, the one good, the other evil: but this we rather ascribe an effect of his zeal for the catholic cause, which determined him to blacken the adversaries thereof than any real sentiment of the Petrobrussians.

PETROJOANNITIES, were followers of Peter John or Peter Joannis, i.e. Peter the son of John, who flourished in the 15th century. His doctrine was not known till after his death, when his body was taken out of his grave and burnt. His opinions were, that he alone had the knowledge of the true fene, wherein the apostles preached the gospel; that the reasonable soul is not the form of man; that there is no grace infused by
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by baptism: and that Jesus Christ was pierced with a lance on the cross before he expired.

PETROLEUM *, or Rock oil; a thick oily substance exuding out of the earth, and collected on the surface of the well: in many parts of the world. It is found on some in Italy, and in a deserted mine in the province of Dalame in Sweden. In this last place it collects itself in small hollows of limestone, like resin into wood of the pine-tree. It is found trickling from the rocks, or issuing from the earth, in many parts of the duchy of Modena, and in various parts of France, Switzerland, Germany, and Scotland as well as in Asia. It is also found not only on the surface of wells as already mentioned, but mixed with earth and sand, from whence it may be separated by infusion of water. It is of a pungent and acid taste, and smells like the oil of amber, but more agreeable. It is very light and very pellucid; but though equally bright and clear under all circumstances, it is liable to a very great variety in its colour. It is naturally almost colourless, and in its appearance greatly resembles the most pure oil of turpentine: this is called white petroleum, though it has no more colour than water. It is sometimes tinged of a brownish, reddish, yellowish, or faint greenish colour; but its most frequent colour is a mixture of the reddish and blackish, in such a degree that it looks black when viewed behind the light, but purple when placed between the eye and a candle or window. It is rendered thinner by distillation with water, and leaves a refrinous residuum; when diffused with a volatile alkali, the latter acquires the properties of fucinated ammoniac, and contains the acid of amber. It is the most frequent of all the liquid bitumens, and is perhaps the most valuable of them all in medicine. It is to be chosen the purest, lightest, and most pellucid that can be had, such as is the most penetrating smell and is most inflammable. Monet informs us that some kinds of it are of the density of mint oil. It is insoluble in spirit of wine; which though it be the great dissolvent of sulphur, has no effect upon petroleum, not even with ever so long a digestion. It will not take fire with the deephegated acid spirits; as oil of cloves and other of the vegetable essentail oils do; and in distillation, either by balneum mariae or in sand, it will neither yield phlegm nor acid spirit; but the oil itself rises in its own form, leaving in the retort only a little matter, thick as honey, and of a brownish colour.

The finer kinds resemble naphtha. Kirwan is of opinion that naphtha is converted into petroleum by a process similar to what takes place in essentail oils when exposed to the atmosphere; in which case the oil absorbs not only the pure, but also the phlogisticated, part of the atmosphere, in consequence of which several alterations take place in them.

Mr Bouldoc made several experiments with the white petroleum of Modena: an account of which he gave to the Paris academy.

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It easily took fire (A) on being brought near a candle. Petroleum and that without immediately touching the flame; and when heated in any vessel it will attract the flame of a candle, though placed at a great height above the vessel; and the vapour it sends up taking fire, the flame will be communicated to the vessel of heated liquor, and the whole will be consumed. It burns in the water; and when mixed with any liquor it swims on the surface of it, even of the highest rectified spirit of wine, which is five heavier than pure petroleum. It readily mixes with all the essentail oils of vegetables, as oil of lavender, turpentine, and the rest, and seems very much of their nature; nor is this very strange, since the alliance between these bodies is probably nearer than is imagined, as the essentail oils of vegetables may have been originally mineral ones, and drawn up out of the earth into the vessels of the plants.

The distinguishing characteristic of the petroleum is its thickness, resembling inquistipated oil; when pure it is lighter than spirit of wine; but though ever so well rectified, it becomes in time thick and black as before. Petroleum, when shaken, yields a few bubbles; but they sooner subside than in almost any other liquor, and the liquor refumes its clear state again almost immediately. This seems owing to the air in this fluid being very equally distributed to all its parts, and the liquor being composed of particles very evenly and nicely arranged. This extensibility of the oil is also amazing. A drop of it will spread over several feet of water, and in this condition it gives a great variety of colours; that is, the several parts of which this thin film is composed act as so many prisms. The most severe frost never congeals petroleum into ice; and paper wetted with it becomes transparent as when wetted with oil; but it does not continue so, the paper becoming opaque again in a few minutes as the oil dries away.

There are three varieties of it according to Mongez.

1. The yellow, found at Modena in Italy: very light and volatile. 2. The red, or yellowish red: some of which is collected at Gabian in Languedoc and in Alface. 3. The heavy, black, or brown kind, which is the most common, and met with in England, France, Germany, and some other countries. It generally runs out either from chinks or gaps of rocks, or is mixed with the earth, and gushes out of it; or it swims on the water of some fountains, as already mentioned. According to Dr Lippert, a kind of rofin is produced by mixing petroleum with smoking nitrous acid. The taste of this substance is very bitter, but the smell resembles that of musk. The vitriolic acid, according to the same author, produces a rofin still more bitter, but without any aromatic smell. Cronsted enumerates the following species.

1. Molva, or Barbadoes tar, a thick substance resembling soft pitch. It is found in several parts of Europe and Asia; particularly Sweden, Germany, and Switzerland: on the coast of the Dead Sea in

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Palestine.

(a) Alonso Barba, in his book of metals, gives a very melancholy influence of the power of petroleum of taking fire at a distance. He tells us, that a certain well yielding petroleum on the surface of its water, being to be repaired, the workman took down into the well with him a lantern and a candle in it; there were some holes in the lantern, through which the petroleum at a considerable distance sucked out the flame of the candle, and, taking fire, burned up with the noise of a cannon, and tore the man to pieces.
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Petroleum. Paleflme; in Peru, in the chinks of rocks, and in frata of gypsum and limestone, or floating upon water. It is found also in America, and at Coalbrookdale in England. Kirwan tells us, that petroleum exposed for a long time to the air forms this substance. It is of a vitrile consellation; and of a brown, black, or reddish black colour. Sometimes it is inodorous, but generally of a more or less disagreeable smell, particularly when burned. It melts easily, and burns with much smoke and foot, leaving either ashes or a flag according to the heterogeneous matter it contains. It contains a portion of the acid of amber. It gives a bitter salt with mineral alkali, more difficult of solution than common salt, and which, when treated with charcoal, does not yield any sulphur.

II. Elastic Petrel; a very singular kind of fossil met with in some parts of England. This in colour and consellation, exactly resembles the Caoutchouc, or elastic, gum-refin, commonly called Indian rubber, found in South America, and used for rubbing out the traces of black lead pencils from paper. It is of a dark brown colour, almost black; and in some pieces has a yellowish brown call like the same gum refin. It can scarce be distinguished from the caoutchouc with regard to its elastic property, excepting that the cohesion of its parts is not so great. It burns with a smoky flame, and melts likewise in a thick oily fluid: but emits a disagreeable smell like the Fossil Pitch or Barbadoes tar. On the whole (says M. Petroleum

Magellan, this fossil seems to confirm the opinion of those mineralogists who believe that thee oily combustibles derive their origin from the vegetable kingdom. It seems worth trying whether pieces of asphaltum, buried in damp beds of sappy rubbish or other kinds of earth, would take the same elastic consellation. This substance was found in the year 1795 near Caflerton in Derbyshire, but in very small quantities. Some of the specimens were of a cylindrical form, like bits of small branches or flakes of vegetables: tho' much more flexible, being perfectly elastic.

III. Hardened rock-oil, or fossil pitch, an inflammable substance dug out of the ground in many parts of the world, and known by the names of petroleum induratum, pix montana, indempex, bergbary, &c. There are two species. 1. The asphaltum (a), or pure fossil pitch, found on the shores of the Dead Sea and of the Red Sea; also in Sweden, Germany, and France; See Asphaltum. It is a smooth, hard, brittle, inodorous substance, of a black or brown colour when looked at; but on holding it up between the eye and the light, appears of a deep red. It swins in water; breaks with a smooth and shining surface; melts easily; and, when pure, burns without leaving any ashes; but, if impure, leaves ashes, or a flag. M. Monet affirms that it contains sulphur, or at least the vitriolic acid. It is lightly and partially acted upon by spirit-of-wine and

(a) This species is found in great quantity in a bituminous lake or plain in the island of Trinidad, of which Mr Anderson gives the following copious account in the 75th volume of the Philosophical Transactions.

A most remarkable production of nature in the island of Trinidad, is a bituminous lake, or rather plain, known by the name of Tar Lake; by the French called La Bras, from the resemblance to, and answering the intention of, ship-pitch. It lies in the leeward side of the island, about half-way from the Bocas to the south end, where the mangrove swamps are interrupted by the land-banks and hills; and on a point of land which extends into the sea about two miles, exactly opposite to the high mountains of Pana, on the north side of the gulf.

This cape, or headland, is about 50 feet above the level of the sea, and is the greatest elevation of land on this side of the island. From the sea it appears a mass of black vitrified rocks; but, on a close examination, it is found a composition of bituminous sferis, vitrified sand, and earth, cemented together: in some parts beds of cinders only are found. In approaching this cape, there is a strong sulphurous smell, sometimes disagreeable. This smell is prevalent in many parts of the ground to the distance of eight or ten miles from it.

This point of land is about two miles broad, and on the east and west sides, from the distance of about half a mile from the sea, falls with a gentle declivity to it, and is joined to the main land on the South by the continuation of the mangrove swamps; so that the bituminous plain is on the highest part of it, and only separated from the sea by a margin of land which surrounds it, and prevents a distant prospect of it. Its situation is similar to a savannah, and like them, it is not seen till treading upon its verge. Its colour and even surface present at first the aspect of a lake of water; but it is possible it got the appellation of Lake when seen in the hot and dry weather, at which time its surface to the depth of an inch is liquid; and then from its cohesive quality it cannot be walked upon.

It is of a circular form, about three miles in circumference. At my first approach it appeared a plain, as smooth as glass, excepting some small clumps of shrubs and dwarf trees that had taken possession of some spots of it; but when I had proceeded some yards on it, I found it divided into areoles of different sizes and shapes: the chains or divisions anastomosed through every part of it; the surface of the areole perfectly horizontal and smooth; the margins undulated, each undulation enlarged to the bottom till they join the opposite. On the surface the margin or first undulation is distant from the opposite from four to six feet, and the same depth before they coalesce; but where the angles of the areole oppose, the chains or ramifications are wider and deeper. When I was at it, all these chains were full of water, the whole forming one true horizontal plane, which rendered my investigation of it difficult and tedious, being necessitated to plunge into the water a great depth in passing from one areole to another. The true form that can be formed of its surface will be from the areole and their ramifications on the back of a turtle. Its more common consistence and appearance is that of pit-coal, the colour rather greyer. It breaks into small fragments of
a cellular appearance, and glossy, with a number of minute and shining particles interspersed through its substance; it is very friable, and, when liquid, is of a jet black colour. Some parts of the surface are covered with a thin and brittle scoria, a little elevated.

As to its depth, I can form no idea of it; for in no part could I find a substratum of any other substance, in some parts I found calcined earth mixed with it.

Although I smelt sulphur very strong on puffing over many parts of it, I could discover no appearance of it, or any rent or crack through which the substance falls into the receiver, which is left in the retort after distillation, or upon the charcoal if burnt in the open fire. It coheres like a flag, and is of the colour of black-lead; but in a strong heat this earth is soon volatilized, so that its nature is not yet well known. During the distillation a liquid substance falls into the receiver, which is found to be of the same nature with rock-soil. The substance itself is found in Sweden and several other countries.

The piasphaltum is of a mean confidence between the asphaltum and the common petroleum. Mongez says that it is the same with the bitumen collected from a well named De la Pege, near Clermont Ferrand in France.

The people of mount Ciaro, in Italy, have some years since found out a much easier way of finding petroleum than that which they formerly had been used to. This mountain abounds with a sort of greyish salt, which lies in large horizontal beds, mingled with strata of clay, and large quantities of a spar of that kind called...
called by the Germans *sicken,* which is the common
fort, that ferments with acids, and readily dissolves in
them, and calcines in a small fire. They pierce these
plates in a perpendicular direction till they find water;
and the petroleum which had been intermixed among
the cracks of these plates is then washed out by the wa-
ter, and brought from all the neighbouring places to
the hole or well in which they have dug, on the surface
of the water of which it swims after eight or ten days.
When there is enough of it got together, they lade it
from the top of the water with brute basons; and it
is then easily separated from what little water is taken
up with it. These wells or holes continue to furnish
the oil in different quantities for a considerable time;
and when they will yield no more, they pierce the plates
in some other place.

It is never used in Britain as a medicine; but the
French give it internally in hysterical complaints, and
to their children for worms: some also give it from 10 to
15 drops in wine for suppurations of the menses. This,
however, is rather the practice of the common people
than of the faculty.

PETROMYZON, the Lamprey, a genus of fishes
belonging to the class of amphibian nates. It has fe-
ven *piracula* at the side of the neck, no gills, a filula
on the top of the head, and no breast or belly fins.
There are three species, distinguished by peculiarities
in their back fins.

1. The marinus, or sea-lamprey, is sometimes found so
large as to weigh four or five pounds. It greatly
resembles the eel in shape; but its body is larger, and
its snout longer, narrower, and sharper, at the termi-
nation. The opening of the throat is very wide; each
jaw is furnished with a single row of very small teeth;
in the middle of the palate are situated one or two
other teeth, which are longer, stouter, and moveable
towards the inside of the throat; the inferior part of
the palate presents moreover a row of very small teeth,
which reaches to the bottom of the throat, where we
find four long notched bones; two short situ1ous pro-
cedles are observable at the extremity of the snout, and
there are two others thicker but still shorter above the
eyes. Willoughby supposes that the latter are the or-
gans of hearing, and the former the organ of smell.

His opinion with regard to the auditory faculty of
this fish is founded on what we read in ancient au-
thors, that the fishermen attracted the lampreys by
whistling, and that Cnepis had tamed one of them to
such a degree that it knew his voice and obeyed his call.

The eyes of the lamprey are small, and covered
with a transparent light blue membrane; the pupil is
bordered with a circle of a colour resembling gold;
neart the gills, which are four in number, there is a
round hole on both sides, through which it discharges
the water. The lamprey has no fins on its belly or
breast; on the back we observe a fin, which begins
pretty near the head, extends to the tail which it turns
round, and is afterwards continued to the anus: this
fin is covered by the skin of the body, to which it ad-
heres but loosely; the skin is smooth, of a red blackish
colour, and flecked with yellow; the lamprey ad-
vances in the water with winding motions like those of
a serpent, which is common to it, with all the anguilo-
form fishes.

The lamprey lives on flesh. During the cold it lies
concealed in the crevices of sea-rocks, and consequently
is fished for only at certain seasons. It lives in a flat
of hostility with the poulpe, a kind of sea-polyapus,
which hunts the combat as long as it can; but when it
finds the impossibility of escape, it endeavours to
surround the lamprey with its long arms. The latter
flips away, and the poulpe becomes its prey. The
lobster, we are told, avenges the poulpe, and destroys
the lamprey in his turn. See Cancer.

Rondelet says, that the fishermen consider the bite
of the lamprey as venomous and dangerous, and never
touch it while alive but with pincers. They beat it
on the jaws with a flick, and cut off its head. The
fame naturalist observes, that its aitches are a cure for
its bite and for the king's evil. When any one has

part of it has had its origin from a very different cause to that of
volcanoes; but they have certainly laid the
foundation of it, as is evident from the high ridge of mountains which surronds its windward side to protect
it from the depredations of the ocean, and it is aiy only barrier against that overpowering element, and may properly
be called the skeleton of the island.

"From every examination I have made, I find the whole island formed of an argillaceous earth, either in
its primitive flate or under its different metamorphoses. The bafes of the mountains are composed of *schiuss,
argillaeus and tatum lithomarqu,* but the plains or lowlands remaining nearly in the same moif state as at its
formation. The component particles have not experienced the vicissitudes of nature so much as the more elevated
parts, consequently retain more of their primitive forms and properties. As argillaceous earth is formed from
the sediment of the ocean, from the situation of Trinidad to the continent its formation is easily accounted for,
granting at first the formation of the ridge of mountains that bound its windward side, and the high mountains
on the continent that nearly join it; for the great influx of currents into the gulf of Paria from the coasts of
Brazil and Andalania must bring a vast quantity of light earthy particles from the mouth of the numerous
large rivers which traverse these parts of the continent; but the currents being repelled by these ridges of
mountains, eddies and smooth water will be produced where they meet and oppose; and therefore the earthy
particles would settle, and form banks of mud, and by fresh accumulations added, would form dry land:
and from these causes it is evident such a tract of country as Trinidad must be formed. But these
causes still exist, and the effect from them is evident; for the island is daily growing on the leeward side, as
may be seen from the mud beds that extend a great way into the gulf, and there constantly increase. But from
the great influx from the ocean at the south end of the island, and its egress to the Atlantic again, through
the Boca, a channel must ever exist between the continent and Trinidad." See Trinidad.
been bit by a lamprey, the most effectual method is to cut out the part affected. Lampreys are very detestable in having themselves: when taken with a hook, they cut the line with their teeth; and when they perceive themselves caught in a net, they attempt to pass through the meshes. They fish for lampreys only on the pebbly edges of sea-rocks; some of these pebbles are drawn together to make a pit as far as the water-edge, or perhaps a little blood is thrown in, and the lamprey is immediately observed to put forth its head between two rocks. As soon as the hook, which is baited with crab or some other flesh, is presented to it, it swallows it greedily, and drags it into its hole. There is then occasion for great dexterity to pull it out suddenly; for if it is allowed time to attach itself by the tail, the jaw would be torn away before the great bone of this fish could be taken. This shows that its strength refides in the end of its tail; the reason of which is, that the great bone of this fish is reversed, so that the bones, which in all other fishes are bent towards the tail, are here turned in a contrary direction, and ascend towards the head. After the lamprey is taken out of the water, it is not killed without a great deal of trouble: the best way is to cut the end of its tail, or perhaps to crush it with repeated blows on the spine, in order to prevent it from leaping. This shows that in the lamprey animal life extends to the end of the spinal marrow.

M. de Querhoen removes our fears concerning the supposed poison of the lamprey. This species of fish, he tells us, abounds on the coasts of Africa and at the Antilles islands; it is found likewise on the coast of Brazil, at Surinam, and in the East-Indies. When taken with a hook, we must have the precaution to kill it before we take it off, otherwise it darts upon the fisher and wounds him severely. Its wounds, however, are not venomous, M. de Querhoen having found several sailors who were bit by it, but experienced no disagreeable consequences. Lampreys are likewise found in great abundance at Aseaflion Island, but particularly in the seas of Italy: their flesh when dried is excellent; and boiling gives to the vertebrae the colour of gridelin.

The flesh of the lamprey is white, fat, soft, and tender; it is pretty agreeable to the taste, and almost as nourishing as that of the eel; those of a large size are greatly superior to the small ones. We know that the most wealthy of the Romans kept them in fish ponds at a great expense. Vellius Poillon, the friend of Augustus, who is distinguished in history for his savage gluttony, on supposition that lampreys fed on human flesh, were more delicate, ordered his slaves when accouched of the slightest faults to be thrown into his fish ponds. We are no less surprized, in reading the ancient authors, to perceive the extraordinary attachment which the celebrated orators Hortensius and Cæsarius, men in other respects so grave and sensible, had to this animal. One of them shed tears at the loss of a lamprey; the other improved upon this puerility, and wore mourning at the death of his favourite. It is remarkable, that this fish, which is proper to the sea, and never comes into the rivers, can live and fatten in fresh water. For the advancement of natural history, it was to be wished, that some person who lives near the sea shore would make observations, in order to discover whether the lamprey is viviparous; its scales are so imperceptible, that they have been overlooked by most ichthyologists.

Mr. Pennant is of opinion, that the ancients were acquainted with this fish; at least, he says, it is certain, that which Dr. Arbuthnot and other learned men render the word lamprey, is a species unknown in our seas, being the murmura of Ovid, Pliny, and others, for which we wish an English name. This fish, the leptos (our baffe), and the myxus, (a species of mullet), formed that pride of Roman banquets the tripalum, so called, according to Arbuthnot, from their being served up in a machine with three bottoms. The words lampetra and petromyon are but of modern date, invented from the nature of the fish; the first a lambendo petrae, the other from petros and nymie, because they are suppose to lick or suck the rocks.

2. The fluvitatis, or seifer lamprey, sometimes grows to the length of 10 inches. The mouth is formed like that of the preceding. On the upper part is a large bifurcated tooth; on each side are three rows of very minute ones; on the lower part are seven teeth; the exterior of which on one side is the largest. The irides are yellow. As in all the other species, between the eyes on the top of the head is a small orifice, of great use to clear its mouth of the water that remains on adhering to the bones; for through that orifice it ejects the water in the same manner as the catfish. On the lower part of the back is a narrow fin, beneath that rides another, which at the beginning is high and angular, then grows narrow; surrounds the tail, and ends near the anus. The colour of the back is brown or duncky, and sometimes mixed with blue; the whole under side silvery. These are found in the Thames, Severn, and Dee; are potted with the larger kind; and are by some preferred to it, as being milder tasted. Vast quantities are taken about Mortlake, and sold to the Dutch for bait for their cod-fishery. Above 430,000 have been sold in a season at 40s. per 1000; and of late, about 100,000 have been sent to Harwich for the same purpose. It is said that the Dutch have the secret of preserving them till the turbot fishery.

3. The bronchialis or lampern, is sometimes found on the length of eight inches, and about the thickness of a swan’s quill; but they are generally much smaller. The body is marked with numbers of transverse lines, that pass cross the sides from the back to the bottom of the belly, which is divided from the mouth to the anus by a straight line. The back fin is not angular like that of the former, but of an equal breadth. The tail is lancedolate, and short at the end. They are frequent in the rivers near Oxford, particularly the Isis; but not peculiar to that county, being found in others of the English rivers, where, instead of concealing themselves under the bones, they lodge themselves in the mud, and never are observed to adhere to any thing like other Lampreys.

PETRONIUS was a renowned Roman senator. When governor of Egypt, he permitted Herod, king of the Jews, to purchase in Alexandria any quantity of corn which he should judge necessary for the supply of his subjects, who were afflicted with a severe famine. When Tiberius died, Caius Caligula, who succeeded him, took from Vitellius the government of Syria, and gave it
The French critics, who had attacked its authenticity, were silent from the moment it was deposited in the Petronius, royal library. It is now generally attributed to Petronius, and found in every subsequent edition of the works of that refined voluptuary. The public did not form the same favourable opinion of some other fragments, which were extricated from a manuscript found at Belgrade in 1688, and printed at Paris by Nodier in 1694, though they are ascribed by the editor Charpentier, and several other learned men, to Petronius; yet, on account of the Gallicisms and other barbarous expressions with which they abound, they have generally been considered as unworthy of that author. His genuine works are, 1, A Poem on the civil war between Cæsar and Pompey, translated into prose by Abbé de Marolles, and into French verse by President Bouhier, 1737, in 4to. Petronius, full of fire and enthusiasm, delighted with Lucan’s flowery language, opposed Pharailus to Pharailus; but his work though evidently superior to the other in form respect, is by no means in the true style of epic poetry. 2. A Poem on the Education of the Roman Youth. 3. Two treatises; one upon the Corruption of Eloquence, and the other upon the Causes of the Decay of Arts and Sciences. 4. A poem on the Vanity of Dreams. 5. The Shipwreck of Lucan. 6. Reflections on the Inconstancy of Human Life. And, 7. Trimalchio’s Banquet. To this last performance morality is not much indebted. It is a description of the pleasures of a corrupt court; and the painter is rather an ingenuous courtier than a perfôn whose aim is to reform abuses. The best editions of Petronius are those published at Venice, 1499, in 4to; at Amsterdam, 1669, in 8vo, cum notis variorium; ibid. with Boschius’s notes, 1677, in 4to; and 1700, 2 vols in 4to. The edition of variorium was reprinted in 1745, in 2 vols 4to, with the learned Peter Burman’s commentaries.—Petronius died in the year 65 or 66.

Petronius (Maximus) was born in the year 395 of an illustrious family, being at first a senator and confid of Rome. He put on the imperial purple in 455, after having effected the assassination of Valentinian III. In order to establish himself upon the throne, he married Eudoxia the widow of that unfortunate prince, as she was ignorant of his villany, he conferred on her a transport of love, that the strong desire he had of being her husband, had made him commit this atrocious crime. Whereupon Eudoxia privately applied to Genserid, king of the Vandals, who coming into Italy with a very powerful army, entered Rome, where the usurper then was. The unhappy wretch endeavoured to make his escape, but the soldiers and people enraged at his cowardice, fell upon him, and overwhelmed him with a shower of stones. His body was dragged through the streets of the city for three days; and after treating it with every mark of disgrace, they threw it into the Tiber the 12th of June the same year, 455. He reigned only 77 days. He had some good qualities. He loved and cultivated the sciences. He was prudent in his councils, circumcised in his actions, equitable in his judgments; a facetious companion, and steady friend. He had the good fortune to win the affection of every body, while he remained a private character; but as a prince, he was so much the more detestable, in that, after he had obtained the throne by villany, he kept possession of it only by violence.
The crown was fearfully on his head before it appeared to him an infupportable burden. "Happy Democles exclaimed he in his despair, thou art a king during a single entertainment!"

PETROSA ossa, in anatomy, a name given to the fourth and fifth bones of the cranium, called also ossa temporum and ossa squamosa; the substance whereof, as their first and last names express, is squamos and very hard.

PETROSELINUM (aphium petroselimum, Lin.) Parley. This plant is commonly cultivated for culinary purposes. The seeds have an aromatic flavour, and are occasionally used as carminatives, &c. The root of parley is one of the five aperient roots, and with this intention is sometimes made an ingredient in apozems and diet-drinks; if liberally used, it is apt to occasion flatulencies; and this, we have no one corresponding in our language. The parts, which the Greeks call by the name of this root is somewhat sweetish, with an effect tooccasion occasionally used as carminatives, &c. The same year he became a member of the college of physicians in Ireland; where he continued till 1659, and acquired a great fortune. After the restoration, he was introduced to King Charles II., who knighted him in 1661. In 1662, he published "A Treatise of taxes and contributions." Next year he was greatly applauded in Ireland for his invention of a double bottomed ship. He died at London of a gangrene in his leg, in 1697, and was created a baronet.

PETTERIA, in the ancient music, a term to which we have no one corresponding in our language.

The melodioe, or the art of arranging sounds in succession so as to make melody, is divided into three parts, which the Greeks call syllogi, mixtia, and cheires; the Latins fupplea, mixtia, and u/ia. The art of expressing the several passions intended to be raised. Thus it shows what sounds are to be used, and what not; how often they are severally to be repeated; with which to begin, and with which to end; whether with a grave sound to rise, or an acute one to fall, &c. The pettia constitutes the manners of the muse; chooses this or that passion, or that motion of the soul, to be awakened; and determines whether it be proper to excite it on this or that occasion. The pettia, therefore, is in music much what the manners are in poetry.

It is not easy to discover whence the denomination should have been taken by the Greeks, unleas from πετητις, their game of chiefs; the musical pettia being a sort of combination and arrangement of sounds, as chiefs is of pieces called περτος, calculi, or "chiefs-men."

PETTY (Sir William), son of Anthony Petty, a clothier, was born at Rumsey, a little haven-town in Hampshire, in 1623; and while a boy took great delight in spending his time among the artificers there, who taught him all work as well as twelve years of age. Then he went to the grammar-school there; at 15 he was master of the Latin, Greek, and French tongues, and of arithmetic and those parts of practical geometry and astronomy usual to navigation. Soon after he went to Caen in Normandy, and Paris, where he studied anatomy, and read Vesalius with Mr. Hobbes. Upon his return to England, he was preferred in the king's navy. In 1643, when the war between the king and parliament grew hot, he went into the Netherlands and France for three years; and having vigorously prosecuted his studies, especially in physis, at Utrecht, Leyden, Amsterdam, and Paris, he returned home to Rumsby. In 1647, he obtained a patent to teach the art of double writing for seventeen years. In 1648, he published at London "Advice to Mr Samuel, Hartlib, for the advancement of some particular parts of learning." At this time he adhered to the prevailing party of the kingdom; and went to Oxford where he taught anatomy and chemistry, and was created a doctor of physis. 1659, he was made professor of anatomy there; and soon after a member of the college of physicians in London. The same year he became physician to the army in Ireland; where he continued till 1659, and acquired a great fortune. After the restoration, he was introduced to King Charles II., who knighted him in 1661. In 1662, he published "A Treatise of taxes and contributions." Next year he was greatly applauded in Ireland for his invention of a double bottomed ship. He died at London of a gangrene in his leg, occasioned by the swelling of the gout, in 1657. The character of his genius is sufficiently seen in his writings, which were much more numerous than those we have mentioned above. Amongst these I find, he wrote the history of his own life, which unquestionably contained a full account of his political and religious principles, as may be conjectured from what he has left us upon those subjects in his will. In that he has these remarkable words: "As for legacies to the poor, I am at a stand; and for beggars by trade and election I give them nothing; as for impotents by the hand of God, the public ought to maintain them; as for those who can get no work, the magistrates should cause them to be employed; which may be well done in Ireland, where are fifteen acres of improveable land for every head: as for prisoners for crimes by the king, or for debt by their profecutors, those who compassionately the sufferings of any object, let them relieve themselves by relieving such sufferers; that is, give them alms (a), &c. I am contented, that I have affioted all my poor relations, and put many into a way of getting their own bread, and have laboured in public works and inventions, and have fought out real objects of charity; and do hereby enjoin all who partake of my estate, from time to time to do the same at their peril. Nevertheless, to answer custom, and to take the sure side, I give twenty pounds to the most wanting of the parish wherein I died." As for religion, he says, "I die in the profession of that faith, and in the practice of such worship, as I find established by the laws of my country; not being able to believe what I myself please, nor to worship God better than by doing as I would be done unto, and observing the laws of my country, and expressing my love and honour to Almighty God, by such signs and tokens as are understood to be such by the people with whom I live." He died possessed of a very large fortune, as appears by his will; where he makes his real estate about

(a) In the town of Rumsby there is a house which was given by him for the maintenance of a charity school the rent of which is still applied to that use.
This should seem to be possessed of some medicinal virtues, but they have never been ascertained with any precision. The expressed juice was used by the ancients in leprous disorders.

PEUTEMAN (Peter) was born at Rotterdam in 1650, and was a good painter of inanimate objects; but the most memorable particular relative to this artist was that incident which occasioned his death.

He was requested to paint an emblematical picture of mortality, representing human skulls and bones fur. Painters adorned with rich gems and musical instruments, to express the vanity of this world's pleasures, amusements, or possessions; and that he might imitate nature with the greater exactness, he went into an anatomy room, where several skeletons hung by wires from the ceiling, and bones, skulls, &c. lay scattered about; and immediately prepared to make his designs.

While he was thus employed, either by fatigue, or by intense study, insensibly he fell asleep; but was suddenly roused by a shock of an earthquake, which happened at that instant, on the 18th of September 1692. The moment he awoke, he observed the skeletons move about as they were shaken in different directions, and the loose skulls roll from one side of the room to the other; and being totally ignorant of the cause, he was struck with such a horror, that he threw himself down stairs, and tumbled into the street half dead. His friends took all possible pains to efface the impression made on his mind by that unlucky event, and acquainted him with the real cause of the agitation of the skeletons; yet the transfixion still affected his spirits in such a manner, that it brought on a disorder, which in a very short time ended his days. His general subjects were either allegorical or emblematical allusions to the shortness and misery of the human life.

PETWORTH, sea crow, or more crow, in ornithology. See Larus.

PEWTER, a facitious metal used in making domestic utensils, as plates, dials, &c.—The ball of the metal is tin; which is converted into pewter by mixing at the rate of an hundred weight of tin with 15 pounds of lead and six pounds of brass.—Besides this composition, which makes the common pewter, there are other kinds, compounded of tin, regulus of antimony, bismuth, and copper, in several proportions.

PEYRERE (Isaac la), was born at Bourdeaux, of protestant parents. He entered into the service of the Prince of Conde, who was much pleased with the singularity of his genius. From the perusal of St Paul's writings he took into his head to aver, that Adam was not the first of the human race; and, in order to prove this extravagant opinion, he published in 1655 a book, which was printed in Holland in 40 and in 12mo, with this title, Pradamitice, five exercitatio super verbiis 12, 13, 14, cap. 15, Epistola Pauli ad Romanos. This work was burnt at Paris, and the author imprisoned at Brussels, through the influence of the archbishop of Malines's grand vicar. The Prince of Conde having obtained his liberty, he travelled to Rome in 1666, and there gave to Pope Alexander VII. a solemn renunciation both of Calvinism and Pradantism. His concession was not thought to be sincere, at least with regard to this last hereby. His desire to be the head of a new sect is evident; and his book discovers his ambition.
PEY

amblion; for he there pays many compliments to the Jews, and invites them to attend his lectures. Upon his return to Paris, notwithstanding the earnest solicitations of his holiness to remain at Rome, he went again into the Prince of Conde's service in the quality of librarian. Some time after he retired to the seminary des Vcris, where he died the 30th of January 1676, at the age of 82, after the sacraments of the church had been administered to him. Father Simon says, that when he was importuned in his last moments to retract the opinion which he had formed respecting the Preadamites, his answer was, *Hi quacunque ignarant, blasphemenat.* His having no fixed sentiments of religion is supposed to proceed more from a peculiar turn of mind than a corruption of the heart; for good nature, simplicity of manners, and humanity, seem to have formed his character. “He was,” says Niceron, a man of a very equal temper, and most agreeable conversation. He was a little too fond, however, of indulging his wit, which sometimes bordered on raillery; but he took care never to hurt or wound the feelings of his neighbor. As to his learning, it was extremely limited. He knew nothing either of Greek or Hebrew; and yet he ventured to give a new interpretation of several passages of the sacred volume. He piqued himself on his knowledge of the Latin; but excepting a few poets which he had read, he was by no means an adept in that language. His style is very unequal; sometimes too swelling and pompous, at other times low and groveling.” Before the works already mentioned, he has left behind him, I. A treatise as singular as it is scarce, intitled, *Du rappel des Juifs,* 1643, in 8vo. The recall of the Israelites, in the opinion of this writer, will be not only of a spiritual nature, but they will be reintegrated in the temporal blessings which they enjoyed before their rejection. They will again take possession of the holy land, which will resume its former fertility. God will then raise up to them a king more just, and more victorious, than any of their former sovereigns had been. Now, though all this is doublets to be understood spiritually of Jesus Christ, yet our author is of opinion, that it ought also to be understood of a temporal prince, who shall arise for the purpose of effecting the temporal deliverance of the Jews; and that this prince shall be no other than the king of France, for the following reasons, which, it is believed, will carry conviction to few minds: 1. Because the two titles of *Maij Christian,* and of *Elder Son of the Church,* are ascribed to him by way of excellence. 2. Because it is presumable, if the kings of France possest the virtue of curing the evil or scourful, which can only affright the bodies of the Jews; that they will likewise have the power of curing their obdurate incredulity and the other inveterate diseases of their souls. 3. Because the kings of France have for their arms a *fleur de luce*; and because the beauty of the church is in scripture compared to the beauty of lilies. 4. Because it is probable that France will be the country whither the Jews shall first be invited to come and embrace the Christian faith, and whither they shall retreat from the persecution of the nations that have dominion over them; for France is a land of freedom; it admits of no slavery, and whoever touches it is free. Peyrere, after explaining his strange system, proposes a method of converting the Jews to Christianity; a method, says Niceron, which will not be acceptable to many. He proposes to reduce the whole of religion to a bare faith or belief in Jesus Christ; taking it for granted, without any shadow of proof, that it is as difficult to comprehend the articles of our faith, as to observe the ceremonies of Moses.—From this scheme (says he) there would result a double advantage to the church; the reunion of the Jews, and of all those Christians who are separated from the body of the church.” Peyrere, when he wrote this book, was a Calvinist; but his Calvinism too nearly resembled the Deism of our age. He confessed himself that his reason for quitting the Preadamites was on account of their being the first and principal opposers of his book concerning the Preadamites. 11. A curious and entertaining account of Greenland, printed in 8vo, 1647. When he was asked, on an occasion of this work, why there were so many witches in the north; he replied, “It is because part of the property of these pretended conjurers, when condemned to suffer death, is declared to belong to their judges.” 11. An equally interesting account of Iceland, 1663, 8vo. IV. A letter to Philotimus, 1678, in 8vo, in which he explains the reasons of his recantation. &c. We find in Moreri the following epitaph of him, written by a poet of his own times.

*Le bon homme partit, & n'en choisit pas une.*

PEYRONIUS (Frances de la) for a long time practised surgery at Paris with such distinguished eclat, that he obtained for himself the appointment of first surgeon to Louis XV. He improved this favourable situation with his majesty, and procured to his protection those honours which had the effect to quicken its progress, and those enlargements which contributed to extend its benefits. The royal College of Surgery at Paris was founded by his means in 1731, was enlightened by his knowledge, and encouraged by his munificence. At his death which happened at Versailles the 24th of April, 1747, he bequeathed to the society of surgeons in Paris two thirds of his effects, his estate of Marigny, which was sold to the king for 200,000 livres, and his library. This useful citizen also left to the society of surgeons at Montpellier two houses situated in that town, with 100,000 livres, for the purpose of erecting there a chirurgical amphitheatre. He appointed the same society universal legatee for the third of his effects; and all these legacies contain clauses whose sole object is to promote the public good, the perfection and improvement of surgery; for which he always solicited the protection of the court. At the time of the famous dispute between the physicians and surgeons, he entertained the Chancellor d'Aguesseau to build up a brazen wall between the two bodies. “I will do so, replied the minifter, but on what side of the wall shall we place the sick?” Peyronius afterwards behaved with more moderation.—He was a philo­opher without any ostentation; but his philosophy was tempered by a long acquaintance with the world and with the court. The acuteness and delicacy of his
PEZAY (N. Masson, marquis of), born at Paris, very early applied himself to the study of letters, and afterwards went into the army. He was made a captain of dragons; and had the honour of giving some lemons to the ill-fated Louis XVI. Being appointed inspector-general of some coasting vessels, he repaired to the maritime towns, and executed his commission with more care and attention than was to have been expected from a votary of the muses. But as, at the same time, he showed too much haughtiness, a complaint was brought against him to the court, and he was banished to his country seat, where he died soon after, in the beginning of 1778. He was an intimate friend and companion of Dora. The story about it is

PEZENAS, a place in France about 24 miles from Montpellier. The soil about it is family. The rock is limestone. The fields are open, and produce corn, wine, and oil. There are to be seen at this place the extensive ruins of a castle, which formerly belonged to the Montmorency family. This strong fortress was blown out of the rock on which it stands, and appears to have been complicated and full of art. The walls are lofty, and above 8 feet in thickness. The rock, which is perpendicular, is a mass of shells, such as turban, oysters, cockles, with a calcareous cement. From hence the circumjacent plain decked with luxuriant verdure, and shut in by rugged mountains, affords a most delightful prospect. E. Long: 3: 35; N. L. 43: 18.

PEZIZA, cup mushrom, in botany; a genus of the natural order of fungi, belonging to the cryptogama class of plants. The fungus capsumulata and felle; Linnium enumerates 8 species.

PEZRON (Paul), a very learned and ingenious Frenchman, born at Hennemont in Brittany in 1639, and admitted into the order of Citeaux in 1660. He was a great antiquarian, and was indefatigable in tracing the origin of the language of the Goths; the result of which was, that he was led to oppose a system of the world's being much more ancient than modern chronologers have supposed. This he communicated to the public in a treatise printed at Paris in 1687, intitled, The antiquity of Time, restored and defended against the Jews and modern chronologers. This book of Pezron's was extremely admired for the ingenuity and learning in it; yet caus'd no small alarm among the religious, against whom he neverthelessedefended his opinions. He went through several promotions, the last of which was to the abbey of Charmoy, to which he was nominated by the king; and died in 1706.

PHAÇA, in botany: A genus of the decandria order, belonging to the diadelphus class of plants; and in the natural method ranking under the 32d order, Papilionaceae. The legumens is semibifoliar.

PHEA, a famous fow which infected the neighbourhood of Cromyion. Theseus destroyed it as he was travelling from Trezene to Athens to make himself known to his father. Some imagine that the boar of Calydon sprang from this fow. According to some authors, Phoea was a woman who prostituted herself to strangers, whom she murdered, and afterwards plundered.

PHEACIA, one of the names of the island Corcyra, (Homer, Stephanus). Phaeaces the people, (Ovid), noted for their insolence and luxury; hence Horace ues Phæaces for a person indolent and fleek; and hence arose their insolence and pride, (Aristotle). The island was famous for producing large quantities of the finest flavoured apples, (Ovid, Juvenal, Propertius).

PHÆDON, a disciple of Socrates, who had been feized by pirates in his youth; and the philopher, who seemed to discover something uncommon and promising in his countenance, bought his liberty for a sum of money, and ever after esteemed him, Phædon, after Socrates's death, returned to Elis his native country, where he founded a fect of philosophers who composed what was called the Elue school. The name of Phædon is affixed to one of Plato's dialogues.

PHÆDRA (tab. hif.) was a daughter of Minos and Pasiphae; she married Theseus, by whom she was the mother of Acamas and Demophoon. They had already lived for some time in conjugal felicity when Venus, who hated all the descendants of Apollo, because he had discovered her amours with Mars, inspired Phædra with the strongest passion for Hippolythus the son of Theseus, by the Amazon Hippolyte. This passion the long attempted to stifle, but in vain; and therefore, in the absence of Theseus, she address'd Hippolythus with all the impiance of despoding love. He rejected her with horror and disdain. She, however, incend'd by the reception she had met, resolved to punish his coldness and refufl; and at the return of Theseus she accused Hippolythus of attempts upon her virtue. He listened to her accusation; and without hearing Hippolythus's defence, he banished him from his kingdom, and implored Neptune, who had promised to grant three of his requets, to punifh him in an exemplary manner. As Hippolythus fled from Athens, his horsef were suddenly terrified by a sea monster, which Neptune had sent on the shore; and he was thus dragged through precipices and over rocks, trampled under the feet of his horsef, and crush'd under the wheels of his chariot. When his tragical end was known at Athens, Phædra confessed her crime, and hung her-
Phædrus, an ancient Latin writer, who composed five books of fables, in fable verse. He was a Thracian; and was born, as there is reason to conclude, some years before Julius Cæsar made himself master of the Roman empire. How he came into the service of Augustus is not known; but his being called Augustus' freedman in the title of the book, shows, in very pure and elegant language: and it is remarkable that they remained buried in libraries altogether unknown to the public, until they were discovered and published by Peter Pithou, or Pithous, a learned French gentleman, toward the close of the 16th century.

Phædrus (Thomas) was a professor of eloquence at Rome, early in the 16th century. He was canon of Lateran, and keeper of the library in the Vatican. He owed his rise to the acting of Seneca's Phælytus, in which he performed the part of Phœbus. Erasmus, who tells this, says he had it from Cardinal Raphael Georgianus, in whose court-yard, before the palace, that tragedy was acted. The cause of its death was very remarkable; for as he was riding through the city on a mule, he met a cart drawn by wild oxen, and was thrown by its mule, who took fright at them. Though corpulent, the cart fortunately passed over him without doing him any hurt, as he fell in the space between the wheels; but fright and the fall together spoiled the whole mass of his blood so much, that he contracted a distemper, of which, after languishing some time, he died under the age of 95. If he had lived, he would most probably have become an author; and perhaps, adds Bayle, have confirmed what has been observed of him, that his tongue was better than his pen. The observation was made by Erasmus, who tells us, that he knew and loved him; and owns that he was called the Cicero of his time. Janus Paraphæus, his colleague, was much grieved at his death, and gave the titles of several works, which were almost ready for public view.

Phænomeneon, in philosophy, denotes any remarkable appearance, whether in the heavens or earth, and whether discovered by observation or experiment.

Phaeton, in fabulous history, was the son of the Sun, or Phœbus and Clymene, one of the Oceanides. He was son of Cephalus and Aurora, according to Theocritus and Pausanias; or of Tithonus and Aurora, according to Apollodorus. He is, however, more generally acknowledged to be the son of Phœbus and Clymene. He was naturally of a lively disposition, and a handsome figure. Venus became enamoured of him, and enthrall’d him with the care of one of her temples. This distinguishing favour of the goddess rendered him vain and aspiring; and when Epaphus, the son of Io, had told him, to check his pride, that he was not the son of Phœbus, Phaeton resolved to know his true origin, and at the instigation of his mother, he visited the palace of the Sun. He begged Phœbus, that if he really was his father he would give him incontestable proofs of his paternal tenderness, and convince the world of his legitimacy. Phœbus received him with great tenderness, and swore by Styx to grant whatever he requested as a proof of his acknowledging him for his son. The youth boldly asked the direction of the chariot of the Sun for one day. His father, grieved and surprised at this demand, used all his arguments to dissuade him from the rash attempt; but all was in vain: and being by his oath reduced to submit to his obstinacy, enthrall’d him with the reins, after he had directed him how to use them. The young adventurer was however soon sensible of his madness. He was unable to guide the fiery steeds; and loosing the reins, Jupiter, to prevent his confounding the heavens and earth, struck him with a thunderbolt, and hurled him from his seat into the river Eridanus or Po. His sisters Phaethus, Lamia, and Phæbe, lamenting his loss upon its banks, were changed by the gods into black poplar trees; and Cyamus king of Liguria, also grieving at his fate, was transformed into a swan.

The poets say, that while Phaeton was driving the chariot of his father, the blood of the Ethiopians was dried up; and their skin became black; a colour which is still preferred among the greatest part of the inhabitants of the torrid zone. The territories of Libya were also, they tell us, parched up, on account of their too great vicinity to the Sun; and ever since, Africa, unable to recover her original verdure and fruitfulness, has exhibited a sandy country and uncultivated wastes. According to those who explain this poetical fable, Phaeton was a Ligurian prince, who studied astronomy, and in whose age the neighbourhood of the Po was, visited with uncommon heats.

Phaeton, in ornithology, a genus of birds belonging to the order of anseres; the characters of which are: The bill is sharp, straight, and pointed; the nostrils are oblong, and the hinder toe is turned forward. There are two species, viz.

1. The demererus, or red-footed penguin, has a thick, arched, red bill; the head, hind-part of the neck, and the back of a dusky purplish hue, and breast and belly white; brown wings, with the tips of the feathers white; instead of a tail, a few black bristles; and red legs. It is found on Pinguin isle, near the Cape of Good Hope, is common all over the South Seas, and is about the size of a goose.

2. The eheerus, or tropic bird, is about the size of a partridge, and has very long wings. The bill is red, with an angle under the lower mandible. The eyes are encompassed with black, which ends in a point towards...
towards the back of the head. Three or four of the larger quill-feathers, towards their ends are black, tipped with white; all the rest of the bird is white, except the back, which is variegated with curved lines of black. The legs and feet are of a vermilion red. The toes are webbed. The tail consists of two long straight narrow feathers, almost of equal breadth from their quills to their points. See Plate CCCXXXIX.

The name tropic bird (says Latham), given to this genus arises from its being chiefly found within the tropic circles; but we are not to conclude, that they never stray voluntarily, or are driven beyond them; for we have met with a few instances to prove the contrary (a). It is, however, so generally found within the tropical limits, that the sight of this bird alone is sufficient to inform the mariner of a very near approach to if not his entrance therein. It has also been thought to portend the contiguity of land (b); but this has often proved fallacious, as it is not unfrequently found at very great distances therefrom. The flight of this bird is often to a prodigious height; but at other times it is seen, along with the frigate pelican, booby, and other birds attending the flying fishes at their rise from the water, driven from the native element into the air by their watery enemies, the shark (c), porpoise albacore bonito, and dolphin, which pursue them behind and prey upon them. These birds are sometimes observed to rest on the surface of the water, and have been now and then seen in calm weather upon the backs of the drowzy tortoises, supinely floating in the sea, so that they have been easily taken by the long boat manned. On shore they will perch on trees; and are said to breed in the woods, on the ground beneath them. They have been met with in plenty on the islands of St Helena, Ascension, Mauritius, New Holland, and various places in the South Seas; but in no place so numerous as at Palmerston Island, where these birds, as well as the frigates, were in such plenty that the trees were absolutely loaded with them, and so tame that they suffered themselves to be taken of the boughs with the hand. At Otaheite, and in the Friendly isles, the natives give them the names of baingoo and toolaite.

As the tropic bird flies the long tail feathers every year, the inhabitants of such isles as they frequent, collect and make use of them by way of ornament in various manners; they are worn in the caps of the Sandwich islanders, being in great plenty at Tahborn, as also in various parts of their dress; but in none more conspicuous than in the mourning garment of Otaheite, in which island numbers are picked up in the mountainous parts, where it also breeds. The flesh cannot be called good, but was found sufficiently acceptable to those who had long been confined to salt provisions, and in which circumstance the sailors did not despise it.”

There is a variety of this bird called by Latham the subite tropic bird. It is less than the one we have already described, and is found in as many places as it. The plumage of this bird is in general of a silvery white. The yellow tropic bird is a further variety of the same species, the plumage being of a yellowish white. These differences, Mr Latham thinks, arise merely from age, if they are not the distinguishing mark of sex.

3. The black-billed tropic bird is smaller than any of the former. The bill is black; the plumage on the upper part of the body and wings is striated, partly black and partly white; before the eye there is a large crescent of black, behind it is a streak of the same colour; the forehead and all the under parts of the body are of a pure white colour; the quills and tail are marked as the upper parts, but the ends of the first are white, and most of the feathers of the tail are marked with dusky black at the tips; the sides over the thighs are striated with black and white; the legs are black.

One of these was found at Turtle and Palmerston islands, in the South Seas, and is in the possession of Sir Joseph Banks.

4. The red-tailed tropic bird is in length about two feet ten inches, of which the two tail-feathers alone measure one foot nine inches. The bill is red; the plumage white, tinged of an elegant pale rose-colour; the crescent over the eyes is somewhat abrupt in the middle; the ends of the scapulars are marked with black. This bird is distinguished from others by two middle long tail feathers, which are of a beautiful deep red colour, except the shafts and base, which are black; the sides over the thighs are dusky; and the legs are black.

“This species (says Latham) is met with frequently as large as the others, but does not seem to be so far spread. Our navigators met with them in various places, though they were seldom seen by them on shore except in the breeding season, which is in September and October. They are found in great numbers in the island of Mauritius, where they make the nest in hollows in the ground under the trees; the eggs are two in number, of a yellowish white marked with rufous spots.

(a) “Dr Forster observes that they are never seen beyond 28 degrees of latitude; but others talk of their spreading far beyond it. In lat. 32° 45'. Ell. Narr. ii. p. 64.—33° 10'. N. Coast's Tav. Voy. iii. p. 178.—38° 34'. S. Park. Voy. p. 132.—38° 29'. Haukef. Voy. iii. p. 77. This is mentioned as not being common; but Kalm says he met with these in 40 degrees north. See Trav. i. p. 22.—And a friend of mine assured me, that he saw one in latitude 47° north; but at the same time observed, that it was the first instance he had ever known of such a circumstance."

(b) "Ulua's Voy. ii. p. 301. He observes, that they seldom are met with above eight or ten leagues from land.

(c) "Squallus conductor, delphinus phocens, scomber thynnus, scomber pelamis, delphinus eorephina. See Phil. Trans. vol. iv. viii. p. 800. It is there observed, that the flying fish is able to fly 60 or more yards at one stretch, and repeat it a second or even a third time, only the slightest momentary touch of the surface that can be conceived intervening; and it is common in these flights for them to fly against ships, or fall on the deck."
spots. The same author gives an account of the introduction of paradise grackles into the island of Bourbon, from whence they spread into that of Mauritius; at first intended for the very useful purpose of destroying the locusts and grasshoppers, which swarmed there to a great degree; the result of their profligate incease, and the unlooked for conseqences of it, he has likewise mentioned. These birds, we are told, are great enemies to the tropic birds, ocular demonstration of which was had by M. de Querhoent; for, being seated beneath a tree in which were perched a number of the grackles, he observed a tropic bird come to its hole, in order to go to the nest; but the grackles attacked the bird all at once, and obliged it to fly off; it then returned with its comfort in company, but without effect, as they were both driven away, as the single one had been before; when the grackles returned to their tree, and the spectator left them in that situation.

"This species of tropic bird has been met with in several places of the south seas; very common at Palmerston and Turtle islands; at Hervey’s island in the greatest plenty, and of which considerable numbers were killed for provisions: and here also they make the nefts in the same manner as at Mauritius. The name it is known by at Otahite and the Friendly Isles is towage and tato. See DIONEDE and PINOIN.

PHAGÉDÉNA, in medicine, denotes a corroding ulcer.

PHAGÉDÉNIC MÉDICINES, those used to eat off proud or fungous flesh; such as are all the eaufties. PHAGÉDÉNIE WATER, in chemistry, denotes a water made from quicklime and sublimate; and is very efficacious in the cure of phagédénic ulcers. To prepare this water, put two pounds of fresh quicklime in a large earthen pan, and pour upon it about ten pounds of rain-water; let them stand together for two days, stirring them frequently; at last leave the lime to settle well, then pour off the water by inclination, filter it, and put it up in a glass bottle, adding to it an ounce of corrosive sublimate in powder; which from white becomes yellow, and sinks to the bottom of the vessel. The water being setted, is fit for use in the cleaning of wounds and ulcers, and to eat off superfluous flesh, and especially in gangrenes; in which case it may be added to it a third or fourth part of spirit of wine.

PHALÉNA, the Moth, in zoology, a genus of insects belonging to the order of lepidoptera. The feelers are cetaceous, and taper gradually towards the points; the wings are often bent backwards.

Barbut divides this genus into eight families, and we are told that there are no less than 460 species. The names of the several families are given by Barbut as follows: 1. The attack, whose wings incline downwards and are spread open: they have pedicinate antennae without a tongue, or pedicinate antennae with a spiral tongue, or cetaceous antennae with a spiral tongue. 2. The bombyces, whose wings cover the body in a position nearly horizontal, and which have pedicinate antennae. They are either elingues, which want the tongue, or have it fo short as not to be manifestly spiral; their wings are either reversed or deflected; or spirelingues, which have a spiral tongue; and are either leaves with smooth backs, or criffate dorfo with a kind of crest or tuft of hair on the back. 3. The noctua, whose wings are incumbent as in the bombyces, from which they differ chiefly in the formation of the antennae, which are cetaceous. The noctua are either elingues, wanting tongues, or spirelingues having spiral tongues. 4. The geometru, whose wings when at rest are extended horizontally; the antennae in one subdivision of this section are pedicinate, in another cetaceous; the under wing in each of these divisions are either angulated, or round with entire edges. 5. The tortrices. The wings are exceedingly obtuse, their exterior margin is curve, and declines towards the sides of the body. They have short palpi. 6. The pyralides. The inner margins of the wings in this section are laid one over the other: the wings themselves decline a little towards the sides of the body, and in shape resemble a delta; they have considerable palpi of different forms. 7. The tinece. The wings are wrapped up or folded round the body, so as to give the insect a cylindrical form; the forehead is stretched out or advanced forwards. 8. The alucites. The wings of this division are split, or divided into branches almost to their base.

The caterpillars of this genus vary much as to size, and considerably as to their shape and number of feet. It is remarkable, that caterpillars of almost every species of this genus are found with 10, 12, 14, and 16 feet. The last are the most common and the largest; those of 10 and 12 feet are called geometri. "Amongst the geometru caterpillars (says Barbut) there are some very singular, whether for their colour, or the tubercula which they bear, or lastly for the difference of their attitudes. Many resemble small branches or bits of dry wood; and that resemblance may be a means of saving many of those insects from the voraciousness of birds, who do not so easily discern them. Other caterpillars are very hairy, while several are quite smooth; the latter have a cleaner look, whereas the hairy ones have something hideous, and may even be hurtful when touched.

"All the caterpillars of phaléna, after having several times cast their flough, spin their cod, in which they are transformed to chrysalids. The texture of the cod, the finenes of the thread of which it is composed, and the different matters joined to the threads, are infinitely various.

"The chrysalids of phaléna are generally oblong, not angular as those of butterflies, nor so soon transformed to perfect insects. They remain a much longer time within the cod, the greatest part not coming forth till the ensuing year. Some I have met with that remained in that state during two or three years successively. Heat or cold contribute greatly to forward or put back their final metamorphosis; a fact which may be ascertained by procuring them a certain degree of moderate heat, by which means one may see phaléna brought forth upon one's mantel-piece in the depth of winter.

The Phaléna or perfect insects spring from those cods, are generally more clumsy and heavy than butterflies; their colours are likewise more brown, dim, and obscure, though there are some phaléna whose colours are very lively and brilliant. Several of them,
The caterpillar feeds upon the roots of burdock, hops, &c. changes into a chrysalis in May, appears in the winged state in June, frequenting low marshy grounds where hops grow.

**Phalaena noctua promina spirinquis, No. 4.** The thorax, head, antennae, feet, and upper wings, are of a brown colour, more or less dark, sometimes so deep as to be nearly black, but often a bluish cast. The upper wings are moreover somewhat clouded, and have two black spots, one on the middle, the other towards the outward angle of the lower part of the wing. The under ones are of a beautiful orange colour, with a broad black band near the lower edge of the wing, of which it follows the direction. The caterpillar is smooth; to be found on several plants, but particularly upon the thalphi and some other cruciferous plants. It keeps in concealment during the day, and only feeds by night. Its metamorphosis is performed underground, and some varieties of colour are observable amongst these caterpillars: some being green, others brown; which latter yield males, the former females.

**Phalaena tetricia prafinana.** The superior wings of this species are of a fine green colour, having two diagonal yellow bars on each, the body and inferior wings are whitish, shaded with yellowish green. The caterpillar is a pale yellowish green, ornamented with small brown specks or spots, the tail being forked and tipped with orange red colour; feeds on the oak, changes to a chrysalis in September, and assumes the fly-state about May, frequenting woods.

**Phalangium, in zoology, a genus of insects belonging to the order of aptera.** They have eight feet, two eyes on the top of the head placed very near each other, and other two on the sides of the head; the feelers resemble legs, and the belly is round. There are nine species.

Mr. Barbut only describes one species, viz. the phalangium opillus of Linneus. His description is as follows: "Its body is roundish, of a dusky brown on the back, with a deeper spot of a rhomboidal figure near the middle of it. The belly is whitish; the legs are extremely long and slender. On the back part of the head there flanks a little eminence, which has on it a kind of double crest, formed as it were of a number of minute spines; the eyes are small and black, and are two in number. It is commonly called the *shepherd spider.*"

"This species of spider multiplies singularly. They are great spinners. In autumn the fluffly is quite covered with the threads of these spiders, by means of which they travel with ease, and ensnare their prey. However, those threads are thought rather to be the produce of a species of tick called *autumnal cocoon.*" A small degree of attention discovers an amazing multitude of those ticks almost imperceptible, and that is their work. The threads, when united appear of a beautiful white, wave about in the air, and are known in the country by the name of virgins' threads. Some naturalists think that those threads, floating in the air, serve the insect as a net to waft it through the air, and as a net to entrap insects on the wing; for remnants of prey, say they, are discoverable in them. As to those parcels in which nothing is seen, they are only essays rejected by those travelling insects. The analogy between the phalangium and the crab, and the facility with
Phaeton or Tripe Bird.

Persepolis.
PHALANGOSIS, in surgery, is a tumor and relaxation of the eye lids, often so great as to deform the eye, and render it impossible to perceive vision. Sometimes the eye lids when in this state subside or sink down, occasioned perhaps either by a puffiness of the muscles which inflame and elevates the eye lids, or else from a relaxation of the cutis above, from various causes. Sometimes an acrimonious or aqueous tumour is formed on the eye lids, so as almost entirely to exclude vision; but this last case should be distinguished from the other, and may be easily remedied by the use of internal and topical medicines, such as purges and diuretics given inwardly, and a compress dipped in warm spirit of wine and lime-water. But in the paralytic or relaxed case, the use of cordial and nervous medicines must be proposed internally; and outwardly, balsam of Peru and Hungary water are to be employed. If these fail, the remaining method of cure is to extirpate a sufficient quantity of the relaxed cutis, and then, after healing up the wound, the remainder will be sufficiently shortened.

PHALANX, in Grecian antiquity, a square battalion of soldiers, with their shields joined and pikes crossing each other; so that it was next to impossible to break it.

The Macedonian phalanx is suppos'd by some to have had this advantage, in valour and strength, over the Roman legion. Its number was 8000 men. But the word phalanx is used for a party of 28, and several other numbers; and even sometimes for the whole body of foot. See Legion.

Phalanx is applied, by anatomists, to the three rows of small bones which form the fingers. In natural history it is a term which Dr Woodward and some other writers of fossils have used to express an arrangement of the columns of that fort of fossil corolloloe body found frequently in Wales, and called lithifolution. In the great variety of specimens we find of this, some have the whole phalanx of columns craked through, and others only a few of the external ones; but these cracks never remain empty, but are found filled up with a white spar, as the smaller cracks of stone usually are. This is not wonderful, as there is much spar in the composition of this fossil; and it is easily washed out of the general mass to fill up these cracks, and is then always found pure, and therefore of its natural colour, white.

The lithifolution, or general crangement of these phalanges of columns, is commonly found immersed in a grey shone, and found on the tops of the rocky cliffs about Milford in Wales. It is usually cretaceous, though somewhat inclining in some specimens, but never lies horizontal. It seems to have been all white at first, but to have been since gradually tintured with the matter of the stone in which it lies. The single columns, which form each phalanx, are usually round or cylindric, though sometimes flattened and bent; some of them are also naturally of an angular figure; these, however, are not regular in the number of their angles, some consisting of three sides, some of five, and some of seven; some are hexagonal also, but these are scarce. They are from five or six to sixteen inches in length; and the largest are near half an inch over, the least about a quarter of an inch; the greater number are very equal to one another in size; but the sides of the columns being unequal, the same column measures of a different thickness when measured different ways; the phalanges or congeries of these are sometimes of a foot or more in diameter.

The columns are often burst, as if they had been affected by external injuries; and it is evident that they were not formed before several other of the extraneous fossils; for there are found a bivalve shells of sea-fishes and entrochi immersed and bedded in the bodies of the columns. It appears plainly from hence, that when these bodies were washed out of the sea, and tossed about in the waters which then covered the tops of these cliffs, this elegant fossil, together with the fomy bed in which it is contained, were so soft, that those other bodies found entrance into their very substance, and they were formed as it were upon them. This fossil takes an elegant polish, and makes in that flate a very beautiful appearance, being of the hardnes of the common white marl, and carrying the elegant structure visible in the smallest lineaments.

PHALARIS, a remarkable tyrant, born at Crete, where his ambitious dispositions occasioned his banishment: he took refuge in Agrigentum, a free city of Sicily, and there obtained the supreme power by stratagem. The circumstance which has chiefly contributed to preserve his name in history is his cruelty; in one act of which he gave, however, an example of first justice. It is thus related: Perillus, a brass-founder at Athens, knowing the cruel disposition of Phalaris, contrived a new species of punishment for him to inflict on his subjects. He cast a brazen bull, bigger than the life, with an opening in the side to admit the victims; who being shut up in the body, a fire was kindled under it, to roast them to death; and the throat was cut off, that their dying groans resembled the roaring of a bull. The artific brought it to the tyrant, expelling a great reward. Phalaris admired the invention and workmanship, but ordered the inventor to be put into it to make the first trial. In allusion to which, Ovid says,

Quam neci artifiae arte perire sua.

The end of this detestable tyrant is differently related; but it is very generally believed, with Cicero, that he fell by the hands of the Agrigentines; and, as some suppute, at the instigation of Pythagoras. Ovid tells us, that his tongue was cut out; and that he was then put into the bull to perish by the flame burning fire by which means he had murdered so many before. Others say that he was stoned to death; and all agree that his end was violent. He reigned, Eusebus says, 28 years; others say 16. After all, there is great uncertainty both as to his life, death, and history. Many of the circumstances related of him, as they are collected by Mr Boyle, depend upon the authenticity of those epistles which go under the name of the tyrant; and which have been judiciously questioned, and with great probability rejected, as the spurious production of some modern sophist. See Bentley, p. 177, col. 2.
Phalaris, or Canary-grass, in botany; a genus of the trigynia order, belonging to the triandra class of plants. The calyx is bivalved, carinated, and equal in length, containing the corolla. There are ten species, of which the most remarkable are the canariensis, or manured Canary-grasses; and the arundinacea, or reed Canary-grasses. These are both natives of Britain. The first grows by the road-sides; and is frequently cultivated for the sake of the seeds, which are found to be the best food for the Canary and other small birds. The second grows on the banks of rivers. It is used for thatching ricks or cottages, and endures much longer than rye. In Scandinavia they mow it twice a-year, and their cattle eat it. There is a variety of this cultivated in our gardens with beautifully rippled leaves. The stripes are generally green and white; but sometimes they have a purplish cast. This is commonly called painted lady-grass, or ladies truffles.

Phaleræ, among the ancient Romans, were military rewards bestowed for some signal act of bravery. Authors do not agree whether the Phaleræ were a suit of rich trappings for a horse, or golden chains something like the torques, but so formed as to hang down to the breast and display a greater profusion of ornament. The late opinion appears to have the greater prevalence, but perhaps both are true.

Phaleræus (Nepos), a village and port of Athens; this last neither large nor commodious, for which reason Themistocles put the Athenians on building the Piræus; both joined to Athens by long walls. The Phaleræ lay nearer the city (Pausanias). Demetrius Phaleræus, the celebrated scholar of Theophrastus, was of this place; to whom the Athenians erected above three statues; which were afterwards destroyed by his enemies, on his flight to Ptolemæus king of Egypt (Strabo). Here Demosthenes was wont to declaim, to accustom his voice to surmount the noise and roaring of the sea; a just and lively emblem of popular assemblies.

Phaleucian Vers, in ancient poetry, a kind of verse consisting of five feet; the first of which is a sponde, the second a dactyl, and the three last trochees.

Phallus, the morel, in botany; a genus of fungi, belonging to the cryptogamia class of plants. The fungus is reticulated above and smooth below. There are two species.

1. The eculentus, or eculent morel, is a native of Britain; growing in woods, groves, meadows, pastures, &c. The substance, when recent, is wax-like and friable; the colour a whitish yellow, turning brownish in decay; the height of the whole fungus, about four or five inches. The stalk is thick and clumsy, somewhat tuberous at the base, and hollow in the middle. The pileus is either round or conical; at a medium about the size of an egg, often much larger; hollow within; its base united to the stalk; and its surface cellular, or latticed with irregular fissures. The magnified seeds are oval. It is much esteemed at table both recent and dried, being commonly used as an ingredient to heighten the flavour of ragouts. We are informed by Gleditch, that morels are observed to grow in the woods of Germany in the greatest plenty in those places where charcoal has been made. Hence the good women who collect them to sell, receiving a hint how to encourage their growth, have been accustomed to make fires in certain places of the woods, with heath, broom, cannabis, and other materials, in order to obtain a more plentiful crop. This strange method of cultivating morels being however sometimes attended with dreadful consequences, large woods having been set on fire and destroyed by it, the magistrates thought fit to interpose his authority, and the practice is now interdicted.

2. The impudicus, flinking morel, or flinkhorn, is also a native of Britain, and found in woods and on banks. It arises from the earth under a veil or volva, shaped exactly like a hen's egg, and of the same colour, having a long fibrous radicle at its base. This egg like volva is composed of two coats or membranes, the space between which is full of a thick, viscid, transparent matter, which, when dry, glues the coats together, and foames like varnish. In the next stage of growth, the volva suddenly bursts into several rared permanent segments, from the centre of which arises an erect, white, cellular, hollow stalk, about five or six inches high and one thick, of a wax-like friable substance, and most fetid cadaverous smell, conical at each end, the base invested in a white, concave, membranaceous turbinate cup, and the summit capped with a hollow, c-nical pileus, an inch long, having a reticulated cellular surface, its base detached from the stalk, and its summit umbilicated, the umbilicus sometimes perforated and sometimes closed. The under side of this pileus is covered with a clear, viscid, gelatinous matter, similar to that found between the membranes of the volva; and under this viscid matter, concealed in reticulated receptacles, are found the seeds, which when magnified appear spherical. As soon as the volva bursts, the plant begins to diffuse its intolerable odours, which are so powerful and widely expanded, that the fungus may be readily discovered by the scent only, before it appears to the sight. At this time, the viscid matter between the coats of the volva grows turbid and fuculent; and when the plant attains its full maturity, the clear viscid substance in the pileus becomes gradually discoloured, putrid, and extremely fetid, and soon afterwards turns blackish, and, together with the seeds and internal part of the pileus itself, melts away. The fetid smell then begins to remit, the fungus fades, and continues for a short time sapless and coriaceous, and at last becomes the food of worms. The cadaverous scent of this fungus g'eatly allures the flies; which, lighting upon the pileus, are entrapped in the viscid matter and perish. We are informed by Gleditch, that the vulgar people in Thuringia call the unopened volva by the ridiculous name of ghafls and demon's egg; and that they collect and dry them either in the smoke or open air, and when reduced to powder, use them in a galls of spirits as an aphrodisiac.

Phallus, among the Egyptians, was the emblem of fecundity. It was very fervently worshipped by women, especially by those who were barren. This custom was introduced among the Greeks, and fêtivals in honour of it were called phallos. See Mythologies, n° 38, &c. Among the Hindoos a similar emblem called lingam is used, and for similar purposes, See Hindoos, n° 4.

Phalti, or Phaltiel, son of Laish. He married...
Pharamond, after Saul had taken her from David; but David afterwards took her away from Phalti.

Some interpreters are of opinion Phalti did not meddle with Michael all the time he continued in his house, for fear that both of them should incur the penalty of death, to be inflicted on adulterers (Levit. x. 10), because Michael had not been legally divorced; but these reasons are frivolous. Saul looked upon David as a rebel to his king, and an outlaw, whose goods and wives belonged to him, and which he could absolutely dispose of. He would not have given Michael to Phalti, nor would he have received her, if he had not thought he might use her as his wife. If Michael had no children by Phalti, by whom then were those children that the scripture says she had, since it is known she had none by David? See 2 Sam. xxvi. 6, and vi. 23.

Phanatics, or Fanatics, a visionary; one who fancies he sees spirits, spirits, apparitions, or other imaginary objects, even when awake; and takes them to be real. See Phantasy and Fanatic.

Such are phrenetics, necromancers, hypochondriacs, lycanthropes, &c. See Phrenetic, Hypochondriac, Lycanthrope.

Hence the word is also applied to enthusiasts, pretenders to revelations, new lights, prophets, &c. See Enthusiast, and Second Sight.

Phantasia, was the daughter of Nicharchus of Memphis in Egypt. It has been supposed she wrote a poem on the Trojan war, and another on the return of Ulysses to Ithaca, from which compositions Homer copied the greatest part of his Iliad and Odyssey, when he visited Memphis, where they were deposited.

Phantasm, a term sometimes used in a synonymous sense with idea, or notion retained in the mind, of an external object.

Phantasy, or Fancy, the Imagination; the second of the powers or faculties of soul, by which the species of objects received by the external organs of sense are retained, recalled, further examined, and either compounded or divided. See Imagination; and Metaphysics, Part I. Chap. ii.

Others define the phantasy to be that internal sense or power, whereby the ideas of absent things are formed, and represented to the mind as if they were present. In melancholics and madmen this faculty is very strong, representing many extravagant and monstrous things, and framing its images as lively as those of sensation; whence the visions and deceptions these persons are liable to.

Phanuel, of the tribe of Asher, the father of a holy widow and prophetess called Anna, who was in the temple when our Saviour was presented there by his parents (Luke ii. 50, 37, 38.)

Phaon, a young man of Mytilene, in the island of Lesbos, received from Venus, as fable reports, an abafter vase filled with an essence which had the virtue of conferring beauty. He had no sooner anointed his body with it, than he became the most beautiful of men. The ladies of Mytilene fell desperately in love with him; and the celebrated Sappho threw herself down a precipice because he would not encourage her passion. He is said to have been killed by a husband who surprised him with his wife. We have in Ovid a letter from Sappho to Phaon, which Mr Pope has translated into English verse.

Phara (anc. geog.), a village between Egypt and Arabia Petraea; or, according to Ptolemy, at a prominence situated between the Sinus Hieropolitis and Elaniticus of the Red Sea; where Ishmael is said to have dwelt. In Heb. brew it is Paran, and in most interpreters Pharan, Septuagint and Vulgate. Pharan, the people (Ptolemy.) Paran or Pharan, the name of the wilderness in its neighbourhood, adjoining to Kadesh.

Pharæ (anc. geog.) a town of Achaea in Peloponnesus, on the river Pirus, 70 stadia from the sea, and to the south of Patre 150 stadia. Another, of Crete (Pliny.) a colony from the Phare of Melitenia, (Stephanus.) A third Phare, or Phara (Strabo, Ptolemy.) Phare, s. Polybius.) a town of Melitenia, on the river Nedo (Strabo); on the north side of the Sinus Melitenius, and to the north west of Abaca. Anciently read Pharis in Homer (Paghinius, Statius), though now read Phare. Phare is the name of the people.

Pharamond is the name which is given by the generality of historians to the first king of France. He is said to have reigned at Treves, and over a part of France, about the year 420; and to have been succeeded by his son Clodion: but the account which is given of these two princes is very uncertain. It is probable Pharamond was properly no more than a general of an army, the head of a military society of Franks, who were masters of their perkins and their fortunes. Gregory of Tours seems to have been of this opinion. "It is not generally known (says he) who was the first king of the French. Sulpius Severus, who mentions several things respecting that nation, takes no notice of its first monarch; he only says that it had generals." Be that as it may, the institution of the famous Salique law (so named from the Salians, the most illustrious of the Franks) is generally attributed to Pharamond. "This law fixed the punishment of crimes, and various points of police. There is no just ground for believing that it expressly settled the right of succession to the crown: it only says, that, with relation to the Salic land, women have no share of heritage, without restricting it to the royal family in particular; for all those were generally called Salic lands which were held by right of conquest; and it is easy to conceive that a nation of foldiers, whose general was their king, would not submit to be governed by a woman. A long custom, supported by the principles of the nation, came in time to be the established law of the kingdom." (See M. Abbe du Bån, Elém. de Pologne de France, tom. 1.)

Pharaoh, a common name of the kings of Egypt. Josephus says, that all the kings of Egypt, from Memnon the founder of Memphis, who lived several ages before Abraham, have always had the name of Pharaoh, down to the times of Solomon, for more than 3300 years. He adds, that in the Egyptian language the word Pharaoh signifies a king; and that those princes did not assume this name but when they ascended the throne, at which time they quitted also their former name. From hence it comes to pass, L 12 says.
What Josephus adds concerning queen Nicaule, or Nicotris, who entertained the patriarch Jacob and his family in Egypt, and gave them the land of Gochen for their habitation. See Joseph and Jacob.

The second Pharaoh spoke of by the Scripture is he that reigned when Joseph arrived there. This prince or his successor had the mysterious dream of the fat and lean king, and the seven full and barren ears of corn, which Joseph explained so well to his satisfaction, that he made him governor of his house and of all Egypt, referring only to himself the name of a king. This is the same Pharaoh that sent for and entertained the patriarch Jacob and his family in Egypt, and gave them the land of Gochen for their habitation. See Joseph and Jacob.

The third Pharaoh known in holy writ is he that persecuted the Israelites. Moses tells us that he was a new king, and had no knowledge of Joseph (Exod. i. 8.). This prince, observing that the Israelites were become very numerous and powerful, resolved to deprive them by hardship and labour; and set cruel and pitiful taskmasters over them. But the more he oppressed them, the fatter they multiplied; insomuch that he gave orders to the Egyptian midwives, who assisted the Hebrew women in their labour, to put all the male children to death, and to save alive the females only. But this command was not strictly executed. The midwives feared the Lord, and preferred alive not only the female children, but the males also.

Pharaoh, seeing this project did not succeed to his wishes, published a decree (Exod. i. 22.) that all the male children born of Hebrew women should be thrown into the Nile, and that only the females should be spared. This order was rigorously executed; yet by the providence of God Moses was preferred, and even brought up in Pharaoh's own court, by his own daughter, who by chance had found the child, as he was exposed upon the Nile.

Moses being grown up, and having killed an Egyptian who had abused an Hebrew, was obliged to fly from Egypt to avoid that death that Pharaoh had threatened him with.

Several years after, being about 80 years old, he returned again by an order from God, and performed mighty miracles before Pharaoh. See Moses. There is a good deal of probability that this Pharaoh before whom Moses appeared, and in whose sight he smote Egypt with so many plagues, was a different person from him who would have had hands on him after he had slain the Egyptian. This same Pharaoh having at last been compelled to fend away the Hebrews, and to suffer them to go out of Egypt, soon repented of the leave he had given, and pursued them at the head of his army with his chariots. But he was drowned in the Red Sea, wherein he had rashly entered in the eagerness of his pursuit. Some historians pretend to give us the name of this Pharaoh; some, as Appian, call him Amosis or Amanis; Eusebius calls him Chenchis; Usher calls him Amenophis; but we may assure ourselves that there can be nothing certain in all this.

The fifth Pharaoh known to us is he that gave protection to Hadad son of the king of Edom, who gave him to wife the sister of his own queen, enriched him with lands, and brought up his son Genuah in his own court. Hadad returned to Edom after the death of David.

The sixth Pharaoh is he that gave his daughter in marriage to Solomon king of the Hebrews (1 Kings iii. 1.) and having taken Gezzar, he set it on fire, drove the Canaanites out of it, and gave it for a present to Solomon, in lieu of a dowry for his daughter, whom he had married to this prince (1 Kings iv. 16.) Before the death of Solomon, a rebellious subject of Solomon, and offered him a refuge in opposition to the king his master. The fame Shishak declared war against Rehoobam the son and successor of Solomon, besieged and took
Pharaoh is probably the name whom Herodotus names the year before he took him. Herodotus sent an army of rats, which knawed the furnaces of Chaldea. Herodotus pronounced ~x.x. The principal rules of which are: the banker keeps, when the card of the ponte is drawn, or the ponte wins, and the gain of the banker is the number of the cards remaining in the stock. De Moivre has calculated a table exhibiting this gain or loss for any particular circumstance of the play; and he observes, that at this play the least disadvantage of the ponte, under the same circumstances of cards remaining in the stock, is when the card of the ponte is, but twice in it, the next greater when three times, the next when once, and the greatest when four times. He has also demonstrated, that the whole gain per cent. of the banker, upon all the money that is ventured at this game, is 21. 195. 10d. See De Moivre's Doctrine of Chances, p. 77; &c. p. 105, &c.

Pharisees, a famous sect of the Jews, who distinguished themselves by their zeal for the traditions of the elders, which they derived from the fountain with the written word itself; pretending that both were delivered to Moses from Mount Sinai, and were therefore both of equal authority. From their rigorous observance of these traditions, they looked upon themselves as more holy than other men; and therefore separated themselves from those whom they thought sinners or profane, so as not to eat or drink with them; and hence, from the Hebrew word pharisi, which signifies "to separate," they had the name of Pharisees or S. paral. This sect was one of the most ancient and most considerate among the Jews; but its original is not very well known (a): however, it was in great repute in the

(a) The Jesuit Serrarius places their first rise about the time of Edras; because it was then that the Jews first began to have interpreters of their traditions. Maldonat, on the other hand, will not have this sect to have arisen among the Jews till a little before the time of Christ. Others, perhaps with more probability, refer the origin of the Pharisees to the time of the Maccabees. Dr Lightfoot thinks, that Pharisaism arose gradually, from a period which he does not assign, to the maturity of a sect. It is certain, from the account given by Josephus, that in the time of John Hyrcanus, the high priest and prince of the Ammonian line, about 188 years before Christ, the sect was not only formed, but made a considerable figure; and that it had advanced to a high degree of popularity and power about 80 years before Christ. Jof. Ant. lib. xiii. cap. 10. § 5, 6. cap. 15. § 5. & cap. 16. § 1. According to Balfage, Hist. of the Jews, book ii. cap. 9. § 2. one Arilobulus, an Alexandrian Jew, and a Peripatetic philosopher, who
The extraordinary pretences of the Pharisees to righteousness drew after them the common people, who held them in the highest esteem and veneration. Our Saviour frequently however, charges them with hypocrisy, and making the law of God of no particular mention. In the gospel; but they had a Saviour and Luke according to John, this more than a tradition which this Pharisees had many pagan notions of other traditions which these are propagators of it as a Pharisee, very shrewdly supposed to teach it as a Pharisee, very shrewdly supposed the Pharisees were both men; but others maintain that a man in the next world to represent the females, performed this office. They performed sacriiice, and wore figs about their necks called unction, 258, which when taken inwardly, were supposed to cause blindness, madness, love, others infected by touch; such was the garment sent by Meade to Creusa, prepared ficundam artem; and others operated upon persons at a distance. PHAROSA foteria were employed as antidotes against these malicious compositions: Thus the herb moly preferred Ulytles from the magical influence of Circe. The laurel, the rhamnus, the Ste-bane, the Jasper-flone, were used for similar purposes. See Potter's Grec. Ant.

PHARMACI, were two persons who were employed in the purification or purification of cities. Some say they were both men; but others maintain that a man to represent the males, and a woman to represent the females, performed this office. They performed sacrifice, and wore figs about their necks called unction, those of the man were blackish, and those of the woman white. Figs were an emblem of fertility, which they doubtless prayed for on their solemn occasions.

PHARMA COCHEMIA, means that part of the chemical art which treats of the preparation of medicines. It is so named by way of distinction from that chemistry which is wholly employed about the transmutation of metals by means of the philosopher's stone; this being called philosophical chemia.

PHARMACOLOGY, is a treatise of medicines, or the art of preparing them, judging of them, &c.

PHARMACOPEIA (from σαμακατανοον remedy, and are ut to male), means a dispensatory, or a treatise describing the preparations of the several kinds of medicines, with their uses, manner of application, &c.

We have various pharmacopoeias, as those of Bauderon, Quercetan, Zwiefel, Charas, Bates, Salmon; Lemery

who flourished about 125 years before Christ, and wrote some allegorical commentaries on the scripture, was the author of those traditions by an adherence to which the Pharisees were principally distinguished from other sects.
PHARMACY (A), is the art of preparing, preserving, and compounding substances, for the purposes of medicine. This art has been commonly divided into two branches, Galenical and Chemical pharmacy. But for this division there is no foundation in nature; and accordingly proceeds in one pharmacopoeia referred to the head of Chemical, are in another referred to the head of Galenical. There can be no doubt, that even the most simple pharmaceutical preparations are to a certain extent chemical. Hence this division, founded on prejudice, and supported merely by a veneration for antiquity, is now banished from pharmacy. But for this division there is no foundation in principles, as are also the operations, which remain to be discussed here only in so far as they are made subservient to the medicinal art, distinct from that which is purely chemical. The objects of pharmacy, however, are much more limited than those of chemistry; the latter comprehending, in the utmost latitude of the word, almost every substance in nature; while pharmacy regards only such bodies in the vegetable, animal, and mineral kingdoms, as, by their effects on the human frame, tend to preserve health, or to relieve it when lost.

**PART I. ELEMENTS OF PHARMACY.**

**CHAP. I. A general View of the Properties and Relations of Medicinal Substances.**

**Sect. I. Vegetables.**

Vegetables are organized bodies, furnished with a variety of vessels for reception, transmixture, and perforation of different fluids. Analogous to animals, they are produced from seeds and eggs, and are endowed with functions, by which the aliment they imbibe is changed into new forms, into solids and fluids, peculiar to particular plants, and to different parts of the same plant.

The analogy between the vegetable and animal kingdoms will appear still more striking, when we consider that the former exhibit, though in a less degree, all the phenomena of sensibility and motion. The plant of vegetables, like that of most animals, is of a mixed nature; and is composed of the necessary union of water, heat, and light, and left necessarily of air and earth: the office of these two last elements seems to be that of filtres, or vehicles for conveying the other principles in proper form.

From varieties in the state and proportion of these several agents, a very multiplied diversity takes place in the external form, quantity, and quality, of one and the same vegetable: hence the difference of plants from the soil, climate, season, and other similar circumstances. The influence of heat and light, mace, heat, and light, or what is probably the same thing, the absorption of the inflammable principle, is perhaps the most important article in the aliment of vegetables. This principle, whether derived from the solar rays, from putrid matters employed in manure, or from the putrefaction of the wild growth, affiliated by calcareous earths and other septs, is found at all times to modify, in a peculiar manner, the form, the quantity, and even the sensible and inherent properties, of vegetables. It is of importance however to remark, that the foundness and specific principles of vegetables are not invariably the more complete in proportion to the vigour of their growth; high health, which is always a dangerous state in the constitution of animals, is often the

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(A) For this article we are indebted to the liberality of Mr Creech bookseller in Edinburgh, who, with his well known zeal for the cultivation of science, and, regardless of the advantage to be expected from his copyright, has permitted us to infert into this work the third and much improved edition of the Edinburgh New Dispensatory.
PHARMACY.

Elements.

means of perverting or destroying the economy of vegetable life. Thus the finer aromatics, which naturally inhabit the dry and sandy soils, when transplanted into a moist and rich one, or in other words, when placed in a soil abounding with the fimiler of inflammable principle, grow with rapidity and vigour, and have their bulk considerably increased; but lose very much of their fragrance, as if their active principles were exhausted by the luxuriance of their growth.

Plants are also found to differ considerably in the different periods of their growth. Thus, some herbs in their infancy abound molt with odoriferous matter; others again yield little or nothing from each other. Thus the bitter herb wormwood, when placed in inflammable principle, grow with rapidity and vigour, principles were exhausted by the common grain, orange, are remarkably different, yet to a more advanced age. Many fruits, in their immature state, contain an aulteric acid juice, which by maturation is changed into a sweet one: others, as the orange, are first warm and aromatic, and afterwards by degrees become filled with a strong acid. The common grain, and sandy other seeds, when beginning to vegetate, are in taste remarkably sweet; yet the kernels of certain fruits prove, at the same period, extremely acid. The roots of some of our indigenous plants, whole juice is, during the summer, thin and watery, if wounded early in the spring, yield rich balsamic juices, which, exposed to a gentle warmth, Soon concrete into solid gummy-refins, superior to many of those brought from abroad. In open exposures, dry soils, and fair warm seasons; aromatic plants become stronger and more fragrant, while those of an opposite nature become weaker. To these particulars, therefore, due regard ought to be had in collecting plants for medicinal uses.

It may be proper to observe also, that the different parts of one plant are often very different in quality from each other. Thus the bitter herb wormwood rises from an aromatic root; and the narcotic poppy-head includes seeds which have no narcotic power. These differences, though very obvious in the common culinary plants, do not seem to have been sufficiently observed or attended to, in those plants that have been admitted as articles of the materia medica.

Without any obvious dependence on the circumstances abovementioned, vegetables are, like animals, also obnoxious to disaases and death; which, whether occasioned by intense cold, by insects, lightning, or other causes, always maintain a striking analogy to the affections of animals. The principal difference between animals and vegetables is, that the several parts of vegetables do not constitute such a mutually depending system as those of the more perfect animals; Hence it is, that a very considerable part of a plant may be disfigured or dead, while the rest enjoys perfect good health and vigour. Though the physiology of vegetables is hitherto insufficient for forming any complete doctrines of the causes and cure of their several diseases; yet, in many cases, it might be useful to attend to the formation of a pathology of the vegetable kingdom; in the late even of our prent knowledge, it is of importance in the study of pharmacy to be aware that such diseases really exist, and are capable of changing or destroying the active principles of many of our most valuable herbs. In the plants more evidently festive, the diseases exhibit a very close analogy to many of those of animals; several of the remote causes are such as are known to obstruct perpiration, to induce general debility, or otherwise disorder the animal economy. The diseases also are evidently marked by a diminution of their sensitive and moving principle; and perhaps, in consequence of this diminution, their folids, sap, and other fluids, shrivel and decay, and the whole plant assumes new forms, and is impregnated with inert, or fraught with noxious principles. Analogous also to animals, the plant when deprived of the living principle, runs into all those changes common to what is called inanition mutat. We shall now proceed to examine the changes to which vegetables are subject.

I. Productions from Vegetables by Fermentation.

Fermentation is a spontaneous motion excited in fermentable dead vegetables and animals, which is peculiar to those organic substances in conformance of the principle of vegetable or animal life. See Fermentation.

The circumstances favouring fermentation are in general, a certain degree of fluidity, a certain degree of heat, and the contact of the air.

There are, however, several substances, themselves not susceptible of fermentation, which nevertheless may be brought into that state by the admixture of those that are; as by adding to them, along with a proper quantity of water, a portion of the yeat or head thrown up to the surface of fermenting liquors. Without this expedient many vegetables would run immediately into the acetic, and some of them into the putrefactive fermentations. It is also found, that though acetic and putrefactive fermenters are unable to stop the vinous fermentation, they are however capable of afflicting the liquor to their own nature in a more perfect form: and hence it is, that in the manufactures of wine, rum, and vinegar, it is found useful to keep the vessels well seasoned with the liquor intended to be prepared. Three different kinds of fermentations have been generally distinguished by chemists. The vinous, which furnishes alcohol, or what is commonly called spirit; the acetic, which affords vinegar; and the putrefactive, which yields volatile alkalii. Being generally constant in succession to each other, the whole process will be best understood by considering each of them apart. All vegetable substances are not capable of the vinous fermentation; the conditions necessary to its production are, a saccharo-mucilaginous matter; a fluidity some what viscous, the proper degree of which is best learned from experience; a heat from 40 to 96 of Fahrenheit's thermometer; a considerable mass of matter; and the action of the external air.

The phenomena exhibited in the vinous fermentation are, a brisk tumultuary motion, the liquor loses its transparency and homogeneous appearance, its bulk and heat are considerably increased, the solid parts are buoyed up to the top, and a great quantity of a permanently elastic fluid is diffused. This fluid or gas being heavier than atmospheric air, floats in separate masses near the surface of the liquor; and is easily distinguishable from common air by extinguishing flame and animal life, precipitating lime from limewater, crystallizing and rendering mild the cough.
Elements.  
13 Carbonic acid.

Wines, various kinds of.

Fermented or vinous liquors are prepared from a great variety of substances: the saccharine substances, or those rendered so by a beginning and inebriating liquor, called wine or vinous liquor.

Wines, various kinds of.

fermentation.

The product of the vinous fermentation.  

Of the product of the vinous fermentation.  

The product of all these fermented vegetables is, as we have just now mentioned, the pungent and intoxicating liquor called wine. It is proper, however, in pharmacy, to inquire into the different principles which enter its composition. As the wine furnished by grapes is the most valuable and generally known, we shall take it as an example: grape-wine, then, is composed of a large quantity of water, of alcohol, of tartar, and of a colouring matter. It is proper, however, that we should lay down the proofs of such a combination, in wine, and explain the methods by which it may be decomposed and separated into the constituent parts abovementioned.

For this purpose, recourse is generally had to the Vol. XIV.
phenomena takes place, yet the wine still suffers a slow and imperceptible degree of fermentation. We are not then to consider the liquor as being in a quiescent state, but as constantly approaching to the next stage, viz. the acetous fermentation, which we are now to consider. This kind of inoffensive fermentation, or what we may call the intermediate change, seems to be necessary to the perfection of the wine. Its degree, however, is to be regulated under certain limitations: when too much checked, as by cold, thunder, or such like causes, the wine becomes vivid: when too much encouraged by heat, contact of air, &c. it approaches too far to the acetous change: but in order that the vinous stage proceed fully to the acetous fermentation, several circumstances are required: and these are in general the same that were before necessary to the vinous stage. These conditions are, a temperate degree of heat, a quantity of unfermented mucilage, an acid matter, such as tartric, and the free access of external air: When thus situated, the liquor soon passes into the acetous fermentation; but during this stage the phenomena are not so remarkable as in the vinous; the motion of air is now less considerable, a gross undigested matter separates at the bottom, the liquor loses its vinous taste and flavour, becomes sour, and on distillation affords no inflammable spirit. It is now the acetic acid or vinegar; and when separated by distillation from the undigested lees, may be preferred a considerable length of time without undergoing the putrid change: to this laft, however, it always approaches in the same manner as the vinous constantly verges to the acetous fermentation; and this will much more readily happen if the acid be allowed to remain with the undigested matter above-mentioned. When thus situated, the vinegar quickly loses its transparency, assumes a blackish colour, loses its fumes and agreeable odour, has an offensive taste and smell, and, when distilled at a certain period of the process, yields volatile alkali.

The liquor is now arrived to the last stage, viz.

3. The Putrefactive Fermentation.

From the preceding phenomena, it is obvious, that the same substance which is capable of the vinous and acetous, is also capable of the putrefactive fermentation. It is perhaps impossible to induce the first without a mixture of the second; or the second without a mixture of the third. Hence every wine is a little acid; and there are few vinegars without some disposition towards putrefaction, or without volatile alkali, neutralized by the acid which predominates. Notwithstanding this seeming continuance of one and the same process, the putrefaction of vegetables has its particular phenomena. The vegetable matter, if in a fluid state, becomes turbid, and deposit a large quantity of fecculent matter; a considerable number of air-bubbles are raised to the top; but their motion is not so brisk in the putrefactive as in the vinous, or even the acetous fermentation: neither the bulk nor heat of the liquor seems to be increased; but an acid pungent vapour is perceived by the smell, and which, by chemical trials, is found to be the volatile alkali; by degrees this pungent odour is changed into one less pungent, but much more nauseous. If the same train of phenomena have taken place in a vegetable consisting of parts somewhat solid, its cohesion is broke down into a soft pulpy mass; this mass, on drying, entirely loses its odour, leaving a black cherry-like residuum, containing nothing but earthy and saline substan-

It is proper to observe, that though the circumstances favourable the putrefactive are the same with those requisite to the vinous and acetous fermentations, yet these several conditions are not so indispensable to the former as to the latter stages. All vegetables have more or less tendency to putrefaction, and a great number of them are capable of the acetous fermentation; but the proportion of those capable of the vinous is not considerable; and these last will run into the putrid in circumstances in which they cannot undergo the vinous or the acetous fermentations. Thus flour made into a soft paste will become sour; but it must be perfectly dissolved in water to make it fit for the vinous stage; whereas merely dampness is sufficient to make it pass to the putrid fermentation: besides the condition of fluidity, a less degree of heat, and a more limited access of air, are sufficient for producing the putrefactive fermentation.

It is therefore probable, that all vegetables, in whatever state they may be, are liable to a kind of putrefaction; in some the change is slow and gradual, but never fails at length to break down the texture and cohesion of the moist solid.

We formerly observed, that the vapours separated during the vinous fermentation were fixed air or aerial acid; and it is indeed true, that in the incipient stage of this fermentation a quantity of gas is still evolved, and along with it a quantity of alkali air: in the advanced stage, however, we find these vapours of a different nature; they now tarnish silver, and render combinations of lead with the vegetable acids black. When produced in large quantity, and much confined, as happens in flacks of hay put up wet, they burst into actual flame, consuming the hay to ashes: on other occasions, the escape of these vapours discovers itself by an emission of light, as in the luminous appearance of rotten wood when placed in the dark. From the above phenomena it is evident, that these vapours abound with the principle of inflammability; and their odour probably depends on this principle loosely combined with the water, or some other parts of the volatile matter. This gas, is therefore different from that separated during the vinous fermentation; it is the phlogisticated, and sometimes the inflammable air of Dr Priestley, or the hydrogen of Lavoisier. See table of chemical nomenclature, &c. Chemistry, page 158.

We have thus, for the sake of clearness, and in order to comprehend the whole of the subject, traced the phenomena of fermentation through its different stages: it is proper, however, to observe, that though every vegetable that has suffered the vinous will proceed to the acetous and putrefactive fermentations, yet the second stage is not necessarily preceded by the first, nor the third by the second; or in other words, the acetous fermentation is not necessarily confined to those substances which have undergone the vinous, nor the putrefactive to those which have undergone the acetous fermentation. Thus it is, that gums dissolved in water pass to the acetous
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...maceutical without undergoing the vinous fermentation; and glutinous matter seems to run into putrefaction without flowing any previous accidence: and farther, these changes frequently happen although the matter be under those conditions which are favourable to the preceding stages.

From the foregoing sketch, the importance of this subject in the study of Pharmacy will be obvious at first sight: it cannot, however, afford us any useful information on the native principles of vegetables; but it presents to us new products, the importance of which is well known in chemistry, in medicine, and in arts. The necessity of being well acquainted with the several facts (for of theory we know none satisfactory), will appear in the pharmaceutical history and preparation of many of our most valuable drugs. We are next to consider a set of no less complicated operations, viz.

II. Productions from vegetables by Fire.

In order to analyse, or rather to decompose, vegetables by the naked fire, any given quantity of dry vegetable matter is put into a retort of glass or earthen. Having filled the vessel about one half or two thirds, we place it in a reverberatory furnace, adapting it to a proper receiver. To collect the elatic fluids, which, if confined, would burst the vessels (and which, too, it is proper to preserve, as being real products of the analysis), we use a perforated receiver with a crooked tube, the extremity of which is received into a vessel full of water, or of mercury, and inverted in a bag containing the same fluid: by this contrivance, the liquid matters are collected in the receiver, and in the aeriform fluids pass into the inverted vessel. If the vegetable is capable of yielding any saline matter in a concrete state, we interpose between the retort and the receiver another vessel, upon whose sides the salt sublimes. These things being properly adjusted, we apply at first a gentle heat, and increase it gradually, that we may observe the different products in proper order. At first an inipid watery liquor passes over, which is chiefly composed of the water of vegetation; on the heat being a little farther increased, this watery liquor, or phlegm, becomes charged with an oily matter, having the odour of the vegetable, if it possessed any in its entire state; along with this oil we also obtain an acid resembling vinegar, and which communicates to the oil somewhat of a faponaceous nature; on the heat being carried still farther, we procure more acid, with an oil of a dark colour, and the colour gradually deepens as the distillation advances. The oil now ceases to retain the peculiar odour of the vegetable; and being scorched by the heat, sends forth a strong disagreeable smell like tar; it is then called empyramatic oil. About this time also some elatic vapours rush into the inverted vessel; these generally consist of inflammable or fixed airs, and very often of a mixture of both; the volatile part now also sublimes, if the vegetable was of a nature to furnish it. By the time the matter in the retort has acquired a dull red colour, nothing further will arise; we then stop; and allowing the vessel to cool, we find a mass of charcoal, retaining more or less the form and appearance of the vegetable before its decomposition.

We have thus described, in the order of their succession, the several products obtained from the general nature of vegetables when analyzed in close vessels and in a naked fire.

It is, however, to be understood, that the proportion of these principles turns out very various; the more sucentuous yield more water, and the more fixed afford a greater quantity of the other principles. Independently also of this difference, the nature of the products themselves are found to differ in different vegetables: thus in the cruciform plants, and in the eminently and farraceous seeds, the saline matter which comes over with the water and oil is found to be alkaline; sometimes it is ammoniacal, from the combination of the acid with the volatile alkali passing over at the end of the proces; it is also probable, that the acids of vegetables are not all of the same nature, though they exhibit the same external marks. When volatile alkali is obtained, it is always found in the first distillation, it is produced, however, from a few vegetables only; it is formed in a concrete form, being generally dissolved in the phlegm; and as it ordinarily makes its appearance about the end of the process, it is probable that its formation is owing to some peculiar combination of the oil and fixed alkali. The plants containing much oily combustible matter seem to be those which more peculiarly yield inflammable alkali, while the mucilages appear to be as peculiarly fitted for affording the fixed air or aerial acid. The chemical properties of charcoal seem to be always the same from whatever vegetable it has been produced: on a minute examination (which however, is not the business of pharmacy), it is found to consist of fixed air, the principle of inflammability, a small quantity of earth, saline matter, and a little water. The whole of the analysis then amounts to air, water, earth, and the principle of inflammability; for by repeated distillations the oil is resolved into water, the principle of inflammability, and a little earth; the saline matter also is a product arising from a combination of the earthy matter with water or the principle of inflammability, in some shape or other, or perhaps with both. That these combinations take place, has at least been the opinion of the chemists. We formerly said that charcoal was partly composed of saline matter; it therefore remains that we should next decompose the charcoal, in order to obtain or separate the articles next to be mentioned.

The fixed Salts of Vegetables.

When vegetable charcoal has been burnt, there remains a quantity of ashes or cinders of a blackish grey or white colour: these, when boiled or inhaled in water, communicate to it a pungent saline taste; the salt thus held in solution may, by evaporation, be reduced to a concrete state: this saline matter, however, is generally found to be mixed with ferruginous earthy and other impurities, and likewise with a number of neutral salts of different kinds. In this mixed condition it is the

Potash of burnt charcoal.

This salt, or rather compound of different kinds, is procured by burning large quantities of wood of any kind; and this process is called in reaction; the pre-dominating salt, however, is alkaline; and as the neutra...
The fixed vegetable Alkali.

Alkalis in general are distinguished by a pungent taste, the very reverse of that of forwards; by their destroying the acidity of every four liquor; and by their changing the blue and red colours of vegetables to a green, they attract more or less the moisture of the air, and some of them deliquesce. The fixed alkali, which we shall at present consider more particularly, are fusible by a gentle heat; by a greater degree of heat they are dissipated; their affinity, therefore, is only relative to the other kind of alkali, viz. the volatile: they dissolve and form glass with earths: and, lastly, when joined with acids to the point of saturation, they form what are called Neutral Salts.

These characters will afford some necessary and preliminary knowledge of these substances in general; and we shall afterwards find that they are sufficient to distinguish them from all other saline bodies: it is necessary, however, to examine them more minutely, for our analysis has not yet reached so far as to present them in their simplest state. Previous to the discoveries of Dr Black, the vegetable fixed alkali (which we at present speak of particularly), when separated from the foreign matters with which it is mixed in the ashes, was confidered to be in its purest state: we shall afterwards find that it is only a compound body, and is really a neutral salt, compounded of pure alkali, and fixed air or the aerial acid. We presume, then, that the particular history of its chemical and medicinal properties will be better understood when we come to those processes by which it is brought to its most pure and simple state: See Chemistry. We shall only therefore observe for the present, that fixed vegetable alkali, not only in its purest state, but also when neutralized by aerial acid, seems always to be one and the same thing, from whatever vegetable it has been produced. Thoso of some sea-plants must, however, be excepted: the saline matter obtained from these last is, like the former, in a mixed and impure state; it differs, however, from potash, in containing an alkali of somewhat different properties. The cinder of sea-plants containing this alkali is called Soda.

Soda, then, as we have just now hinted, is produced by the incineration of the kalk and other sea-plants: And from this impure and mixed mass of cinder, is obtained the marine, mineral, or muriatic alkali, or natron, as it is now denominated by the London College. This alkali has acquired these names, because it is the base of the common marine or sea-salt; it differs from the vegetable alkali in being more easily crystallizable; when dried, it does not like the former attract humidity sufficient to form a liquid; it is somewhat less pungent to the taste, and, according to Bergman, has less attraction for acids than the vegetable alkali.

It is, however, to be observed, that this alkali, when deprived of fixed air, that is to say, when brought to its purest state, can scarcely, if at all, be distinguished from the vegetable alkali; and indeed the true distinction can only be formed from their combinations, each of them affording with the same acid very different neutral salts. It belonged to this place to mention some of the characters of alkalis in general, and also some of those marks by which the vegetable and mineral alkalis are distinguished from each other: but for a more particular history of their chemical and medicinal properties, we refer to an account of the pharmaceutical preparations. As the volatile alkali is rarely produced from vegetables, but is generally obtained from animal matter, we shall consider that kind of alkali when we come to analyze the animal kingdom.

Of Vegetable Earth.

After all the saline matter contained in the ashes of vegetable vegetables has been washed off by the processes before mentioned, there yet remains one infipid earthy-like powder, generally of a whitish colour, infoluble in water, and from which some iron may be attracted by the magnet. It is said to have formed alum with the vitriolic acid; a kind of felenite has also been obtained, but somewhat different from that produced by the union of the same acid with calcareous earth; this residuum of burnt vegetables differs also from calcareous earth, in not being susceptible of becoming quicklime by calculation. It has been found that this residuum, instead of an earth, is a calcareous phosphoric salt, similar to that obtained from the bones of animals.

We have thus finished our analysis of vegetables by the naked fire; and have only to observe, that, like the analysis by fermentation, it can afford us no useful information on the native principles of the vegetable itself.

When chemistry began first to be formed into a rational science, and to examine the component parts and internal constitution of bodies, it was imagined, that this resolution of vegetables by fire, discovering to us all their active principles, unclogged and unmixed with each other, would afford the surest means of judging of their medicinal powers. But on prosecuting these experiments, it was soon found that they were insufficient for that end: that the analyses of poisonous and efficacions plants agreed often as nearly as the analyses of one plant; that by the action of a burning heat, two principles of vegetables are not barely separated, but altered, transformed, and combined into new forms; in which it was impossible to know in what form they existed, and with what qualities they were endowed, before these changes and transformations happened. If, for example, 32 ounces of a certain vegetable substance are found to yield ten ounces and a half of acid liquor, above one ounce and five drams of oil, and three drams and a half of fixed alkaline salt: what idea can this analysis give of the medicinal qualities of gum Arabic?

III. Substances naturally contained in vegetables, and separable by Art without Alteration of their native Qualities.

It has been supposed, that there is one general fluid or blood which is common to all vegetables, and from which the fluids peculiar to particular plants and their parts are prepared by a kind of secretion: To this supposed...
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Vegetable fluids botanists have given the name of Sap. This opinion is rendered plausible from the analogy in many other respects between vegetable and animal substances: and indeed if we consider the water of vegetation as this general fluid, the opinion is perhaps not very far from the truth; but the notion has been carried much farther than supposing it to be mere water; and the opinion of naturalists on this subject does not seem to be well supported by experience. It is difficult to extract this Sap without any mixture of their constituent parts. But in a few vegetables, from which it diffils by wounding their bark, we find this suppossed general blood possessing properties not a little various: Thus the juice effused from a wounded birch is consideribly different from that poured out from an incision in the vine.


Vegetables, like animals, contain an oil in two different states. That is, in several vegetables a certain quantity of oil is superabundant to their constitution, is often lodged in distinct reservoirs, and does not enter into the composition of their other principles: in most vegetables, again, another quantity of oil is combined, and makes a constituent part of their principles. Of this last we formerly spoke in our analysis of vegetables by fire; and it is the former we mean to consider, under the three following heads.

Gross oils abound chiefly in kernels of fruits, and in certain seeds; from which they are commonly extracted by expression, and are hence distinguished by the name of expressed oils. They are contained also in all the parts of all vegetables that have been examined, and may be forced out by vehemence of fire; but here their qualities are much altered in the process by which they are extracted or discovered, as we have seen under the foregoing head.

These oils, in their common state, are not dissolvable either in vinous spirits or in water: though by means of certain intermedia they may be united both with the one and the other. Thus a skilful interposition of sugar renders them miscible with water into what are called loachs and oily draughts; by the intervention of gum or mucilage they unite with water into a milky fluid: by alkaline salts they are changed into a soap, which is miscible both with water and spiritsious liquors, and is perfectly dissolved by the latter into an uniform transparent fluid. The addition of any acid to the foapy solution absorbs the alkaline salt; and the oil, which of course separates, is found to have undergone this remarkable change, that it now dissolves without any intermedium in pure spirit of wine.

Expressed oils exposed to the cold lose their fluidity greatly: some of them, in a small degree of cold, congeal into a consistant mass. Kept for some time in a warm air, they become thin and highly rancid: their soft, lubricating, and relaxing quality is changed into a sharp acrimonious one: and in this state, instead of allaying, they occasion irritation; instead of obtunding corrosive humours, they corrode and inflame. These oils are liable to the fame noxious alteration while contained in the original subject: hence arises the rancidity which the oily seeds and kernels, as almonds and those called the cold seeds, are so liable to extract in keeping. Nevertheless, on triturating these seeds or kernels with water, the oil, by the intervention of the other matter of the subject, unites with the water, into an emulsion or milky liquor, which, instead of growing rancid, turns four on standing.

It appears then that some kind of fermentation goes on in the progress of oils in the rancid state; and it would seem from some experiments by Mr Macquar, that an acid is evolved, which renders them more soluble in spirit of wine than before.

In the heat of boiling water, and even in a degree of heat much exceeding this as the heat of boiling water does that of the human body, these oils suffer little: distillation of their parts. In a greater heat they emit a pungent vapour, seemingly of the acid kind: and when suffered to grow cold again, they are found to have acquired a greater degree of consistence than they had before, together with an acrid taint. In a heat approaching to ignition, in close vessels, the greatest part of the oil arises in an empyrean state, a black coal remaining behind.

2. Gross sebaceous matter.

From the kernels of some fruits, as that of the choicest colate nut, we obtain, instead of a fluid oil, a substance of seaceous butyrous consistence; and from others, as the Juan sementes, a solid matter as firm as tallow. These concretes are most commodiously extracted by boiling the substance in water: the sebaceous matter, liquefied by the heat, separates and rises to the surface, and resumes its proper consistence as the liquor cools.

The substances of this class have the same general properties with expressed oils, but are left disposed to become rancid in keeping than most of the common fluid oils. It is suppos'd by the chemists, that their thick consistence is owing to a larger admixture of an acid principle: for, in their resolution by fire, they yield a vapour more fсолifacible than the fluid oils; and fluid oils, by the admixture of concentrated acids, are reduced to a thick or solid mass.

3. Essentia1 Oils.

Essential oils are obtained only from those vegetables, or parts of vegetables, that are considerably odorous. They are the direct principle in which the whence of certain matters consists; and from which the name of essences or essential oils.

Essential oils are secreted fluids; and are often lodged in one part of the plant, while the rest are entirely void of them. Sometimes they are found in separate spaces or receptacles; and are there visible by the naked eye: thus, in the rind of lemons, oranges, citrons, and many others, there are placed everywhere small pellucid vehicles, which, by press ing the peel near to the flame of a candle, squirt out a quantity of essential oil, forming a stream of lambent flame: hence, too, an oleofascharum may be made, by rubbing the exterior surface of these peels with a piece of lump sugar, which at once tears open these vehicles, and absorbs their contained oil.

Essential oils unite with rectified spirit of wine, and compose with it one homogeneous transparent fluid; though some of them require for this purpose a much larger
larger proportion of the spirit than others. The difference of their solubility perhaps depends on the quantity of disengaged acid; that being found by Mr. Macquer not only to promote the solution of essential oils, but even of those of the unintoxic kind. Water also, though it does not dissolve their whole substance, may be made to imbibe some portion of their more subtle matter, so as to become considerably impregnated with their flavour; by the admixture of sugar, gum, the yolk of an egg, or alkaline salts, they are made totally dissoluble in water. Digested with volatile alkali, they undergo various changes of colour, and some of the less odorous acquire considerable degrees of fragrance, while fixed alkali universally impairs their odour.

The specific gravity of most of these oils is less than that of water: some of them, however, are so heavy as to sink in water; but these varieties shall be noticed when we come to their preparation.

In the heat of boiling water, these oils totally exhale; and on this principle they are commonly esteemed with their flavour; by the admixture of sugar, gum, the yolk of an egg, or alkaline salts, they are made totally dissoluble in water. Digested with volatile alkali, they undergo various changes of colour, and some of the less odorous acquire considerable degrees of fragrance, while fixed alkali universally impairs their odour.

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In the heat of boiling water, these oils totally exhale; and on this principle they are commonly extracted from subjects that contain them; for no other fluid, which naturally exists in vegetables, is exhalable by that degree of heat, excepting the aqueous moisture, from which the greatest part of the oil is easily separated. Some of these oils arise with a much less heat, a heat little greater than that in which water begins visibly to evaporate. In their resolution by a burning heat, they differ little from expressed oils.

Essential oils, exposed for some time to a warm air, suffer an alteration very different from that which the expressed undergo. Instead of growing thin, rancid, and acrimonious, they gradually become thick, and at length harden into a solid brittle concrete; with a remarkable diminution of their volatility, fragrancy, pungency, and warm stimulating quality. In this state, they are found to consist of two kinds of matter; a fluid oil, volatile in the heat of boiling water, and nearly of the same quality with the original oil; and of a grofer substance which remains behind, not exhalable without a burning heat, or such as changes its natural and resolves it into an acid, an empyreumatic oil, and a black coal.

The admixture of a concentrated acid instantly produces, in essential oils, a change nearly similar to that which time effects. In making these kinds of mixtures, the operator ought to be on his guard; for when a strong acid, particularly that of nitre, is poured hastily into an essential oil, a great heat and ebullition ensue, and often an explosion happens, or the mixture bursts into flame. The union of expressed oils with acids is accompanied with much less conflict.

Concrete essential oil.

Some vegetables, as roes and decampine root, instead of a fluid essential oil yield a substance possessing the same general properties, but of a thick or febaceous consistence. This substance appears to be of as great volatility and facility of parts as the fluid oils: it equally exhales in the heat of boiling water, and concretes upon the surface of the collected vapour. The total exhalation of this matter, and its concreting again into its original conffitut flat, without any separation of it into a fluid and a solid part, distinguishes it from essential oils that have been thickened or indurated by age or by acids.

5. Camphor.

Camphor is a solid concrete, obtained chiefly from Camphor, the woody parts of certain Indian trees. See Camphor, distinguitishing characters of.

Or spiritus rectior, is the name given to the odorous principle of vegetables. These bodies differ greatly from one another in the quantity, strength, and volatility of the odorous principle which they contain. It is generally found united with volatile oils; but in its indurated form, it is soluble in alcohol and water as well as in thefe. The flighted degree of heat is sufficient to disengage the aroma of plants. To obtain it, the plant must be distilled in a balneum mariae, and its vapours received into a cold capital, which may condense and afterwards conduct them in a fluid state into the receiver. The product is pure odoriferous water, and is known by the name of essential or distilled water. This liquor is to be considered as a solution of the aroma or odorous principle in water. When aromatic water is heated, it loses its smell in consequence of the odorous principle being more volatile than the fluid in which it was dissolved. This principle is also diffipated by exposure to the air. Many facts would induce us to believe, that the principle of smell is one of the elementary principles of volatile oils; but we are as yet almost completely ignorant of its chemical nature, properties, and combinations.

6. Aroma.

Or spiritus rectior, is the name given to the odorous principle of vegetables. These bodies differ greatly from one another in the quantity, strength, and volatility of the odorous principle which they contain. It is generally found united with volatile oils; but in its indurated form, it is soluble in alcohol and water as well as in thefe. The flighted degree of heat is sufficient to disengage the aroma of plants. To obtain it, the plant must be distilled in a balneum mariae, and its vapours received into a cold capital, which may condense and afterwards conduct them in a fluid state into the receiver. The product is pure odoriferous water, and is known by the name of essential or distilled water. This liquor is to be considered as a solution of the aroma or odorous principle in water. When aromatic water is heated, it loses its smell in consequence of the odorous principle being more volatile than the fluid in which it was dissolved. This principle is also diffipated by exposure to the air. Many facts would induce us to believe, that the principle of smell is one of the elementary principles of volatile oils; but we are as yet almost completely ignorant of its chemical nature, properties, and combinations.

7. Resin.

Essential oils, indurated by age or acids, are called resins. When the indurated mass has been exposed to heat, the heat of boiling water, till its more subtle part, or the pure essential oil that remained in it, has exhaled, the gross matter left behind is likewise called resin. We find,

(5) It may likewise be procured from most of the volatile oils, by volatilizing the oil in a temperature a few degrees below that which is sufficient to elevate the camphor.
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Elements. — find, in many vegetables, resins analogous both to one and the other of the five concretes; forms containing a sufficient oil, separable by the heat of boiling water; others containing nothing that is capable of dissolving in that heat.

Resins in general dissolve in rectified spirit of wine, though some of them much less easily than others: it is chiefly by means of this solvent that they are extracted from the subjects in which they are contained. They dissolve also in oils both expressed and essential, and may be united with watery liquors by means of the same intermediary which render the fluid oils miscible with water. In a heat less that of boiling water, they melt into an oily fluid; and in this state they may be incorporated one with another. In their resolution by fire, in close vessels, they yield a manifelled acid, and a large quantity of empyreumatic oil.

8. Gum.

Gum differs from the foregoing substances in being unflammable; for though it may be burnt to a coal, and thence to ashes, it never yields any flame. It differs also from gum, in the proportion of the principles into which it is resolved by fire; the quantity of empyreumatic oil being far less, and that of an acid far greater. In the heat of boiling water, it suffers no dilatation; nor does it liquefy like resins; but continues unchanged, till the heat be so far increased as to fcorch or turn it to a coal.

By a little quantity of water, it is softened into a viscid adhesive mass, called mucilage: by a larger quantity it is dissolved into a fluid, which proves more or less glutinous according to the proportion of gum. It does not dissolve in vinous spirits, or in any kind of oil; nevertheless, when softened with water into a mucilage, it is easily miscible both with the fluid oils and with resins; which by this means becomes soluble in watery liquors along with the gum, and are thus excellently fitted for medicinal purposes.

This elegant method of uniting oils with aqueous liquors, which has been kept a secret in few hands, and by which we had been known to Dr. Grew: "I take (says he) the oil of aniseed, and pouring it upon a body, I sf order it, that it was thereby turned into a perfect milk-white balsam or butter; by which means the oil became mingeable with any vinous or watery liquor, easily and instantaneously dissolving therein in the form of a milk. And note, this is done without the leas alteration of the smell, taste, nature, or operation of the said oil. By somewhat the same means any other inflammable oil may be transformed into a milk-white butter, and in like manner be mingled with water or any other liquor: which is of various use in medicine, and what I find oftentimes very convenient and advantageous to be done." (Grew of Mixtures, chap. v. &c. p. 6.) This inquiry has lately been further prosecuted in the first volume of the Medical Observations published by a society of physicians in London; where various experiments are related, for rendering oils, both essential and expressible, and different unctuous and resinous bodies, soluble in water by the mediation of gum. Mucilages have also been used for suspending crude mercury, and some other ponderous and insoluble substances: the mercury is by this means not a little divided; but it is found that the particles are very apt to run together or subside, if a pretty constant agitation be not kept up.

As oily and resinous substances are thus united to water by the means of gum, so gums may in like manner be united to spirit of wine by the intervention of resins and essential oils; though the spirit does not take up far so much of the gum as water does of the oil or resin.

Acid liquors, though they thicken pure oils, or render them confettent, do not impede the diffusion of gum, or of oils blended with gum. Alkaline salts, on the contrary, both fixed and volatile, though they render pure oils insoluble in water, prevent the solution of gum, and of mixtures of gum and oil. If any pure gum be dissolved in water, the addition of any alkali will occasion the gum to separate, and fall to the bottom in a confluent form; if any oily or resinous body was previously blended with the gum, this also separates, and either sinks to the bottom, or rises to the top, according to its gravity.


By gum-refin is understood a mixture of gum and resin. Many vegetables contain mixtures of this kind, in which the component parts are so intimately united, that the compound, in a pharmaceutical view, may be considered as a distinct kind of principle; the whole mass dissolving almost equally in aqueous and in spirituous liquors; and the solutions being not turbid or milky, like those of the groffer mixtures of gum and resin, but perfectly transparent. Such is the affrangent matter of bitternroot, and the bitter matter of gentian. It were to be wished that we had some particular name for this kind of matter; as the term gum-refin is appropriated to the grossest mixtures, in which the gummy and resinous parts are but loosely joined, and easily separable from each other.

We shall afterwards find that it will be convenient to imitate this natural combination by art. As the effects of medicines very generally depend on their solubility in the stomach, it is often necessary to bring their more inoffensive parts, such as resinous and oily matters, into the state of gum-refin: this is done, as we have mentioned in the former article, by the mediation of mucilage. By this management these matters become much more soluble in the stomach; and the liquor thus prepared is called an emulsion, from its whitish colour, resembling that of milk.

10. Saline Matter.

Of the saline juices of vegetables there are different kinds, which have hitherto been but little examined: the sweet and the acid ones are the most plentiful and the best known.

There have lately, however, been discovered a consideraflible variety of salts in different vegetables. The salts in very mild fixed alkali, which was formerly considered as a redal, product of the fire, has been obtained from almost all plants by macerating them in acids; the vegetable alkali is the most common, but the mineral is also found in the marine plants. Besides the fixed alkali, several other salts have been detected in different vegetables; such as vitriolated tartar, common salt, Glaber's salt, nitre, ferruginous salt, and selenite. From 

sone
Pharmacy.

11. Farina or flour.

This substance partakes of the nature of gum, but has more taste, is more fermentable, and much more nutritive. It abounds in very many vegetables, and is generally deposited in certain parts, seemingly for the purpose of its being more advantageously accommodated to their nourishment and growth. Several of the bulbous and other roots, such as those of potatoes, briony, those from which cassia is extracted, salsify, and many others, contain a great quantity of white juce resembling and really possessing the properties of farina. The plants of the leguminous tribe, such as peas and beans, are found also to abound with this matter. But the largest quantity of farina resides in grains, which are therefore called farinaeum. Of this kind are wheat, rye, barley, oats, rice, and other similar plants.

At first sight farina appears to be one homogeneous farina of subfance: it is, however, found to be a compound of what are three different and separable parts. To illustrate this, we shall take as an example the farina of wheat, being the vegetable which affords it in greatest quantity, and in its most perfect state. To separate these different parts we form a paste with any quantity of flour and cold water; we suspend this paste in a bag of muffin or such-like cloth; we next let fall on it a stream of cold water from some height, and the bag may now and then be very gently squeezed; the water in its descent carries down with it a very fine white powder, which is received along with the water in a vessel placed below the bag; the process must be continued till no more of this white powder comes off, which is known by the water that passes through the bag ceasing to be of a milky colour. The process being now finished, the farina is found to be separated into three different substances: the glutinous or vegeto-animal part remains in the bag; the amylo or farina is deposited from the water which has been received in the vessel placed below the bag; and, lastly, a mucous matter is held dissolved in the same water from which the farina has been deposited; this mucous part may be brought to the confidence of honey, by evaporating the water in which it is kept in solution.

These several parts are found also to differ remarkably in their sensible and chemical properties. The vegeto-animal part is of a whitish grey colour, is a tenacious, ductile, and elastic matter, partly possessing the texture of animal membranes. Distilled in a retort, it yields, like all animal matters, a true volatile alkali; and its coal affords no fixed alkali. It is not only indoluble, but even indiffuible, in water; both which appear from its remaining in the bag after long-continued lotions. Like gums, it is insoluble in alcohol, in oils, or ether; but it is also indoluble in water, and yields on distillation products very different from those afforded by gums: it is therefore of an animal nature, and approaches perhaps nearer to the coagulable lymph of animals than to any other substance.

The fixed alkali, by means of heat, dissolves the gluten vegeto-animal; but when it is precipitated from this solution by means of acids, it is found to have lost its elasicity. The mineral acids, and especially the nitric,
Part I. PHARMACY.

NITROUS, are also capable of dissolving the vegeto-animai part of the farina.

The starch, amyllum, or the amylaceous matter, makes the principal part of the farina. As we before noticed, it is that fine powder deposited from the water which has pervaded the entire farina: it is of a greyish white colour, but can be rendered much whiter by making it undergo a certain degree of fermentation. Starch is insoluble in cold water; but in hot water it forms a transparent glue: hence the necessity of employing cold water in separating it from the vegeto-animai part. Diluted in a retort, it yields an acid phlegm; and its coal affords, like other vegetables, a fixed alkaline salt. As starch forms the greatest part of the farina, it is probably the principal nutritive constituent in bread.

The mucous or rather the mucoso-saccharine matter, is only in a very small quantity in bread. This substance on distillation is found to exhibit the phenomenon of sugar. The use of this matter seems to be that of producing the vinous fermentation: and we may observe for once, for all that the preparation of good bread probably depends on a proper proportion of the three different parts above described; viz. that the vinous fermentation is promoted by the mucoso-saccharine part, the acetic by the starch, and the putrid by the gluten vegeto-animai. From different states or degrees of these several stages of fermentation the qualities of good bread are probably derived.


The colouring matter of vegetables seems to be of an intermediate nature between the gummy and resinous parts. It is in many plants equally well extracted by water, and by rectified spirit: it is also, however, procurable in the form of a lake, not at all soluble in either of these menstrua. It would seem that the colouring matter, strictly so called, has hitherto eluded the researches of chemists. It is only the bals or nids, in which the real colouring matter is embodied, that chemistry has as yet reached; and on the chemical properties of this bals colours are capable of being extracted by different menstrua, and of being variously accommodated to the purposes of dyeing. The substance from which the colours of vegetables are immediately derived, is without doubt a very subtle body. Since plants are known to lose their colour when excluded from the light of the sun, there is reason to think that the immediately colouring substance is primarily derived from the matter of the sun, somewhat elaborated by vegetable life.

Many of these dyes are evolved or variously modified by chemical operations. Thus a colouring matter is somewhat deposited in the form of a fascula during the putrefaction of the vegetable; in others it is evolved or changed by alum, by acids, or by alkali. We may also observe, that any part of the vegetable may be the balse of the colouring matter. This appears from the solubility of the different dyes in their proper menstrua; and in these solutions we have not been able to separate the real colouring matter from the balse in which it is inviolated. After all, then, we must conclude, that a full investigation of this subject more properly belongs to the sublimer parts of Chem.

MISTRY, than to the business in which we are at present engaged.

The colouring drugs are considered in their proper places.

In finishing our history of the vegetable kingdom, it only remains that we should offer some

General Observations on the foregoing Principles.

1. Essential oils, as already observed, are obtainable only from a few vegetables: but gross oil, resin, gums, and fufpicious matter, appear to be common, in greater or less proportion, to all; some abounding more or less with one and others with another.

2. The several principles are in many cases intimately combined; so as to be extracted together from the subjed, or by these solvents, in which some of them separately could not be dissolved. Hence water infusions and spidrous tinctures of a plant, contain respectively more of these than those of which water or spirit is the proper solvent.

3. After a plant has been sufficiently infused in water, that spirit extracts from the residuum may be considered as confitling wholly of such matter as directly belongs to the action of spirit. And, on the contrary when spirit is applied first, all that water extracts afterwards may be considered as confitling only of that matter of which water is the direct solvent.

4. If a vegetable substance, containing all the principles we have enumerated, be boiled in water, the essential oil, whether fluid or concrete, and the camphor, and volatile essential oil, will gradually exhaile with the steam of the water, and may be collected by receiving the steam in proper vessels placed beyond the action of the heat. The other principles not being volatile in this degree of heat, remain behind: the gross oil and sebaceous matter float on the top: the gummy and saline substance, and a part of the resin, are dissolved by the water, and may be obtained in a solid form by draining the liquor, and exposing it to a gentle heat till the water has exhaled. The rest of the resin, still retained by the subject, may be extracted by spirit of wine, and separated in its proper form by exhalation of the spirit. On these foundations most of the substances contained in vegetables may be extracted, and obtained in a pure state, however they may be compounded together in the subject.

5. Sometimes one or more of the principles is found naturally disengaged from the others, lying in distinct receptacles within the subject, or extraneous and accumulated on the surface. Thus, in the dried roots of angelica, cut longitudinally, the microscope discovers veins of resin. In the flower cups of hypericum, and the leaves of the orange-tree, transparent points are distinguished by the naked eye: which, at first view, seem to be holes, but on a closer consideration are found to be little vesicles filled with essential oil. In the bark of the fir, pine, larch, and some other trees, the oily receptacles are extremely numerous, and so copiously supplied with the oily and resinous fluid, that they frequently burst, especially in the warm climates, and discharge their contents in great quantities. The acacia tree in Egypt, and the plum and cherry among our selves, yield almost pure gummy exudations. From
a species of sfa is secreted the saline sweet substance manna; and the only kind of sugar with which the ancients were acquainted, appears to have been a natural exudation from the cane.

6. The foregoing principles are, as far as is known, all that naturally exist in vegetables; and all that art can extract from them, without such operations as change their nature, and destroy their original qualities. In one or more of these principles, the colour, smell, taste, and medicinal virtues, of the subject, are almost always found concentrated.

7. In some vegetables the whole medicinal activity resides in one principle. Thus, in sweet almonds, the only medicinal principle is a gross oil; in horde-radish root, an essential oil; in jalap root, a resin; in marshmallow root, a gum; in the leaves of forrel, a saline acid substance.

8. Others have one kind of virtue residing in one principle, and another in another. Thus Peruvian bark has an astringent resin and a bitter gum; wormwood a strong flavoured essential oil and a bitter gum resin.

9. The gross impid oils and febacious matters, the simple infipid gums, and the sweet and acid saline substances, seem to agree both in their medicinal qualities and in their pharmacutic properties.

10. But essential oils, resins, and gum-resins, differ much in different subjects. As essential oils are universally the principle of odour in vegetables, it is obvious that they must differ in this respect as much as the subjects from which they are obtained. Resins frequently partake of the oil, and consequently of the differences depending on it; with this further diversity, that the gross resinous part often contains other powers than those which reside in oils. Thus from wormwood a resin may be prepared, containing not only the strong smell and flavour but likewise the whole bitterness of the herb; from which last quality the oil is entirely free. The bitter, astringent, purgative, and emetic virtue of vegetables, reside generally in different sorts of resinous matter, either pure or blended with gummy and saline parts; of which kind of combinations there are many so intimate, that the component parts can scarcely be separated from each other, the whole compound diffusing almost equally in aqueous and spirituous menstrua.

11. There are some substances also, which, from their being totally soluble in water, and not in spirit, may be esteemed to be mere gums; but which, nevertheless, possess virtues never to be found in the simple gums. Such are the astringent gum called acacia, and the purgative gum extracted from aloes.

12. It is supposed that vegetables contain certain subtile principles different in different plants, of too great tenuity to be collected in their pure state, and of which oils, gums, and resins, are only the matrices or vehicles. This inquiry is foreign to the purposes of pharmacy, which is concerned only about grosser and more sensible objects. When we obtain from an odoriferous plant an essential oil, containing in a small compass the whole fragrance of a large quantity of the subject, our intentions are equally answered, whether the substance of the oil be the direct odorous matter, or whether it has diffused through it a fragrant principle more subtile than itself. And when this oil in long keeping loses its odour, and becomes a resin, it is equal in regard to the present considerations, whether the effect happens from the evaporation of a subtile principle, or from a change produced in the substance of the oil itself.

Sect. II. Animals.

From the history we have already given of the vegetable kingdom, our details on animal substances may in many particulars be considerably abridged. All animals are fed on vegetables, either directly or by the intervention of other animals. No part of their substance is derived from any other source except water. The small quantity of salt used by man and some other animals, is only necessary as a seasoning or stimulant to the stomach. As the animal then is derived from the vegetable matter, we accordingly find that the former is capable of being resolved into the same principles as those of the latter. Thus, by repeated distillations, we obtain from animal substances, water, oil, air, an easily destructible salt, and charcoal. These secondary principles are by farther processes at length resolvable into the same proximate principles which we found in vegetables, viz. water, oil, air, earth, and the principle of inflammability. But though the principles of vegetable and animal substances are fundamentally the same, yet these principles are combined in a very different manner. It is exceedingly rare that animal substances are capable of the vinous or acetous fermentations; and the putrefactive, into which they run remarkably fast, is also different in some particulars from the putrefaction of vegetables; the escape of the phlogiston in the form of light is more evident, and the smell is much more offensive, in the putrefaction of animal than of vegetable substances. The putrefaction of urine is indeed accompanied with a peculiar fetor, by no means so intolerable as that of other animal substances: this we suppose to be owing to the pungency derived from the volatile alkali, and also to the urine containing less inflammable matter than the blood and many other fluids. When analyzed by a destructive heat, animals afford products very different from those of vegetables: the empyreumatic oil has a particular and much more fetid odour; and the volatile salt, instead of being an acid, as it is in most vegetables, is found in animals to be a volatile alkali. Chemists have spoken of an acid procurable from animal substances, and indeed certain parts of animal bodies are found to yield a salt of this kind; but it by no means holds with animal substances in general; and though the proofs to the contrary were even conclusive, it is confidcucely in so small a quantity as not to deserve any particular regard. In some animals, however, an acid exsits, uncombined and ready formed in their bodies. This is particularly manifest in some insects, especially ants, from which an acid resembling the acetous has been procured by boiling them in water. The solid parts of animal bodies, as the muscles, tendons, cartilages, and even the bones, when boiled with water, give a gelatinous matter or glue resembling the vegetable gums, but much more adhesive. We must, however, except the horned parts and the hair, which seem to be little soluble either in water or in the liquors of the stomach. The acids, the alkalis, and quicklime, are also found to be powerful solvents of animal matters. It is from the solid parts
parts, that the greatest quantity of volatile alkali is obtained; it arises along with a very fluid empyreumatic oil, from which it is in some measure separated by exposed rectifications. This oil is mostly in a fluid, and partly in a concrete state; and from its having been extensively prepared in the greatest quantity from the horns of the hart, it has been called \textit{fat} or spirit of hartborn. Volatile alkali is, however, procurable from all animals, and from almost every part of animal bodies except fat. Though we are sometimes able to procure fixed alkali from an animal cinder, yet it is probable that this oil did not make any part of the living animal, but rather proceeded from the introduction of some fatty matter, incapable of being assimilated by the functions of the living creature.

In speaking of the fluid parts of animals, we should first examine the general fluid, or blood, from whence the reft are secreted. The blood, which at first sight appears to be an homogeneus fluid, is composed of several parts, easily separable from each other, and which the microscope can even perceive in its uncoagulated state. On allowing it to stand at rest, and to be exposed to the air, it separates into what are called the 	extit{crassamentum}, and the 	extit{ferum}. The crassamentum, or crust, chiefly consists of the red globules, joined together by another substance, called the coagulable lymph: the chemical properties of these globules are not as yet understood; but they seem to contain the greatest quantity of the iron found in the blood. The ferum is a yellow subfividic liquor, having little sensible falt or smell: at a heat of 160 of Fahrenheit, it is converted into a jelly. This coagulation of the ferum is also owing to its containing a matter of the same nature with that in the crassamentum, viz. the coagulable lymph: whatever then coagulates animal blood, produces that effect on this concrescent part. Several causes, and many different subfiances, are capable of effecting this coagulation; such as contact of air, heat, alcohol, mineral acids, and their combinations with earths, as alum, and some of the metallic farts. The more perfect neutral farts are found to prevent the coagulation, such as common falt and nitre.

Of the fluids secreted from the blood, there are a great variety in men and other animals. The excrementitious and redundant fluids are those which afford in general the greatest quantity of volatile alkali and empyreumatic oil: there are also some of the secreted fluids, which, on a chemical analysis, yield products in some degree peculiar to themselves. Of this kind is the urine, which is found to contain in the greatest abundance the noted falt formed from the pholphoric acid and volatile alkali. The fat, too, has been found to differ from the other animal matters, in yielding by distillation a strong acid, but no volatile alkali. There is also much variety in the quantity and state of the combination of the falt and other matters in different secreted fluids. But for a fuller investigation of this and other parts of the subject, we refer to \textit{Anatomy, Chemistry, and Physiology}; with which it is more immediately connected than with the elements of \textit{Pharmacy}.

Animal oils and fats, like the gross oils of vegetables, are not of themselves soluble either in water or vinous spirits: but they may be united with water by the intervention of gum or mucilage. Melt of them may be changed into soap, by fixed alkaline farts; and be thus rendered miscible with spirit as well as water.

The odorinous matter of some odoriferous animal substances, as must, civet, castore, is, like effalent oils, soluble in spirit of wine, and volatile in the heat of boiling water. Carthusian relates, that from castore an animal essentail oil has been obtained in a very small quantity, but of an exceedingly fragrant diffusive smell.

The vesicating matter of carthamides, and those parts of sundry animal substances in which their peculiar tallow resides, are dissolved by rectified spirit, and seem to have some analogy with retins and gummy retins.

The gelatinous principle of animals, like the gum of vegetables, dissolves in water, but not in spirit or in oils: like gums also, it renders oils and fats miscible with water into a milky liquor.

Some insects, particularly the ant, are found to contain an acid juice, which approaches nearly to the nature of vegetable acids.

There are, however, sundry animal juices, which differ greatly, even in these general kinds of properties, from the corresponding ones of vegetables. Thus animal serum, which appears analogous to vegetable gummy juices, has this remarkable difference, that though it mingles uniformly with cold or warm water, yet on considerably heating the mixture, the animal-matter separates from the watery fluid, and concretes into a solid mass. Some physicians have been apprehensive, that the heat of the body, in certain difeases, might rise to such a degree, as to produce this dangerous or mortal concretion of the fermo humours: but the heat requisite for this effect is greater than the human body appears capable of sustaining, being nearly about the middle point between the greatest human heat commonly observed and that of boiling water.

The soft and fluid part of animals are strongly disposed to run into putrefaction; they putrify much sooner than vegetable matters; and when corrupted, prove more offensive.

This process takes place, in some degree, in the bodies of living animals, as often as the juices stagnate, or are prevented, by an obftruction of the natural emanations, from throwing off their more volatile and corruptible parts.

During putrefaction, a quantity of air is generated; all the humours become gradually thinner, and the fibrous parts more lax and tender. Hence the tympany, which succeeds the corruption of any of the viscera, or the imprudent suppression of dyenteries by alriment; and the weakness and laxity of the vessels observable in seuries, &c.

The crassamentum of human blood changes by putrefaction into a dark livid-coloured liquor; a few drops of which ting the serum with a tawny hue, like the ichor of fores and dyenteric fluids, as also the white of the eye, the saliva, the serum of blood drawn from a vein, and the liquor that oozes from a blister in deep seuries and the advanced state of malignant fevers.

The patrid crassamentum changes a large quantity of recent urine to a flame-coloured water, so common in fevers and in the seury. This mixture, after standing an hour or two, gathers a cloud resembling what is seen in the crude water of acute distempers, with some
The putrefaction of animal substances is prevented or retarded by most saline matters, even by the fixed and volatile alkaline salts, which have generally been supposed to produce a contrary effect. Of all the salts that have been made trial of, sea-salt seems to resist putrefaction the least; in small quantities it even accelerates the process. The vegetable bitters, as chamomile flowers, are much stronger antiseptics, not only preventing flesh long uncorrupted, but likewise somewhat correcting it when putrid: the mineral acids have this last effect in a more remarkable degree. Vinous spirits, aromatic and warm substances, and the acid plants, falsely called alkali-plant, as scurvy-grass and horse-radish, are found also to resist putrefaction. Sugar and camphor are found to be powerfully antiseptic. Fixed air, or the aerial acid, is likewise thought to resist putrefaction; but above all the vapours of nitrous acid, in the form of air (the nitrous air of Dr. Priestley), is found to be the most effectual in preserving animal bodies from corruption. The lift of the septic, or of those substances that promote putrefaction, is very short; and such a property has only been discovered in calcareous earths and magnesia, and a very few salts, whose bases are of these earths.

It is observable, that notwithstanding the strong tendency of animal matters to putrefaction, yet broths made from them, with the admixture of vegetables, instead of putrefying turn sour. Sir John Pringle has found, that when animal flesh in sub stance is beaten up with bread or other farinaceous vegetables, and a proper quantity of water, into the consistence of a pap, this mixture likewise, kept in a heat equal to that of the human body, grows in a little time sour; while the vegetable matters, without the flesh, suffer no such change.

It was observed in the preceding section, that some few vegetables, in the resolution of them by fire, discover some agreement in the matter with bodies of the animal kingdom; yielding a volatile alkaline salt in considerable quantity, with little or nothing of the acid or fixed alkali, which the generality of vegetables afford. In animal sub stances also, there are some exceptions to the general analysis: from animal fats, as we before observed, instead of a volatile alkali, an acid liquor is obtained; and their empyreumatic oil wants the peculiar offensiveness of the other animal oils.
Part 1.

Of this kind are,

1. The mineral calcareous earth: distinguished by its being convertible in a strong fire, without addition, into an acrimonious calx called quicklime. This earth occurs in a variety of forms in the mineral kingdom: the fine soft chalk, the coarser limestone, the hard marbles; the transparent spar, the earthy matter contained in waters, and which separating from them incrusts the sides of the caverns, or hangs in icicles from the top, receiving from its different appearances different appellations. How strongly foredo some of these bodies have been recommended for particular medicinal purposes, they are fundamentally no other than different forms of this calcareous earth: simple pulverization depriving them of the superficial characters by which they were distinguished in the mafs. Most of them generally contain a greater or less admixture of some of the indissoluble kinds of earth; which, however, affects their medicinal qualities no otherwise than by the addition which it makes to their bulk. Chalk appears to be one of the purer sorts; and is therefore in general preferred. They all burn into a strong quicklime: in this state a part of them dissolves in water, which thus becomes impregnated with the astringent and lithotrityptic powers that have been erroneously ascribed to some of the earths in their natural state.

During the calcination of calcareous earths, a large quantity of elastic vapour is discharged: the absence of this fluid is the cause of the causticity of quicklime, and of its solubility in water in the form of lime-water. For a more full inquiry into this subject, see Fixed Air, &c.

2. The animal calcareous earth: burning into quicklime like the mineral. Of this kind are oyster-shells and all the marine shells that have been examined; though with some variation in the strength of the quicklime produced from them.

3. The earth of bones and horns: not at all burning into quicklime. This kind of earth is more difficult of solution in acids than either of the preceding. It is accompanied in the subjefts with a quantity of gelatinous matter, which may be separated by long boiling in water, and more perfectly by burning in the open air. The earth may be extracted also from the bone or horn, though difficulty, by means of acids; whereas vegetables and the soft parts of animals yield their pure earth by burning only.

2d. Earth soluble with ease in the vitriolic as well as other acids, and yielding, in all other combinations therewith, saline concretes soluble in water.

1. Magnesia alba: compoing with the vitriolic acid a bitter purgative salt. This earth has not yet been found naturally in a pure state. It is obtained from the purging mineral waters and their salts; from the bitter liquor which remains after the crystallization of sea-salt from sea-water; and from the fluid which remains uncrystallized in the purest fraction of some sorts of rough nitre. The ashes of vegetables appear to be nearly the same kind of earth.

2. Aluminous earth: compoing with the vitriolic acid a very astringent salt. This earth also has not been found naturally pure. It is obtained from alum; which is no other than a combination of it with the vitriolic acid; it may likewise be extracted, by strong boiling in that acid, from clays and boles.

3d. Earths which by digglng in acids, either in the cold or in a moderate warmth, are not at all dissolved.

1. Argillaceous earth: becoming hard, or acquiring an additional hardnifs, in the fire. Of this kind of earth there are several varieties, differing in some particular properties: as the purer clays, which when moistened with water form a very vitious mafs, diffusibly through a larger quantity of the fluid, and slowly subdubing from it; bricks, less vitious, more readily miscible with water, and more readily subdubing; and coks, which have little or nothing of the virtiofity of the two foregoing, and are commonly impregnated with a yellow or red ferruginous calx.

2. Crystalline earth: naturally hard so as to strike sparks with steel; becoming friable in a strong fire. Of this kind are clints, crysfals, &c. which appear to confi, of one and the same earth, differing in the purity, hardnefs, and transparency of the mafs.

3. Gypseous earth: reducible by a gentle heat into a soft powder, which unites with water into a snafs, somewhat vitious and tenacious while moist, but quickly drying and becoming hard. A greater heat deprives the powder of this property, without occafioning any other alteration. Such are the transparent felenites; the fibrous fomy maffes improperly called English talc; and the granulated gypfa or playfer of Paris fones. Though these bodies, however, have been commonly thought to be mere earths, of a distinct kind from the refl, they appear, both from analytical and fynthetical experiments, to be no other than combinations of the mineral calcareous earth with vitriolic acid.

4. Talty earth: scarcely alterable in a vehement fire. The maffes of this earth are generally of a fibrous or leafy texture; more or less pellucid, bright or glittering, smooth and unctuous to the touch; too flexible and elastic to be easily pulverized; soft so as to be cut with a knife. In these respects some of the gypseous earths nearly resemble them, but the difference is readily discovered by fire; a weak heat reducing the gypseous to powder, while the strongest makes no other alteration in the talty, than somewhat diminishing their flexibility, brightnefs, and unctuoity.

III. Metals.

Of metals, the next division of mineral bodies, the Metals, most obvious characters are, their peculiar bright perfed and imperfect opaqueness, and great weight; the lightest of them is fix, and the heaviest upwards of 91 times heavier than an equal bulk of water.

To understand the writers in chemistry, it is proper to be informed, that metals are subdivided into the perfect, the imperfect, and the femimetal.

Those possesed of dulthility and malleability, and which are not sensibly altered by very violent degrees of heat, are called perfect metals: Of these there are three; gold, silver, and platina. It is, however, probable, that the mark of their indefluxibility by fire is only relative: and indeed modern chemists have been able, by a very intense degree of heat, to bring gold into the state of a calx, or something very nearly resembling it.
Those metallic substances which possess the distinctive properties of the perfect metals, but in a less degree, are called the imperfect metals: These are, copper, iron, tin, lead.

Lately, those bodies having the metallic characters in the most imperfect state, that is to say, those which have no ductility and the least figurative in the fire, are distinguished by the name of semi-metals: These are, regulus of antimony, bismuth, zinc, regulus of cobalt, nickel, and regulus of arsenic; which latter might be rather considered as the boundary between the metallic and the saline bodies.

Mercury has been generally ranked in a class by itself.

All metallic bodies, when heated in close vessels, melt or fuse. This fusion takes place at different degrees of heat in different metals; and it does not appear that this process produces any change in the metals, provided it be conducted in close vessels. Metals, exposed to the combined action of air and fire, are converted into an earth like substance called calx; by this process, which we call calcination, the metal suffers remarkable changes. From the diffusive marks we have before given of the metallic bodies, it will be obvious, that the perfect metals are most fluidly, the imperfect more quickly, and the semi-metals most easily and soonest, affected in this operation. This earth-like powder, or calx, is found to possess no metallic aspect, but is considerably heavier than the metal before its calculation: it has no longer any affinity with metallic bodies, nor even with the metal from which it has been produced.

Besides this method of calcining metals by air and fire, they may likewise be brought into the state of a calx, by dissolving them in acids, from which they may be afterwards freed by evaporating the acid, or by adding to the solution an alkaline salt. Metals are also sometimes dephlogisticated by detonation with nitre. This change in their obvious properties is generally accompanied with a remarkable alteration in their medicinal virtues: thus quicksilver, which taken into the body in its crude state and undivided, seems inactive; proves, when calcined by fire, even in small doses, a strong emetic and cathartic, and in smaller ones, a powerful alternative in chronic disorders; while regulus of antimony, on the contrary, is changed by the same treatment, from a high degree of virulence to a state of inactivity.

Caleces of mercury and arsenic exhale in a heat below ignition: those of lead and bismuth, in a red or low white heat, run into a transparent glass; the others are not at all vitreifiable, or not without extreme vehemence of fire. Both the caleces and glaeses recover their metallic form and qualities again by the skilful addition of any kind of inflammable substance that does not contain a mineral acid. This recovery of the metallic caleces into the metallic form is called reduction. During this process, an elastic aerial fluid escapes, which is found to be pure air.

Is the conversion of metals into caleces owing to the discharge of phlogition, or to the absorption of pure air? And is the reduction effected by the absorption of phlogition, either furnished by inflammable bodies or precipitated in consequence of the discharge of pure air? On these questions there is much dispute among modern chemists: We thought it only necessary to state them here, as a full inquiry into the subject is by no means the province of pharmacy. We, however, think it prudent to retain the doctrine of Stahl: and we do this the more readily, because it has been followed in our article Chemistry, and because it is abundantly clear in its illustration of the pharmaceutical processes. We do not mean, however, to reject any modern discovery which may serve to illustrate our subjects.

All metallic bodies dissolve in acids; some only in particular acids, as silver and lead in the nitrous: some only in compositions of acids, as gold in a mixture of the nitrous and marine: and others, as iron and zinc, in all acids. Some likewise dissolve in alkaline liquors, as copper: and others, as lead, in express oils. Fused with a composition of sulphur and fixed alkaline salt, they are all except zinc, made soluble in water.

All metallic substances, dissolved in saline liquors, have powerful effects in the human body, though many of them appear in their pure state to be inactive; their activity is generally in proportion to the quantity of acid combined with them: Thus lead, which in its crude form has no sensible effect, when united with a small portion of vegetable acid into ceruss, discovers a low degree of the pyritic and malignant quality, which it so strongly exerts when blended with a larger quantity of the same acid into what was called succarum Saturni, but now more properly sal plumbo, or plumbum acetaum: and thus mercury, with a certain quantity of the marine acid, forms the violent corrosive sublimate, which by diminishing the proportion of acid becomes the mild medicine called mercurius dulcis.

IV. Acids.

The facts of this order are very numerous; but as we are at present treating of Minerals, it is only therefore the mineral or fusil acids we mean to speak of in various places.

These are distinguished by the names of the concretes from which they have been principally extracted; the vitriolic from vitriol, the nitrous from nitre or sulphur; and the marine or muriatic from common sea-salt. The form they are generally in, is that of a watery fluid: They have all a remarkable attraction for water: They imbibe the humidity of the air with rapidity and the generation of heat. Although heat be produced by their union with water, yet when mixed with ice in a certain manner, they generate a prodigious degree of cold. Acids change the purple and blue colours of vegetables to a red: they infect fermentation; and lastly, they impregnate that peculiar sensation on the tongue called Fourmets, and which their name imports. But it is to be observed, that they are all highly corrosive, in much as not to be safely touched, unless largely diluted with water, or united with such substances as obtund or supress their acuity. Mixed hastily with vineous spirits, they raise a violent ebullition and heat accompanied with a copious discharge of noxious fumes: a part of the acid unites
The nitrous acid unites intimately with the vinous spirit into a new compound, void of acidity, called dulcitel spirit. It is observable, that the marine acid is much less disposed to this union with spirit of wine than either of the other two; nevertheless, many of the compound salts resulting from the combination of earthy and metallic bodies with this acid, are soluble in that spirit, while those with the other acids are not. All these acids effervesc strongly with alkaline fixed and volatile, and form with them neutral salts; that is, such as discover no marks either of an acid or alkaline quality.

The nitrous and marine acids are obtained in the form of a thin liquor; the acid part being blended with a large proportion of water, without which it would be diffused into an incendible vapour: the vitriolic stands in need of so much less water for its condensation as to assume commonly an oily consistence (whence it is called oil of vitriol), and in some circumstances even a solid one. Alkaline salts, and the soluble earths and metals, absorb from the acid liquors only the pure acid part, so that the water may now be evaporated by heat, and the compound salt left in a dry form.

From the coalition of the different acids with the three different alkalis, and with the several soluble earths and metallic bodies, result a variety of saline compounds; the principal of which shall be particularized in the sequel of this article.

The vitriolic acid, in its concentrated liquid state, is much more ponderous than the other two; it emits no visible vapour in the heat of the atmosphere, but imbibes moisture which increases its weight: the nitrous and marine emit copious corrosive fumes, the nitrous yellowish red, and the marine white ones. If bottles containing the three acids be flopped with cork, the cork is found in a little time tinged black with the vitriolic, corroded into a yellow substance by the nitrous, and into a whitish one by the marine.

It is above laid down as a character of one of the classes of earths, that the vitriolic acid precipitates them when they are previously diffused in any other acid: it is obvious, that on the same principle this particular acid may be distinguished from all others. This character serves not only for the acid in its pure state, but likewise for all its combinations that are soluble in water. If a solution of any compound salt, whose acid is the vitriolic, be added to a solution of chalk in any other acid, the vitriolic acid will part from the substance with which it was before combined, and join itself to the chalk, forming therewith a compound; which, being no longer soluble in the liquor, renders the whole milky for a time, and then gradually subsides.

This acid may be distinguished also, in compound salts, by another criterion not less strongly marked: If any salt containing it be mixed with powdered charcoal, and the mixture exposed in a close vessel to a moderately strong fire, the acid will unite with the directly inflammable part of the charcoal, and compose therewith a genuine sulphur. Common brimstone is no other than a combination of the vitriolic acid with a small proportion of inflammable matter. With any kind of inflammable matter which is not volatile in close vessels, as the coal of vegetables, of animals, or of bitumens, this acid composes always the same identical sulphur.

The nitrous acid also, with whatever kind of body it be combined, is both distinguished and extricated by means of any inflammable substance being brought to a state of ignition with it. If the subject be mixed with a little powdered charcoal and made red hot, a deflagration or fulmination ensues, that is, a bright flame with a hissing noise; and the inflammable matter and the acid being thus consumed or diffused together, there remains only the substance which was before combined with the acid, and the small quantity of ashes afforded by the coal.

These properties of the nitrous acid desfigrating with inflammable substances, and of the vitriolic forming sulphur with them, serve not only as criteria of the respective acids in the various forms and disguises, but likewise for discovering inflammable matter in bodies, when its quantity is too small to be sensible on other trials.

All these acids will be more particularly examined when we come to treat of each of them apart. There are, however, a few other mineral acids which are of importance to be known: these are, aqua regia; acid of borax; sparry acid; and, lastly, fixed air, which has of late been called aerial acid, or acid of chalk.

Aqua regia has been generally prepared by a mixture of certain proportions of the nitrous and muriatic acids. It is of little avail in pharmacy whether we consider it as a distinct acid, or only as a modification of the muriatic. It has been found, that the muriatic acid when diffused with manganese (a peculiar volatile substance, showing a remarkable attraction to phlogiston), suffers a change which renders it capable of diffusing gold and platinum. Whether this change be produced by the acid acquiring a redundancy of pure air, or by its being deprived of phlogiston, it is not our business to decide. This experiment, however, renders it probable, that the nitrous acid in the common aqua regia is only sublimate of accomplishing the same change in the muriatic acid which is produced by diffusing that acid with manganese.

As aqua regia has been only used in the nicer operations in chemistry, and in the art of etching, we think it unnecessary to say more of it in this place.

The acid of borax, or fediae fall of Homberg, may be extracted from borax, a neutral salt, whole base is mineral alkali. It has also been found native in the waters of several lakes in Tuscany. It is a light, crystallized, concrete salt; its taste is febile; it is difficultly soluble in water; but the solution changes blue vegetable colours to a red. With vitriform earths it fuses into a white glass; it unites with the other alkalies, with magnesia, and with quicklime. The salts resulting from these combinations are very imperfectly known. The salt has been called fediae, from its supposed virtues as an anodyne and refrigerant remedy; but modern physicians have very little faith in this once celebrated drug.

The sparry acid is so called from its being extracted from a foill called sparry flour, or nitrous flour. It is not yet determined whether it be a distinct acid; and as it has not yet been employed for any purpose in pharmacy, we think it would be improper to attempt any farther account of it here.

Besides
Besides the acids abovementioned, there have also been discovered acids seemingly of a particular nature, in amber, in arsenic, and in black-lead: but as these have not hitherto been applied to any use in pharmacy, they cannot properly have a place in this article.

We now come to the left, but perhaps the most generally diffused, acid in nature: this is the aerial acid, or fixed air.

Fixed Air.

In our pharmaceutical history of this body, we shall only make use of the two names fixed air and aerial acid; being those most generally used, and which in our opinion are most applicable to our own subject. Fixed air is a permanently elastic fluid, being only fixed when in a state of combination with calcareous earth or other substances from which it may be extricated. It has received many different names, according to the substances from which it is diffused, and to the different opinions concerning its nature; it is called the atmosphere of Helmot, the fixed air of Dr Black, the acid of chalk, calcareous gas, mephitic gas, mephitic acids, and aerial acid, of many modern chemists. In accommodating our account of it to the purposes of pharmacy, it is most convenient to consider it as an acid. The aerial acid may be extricated by heat, or by other acids, from all calcareous earths; that is, from all those earths which by calcination are converted into quicklime; such as chalk, marble, limestone, sea-shells, &c. It is likewise extracted from mild, fixed, and volatile alkalies, and from magnesia alba. Thus, if the vitriolic, or almost any other acid, be added to a quantity of calcareous earth or mild alkali, a brief evaporation immediately ensues; the fixed air, or aerial acid, is discharged in bubbles; and the other acid takes its place. If this process be conducted with an apparatus to be afterwards described, the aerial acid, now separated from the calcareous earth, may be received and preserved in close vessels. When this diffused gas is difengaged, viz. that of a permanently elastic fluid, fixed air is also separated in great quantity during the vinous fermentation of vegetable matters. When a calcareous earth is deprived of this acid by heat, it is converted into the calcic substance quicklime. When alkali, fixed or volatile, are deprived by any means of their aerial acid, they are rendered much more caustic, incapable of crystallization, or of effervescing with other acids. They are also in this deteriorated state much more powerful in dissolving other bodies. By recomposing this acid with quicklime, calcined magnesia, or alkali, any of which had been deprived of it, these substances again assume their former weight and properties. These bodies, then, when combined with aerial acid, are called mild; as mild calcareous earth, mild alkali, &c. and when deprived of this acid they are called caustic; as caustic calcareous earth, caustic alkali, &c. But as magnesia is not rendered caustic by calcination, there would perhaps be less danger in calling them aerated and deteriorated. The aerial acid is more diffused to unite with calcic calcareous earth (quicklime) than with any other substance; next to that, its attraction is for fixed alkali, then for magnesia, and lastly for volatile alkali. We shall afterwards find that these relative powers of the different substances to unite with this acid, lay the foundation of many important processes in pharmacy.

When we pour a small quantity of the aerial acid into lime-water, the liquor instantly assumes a white colour, and the lime gradually precipitates, leaving the water clear and tasteless: the lime in this experiment has absorbed the acid, and has therefore become mild or aerated earth. The aerial acid is capable of being absorbed by water, and the water thus impregnated precipitates lime in lime-water; but if a certain larger quantity of this impregnated water be added, the lime is redissolved, and the liquor recovers its transparency. Water impregnated with aerial acid is capable of dissolving iron; and in this way are formed native and artificial chalybeate waters. Zinc is also soluble in the same liquor. This acid is easily expelled from the water by removing the pressure of the atmosphere, by boiling, and even by time alone, if the vessel be not kept close shut. Fixed air extinguishes flame, vegetable and animal life; and ought therefore to be cautiously managed: like other acids it changes the blue colours of vegetables to a red, and communicates an acidulous taste to the water impregnated with it. The attraction of the aerial acid, even to quicklime, is but feeble; as we know of no other acids whatever that are not able to disengage it.

From these several facts it will appear obvious, that mild or aerated alkalies, whether fixed or volatile, are really neutral salts, compounded of the aerial acid and pure alkali: like other acids, it unites with these bodies, diminishes their causticity, and effects their crystallization. In speaking, therefore, of pure alkali, we ought to confine ourselves to those in the calceic or deaerated state; or, in other words, to those which are deprived of their fixed air or aerial acid, with which they formed a compound salt. Many other properties of this acid might be mentioned, but we have now noticed all those which we thought were concerned in the business of pharmacy. We shall have occasion to recur to the subject when we come to the preparation of several compound drugs.

Let us next take a view of what passes in the combinations of acids with different substances.

If a fixed alkaline salt be united with a vegetable acid, as vinegar, and formed into a neutral salt, on adding to this compound some marine acid, the acetous acid will be disengaged, so as to exhale totally in a moderate heat, leaving the marine in possession of the alkali; the addition of the nitrous acid will in like manner dispossess the marine, which now unites in its proper white fumes, though without such an addition it could not be extricated from the alkali by any degree of heat: on the addition of the vitriolic acid, the nitrous gives way in its turn, exhaling in red fumes, and leaving only the vitriolic acid and the alkali united together.

Again, if any metallic body be dissolved in an acid, the addition of any earthy body that is dissoluble in that acid will precipitate the metal: a volatile alkaline salt will in like manner precipitate the earth; and a fixed alkali will dislodge the volatile; which left being readily exhaled by heat, the remaining salt will be the same as if the acid and fixed alkali had been joined together at first, without the intervention of any of the other bodies.
The power in bodies on which these various transpositions and combinations depend, is called by the chemists affinity or elective attraction; a term, like the Newtonian attraction, designed to express not the cause, but the effect. When an acid spontaneously quits a metal to unite with an alkali, they say it has a greater affinity or attraction to the alkali than to the metal: and when, on the contrary, they say it has a greater affinity to fixed alkali than to the volatile, they mean only that it will unite with the fixed in preference to the volatile; and that if previously united with a volatile alkali, it will forfake this for a fixed one.

The doctrine of the affinities of bodies is of a very extensive use in chemical pharmacy: many of the official processes, as we shall see hereafter, are founded on it; several of the preparations turn out very different from what would be expected by a person unacquainted with these properties of bodies; and several of them, if, from an error in the process, or other causes, they prove unfit for the use intended, may be rendered applicable to other purposes, by such transpositions of their component parts as are pointed out by the knowledge of their affinities.

We shall therefore subjoin a table of the principal affinities observed in pharmaceutical operations, formed from that of the famous Bergman. See other tables for more general purposes in the article Chemistry.

The table is to be thus understood. The substances printed in capitals, on the top of each series, has the greatest affinity with that immediately under it, a less affinity with the next, and so on to the end of the series: that is, if any of the remote bodies has been combined with the top one, the addition of any of the intermediate bodies will disunite them; the intermediate body uniting with the uppermost body of the series, and throwing out the remote one. Thus, in the first series of the affinities of the vitriolic acid, a fixed alkali being placed between the acid and iron, it is to be concluded, that wherever vitriolic acid and iron are mixed together, the addition of any fixed alkaline salt will unite with the acid, and occasion the iron to be separated. Where several substances are expressed in one series, it is to be understood, that any of those bodies which are nearer to the uppermost, will in like manner disengage from it any of those which are more remote.
## Table of Single Attractions

### By Water

<table>
<thead>
<tr>
<th>Vitriolic Acid</th>
<th>Nitrous Acid</th>
<th>Marine Acid</th>
<th>Aqua Regia</th>
<th>Acid of Borax</th>
<th>Acid of Sugar</th>
<th>Acid of Tartar</th>
<th>Acid of Sorrel</th>
<th>Acid of Lemon</th>
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### By Fire

**Table of Single Attractions continued.**

**By Water.**

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**By Fire.**


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*TABLE*
### Table of Single Attractions continued.

#### By Water.

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#### By Fire.

# Table of Single Attractions continued.

## By Water

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<tbody>
<tr>
<td>Marine acid, Acid of sugar, Vitriolic acid, Phosphoric acid, Nitrous acid, Acid of tartar, Acid of forrel, Acid of lemon, Acetous acid, Aerial acid, Volatile acid.</td>
<td>Marine acid, Acid of sugar, Vitriolic acid, Acid of tartar, Vitriolic acid, Nitrous acid, Acid of forrel, Acid of lemon, Acetous acid, Acid of borax, Aerial acid.</td>
<td>Acid of sugar, Acid of tartar, Vitriolic acid, Acid of forrel, Acid of lemon, Acetous acid, Acid of borax, Aerial acid, Fixed alkali, Volatile alkali, Expressed oils.</td>
<td>Acid of sugar, Acid of tartar, Marine acid, Vitriolic acid, Phosphoric acid, Nitrous acid, Acid of forrel, Acid of lemon, Acetous acid, Acid of borax, Aerial acid, Fixed alkali, Volatile alkali.</td>
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## By Fire

The most simple furnace in the common stove, otherwise called the furnace for open fire. This is usually made of an iron hoop, five or six inches deep; with a grate or some iron bars across the bottom for supporting the fuel. It either stands upon feet, so as to be movable from place to place; or is fixed in brickwork. In this last case, a cavity is left under the grate, for receiving the ashes that drop through it; and an aperture or door, in the forepart of this ash-pit, serves both for allowing the ashes to be occasionally raked out, and for admitting air to pass up through the fuel. This furnace is designed for such operations as require only a moderate heat; as infusion, decoction, and the evaporation of liquid.

A deeper hoop or body, cylindrical, parallelopipedal, widening upwards, elliptical, or of other figures; formed of, or lined with, such materials as are capable of sustaining a strong fire; with a grate and ash-pit beneath, as in the preceding; and communicating at the top with a perpendicular pipe, or chimney; makes a wind furnace.

The greater the perpendicular height of the chimney, the heat of the greater will be the draught of air through the furnace, and the more intensively will the fire burn; provided the width of the chimney is sufficient to allow a free passage to all the air that the furnace can receive through the grate; for which purpose, the area of the aperture of the chimney should be nearly equal to the area of the interstices of the grate.

Hence, where the chimney consists of moveable pipes, made to fit upon each other at the ends, so that the length can be occasionally increased or diminished, the vehemence of the fire will be increased or diminished in the same proportion.

In furnaces whose chimney is fixed, the same advantage may be procured on another principle. As the intensity of the fire depends wholly upon the quantity of air successively passing through and animating the burning fuel, it is obvious, that the most vehement fire may be suppressed or restrained at pleasure, by closing more or less either the ash-pit door by which the air is admitted, or the chimney by which it passes off; and that the fire may be more or less raised again, by more or less opening these passages. A moveable plate, or regulator, in any convenient part of the chimney, affords commodious means of varying the width of the passage, and consequently of regulating the heat. This is most conveniently accomplished by keeping the ash-pit door entirely shut, and regulating the heat by a range of holes in a damping plate; each hole is provided with a proper pin, whereby we may shut it at pleasure. These holes may be made to bear a certain proportion to each other; the smallest being considered as one, the next to it in size must have twice the opening, to the next that double of the second, &c.; and so on to the number of seven or eight; and by combining these holes variously together, we can admit any quantity of air from 1 to 128; as 1 2 4 8 16 32 64 128. See Furnace, p. 507.

There are two general kinds of these wind-furnaces; one, with the chimney on the top, over the middle of the furnace; the other with the chimney on one side, and the mouth clear.
In the first, either the upper part of the furnace is contracted to fuch an aperture, that the chimney may fit upon it; or it is covered with an arched dome, or with a flat plate, having a like aperture in the middle. As in this disposition of the chimney, the inside of the furnace cannot be come at from above, a door is made in the side, a little above the grate, for supplying the fuel, inspecting the matter in the fire, &c.

For performing futfins in this furnace, the crucible, or melting vessel, is placed immediately among the fuel, with a flip of brick, or some other like support, between it and the grate, to keep the cold air, which enters underneath, from striking on its bottom.

When designed as a reverberatory, that is for distillation in long-necked coated glass retorts, two iron bars are placed acrofs, above the fire, for supporting the vessel, whose neck comes out at an aperture made for that purpose in the fide. This aperture should be made in the fide opposite to the door abovementioned; or at least so remote from it, that the receiver, fitted out with fide made to fit the distilling veffel without the furnace, may not lie in the operator's way when he wants to fill the fire or throw in fresh fuel.

The other kind of wind-furnace communicates, by an aperture in its back part near the top, either with an upright pipe of its own, or with the chimney of the room; in which fmall, all other passages into the chimney must be clofed. Here the mouth of the furnace serves for a door, which may be occasionally covered with a plate or tile. Of this kind is the furnace most commonly used for fufion in a crucible.

This fmall contrivance, by leaving the mouth of the furnace clear, affords the convenience of letting into it a boiling or evaporating pan, a copper still, an iron pot, for distilling hartthorn, an iron fand-pot, or other like vessels, of fuch a fize that they may be supported on the furnace by their rims. The mouth being thus occupied by the vefsels, a door must be made in the fide for supplying and ftrirring the fuel.

When a furnace of this kind is designed only for a fand-bath, it is most commodious to have the fand placed on a long iron plate, furnifhed with a ledge of freestone or brick work at each fide. The mouth of the furnace is to be clofely covered by one end of this plate; and the canal by which the furnace communicates with its chimney, is to be lengthened and carried along under the plate, the plate forming the upper fide of the canal. In this kind of fand-bath, digifitions, &c. requiring different degrees of heat, may be carried on at once; for the heat decreases gradually from the end over the furnace to the other.

When large vefefls, as stills and iron pots for distilling hartthorn and aquafortis, are fixed in furnaces, a confiderable part of the bottom of the vessel is commonly made to refi upon folid brick-work.

The large still, whose bottom is narrow in proportion to its height, and whose weight, when charged with liquor, requires great part of it to be thus supported, excels but a small surface to the action of the fire underneath. To make up for this disadvantage, the heat, which rises at the further end of a long narrow grate, is conveyed all round the fides of the veffel by a fpiral canal, which communicates at top with a common chimney.

The pots for distilling hartthorn and aquafortis in the larger way, have part of their great weight borne up by three strong pins or trụnsions at equal difiances round the pot towards the middle reaching into a brick-work: so that let support being neceflary underneath, a greater surface of the wide bottom lies expoed to the immediate action of the fire.

If a furnace, communicating with its chimney by a lateral canal, as in the fand-furnace abovementioned, be carried to a conliderable height above the part where this canal enters it, and if it be filled with fuel to the top, and closely covered, the fuel will burn no higher than up to the upper fide of the canal through which the air paffes off; and in proportion as this lower part of the fuel continues, it will be supplied by that above, which falls down in its place. Hence in this furnace, called an athme, a conftant heat may be kept up for a conliderable length of time without attendance.

The tower of the athenm, or that part which receives the fuel, is commonly made to widen a little downwards, that the coals may fall the more freely; but not so much as that the parf on fire at bottom may be too strongly preffed. A small aperture is made opposite to the canal or fume, or a number of openings according to the fize of the furnace and the degree of heat required, for supplying the air, which is more conveniently admitted in this manner than through the grate, as the interfeices of the grate are in time choked up by the ashes.

This furnace is designed only for heating bodies exterior to it. Its canal or flue, as in the fand-furnace already decribed, paffes under a fand-bath or water-bath; at the farther end of which it rises perpendicularly to fuch a height, as may occafion a fufficient draught of air through the fire.

The flue may be fo wide as to correspond to the whole height of the fire-place. A regifter or fiding plate, placed between the flue and the furnace, enable us to increafe or diminish this height, and consequently the quantity of fire, at pleafure. If the space beneath the flue be inclofed to the ground, the heat in this cavity will be confiderable enough to be applicable to fome useful purpofes.

With regard to the materials of furnaces, the fixed of the ma­
ones are built of bricks, cemented together by some tertials of
which furnaces are made.

good loam or clay. Any kind of loam or clayey com­
position that is of a proper degree of tenacity, which
when made into a paffe with water and well-worked,
does not flick to the fingers, and which, when thoroughly
ried, neither cracks nor melts in a vehement fire, is
fit for us. The purer and more tenacious clays require
to have their tenacity leffened by an admixture of fand,
or rather of the fame kind of clay burnt and grofsly
powdered.

Smaller portable furnaces are made of frong iron or
copper plates, lined, to the thicknefs of an inch or
more, with the fame kind of clayey composition which
for this ufe may be beaten with fome horfe-dung, chopp­
d straw, or cut hair or tow.

Very commodious portable furnaces, for a bufinefs
of moderate extent, may be formed of the larger kind
of common black-lead melting-pots, by cutting a door
at the bottom of the pot for the afh-pit, another above
this for the fire-place, and introducing a circular iron
grate of fuch a fize as may refi between the two doors.
For a more particular account of the method of preparing furnaces, see Furnace.

Baths.

Where a strong degree of heat is requisite, as in the fusion of metals, &c. the vessel containing the subject matter is placed among the burning fuel, or immediately over it: this is called operating in a naked fire. Where a smaller heat is sufficient, and the vessel employed is either of glafs, or of the more tender kinds of earthen ware, the sand-bath or water-bath is used to defend the vessel from the immediate action of the fire, and to render the heat less fluctuating.

Both these baths have their peculiar advantages and inconveniences. In water, the heat is equal through every part of the fluid: whereas in sand it varies in different parts of one perpendicular line, decreasing from the bottom to the top. Water cannot be made to receive, or to retain among the vessels immersed in it, almost a certain degree of heat, viz. that which is sufficient to make it boil; and hence it secures effectually against any danger of an excess of heat in those operations wherein the product would be injured by a heat greater than that of boiling water: but this advantage renders it useless for processes which require a greater heat, and for which sand or other solid intermedii are necessarily employed. There is this convenience also in the sand-bath, that the heat may be readily diminished or increased about any particular vessel, by raising it higher out of the sand or sinking it deeper; that different vessels may be employed to different degrees of heat from one fire; and that it keeps the vessels steady. The sand made choice of should be a large coarse grained kind, separated from the finer parts by washing, and from little stones by the sieve.

Coating of Glasses, Lutes.

Some processes require to be performed with glass vessels in a naked fire. For these purposes, vessels made of the thinnest glass should be chosen; for these bear the fire without cracking, much better than those which are thicker, and in appearance stronger.

All glasses, or other vessels that are apt to crack in the fire, must be cautiously sealed, that is, heated by flow degrees: and when the process is finished, they should be as soon cooled, unless where the vessel is to be broken to get out the preparation, as in some sublimations; in this case it is more advisable to expose the hot glasses suddenly to the cold air, which will soon occasion it to crack, than to endanger throwing down the sublimated matter by a long time.

As a defence from the violence of the fire, and to prevent the contact of cold air on supplying fresh fuel, &c. the glasses is to be coated over, to the thickness of about half-a-crown, with Windsor loam, softened with water into a proper consistence, and beaten up with horse-dung, or with the other clayey compositions abovementioned.

These compositions serve also as a lute, for securing the junctures of the vessels in the distillation of the volatile spirits and spirits of animals; for the distillation of acid spirits, the matter may be mixed with a solution of fixed alkaline salts instead of water. For most other purposes, a piece of wet bladder, or pale of flour and water, or of linseed meal (that is, the cake left after the expression of oil of linseed), are sufficient lutes.

Sometimes clay and chalk are mixed up into a paste, and spread upon slips of paper; and sometimes gum-arabic is used instead of the clay, and mixed up in the same manner.

Wet bladders contract so strongly by drying, that they are often obliged, even where the common lutes are employed, to leave or make an opening which may be occasionally stopped by a plug: by this means we give passage to a part of these vapours, which prevents the bursting of the vessels and facilitates the condensation of the reft. If we wish to collect incondensible vapours, we receive them into a jar inverted under a basin of water, or quicksilver, as is usually done in the analysis of vegetables by fire.

Besides these, there are also required some other kinds of lutes for joining vessels together in operations requiring a strong heat, and for lining furnaces; for which see Chemistry, n. 604, 605.

Vessels.

In this place, we shall only give the operator a few general cautions with regard to the matter of the vessels designed for containing the subject; and refer their description, to the account of the operations in which they are employed. See likewise Chemistry, n. 557, &c.

Metalline vessels possess the advantage of being able to bear sudden alterations of heat and cold, and of being very strong, so as to be capable of containing elastic flames; but, except those made of gold or silver, they are readily corroded by acids, even by the mild solutions of the vegetable kingdom. Copper vessels are corroded also by alkaline liquors, and by some neutral ones, as solutions of sal ammoniac. It is observable, that vegetable acids do not act upon this metal by boiling, so much as by standing in the cold; for even lemon juice may be boiled in a clean copper vessel, without receiving from it any taint or ill quality; whereas, in the cold, it soon dissolves so much as to contract a pungent taint. The tin, with which copper vessels are usually lined, gives likewise a sensible impregnation to acid juices; and this impregnation also is probably not innocent, more especially as a quantity of lead is commonly mixed with the tin. From the want of transparency in these vessels, we are also deprived of the advantage of seeing the different changes during the operation. The earthen vessels possess none of the desirable qualities for chemical operations, except that of sustaining very violent degrees of heat, without being melted or otherwise changed. These vessels are less liable to external cracks, from sudden applications of heat and cold, when they are made with a certain proportion of sand, than with pure clay. Black lead, too, mixed with the clay, makes the vessels sustain violent degrees and sudden alterations of heat surprizingly well: crude clay, reduced to a kind of sand by violent heat, and then mixed with raw clay, is also found to furnish vessels excellently fitted for those operations.
PHARMACY.

Part I. Elements.

The medical or Troy pound is less than the Avoirdupois, but the ounce and the dram greater. The Troy pound contains 5760 grains; the Avoirdupois 7000 grains. The Troy ounce contains 480 grains; the Avoirdupois only 437. The Troy dram is 60; the Avoirdupois dram somewhat more than 27. Eleven drams Avoirdupois are nearly equal to five drams Troy; 12 ounces Avoirdupois to nearly 11 ounces Troy; and 19 pounds Avoirdupois are equal to somewhat more than 23 pounds Troy.

These differences in our weights have occasioned great confusion in the practice of pharmacy. As the druggists and grocers fell by the Avoirdupois weight, the apothecaries have not in general kept a weight adjusted to the Troy pound greater than two drams, using Avoirdupois ounces. By this means it is apparent, that in all compositions, where the ingredients are prescribed, some by pounds and others by ounces, they are taken in a wrong proportion to each other; and the same happens where any are directed in letter denominations than the ounce, as these subdivisions used by the apothecaries are made to a different ounce.

Measures.

The measures employed in pharmacy are the common wine measures.

A gallon contains eight pints (librae.)
The pint contains sixteen ounces.
The ounce contains eight drams.

Though the pint is called by Latin writers libra or pound, there is not any known liquor of which a pint measures answers to that weight. A pint of the weight redistilled spirit of wine exceeds a pound by above half an ounce; a pint of water exceeds it by upwards of three ounces; and a point of oil of vitriol weighs more than two pounds and a quarter.

The Edinburgh College, sensible of the many errors from the promiscuous use of weights and measures, and of their different kinds, have in the last edition of their Pharmacopæa entirely rejected measures, and employ the Troy weight in directing the quantity of either of solid or fluid substances. They have, however, taken all possible care that the proportion of the simples and strength of the compounds should neither be increased nor diminished by this alteration. This change in the Edinburgh Pharmacopæa must be very particularly adverted to. And it is, we think to be regretted, that the London College have not in the last edition of their Pharmacopæa followed the same plan.

A table of the weights of certain measures of different fluids may on many occasions be useful, both for the weights affiling the operator in regulating their proportions in certain cases, and showing the comparative gravities of the fluids themselves. We here insert such a table, not only for a pint, an ounce, and a dram measure, of those liquids whose gravity has been determined by experiments that can be relied on. The wine gallon contains 231 cubic inches; whereas the pint contains 28 1/3, the ounce 1 3/8, and the dram 1/48 of a cubic inch.
### PHARMACY.

#### Chap. III. Of the Pharmaceutical Operations.

**Part I. Solution.**

**SECT. I. Solution.**

Solution is an intimate conniuncture of solid bodies with fluids into one seemingly homogeneous liquor of solution, both in the humid and dry way.

Objections have been made, and perhaps with propriety, to these terms; as it is supposed that the two bodies uniting in solution act reciprocally on each other: there is, however, no danger from the words themselves, if we do not derive them from a mistaken theory. Solution cannot take place, unless one of the bodies, at least, be in a fluid state; and this fluidity is effected either by water or fire: hence solution is said to be performed in the humid or the dry way. Thus, for instance, if any quantity of brimstone be dissolved in a solution of fixed alkali, the brimstone is said to be dissolved in the humid way: but if the brimstone be dissolved by melting it in a pan with the dry alkali, the solution is said to be done in the dry way. The hepar sulphur is the same in both. Another kind of solution resembling that by the dry way, is, however, to be carefully distinguished from it: if, for instance, a piece of Glauber's salt is put into a pan over the fire, the salt very soon assumes a liquid state; but on continuing the heat, it loses its fluidity, and becomes a white powder: this powder is the salt freed from its water, and it is found to be very refractory. This liquidity depended on the water of crystallization being enabled by the heat to keep the salt in solution, and the salt ceased to be fluid as soon as its crystallizing water was evaporated. This kind of solution, then, differs not from the first, or humid way.

If one of the two bodies to be united is transparent, the solution, if complete, is a transparent compound: this is the case in solutions of alkalis and calcareous earths in acids. But if the solution be opaque and milky, as is the case with soap and water, it is then considered as incomplete.

The principal menstrua used in pharmacy are, water, tinctures, oils, acid and alkaline liquors.

Water is the menstrum of all salts, of vegetable gums, and of animal gellies. Of salts, it dissolves only a determinate quantity, though of one kind of salt more than another; and being thus *saturated*, leaves any additional quantity of the same salt untouched.

Experiments have been made for determining the quantities of water which different salts require for the dissolution. Mr. Eller has given a large part in the Memoirs of the Royal Academy of Sciences of Berlin for the year 1750, from which the following table has been taken.

Eight ounces by weight of distilled water dissolved.

<table>
<thead>
<tr>
<th>Elements</th>
<th>Pint weights</th>
<th>Ounce measure weights</th>
<th>Dram measure weights</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imflammable Spirits.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethereal spirit of wine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highly-refined spirit of wine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common-refined spirit of wine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proc spirit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duly refined spirit of salt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duly refined spirit of nitre</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wines.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burgundy</td>
<td>14 1 36</td>
<td>426</td>
<td>354</td>
</tr>
<tr>
<td>Red port</td>
<td>15 1 36</td>
<td>426</td>
<td>354</td>
</tr>
<tr>
<td>Canary</td>
<td>16 0 40</td>
<td>475</td>
<td>384</td>
</tr>
<tr>
<td><strong>Expressed Oils.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil clive</td>
<td>14 0 0</td>
<td>420</td>
<td>334</td>
</tr>
<tr>
<td>Linseed oil</td>
<td>14 2 8</td>
<td>428</td>
<td>334</td>
</tr>
<tr>
<td><strong>Essential Oils.</strong></td>
<td>12 1 4</td>
<td>364</td>
<td>454</td>
</tr>
<tr>
<td>Oil of turpentine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of orange-peel</td>
<td>408</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>of juniper-berries</td>
<td>419</td>
<td>524</td>
<td></td>
</tr>
<tr>
<td>of rosemary</td>
<td>430</td>
<td>534</td>
<td></td>
</tr>
<tr>
<td>of origanum</td>
<td>432</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>of caraway seeds</td>
<td>432</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>of nutmegs</td>
<td>436</td>
<td>544</td>
<td></td>
</tr>
<tr>
<td>of saffron</td>
<td>443</td>
<td>555</td>
<td></td>
</tr>
<tr>
<td>of hyssop</td>
<td>444</td>
<td>555</td>
<td></td>
</tr>
<tr>
<td>of commin-feed</td>
<td>448</td>
<td>556</td>
<td></td>
</tr>
<tr>
<td>of mint</td>
<td>448</td>
<td>556</td>
<td></td>
</tr>
<tr>
<td>of pennyroyal</td>
<td>450</td>
<td>564</td>
<td></td>
</tr>
<tr>
<td>of dill-feed</td>
<td>457</td>
<td>574</td>
<td></td>
</tr>
<tr>
<td>of fennel-feed</td>
<td>458</td>
<td>574</td>
<td></td>
</tr>
<tr>
<td>of cloves</td>
<td>476</td>
<td>594</td>
<td></td>
</tr>
<tr>
<td>of cinnamon</td>
<td>576</td>
<td>594</td>
<td></td>
</tr>
<tr>
<td>of saffra</td>
<td>503</td>
<td>624</td>
<td></td>
</tr>
<tr>
<td><strong>Alkaline Liquors.</strong></td>
<td>16 0 0</td>
<td>480</td>
<td>60</td>
</tr>
<tr>
<td>Aquakali pura, Pharm. Lond.</td>
<td>17 1 10</td>
<td>512</td>
<td>644</td>
</tr>
<tr>
<td>Spirit of sal ammoniac</td>
<td>17 0 24</td>
<td>534</td>
<td>664</td>
</tr>
<tr>
<td>Strong soap-borders ley</td>
<td>24 0 0</td>
<td>720</td>
<td>90</td>
</tr>
<tr>
<td><strong>Acid Liquors.</strong></td>
<td>15 3 44</td>
<td>464</td>
<td>58</td>
</tr>
<tr>
<td>Wine-vinegar</td>
<td>15 6 56</td>
<td>476</td>
<td>594</td>
</tr>
<tr>
<td>Beer vinegar</td>
<td>17 4 0</td>
<td>525</td>
<td>654</td>
</tr>
<tr>
<td>Glauber's spirit of salt</td>
<td>20 2 40</td>
<td>610</td>
<td>764</td>
</tr>
<tr>
<td>Glauber's spirit of nitre</td>
<td>28 5 20</td>
<td>860</td>
<td>1074</td>
</tr>
<tr>
<td>Strong oil of vitriol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Animal Fluids.</strong></td>
<td>15 5 20</td>
<td>470</td>
<td>584</td>
</tr>
<tr>
<td>Urine</td>
<td>15 6 40</td>
<td>475</td>
<td>594</td>
</tr>
<tr>
<td>Cows milk</td>
<td>16 0 0</td>
<td>480</td>
<td>60</td>
</tr>
<tr>
<td>Affes milk</td>
<td>16 1 4</td>
<td>484</td>
<td>604</td>
</tr>
<tr>
<td>Blood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Waters.</strong></td>
<td>15 1 50</td>
<td>4562</td>
<td>57</td>
</tr>
<tr>
<td>Distilled water</td>
<td>15 2 40</td>
<td>460</td>
<td>574</td>
</tr>
<tr>
<td>Rain-water</td>
<td>15 3 12</td>
<td>452</td>
<td>574</td>
</tr>
<tr>
<td>Spring-water</td>
<td>15 5 20</td>
<td>470</td>
<td>584</td>
</tr>
<tr>
<td>Sea-water</td>
<td>214 5 20</td>
<td>6440</td>
<td>805</td>
</tr>
<tr>
<td><strong>Quicksilver.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part I.

<table>
<thead>
<tr>
<th>Elements</th>
<th>P</th>
<th>H</th>
<th>A</th>
<th>R</th>
<th>M</th>
<th>A</th>
<th>C</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sal c atharticus Glaucri</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solignée's salt</td>
<td>-</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alum</td>
<td>-</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sal ammoniac</td>
<td>-</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitriolated tartar</td>
<td>-</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt of Hartthorn</td>
<td>-</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugar of lead</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cream of tartar</td>
<td>-</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borax</td>
<td>-</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Though great care appears to have been taken in making their experiments, it is not to be expected that the proportions of the several salts, soluble in a certain quantity of water, will always be found exactly the same with these above set down. Salts differ in their solubility according to the degree of their purity, perfection, and dryness: the vitriols, and the artificial compound salts in general, differ remarkably in this respect, according as they are more or less impregnated with the acid ingredient. Thus vitriolated tartar, perfectly neutralized, is extremely difficult of solution: the matter which remains in making Glau-ber's spirit of nitre is no other than a vitriolated tartar; and it dissolves so difficultly, that the operator is obliged to break the retort in order to get it out; but on adding more of the vitriolic acid, it dissolves with ease. Hence many have been tempted to use an over-proportion of acid in this preparation: and we frequently find in the shops, under the name of vitriolated tartar, this acid soluble salt. The degree of heat occasions also a remarkable difference in the quantity of salt taken up: in very cold weather, 8 ounces of water will dissolve only about one ounce of nitre; whereas in warm weather, the same quantity will take up three ounces or more. To these circumstances are probably owing, in part, the remarkable differences in the proportionable solubilities of salts, as determined by different authors. It is observable that common salt is less affected in its solubility by a variation of heat than any other; water in a temperate state dissolving nearly as much of it as very hot water: and accordingly this is the salt in which the different experiments agree the best. In the experiments of Hoffmann, Neumann, and Pett, the proportion of this salt, on a reduction of the numbers comes on exactly the same, viz. three ounces of the salt to eight of water; Dr Brownrigg makes the quantity of salt a little more; Dr Grew, a dram and a furlong more; and Eller, as appears in the above table, four drams more: so that in the trials of six different persons, made probably in different circumstances, the greatest difference is only one fifth of the whole quantity of salt; whereas in some other salts there are differences of twice or thrice the quantity of the salt. In the experiments from which the table is drawn, the water was of the temperature of between 40 and 42 degrees of Fahrenheit's thermometer, or above freezing by about one-sixth of the interval between freezing and the human heat.

Some salts omitted by Eller are here subjoined; the first is taken from Dr Grew, and the other four from Neumann.

Eight ounces of water dissolved,

<table>
<thead>
<tr>
<th>Of fixed alkaline salt</th>
<th>oz</th>
<th>dr</th>
<th>gr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sal diuretus</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Sugar candy, both brown and white 9 5 0
Sugar of milk 0 2 40
Essential salt of ferro 0 1 20

Though water takes up only a certain quantity of one kind of salt, yet when saturated with one, it will still dissolve some portion of another; and when it can bear no more of either of these, it will still take up a third, without letting go any of the former. The principal experiments of this kind which have been made relative to pharmaceutical subjects, are exhibited in the following table; or which the two first articles are from Grew, and the others from Eller.

Water, 32 parts by weight,

<table>
<thead>
<tr>
<th>Fully saturated with</th>
<th>dissolved afterwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitre</td>
<td>Nitre</td>
</tr>
<tr>
<td>Common salt</td>
<td>Common salt</td>
</tr>
<tr>
<td>Nitre</td>
<td>Fixed alkali</td>
</tr>
<tr>
<td>Fixed alkali</td>
<td>Nitre, near</td>
</tr>
<tr>
<td>Volatile alkali</td>
<td>Nitre</td>
</tr>
<tr>
<td>Sal ammoniac</td>
<td>Common salt</td>
</tr>
<tr>
<td>Soluble tartar</td>
<td>Fixed alkali</td>
</tr>
<tr>
<td>Vitriolated tartar</td>
<td>Glauber's salt</td>
</tr>
<tr>
<td>Epsom salt</td>
<td>Sugar</td>
</tr>
<tr>
<td>Borax</td>
<td>Fixed alkali</td>
</tr>
</tbody>
</table>

In regard to the other clas of bodies for which water is a menstruum, viz. those of the gummy gelatious kind, there is no determinate point of saturation: the water unites readily with any proportions of them, forming with different quantities liquors of different consistence. This fluid takes up likewise, when affil- ed by trituratation, the vegetable gummy refrains, as amno- nium and myrrh; the solutions of which, though imperfect, that is, not transparent, but turbid and of a milky hue, are nevertheless applicable to valuable purposes in medicine. It mingles with vinous spirits, with acid and alkaline liquors, not with oils, but imbibes some of the more soluble parts of essentitial oils, so as to become impregnated with their smell and taste.

Rectified spirit of wine, or rather alcohol, is the men- struum of the essentitial oils and refrains of vegetables; of spirit of the pure distilled oils, and several of the colouring and medicinal parts of animals; of some mineral bituminous and mineral substances, as of ambergris; and of soaps, though it of the essence does not act upon the expressed oil and fixed alkaline fential salts, of which soap is composed: whence, if soap contains any superfluous quantity of either the oil or salt, of vegetable tables, it may by means of this menstruum be excellently purified. It dissolves, by the affinity of heat, volatile alkaline salts; and more readily the neutral ones, composed either of fixed alkali and the acetous acid, as the sul diuretus, or of the volatile alkali and the nitrous acid, as also the salt of amber, &c. It mingles with water and with acids; not with alkaline lixivia.

Oils dissolve vegetable refrains and balsams, wax, ani- mal fats, mineral bituminus, sulphur, and certain metallic refrains, particularly lead. The expressed oils are, for most of those bodies, more powerful menstru- a than those obtained by distillation; as the former are more capable of sustaining, without injury, a strong heat, which is in most cases necessary to enable them to act. It is said, that one ounce of sulphur will dissolve in seven ounces of expressed oil, particularly linseed.
All acids dissolve alkaline salts, alkaline earths, and metallic substances. The different acids differ greatly in their action upon these salt; one dissolving only some particular metals; and another, others.

The vegetable acids dissolve a considerable quantity of zinc, iron, copper, lead, and tin; and extract so much from the metallic part of antimony, as to become powerfully emetic; they dissolve lead more readily, if the metal be previously calcined by fire, than in its metallic state.

The marine acid dissolves zinc, iron, and copper; and though it scarcely acts on any other metallic substance in the common way of making solutions, it may nevertheless be artfully combined with them all except gold. The corrosive sublimate, and antimonial cauffe of the elets, are combinations of it with mercury and the metallic part of antimony, effected by applying the acid, in the form of fume, to the subjects, at the same time also strongly heated.

The nitrous acid is the common menstruum of all metallic substances, except gold and the metallic part of antimony; of which two, the proper solvent is a mixture of the nitrous and marine acids, called aqua regia.

The vitriolic acid diluted with water, easily dissolves zinc and iron. In its concentrated state, and diffused by a boiling heat, it may be made to corrode, or imperfectly dissolve, most of the other metals.

The aerial acid dissolves iron, zinc, and calcareous earth: and those solutions must be conducted without heat.

Alkaline liquor inevitable dissolves oils, resineous substances, and sulphur. Their power is greatly promoted by the addition of quicklime; infinrures of which occur in the preparation of soap, and in the common cauffe. Thus acuited, they reduce the flesh, bones, and other solid parts of animals, into a gelatinous matter. This increased acrimony in alkaline fluids is owing to the abstraction of their fixed air; that acid having a greater attraction for quicklime than for alkalies.

Solutions made in water and in spirit of wine possess the virtues of the body dissolved; while oils generally sheath its activity, and acids and alkalis vary its quality. Hence watery and spirituous liquors are the proper menstrua of the native vegetables and animal matters.

Most of the foregoing solutions are easily eflfect, by pouring the menstruum on the body to be dissolved, and inyang them to stand together for some time exposed to a suitable warmth. A strong heat is generally requisite to enable oils and alkaline liquors to perform their office; nor will acids act en fome metallic bodies without its assistance. The action of watery and spirituous menstrua is likewise expedited by a moderate heat; though the quantity which they afterwards keep dissolved is not, as some suppose, by this means increased; all that heat occasioneth the heat, take up, more than they would do in a longer time in the cold, will, when the heat ceases, subside again. This at least is most commonly the case, though there may be some infinures of the contrary.

The action of acids on the bodies which they dissolve is generally accompanied with heat, effervescence, and a copious discharge of fumes. The fumes which arise during the solution of some metals in the vitriolic acid, prove inflammable: hence in the preparation of the artificial viorfols of iron and zinc, the operator ought to be careful, especially where the solution is made in a narrow mouthed vessel, left by the imprudent approach of a candle the exhalating vapour be set on fire. This vapour is the inflammable air of Dr. Priestley and other modern chemists.

There is another species of solution, in which the moisture of the air is the menstruum. Fixed alkaline salts, and those of the neutral kind, composed of alkaline earths and the vegetable acids, or of soluble earths and any acid, except the vitriolic, and some metallic salts, on being exposed for some time to a moist air, gradually attract its humidity, and at length become liquid. Some substances, not dissoluble by the application of water in its larger form, as the butter of antimony, are easily liquified by this flow action of the aerial moisture. This process is called dissolution.

**Sect. II. Extraction.**

The liquors which dissolve certain substances in their pure state, serve likewise to extract them from admixtures of other matter. Thus ardent spirit, the menstruum of essential oils and resins, takes up the virtues of the resins and oily vegetables, as water does the body of the mucilaginous and fatty; the inactive earthly parts remaining untouched by both. Water extracts likewise from many plants, substances which by themselves it has little effect upon; even essential oils being, as we have formerly observed, rendered insoluble in that fluid by the admixture of gummy and fatty matter, of which all vegetables participate, in a greater or less degree. Thus many of the aromatic plants, and most of the bitters and astringents, yield their virtues to this menstruum.

Extraction is performed, by macerating or steeping the subject in its appropriated menstruum in the cold; or digerating or circulating them in a moderate warmth; or infusing the plant in the boiling liquor, and suffering them to stand in a covered vessel till grown cold; or actually boiling them together for some time. If the vegetable matter be itself succulent and watery, it is sometimes only necessary to express the juice, and evaporate it to the proper consistence.

The term digestion is sometimes used for maceration; and in this case the process is directed to be performed without heat: where this circumstance is not expressed, digestion always implies the use of heat. Circulation differs from digestion only in this, that the steam, into which a part of the liquor is resolved by the heat, is, by means of a proper disposition of the vessels, condensed and conveyed back again upon the subject. Digestion is usually performed in a matrafs (or bolt head), Florence flask, or the like; either of which may be conveyed into a circulatory vessel, by inverting another into the mouth, and securing the juncture with a piece of waxed bladder. A single matrafs, if its neck be very long and narrow, will answer the purpose as effectually; the vapour cooling and condensing before it can rise to the top; in a vessel of this kind, even spirit of wine, one of the most volatile liquors we know, may be boiled without any considerable loss: the use of the
Decantation, colature, and filtration, are applicable to most of the medicated liquors that stand in need of purification. Distillation and clarification very rarely have place; since these, along with the impurities of the liquor, frequently separate its medicinal parts. Thus, if the decoction of poppy heads, for makingassic, be formally distilled or clarified, the medicine will lose almost all that the poppies communicated; and instead of a mild opiate, turns out little other than a plain syrup of sugar.

It may be proper to observe, that the common sorts of filtering paper are apt to communicate a disagreeable flavour: and hence in filtering fine bitters or other liquids, whole gratefulness is of primary consequence, the part which passes through first ought to be kept apart for inferior purposes.

Sect. IV. Crystallization.

Water, affixed by heat, dissolves a larger proportion of most tinctuous substances than it can retain when grown pure, and cold; hence, on the abatement of the heat, a part of the salt separates from the menstruum, and concretes by crystallization at the sides and bottom of the vessel. The concretions, unless too hastily formed by the sudden cooling of the liquor, or disturbed in their coalescence by agitation, or other similar causes, prove transparent and of regular figures, resembling in appearance the natural spring-crystals.

Salt, dissolved in a large quantity of water, may in like manner be recovered from it in their crystalline form, by boiling down the solution, till so much of the fluid has exhaled as that the remainder will be too little to keep the salt dissolved when grown perfectly cold. It is customary to continue the evaporation till the salt shows a disposition to concrete even from the hot water, by forming a pellicle on that part which is least hot, viz. on the surface. If large, beautiful, and perfectly figured crystals are required, this point is somewhat too late for if the salt thus begins to coalesce whilst considerably hot, on being removed into a cold place its particles will run too hastily and irregularly together; the pellicle at the same time falling down through the liquor, proves a farther disturbance to the regularity of the crystallization.

In order to perform this process in perfection, the evaporation must be gentle, and continued no longer than till some drops of the liquor, let fall on a cold glass plate, discover crystalline filaments. When this mark of sufficient exhalation appears, the vessel is to be immediately removed from the fire into a less warm but not cold place, and covered with a cloth to prevent the access of cold air, and consequently the formation of a pellicle.

The fixed alkalies, especially the mineral, when fully saturated with fixed air or the aerial acid, assume a crystalline form; but these crystals, are not so perfect as when the same alkalies are united with the other acids; the volatile alkalies cannot crystallize, because they escape before the menstruum exhalates.

Some even of the other neutral salts, particularly those of which certain metallic bodies are the bases, are so strongly retaing by the aqueous fluid, as not to exhibit any appearance of crystallization, unless some...
other solvents be added, with which the water has a greater affinity. The table of Affinity shows that spirit of wine is such a substance; by the prudent addition of which, these kinds of salt separate freely from the menstruum, and form large and beautiful crystals scarcely obtainable by any other means.

The operator must be careful not to add too much of the spirit; lest, instead of a gradual and regular crystallization, the baths of the salt be hasty precipitated in a powdery form. One-twentieth part of the weight of the liquor will in most cases be a sufficient, and in some too large a quantity.

Different sorts require different quantities of water to keep them dissolved: and hence, if a mixture of two or more be dissolved in this fluid, they will begin to separate and crystallize at different periods of the evaporation. Upon this foundation, salts are freed not only from such impurities as water is not capable of dissolving and carrying through the pores of a filter, but likewise from admixtures of each other; that which requires most water to dissolve shooting first into crystals.

It is proper to remark, that a salt, when crystallizing, still retains and combines with a certain portion of water: this water is not essential to the salt as a salt, but is essential to a salt as being crystallized; it is therefore called by the chemists the water of crystallization. The quantity of this water varies in different sorts: In some of them, as in Glauber’s salt, alum, and copperas, it makes up about one half of their weight; in others, as in nitre, common salt, and especially sulfur, it is in very small quantity. As salts unite to the water of their crystallization by their attraction for water alone, we accordingly find that this water is perfectly pure, and contains, in complete crystals, no substance foreign to the salt. Salts not only differ in the quantity of water necessary to their solution, but some of them are also soluble with equal facility in cold as in hot water. Sometimes then we employ evaporation; sometimes cooling; and at other times both these expedients are used alternately, to separate different sorts dissolved in the same liquor. It is obvious, then, that those which are nearly or equally soluble in cold as in boiling water, can only be crystallized by evaporation; those again, which are much more soluble in boiling than in cold water, are to be separated by cooling. Of the first of these is common or marine salt; of the latter is nitre or saltpetre. It remains, then, that we should know how to separate these two sorts, when both of them happen to be dissolved in the same water; this method consists in alternate evaporation and cooling. If in such a solution a pellicle appears in the boiling liquor before crystals can be formed in the cooling, we then conclude that the common salt predominates: in this case we evacuate the water, and separate the common salt as fast as it is formed, till the liquor on cooling shows crystals of nitre: we then allow the nitre to crystallize by cooling. After all the nitre which had been dissolved by the heat alone has now separated by cooling, we resume the evaporation, and separate the common salt till the cooling liquor again shows crystals of nitre. We thus repeat the same series of operations, by which means these two sorts may be alternately crystallized: the one by evaporation, the other by cooling, till they are perfectly separated from each other. If in the beginning of the operation the liquor had, upon trial, given crystals of nitre by cooling, before any pellicle appeared on its surface when boiling, this would have indicated that the nitre was predominant in the solution; the nitre in this case would have been crystallized, first by cooling, till the quantity of nitre exceeding that of the common salt having been separated, the common salt would next have crystallized in its turn by evaporation. The example we have now given may be applied to other salts, or to a number of salts which may happen to be dissolved in the same liquor. For though there are few so completely soluble in cold water as common salt, and few so scantily as nitre; yet there are scarcely two sorts which either precisely show the same solubility or the same appearance of their crystals. It is obvious, too, that by crystallization we discover the peculiar predominant salt in any solution of mixed saline matter; but as one salt always takes down a small portion of another, it is necessary to redissolve the first products, and repeat the crystallization, in order to render the separation complete.

We see, then, that though the crystal appearance and form does not alter the salt itself, yet that this proceeds affords an elegant method of discovering compound solutions of salts, of judging of their purity, and lastly of separating different sorts very completely from each other. Crystallization, then, is one of the most important agents in pharmacy, and ought to be well understood. We shall attempt to explain the particular management in crystallizing particular sorts, when we come to treat of each of them separately.

SECT. V. PRECIPITATION.

By this operation bodies are recovered from their Nature of solutions by means of the addition of some other substance, with which either the menstruum or the body dissolved have a greater affinity than they have with each other.

Precipitation, therefore, is of two kinds: one, where the substance superadded unites with the menstruum, and occasions that before dissolved to be thrown down; the other, in which it unites with the diffolved body, and falls along with it to the bottom. Of the first, we have an example in the precipitation of sulphur from alkaline lixiviae by the means of acids; of the second, in the precipitation of mercury from aquafortis by fea­­salt, or its acid.

The subjects of this operation, as well those which are capable of being precipitated as those which precipitate them, will readily appear from inspection of the Table of Affinity. See Chemistry, page 438. The manner of performing it is so simple, as not to stand in need of any particular directions; no more being required than to add the precipitant by degrees as long as it continues to occasion any precipitation. When the whole of the powder has fallen, it is to be well adulterated, that is, washed in several fresh parcels of water, and afterwards dried for use.

Where metals are employed as precipitants, as in the purification of martial vitriol from copper by the addition of fresh iron, they ought to be perfectly clean and free from any rusty or greatly matter; otherwise they will not readily, if at all, dissolve, and consequent­
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EVAPORATION, the third method of recovering solid bodies from their solutions, is effected by the means of heat; which evaporating the fluid part, that is forcing it off in steam, the matter which was dissolved therein is left behind in its solid form.

The general rules for evaporation are, to place the matter in a flat, shallow, wide vessel, so that a large surface of the liquor may be presented to the air; for it is only from the surface that evaporation takes place.

The degree of heat ought to be proportioned to the volatility of the substance to be evaporated, and to the degree of the fixity of the matter to be left: thus, the less fixed the matter to be left is, and the more strongly it adheres to the volatile parts, the less the degree of heat ought to be; and in such cases, too, a forcible current of air is sometimes scarcely admittable: on the contrary, when the matter to be evaporated is not very volatile, and when the matter to be left is very fixed, and does not adhere strongly to the volatile part, the evaporation may be urged by a strong heat, aided by a current of air directed upon the surface of the liquor.

This process is applicable to the solutions of all these substances which are less volatile than the menirrum, or which will not exhalbe by the heat requisite for the evaporation of the fluid; as the solutions of fixed alkaline salts; of the gumy, gelatinous, and other inodorous parts of vegetables and animals in water; and of many refinuous and odorous substances in spirit of wine.

Water extracts the virtues of sundry fragrant aromatic herbs, almost as perfectly as rectifed spirit of wine; but the aqueous infusions are far from being equally suited to this process with those made in spirit, water carrying off the whole odour and flavour of the subject which that lighter liquor leaves entire behind it. Thus a watery infusion of mint loefs in evaporation the smell, taste, and virtues, of the herb; whilst a tincture drawn with pure spirit yields on the same treatmen a thick balsamic liquor, or solid gummy refins, extremely rich in the peculiar qualities of the mint. 

In evaporating these kinds of liquors, particular care must be had, towards the end of the process, that the heat be very gentle; otherwise the matter as it grows thick will burn to the vessel, and contrate a disagreeable smell and taste: this burnt flavour is called empyreuma. The liquor ought to be kept stirring during the evaporation; otherwise a part of the matter concretes on the surface exposed to the air, and forms a pellicle which impedes the farther evaporation.

Sect. VII. Distillation.

Is the foregoing operation fluids are rarely dried by heat into steam, or vapour, which is suffered to exhale in the air, but which it is the business of distillation to collect and preserve. For this purpose the steam is received in proper vessels, luted to that in which the subject is contained, and being there cooled, condenses into a fluid form again.

There are two kinds of distillation: by the one, the more subtle and volatile parts of liquors are elevated from the groffer; by the other, liquids incorporated with solid bodies, are forced out from them with vehemence by fire.

To the fist belong the distillation of the pure inflammable spirit from vinous liquors; and of such of the active parts of vegetables as are capable of being extracted by boiling water or spirit, and at the same time of ariling along with their stem.

As boiling water extracts or disolves the essential oils of vegetables, while blended with the other principles of the subject, without saturation, but imbibes only a determinate, and that a small proportion of them, in their pure state; as these oils are the only substances contained in common vegetables, which prove totally volatile in that degree of heat; and as it is in them that the virtues of aromatics, and the peculiar odour and flavour of all plants, reside; — it is evident, that water may be impregnated by distillation, with the more valuable parts of many vegetables: that this impregnation is limited, the oil arising in this process pure from those parts of the plant which before rendered it soluble in water without limitation; hence the greatest part of the oil separates from the distilled aqueous liquor, and, according to its greater or less gravity, either sinks to the bottom, or floats on the surface; that consequentluy infusious and distilled waters are very different from each other: that the first may be rendered stronger by pouring the liquor on fresh parcels of the subject; but that the latter cannot be in like manner improved by coloting or redistilling them from fresh ingredients.

As the oils of many vegetables do not freely distil with a less heat than that in which water boils; as rectifed spirit of wine is not susceptible of this degree of heat; and as this menirrum totally disolves these oils in their pure state; it follows, that spirit elevates far less from most vegetables than water; but that nevertheless the distilled spirit, by keeping all that it does elevate perfectly dissolved, may, in some cases, prove as strong of the subject as the distilled water. The more gentle the heat, and the flower the distillation goes on, the volatile parts are the more perfectly separated in their native state.
It may be observed, that as the parts which are preferred in evaporation cannot arise in distillation, the liquor remaining after the distillation, properly depurated and infuscated, will yield the same extracts as those prepared from the tincture or decoction of the subjedt made on purpose for that use; the one of these operations collectively only the volatile parts, and the other the more fixed; so that where one subjedt contains medicinal parts of both kinds, they may thus be obtained distinct, without one being injured by the process which collects the other.

The subjedts of the second kind of distillation are, the gross oils of vegetables and animals, the mineral acid spirits, and the metallic fluid quicksilver; which as they require a much stronger degree of heat to elevate than the foregoing liquors can fullain, so they likewise condense without arising so far from the action of the fire. The distillation of these is performed in low glass vesfels, called, from their neck being bent to one fide, revere. To to the further end of the neck a receiver is luted, which, standing without the furnace, the vapours flow condense in it, without the use of a refrigeratory: nevertheless, to promote this effect, some are accustomed, especially in warm weather, to cool the receiver, by occasionally applying wet clothes to it, or keeping it partly immersed in a fessel of cold water.

The vapours of some subfances are fo fliggili, or strongly retained by a fixed matter, as fearce to arise even over the low neck of the revere. These are most commodiously distilled in straight-necked earthen vesfels called longnecks, laid on their fides, so that the vapour passes off laterally with little or no accent: a receiver is luted to the end of the neck without the furnace. In this manner, the acid spirit of vitriol is disflied. The matter which remains in the revere or longneck, after the distillation, is vulgarly called caput-mortuum.

In these distillations, a quantity of elafic air is frequently generated: which, unless an exit be allowed, blows off or burfts the receiver. The danger of this may in good measure be prevented, by slowly rafing the fire; but more effectually by leaving a small hole in the luting, to be occasionally opened or flot with a wooden plug; or inferting at the junclure an upright pipe of fuch a height, that the fream of the diftilling liquor may not be able to rise to the top: but it is flill better done by fetting to the apparatus other vesfels, by which their vapours may be condended. For the purpofe of diftilling, and the apparatus made uf of, fee Distillation; and Chemistry, p. 574.

SEC. VIII. Sublimation.

As all fluids are volatile by heat, and confequently capable of being separated, in many cafes, from fixed matters, hy the foregoing process; fo various folid bodies are subjected to a similar treatment. Fluids are laid to diftil, and folida to fublime; though sometimes both are obtained in one and the fame operation. If the fubliming matter concrctes into a mass, it is commonly called a fublimate; if into a powdery form, flourer.

The principal subjedts of this operation are, volatile alkaline fads; neutral fads, compofed of volatile alkalies and acid-, as falt ammoniac; the falt of amber, and flowers of benzoin; mercurial preparations; and fulphur. Bodies of themfelves not volatile, are frequently made to fublime, by the mixture of volatile ones: this iron is carried up by falt ammoniac in the preparation of the fers martials, or ferum ammoniacalis.

The fumes of solid bodies in clofe vesfels rise but little way, and adhere to that part of the vesfels where they concrete. Hence a receiver or condenser is left necessary here than in the preceding operation; a single vesfels, as a matrafs, or tall pliafd, or the like, being frequently fufficient.

SEC. IX. Expiration.

The fublime is chiefly made uf of, for forcing out the On the ex- juices of succulent herbs and fruits, and the imipid oils of the nucous feeds and kernels. The harder fruits, as quinces, require to be previoufly well beat or ground; but herbs are to be only moderately bruised. The fublime is then included in a hair bag, and preffed between wooden plates, in the common fcrew-preff, as long as any juice runs from it.

The expiration of oils is performed nearly in the fame manner as that of juices: only here, iron-plates are substituted for the wooden ones there made uf of. The subjedt is well pounded, and included in a frong canvas bag, between which and the plates of the preff a hair cloath is interposed.

The imipid oils of all the nucous feeds are obtained, uninjured, by this operation, if performed without the use of heat which though it greatly promotes the extraction of the oil, at the fame time imprifes an ungrateful flavour, and increafes its propensity to grow rancid.

The oils exprefled from aromatic subfances generally carry with them a portion, of their effential oil; hence the small and flavour of the expreffed oils of nutmegs and mace. They are very rarely found impreffed with any of the other qualities of the subjedt; oil of muftard feed, for inffance, is as soft and void of acrimony as that of the almonds, the pungency of the muftard remaining entire in the cake left after the expiration.

SEC. X. Exsiccation.

There are two general methods of exsiccating or Two me- drying moist bodies; in the one, their humid parts are kinds of ex- exhibited by heat; in the other, they are imbied or adhrea by heat; and in the other, they are imbied or adsorbed by subfances whose soft and fpongy texture adapts them to that use. Bodies intimately combined do not, with, or diffolved in a fluid, as recent vegetables and their juices, require the first; fuch as are only superficially mixed, as when earthly or indiffoluble powders are ground with water, are commodiously separated from it by the second.

Vegetables and their parts are ufually exsiccated by the natural warmth of the air; the affiduity of a gentle artificial heat may, nevertheless, in general, be not only safely, but advantageously, had recourse to. By a moderate fire, even the more tender flowers may be dried, in a little time, without any considerable loss either of their odous or lively colour; which would both be greatly injured or destroyed by a more forcible exsiccation in the air. Some plants, indeed, particularly
The comminution of the harder minerals, as calamine, crysal, flint, &c., is greatly facilitated by exclusion; that is, by heating them red-hot, and quenching them in water: by repeating this process a few times, most of the hard stones become easily pulverizable. This process, however, is not to be applied to any of the alkaline or calcareous stones; lest, instead of an infipid powder, we produce an acrimonious calx or lime.

Some metals, as tin, though strongly cohering in their natural state, prove extremely brittle when heated, insomuch as to be easily divided into small particles by dexterous agitation. Hence the official method of pulverizing tin, by melting it, and at the instant of its beginning to return into a state of fluidity, briskly shaking it in a wooden box. The comminution of metals, in this manner, is termed by the metallurgists granulation.

On a similar principle, certain salts, as nitre, may be reduced into powder in large quantity, by dissolving them in boiling water, setting the solution over a moderate fire, and keeping the salt constantly stirring during its evaporation, so as to prevent its particles, disjointed by the fluid, from reuniting together into larger masses.

Powders are reduced to a great degree of fineness by triturating, or rubbing them, for a length of time, in a mortar. Such as are not diissolvable in water, or injured by the admixture of that fluid, are moistened with it into the consistence of a paste, and levigated or ground on a flat smooth marble or iron plate; or where a large quantity is to be prepared at a time, in mills made for that use.

Comminution, though one of the most simple operations of pharmacy, has, in many cases, very considerable effect. The refrinous purgatives, when finely triturated, are more easily soluble in the animal fluids, and consequently prove more cathartic, and less irritating, than in their grocer state. Crude antimony, which, when reduced to a tolerably fine powder, discovers a little medicinal virtue, if levigated to a great degree of subtility proves, a powerful medicine in many chronic disorders.

By comminution, the heaviest bodies may be made to float in the lightest fluids (c), for a longer or shorter time, according to their greater or less degree of tenacity. Hence we are furnished with an excellent criterion of the fineness of certain powders, and a method of separating the more subtile parts from the grosser, distinguished by the name of elutrition or washing over.

(c) Some attribute this effect to a diminution of the specific gravity of the body; and at the same time, suppose the peculiar virtues of certain medicines, particularly mercury, to be in great measure owing to their gravity. If these hypotheses were just, it should follow, that the mercurial preparations, by being finely comminuted, would lose proportionably of their efficacy; and so indeed mercurius dulcis, for instance, has been supposed to do. But experience shows, that this is far from being the case; and that comminution by no means lessens but rather increases its power: when reduced to a great degree of subtility, it passes readily into the habit, and operates, according to its quantity, as an alterative or a dialogue; while in a grofer form, it is apt to irritate the flomach and bowels, and run off by the intestines, without being conveyed into the blood.


**PHARMACY.**

Sect. XII. Fusion.

Fusion is the reduction of solid bodies into a flake of fluidity by fire. Almost all natural substances, the pure earths and the solid parts of animals and vegetable excepted, melt in proper degrees of fire; some in a very gentle heat, while others require its utmost violence.

Turpentine, and other soft resinous substances, liquefy in a gentle warmth; wax, pitch, sulphur, and the mineral bitumens, require a heat too great for the hand to support: fixed alkaline salts, common salts, nitre, require a red or almost white heat to melt them; and glass, a full white heat.

Among metallic substancess, tin, bismuth, and lead, flow long before ignition: antimony likewise melts before it is visibly red-hot; but not before the vessel is considerabily hot; the regulus of antimony demands a much stronger fire. Zinc begins to melt in a red heat; gold and silver require a low white heat; copper a bright white heat; and iron an extreme white heat.

One body, rendered fluid by heat, becomes sometimes a menstruum for another, not fusible of itself in the same degree of fire. Thus red-hot silver melts on being thrown into melted lead less hot than itself; and thus if steel, heated to whiteness, be taken out of the furnace, and applied to a roll of sulphur, the sulphur instantly liquefying, occasions the steel to melt with it; hence the chalcopyrite or sulphure of the thorns. This concrete, nevertheless, remarkably impedes the fusion of some other metals, as lead; which when united with a certain quantity of sulphur is scarce to be perfectly melted by a very strong fire. Hence the method, described in its place, of purifying zinc; a metal upon which sulphur has no effect from the lead so frequently mixed with it.

Sulphur is the only unmetallic substance which mixes in fusion with metals. Earthy, saline, and other like matters, even the calces and glases prepared from metals themselves, float distinct upon the surface, and form what is called scoria or dross. Where the quantity of this is large in proportion to the metal, it is most commodiously separated by pouring the whole into a conical mould; the pure metal or regulus, though small in quantity, occupies a considerable height in the lower narrow part of the cone; and when congealed, may be easily freed from the scorie by a hammer. The mould should be previously greased, or rather smoked, to make the metal come freely out; and thoroughly dried and heated, to prevent the explosion which sometimes happens from the sudden contact of melted metals with moist bodies.

Sect. XIII. Calcination.

Calcination, or reducing bodies by means of fire from a coherent to a powdery state, and changing their quality.

By calcination is understood the reduction of solid bodies, by the means of fire, from a coherent to a powder, accompanied with a change of their quality; in which last respect this process differs from combustion.

To this head belong the burning of vegetable and animal matters, otherwise called fussion, incineration, or congestration; and the change of metals into a powder, which in the fire either does not melt or vitrifies, that is, runs into glases.

The metals which melt before ignition, are calcined by keeping them in fusion for some time. The free admission of air is effectually necessary to the success of this operation; and hence, when the surface of the metal appears covered with calx, this must be taken off or raked to one side, otherwise the remainder excluded from the air will not undergo the change intended. If any coal, or other inflammable matter which does not contain a mineral acid, be suffered to fall into the vessel, the effect expected from this operation will not be produced, and part of what is already calcined will be revived or reduced; that is, it will return into its metallic form again.

Those metals which require a strong fire for fusion, calcine with a much less heat than is sufficient to make them flow. Hence the burning or scorification of such iron or copper vessels as are long exposed to a considerable fire without defence from the air. Gold and silver are not calcinable by any degree of fire.

In calcination, the metals visibly emit fumes; nevertheless the weight of the calx proves greater than that of the metal employed. The antimonial regulus gains about one-twelfth part of its weight; zinc sometimes one-tenth; tin above one-sixth; and lead in its conversion into minium often one fourth.

The calcination of metallic bodies, gold, silver, and mercury excepted, is greatly promoted by nitre. This salt exposed to the fire in conjunction with any inflammable substancess, extricates their inflammable matter, and burns with it into flame, accompanied with a hissing noise. This process is usually termed decommission or detonation.

All the metallic calces and scorie are revived into their metallic state by fusion with any vegetable or animal inflammable matter. They are all more difficult of fusion than the respective metals themselves; and scarcely any of them, those of lead and bismuth excepted, can be made to melt at all, without some addition, in the strongest fire that can be produced in the common furnaces. The additions called fluxes employed for promoting the fusion, consist chiefly of fixed alkaline salts. A mixture of alkaline salt with inflammable matter, as powdered charcoal, is called a reducing flux, as contributing at the same time to bring the calx into fusion, and to revive it into metal. Such a mixture is commonly prepared from one part of nirre and two parts of tartar, by grinding them well together, setting the powders on fire with a bit of coal or a red hot iron, then covering the vessel, and suffering them to deaggregate or burn till they are changed into a black alkaline coally mafs. This is the common reducing flux of the chemists, and is called from its colour the black flux. Metallic calces of scorie, mingled with twice their weight of this compound, and exposed to a proper fire in a close covered crucible, melt and resume their metallic form; but though they receive an increase of weight in the calcination, the revived metal is always found to weigh considerably less than the quantity from which the calx was made.

For a more particular account of all these processes, and an explanation of the principles on which they depend, see Chemistry, and the articles themselves as they occur in the order of the alphabet.

Part
CHAP. I. The more Simple Preparations.

The preparation of some substances not soluble in water. L.

Pour these substances first in a mortar; then, pouring on a little water, levigate them on a hard and polished, but not calcareous, stone, that they may be made as fine as possible. Dry this powder on blotting-paper laid on chalk, and let it in a warm place, or at least a dry place, for some days.

In this manner are to be prepared, Amber, Antimony, Calamine, Chalk, Coral, Oyster-shells, first cleaned from their impurities, Tuttty. Crab claws, first broken into small pieces, must be washed with boiling water before they be levigated.

Verdegris must be prepared in the same manner.

Where large quantities of the foregoing powders are to be prepared, it is customary instead of the stone and mallet, to employ hand-mills made for this purpose, consisting of two stones; the uppermost of which turns horizontally on the lower, and has an aperture in the middle, for supplying fresh matter, or of returning that which has already passed, till it be reduced to a proper degree of fineness.

For the levigation of hard bodies, particular care should be taken, whatever kind of instruments be used, that they may be of sufficient hardness, otherwise they will be abraded by the powders. The hematomas, a hard iron one, is most conveniently levigated between two iron planes; for if the common levigating stones be used, the preparation, when finished will contain almost as much foreign matter from the instrument as the hematomas.

It has been customary to moisten several powders in levigation, with rose, balm, and other diffiluted waters: these, nevertheless, have no advantage above common water, since in the subseuent excitation they must necessarily exhale, leaving the medicine pollenated of no other virtue than what might be equally expected from it when prepared with the cheaper element.

Some few substances, indeed, are more advantageously levigated with spirit of wine than with water. Thus bezoar has the green colour usually expected in this costly preparation considerably improved thereby. A little spirit may be added to the other animal substances, if the weather be very hot, and large quantities of them be prepared at once, to prevent their running into patresfaction; an accident which in those circumstances sometimes happens when they are levigated with water only. Crab-eyes, which abound with animal gelatinous matter, are particularly liable to this inconvenience.

The caution given above for reducing antimony, calamine, and turtty, to the greatest subtility possible, demands particular attention. The tenderest of the parts to which the two last are usually applied, requires them to be perfectly free from any admixture of gross irritating particles. The first, when not thoroughly comminuted, might not only, by its sharp needle-like spicula, wound the stomatch, but likewise answers little valuable purpose as a medicine, proving either an useless load upon the viscerâ, or at best palping off without any other sensible effect than an increase of the grofer evacuations; while, if reduced to a great degree of fineness, it turns out a medicine of considerable efficacy.

The most successful method of obtaining these powders of the requisite tenacity, is, to wash off the finer parts by means of water, and continue levigating the remainder till the whole become fine enough to remain for some time suspended in the fluid; this process is received in the Edinburgh pharmacopoeia, and there directed in the preparation of the following article.

Prepared antimony. E.

Let the antimony be first pounded in an iron mortar, and then levigated on a porphyry with a little water. After this, put it into a large vessel, and pour a quantity of water on it. Let the vessel be repeatedly shaken, that the finer part of the powder may be diffused through the water; the liquor is then to be poured off, and set by till the powder settles. The gross part, which the water would not take up, is to be further levigated, and treated in the same manner.

By this method, which is that commonly practised in the preparation of colours for the painter, powders may be obtained of any required degree of tenacity; and without the least mixture of the gross parts, which are always found to remain in them after long continued levigation; all the coarser matter settles at first, and the finer powder continues suspended in the water longer and longer, in proportion to the degree of its fineness. The same process may likewise be advantageously applied to other hard pulverizable bodies of the mineral kingdom, or artificial preparations of them; provided they be not soluble in, or specifically lighter than water. The animal and absorbent powders, crab-claws, crab-eyes, oyster-shells, egg-shells, chalk, pearl, coral, and bezoar, are not well adapted to this treatment; nor indeed do they require it. These substances are readily soluble in acid juices without much comminution: if no acid be contained in the first passage, they are apt to concret, with the mucous matter; usually lodged there, into hard indissoluble masses; the greater degree of fineness they are reduced to, the more they are disposed to form such concretions, and become liable to obstruct the orifices of the small vessels.
Prepared calamine.  E.

Calamine previously calcined for the use of those who make bracts, is to be treated in the same manner as antimony.

Prepared chalk.

Chalk first triturated, and then frequently washed with water, till it imports to it neither taste nor colour, is to be treated in the same manner as antimony.

As calamine is intended for external application, and often to parts very irritated, too much pains cannot be bestowed on reducing it to a fine powder; and the frequent washing of the chalk may have the effect of freeing it from some foreign matters: But with regard to this substance, the after part of the process, if not improper, is, in our opinion at least unnecessary: and this observation may also be made with regard to the oculi, or more properly lapilli, cancrorum, which is not improper, is, in our opinion at least unnecessary: for the process requires to be very cautiously conducted, to prevent the fat from burning or turning black.

The preparation of hog’s lard and mutton fat.  L.

Cut them into pieces, and melt them over a slow fire; then separate them from the membranes by strain­ing.

These articles had formerly a place also among the preparations of the Edinburgh college: But now they introduce them only into their list of the materia medica; as the apothecary will in general find it more for his interest to purchase them thus prepared, than to prepare them for himself: for the process requires to be very cautiously conducted, to prevent the fat from burning or turning black.

The purification of gum ammoniacum.  L.

If gum ammoniac do not seem to be pure, boil it in water till it become soft; then squeeze it through a canvas bag, by means of a press. Let it remain at rest till the resinous part subsides; then evaporate the water; and toward the end of the evaporation re­move the resinous part, mixing it with the gummy.

In the same manner are purified asafoetida and such like gum refins.

You may also purify any gum which melts easily, such as Galbanum, by putting it in an ox bladder, and holding it in boiling water till it be so soft that it can be separated from its impurities by pressing through a coarse linen cloth.

In straining all the gums, care should be taken that the heat be neither great nor long continued; otherwise a considerable portion of the more active volatile matter will be lost; an inconvenience which cannot by any care be wholly avoided. Hence the purer tears, unstrained, are in general to be preferred, for internal use, to the strained gums.

As an additional reason for this preference, we may add, that some of the gum-refins, purified in the common way, by solution in water, expression and evaporation, are not so easily soluble in aqueous menstrua after as before such depuration. On these accounts this process is entirely omitted by the Edinburgh college; and in every case where a gummy resinous substance, before it be taken, is to be dissolved in water, it may be as effectually freed from impurities at the time of solution as by this process. And when it is to be employed in a solid state, care should be taken that the pure parts alone be selected.

The burning of hart­horn.  L.

Burn pieces of hart­horn till they become perfectly white; then reduce them to a very fine powder.

The pieces of horn generally employed in this operation are those left after distillation.

In the burning of hart­horn, a strong fire and the free admixture of air are necessary. The potter’s furnace was formerly directed for the sake of convenience; but any common furnace or stove will do. If some lighted charcoal be spread on the bottom of the grate, and above this the pieces of the horn are laid, they will be burnt to whiteness, still retaining their original form.

Burnt hart­horn is not now considered as a pure earth, having been found to be a compound of calcareous earth and phosphoric acid. It is the weakest of the animal absorbents, and is difficultly soluble in acids; but whether it be of equal or superior use in diarrhoas to more powerful absorbents, must be left to observation.

The drying of herbs and flowers.

Let these, spread out lightly, be dried by a gentle heat.  L.

Herbs and flowers must be dried by a gentle heat, from a stove or common fire. They must be taken in such quantities at a time, that the process will be speedily finished; for by this means their medical powers are best preserved. The most certain test of this is the perfect preservation of the natural colour: but the leaves of cicuta, and of other plants containing a volatile matter, must be immediately pounded, after being dried, and afterwards kept in a phial with a ground stopper. E.

The directions given by the London college are here left explicit, and perhaps less proper, than those of the Edinburgh college: for there can be no doubt of the propriety of drying these substances hastily, by the aid of artificial heat, rather than by the heat of the sun.

In the application of artificial heat, the only caution requisite is to avoid burning; and of this a sufficient test is afforded by the preservation of colour. And the direction given with regard to cicuta may perhaps with advantage be followed with most of the other flowers and herbs, afterwards to be exhibited in powder.

The purifying of honey.  L.

Melt the honey by the heat of a water bath, and remove the scum.

The intention of this process is to purify the honey from wax, or other droppy matters that have been united with it by the violence of the press in its separation from the combs, and from meal and such-like substances, which are sometimes fraudulently mixed with it. When the honey is rendered liquid and thin by the heat, these lighter matters rise freely to the surface.

This preparation is not so necessary for honey that is to be used as an article of diet, as for that which is employed
employed in the preparation of oxymels: hence the Edinburgh college, who have rejected all the oxymels, have omitted this process.

The preparation of millipedes. L. E.

The millipedes are to be inclosed in a thin canvas cloth, and suspended over hot proof spirit in a close vessel, till they be killed by the steam, and rendered friable.

This is a convenient way of rendering millipedes pulv-ervisible, without endangering any loss of such virtues as they may posses.

The directions given by both colleges are precisely the same, and delivered in almost the same words.

The extracting of pulps. L. E.

Unripe pulpy fruits, and ripe ones if they be dry are to be boiled in a small quantity of water until they become soft: then press out the pulp through a strong hair-sieve, and afterwards boil it down to the confinence of honey in an earthen vessel, over a gentle fire; taking care to keep the matter continually stirring, to prevent its burning.

The pulp of calia fistularis is in like manner to be boiled out from the bruised pod, and reduced afterwards to a proper consistence, by evaporating the water.

The pulps of fruits that are both ripe and fresh, are to be pressed out through the sieve, without any previous boiling.

In the extraction of pulps, the direction of both colleges so nearly agree, that it is unnecessary to give a separate translation of each. We may only observe, that the London college, instead of softening the fruits by boiling them in a small quantity of water, direct them to be put in a moist place. This direction, though proper in some cases, is not generally the most suitable.

The drying of squills. L. E.

Let the squill, cleared from its outer skin, be cut transversely into thin slices, and dried with a very gentle fire. When properly managed, the squill is friable and retains its bitterness and acrimony.

By this method the squill dries much sooner than when its several coats are only separated, as has been usually directed; the internal part is here laid bare, but, in each of the entire coats, it is covered with a thin skin, which impedes the exhalation of the moisture. The root loaves in this process four-fifths of its original weight; the parts which exhale appear to be merely watery; six grains of the dry root being equivalent to half a dram of the fresh; a circumstance to be particularly regarded in the exhibition of this medicine. In the preceding editions of our pharmacopoeia, a particular caution was given, not to use an iron knife for cutting squills, but one of wood, ivory, or bone; the reason of this caution is said to be, not so much that the squill would receive any ill qualities from the iron; as, that its acrid juice, adhering to the knife, might render a wound received by it extremely painful, or even dangerous; but as no danger is to be apprehended from such an accident, the direction appears unnecessary. Dried squills furnish us with a medicin, sometimes advantageously employed as an emetic, often as an expectorant, but still more frequently as a powerful diuretic.

The burning of a sponge.

Beat the sponge, after cutting it in pieces; and, when separated from its gritty matter, burn it in a close iron vessel, until it becomes black and friable; afterwards rub it to a very fine powder. L.

Put the sponge, cut into small pieces, and well freed from adhering earthy matters, into a close earthen vessel. Place it on the fire, and let it be stirred frequently till it become black and friable; then reduce it to a powder in a glass or marble mortar.

This medicine has been in use for a considerable time, and employed against scrofulous disorders and cutaneous futilities, in doses of a scruple and upwards. Its virtues seem to depend on a volatile salt just formed, and combined with its own oil. If the sponge be distilled with a strong heat, it yields a large proportion of that salt in its proper form. The salt is in this preparation so far extricated, that if the burnt sponge be ground in a brass mortar, it corrodes the metal so as to contract a disagreeable taint, and sometimes an emetic quality.

Bees, earthworms, and other animal substances, have by some been prepared in the same manner, and recommended in different diseases: but as these substances fall much short of sponge in the quantity of volatile salt producible from them by fire, they are probably inferior also in medicinal efficacy. Of all the animal matters that have been tried, raw silk is the only one which exceeds or equals sponge, in the produce of salt.

A good deal of address is requisite for managing this process in perfection. The sponge should be cut small, and beaten for some time in a mortar, that all the flaky matters may be got out, which compared with the weight of the sponge when prepared, will sometimes amount to a considerable quantity. The burning should be discontinued as soon as the matter is become thoroughly black. If the quantity put into the vessel at once be large, the outside will be sufficiently burnt before the inside be affected; and the volatile salt of the former will in part escape, before that in the latter is begun to be formed. The best method of avoiding this inconvenience seems to be, to keep the sponge continually stirring, in such a machine as is used for the roasting of coffee.

And from this circumstance the iron vessel directed by the London college is preferable to the earthen one directed by that of Edinburgh. But the pounding in a glass or marble mortar, directed by the latter, is a necessary caution which the former college have omitted.

The purifying of storax. L.

Dissolve the storax in rectified spirit of wine, and strain the solution; afterwards reduce it to a proper thickness with a gentle heat.

Storax was formerly directed to be purified by means of water; hence it was styled storaxis collatio: but the method now adopted is much preferable, for the active parts
parts of the florum totally dissolve in spirit of wine, the
impurities alone being left. And as these active parts
do not rise in distillation, the spirit may be again re-
covered by distillation.

**Purified filings of iron.** E.

**104**

Apply a magnet to a sieve placed on filings of iron, so
that the filings may be attracted upwards through the
sieve.

*Raft of iron, commonly called savings of iron, pre-
pared.* E.

**105**

Set purified filings of iron in a moist place, that they
may turn to rust, which is to be ground into an im-
palpable powder.

The cleaning of iron filings by means of a magnet
is very tedious, and does not answer so well as might be
expected; for if they are rusty, they will not be at-
ttracted by it, or not sufficiently: nor will they by this
means be entirely freed from brass, copper, or other
metallic substances which may adhere to them. It
appears from the experiments of Henckel, that if iron
be mixed with foven with even its own weight of any
of the other metals, regardless of antimony alone excepted,
the compound will be vigorously attracted by the loadstone.
The rust of iron is to be procured at a moderate rate from the dealers in iron, free from any
impurities except such as may be washed off by wa-
ter.

The rust of iron is by some preferred as a medicine
to the calces or croci made by a strong fire. Hoff-
man relates, that he has frequently given it with re-
markable success in oblitinate chlorotic cafes accompa-
nied with excessive headaches and other violent symp-
toms; and that he usually joined with it pimipinella,
ard root, and salt of tartar, with a little cinnamon
and rufty, where others would otherwise undergo. There are,
however, fundry vegetables whose virtues are impaired
by this treatment. Mucilaginous substances by long
lying with fugar, become less glutinous; and alin-
rents become feebly fober on the palate. Many of
the fragrant flowers are of fo tender and delicate a
texture, as almost entirely to losf their peculiar quali-
ties by being beaten or bruited.

In general, it is obvious, that in this form, on account
of the large admixture of fugar, substances of con-
derable activity can alone be taken to advantage as
medicines. And, indeed, conserves are at prefent con-
fidered chiefly as auxiliaries to medicines of greater
cfficacy, or as intermedia for joining them together.
They are very convenient for reducing into bolufes or
pills, the more ponderous powders of iron, and
alnent. The cleanfing of iron filings by means of a magnet
is very tedious, and does not answer so well as might
be expected; for if they are rusty, they will not be at-
ttracted by it, or not sufficiently: nor will they by this
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the fragrant flowers are of fo tender and delicate a
texture, as almost entirely to losf their peculiar quali-
ties by being beaten or bruited.

Pluck the leaves from the falks, the unblown petals
from the cups, taking off the heels. Take off the
outer rind of the oranges by a grater; then beat
each of them with a wooden pestle in a marble mor-
tar, first by themfelves, afterwards with three times
their weight of double refined fugar, until they be
mixed.

Conserves of the freft leaves of mint;
red rofe not blown;
the outer rind of Seville oranges rasped off by
a grater. E.

These are directed to be prepared with triple their
weight of fugar in the fame manner as the conserves
of the London college. The fugar should be pound-
ed by itfelf, and passed through a sieve before it be
mixed with the vegetable mafs; for without this it

cannot be properly incorporated. Rose buds, and some other vegetables, are prepared for mixing with sugar by a small wooden mill contrived for that purpose.

In the same manner conserves may be prepared from many other vegetables. But besides the conserves for which general directions are given, there are others, for which, either on account of the particular mode of preparation, or of the proportion, our pharmacopoeias have thought it necessary to give particular directions. But before taking notice of these, it is necessary to mention the medical properties of the conserves above enumerated.

Conservé of the leaves of wood-sorrel. L.

This is a very elegant and grateful conserve; in tafte it is lightly acidulous, with a peculiar flavour, which some compare to that of green-tea. It is taken occasionally for quenching thirst, and cooling the mouth and fauces, in diarrhœas, where the heat of the body is much increased.

Conservé of the tops of sea wormwood. L.

The conserve of wormwood has been celebrated in dropples; Matthiolus relates, that several persons were cured by it of that distemper without the assistance of any other medicine. Where the disorder indeed proceeds from a simple laxity or flaccidity of the solids, the continued use of this medicine may be of some service; as it appears to be an elegant mild corroborant. It is directed to be given in the dose of half an ounce about three hours before meals.

Conservé of the buds of red rosin. L. E.

This is a very agreeable and useful conserve. A dram or two dissolved in warm milk are frequently given as a light astringent, in weakness of the stomach, and likewise in coughs and phthisical complaints. In the German aphorisms, examples are related of very dangerous phthises cured by the continued use of this medicine: in one of these cases, twenty pounds of the conserve were taken in the space of a month; and in another, upwards of thirty. Riverius mentions several other instances of this kind. There is, however, much room for fallacy in such observations; as phthises has not at all times been accurately distinguished from obliterative catarrhs, and some other affections; the astringent property of the sugar may perhaps have some share in the effect.

Conservé of the yellow rind of Seville orange peel. L. E.

This conserve is a very elegant one, containing all the virtues of the peel in a form sufficiently agreeable, both with regard to the dose and the convenience of taking. It is a pLEasant warm stomachic; and with this intention is frequently used.

Conservé of the leaves of spearmint. E.

The conserve of mint retains the taste and virtues of the herb. It is given in weakness of the stomach and retching to vomit; and frequently does service in some cases of this kind, where the warmer and more active preparations of mint would be less proper.

Conservé of arum.

Take of the fresh root of arum bruised, half a pound; double refined sugar, a pound and a half. Beat them together in a mortar.

The root of arum, in its recent state, is a substance of great-activity; but this activity is almost entirely lost on drying. Hence the compound powder which had formerly a place in our pharmacopoeias is now rejected. And as neither water nor spirit extract its activity, this conserve is perhaps the best form in which it can be preferred in our shops. It may be given to adults in doses of a dram.

Conservé of hips. L.

Take of pulp of ripe hips one pound; double refined sugar, powdered, twenty ounces. Mix them into a conserve.

The conserve of hips is of some esteem as a soft cooling refringent; three or four drams or more are given at a time, in bilious fluxes, sharpness of urine, and hot indispositions of the stomach: A good deal of care is requisite on the part of the apothecary in making this conserve: the pulp is apt to carry with it some of the prickly fibres, with which the inside of the fruit is lined; if these be retained in the conserve, they will irritate the stomach, so as to occasion vomiting.

Conservé of floes. L. E.

Put the floes in water upon the fire that they may soften, taken care that they be not broken; then, the sloes being taken out of the water, press out the pulp, and mix it with three times its weight of double refined sugar into a conserve.

This preparation is a gentle astringent, and may be given as such in the dose of two or three drams. The degree of its astringency will vary according to the maturity of the sloes, and the length of time for which the conserve has been kept.

Conservé of squills.

Take of fresh squills, one ounce; double-refined sugar, five ounces. Beat them together in a mortar into a conserve.

This conserve is directed to be prepared in a small quantity, to guard against its varying in strength. It may be given to adults from half a dram to two or three. But the conserve of squills is a more uncertain and less agreeable mode of exhibiting this article, than the powder of the dried root, particularly when made into pills, or given in the form of bolus with any other conserve.

Conservé of chervil. S. E.

Take of fresh leaves of chervil, double-refined sugar, each equal parts. Beat them together into a conserve.

Chervil has by some been extolled as an useful diuretic; and this is perhaps one of the most pleasant forms under which it can be exhibited.

Conservé of millepeds. B. rum.

Take of live millepeds, one pound; double refined sugar, two pounds and an half. Beat them together into a conserve.

If the millepeds possess those virtues which some have alleged, this is perhaps one of the best forms under
der which they can be exhibited. And by children, to whom they are frequently preferred, it may be easily taken, when other forms cannot be introduced.

**Pharmacuate of Roses.** Brune.

To each pound of the conserve of roses add two drams of the diluted vitriolic acid.

This may be in some cases an useful means of increasing somewhat the subliming of the conserve of roses: But for the purposes for which the vitriolic acid is in general employed, the quantity that can thus be introduced is too inconsiderable to be of much service.

**CHAP. III. Of Juices,**

Juices are obtained from the succulent parts of plants, by including them, after being properly cut, bruised, &c. in a hair bag, and pressing them, between wooden cheeks, in the common screw-press, as long as any liquor exudes.

The harder fruits require to be previously well beaten or ground; but herbes are to be only moderately bruised, for if there are over bruised, a large quantity of the herbaceous matter will be forced out along with the juice. Hemp or woods-bags are apt to communicate a disagreeable flavour; the threads of these likewise swell in proportion as they imbibe moisture, so as in great measure to prevent the free percolation of the juice.

The fluids thus extracted from succulent fruits, both of the acid and sweet kind, from most of the acid herbs, as fuvvy grafs and water-cresses, from the acid herbs, as scrofula and wood-ferrel, from the aperient lacteal plants, as dandelion and hawkweed, and from sundry other vegetables, contain great part of the peculiar tate and virtues of the respective subjects. The juices, on the other hand, extracted from most of the aromatic herbs as thistle of mint and the fragrant Turkey balm, commonly called bain of Gilhead, have scarcely anything of the flavour of the plants, and seem to differ little from decoctions of them made in water boiled till the volatile odorous parts has been distilled. Many of the odoriferous flowers, as the lily, violet, hyacinth, not only impart nothing of their fragrance to their juice, but have it totally destroyed by the previous bruising. From want of sufficient attention to these particulars, practitioners have been frequently deceived in the effects of preparations of this class; juice of mint has been often preferred as a stimulicate, tho' it wants those qualities by which mint itself and its other preparations operate.

The juices, thus forcibly prejus from plants, differ from those which flow spontaneously, or from incisions; these last consisting chiefly of such fluids as are not diffused through the whole substance of the vegetable subject, but elaborated in distinct vessels, or secreted into particular receptacles. From poppy heads, slightly wounded, there issues a thick milky liquor, which dries by a moderate warmth into opium; whilst the juice obtained from them by preasure is of a dark-green colour, and far weaker virtue.

Juices newly expressed are generally thick, viscid, and very impure: By colature, a quantity of gross matter is separated, the juice becomes thinner, limpid, and better fitted for medicinal purposes, though as yet not entirely pure; on standing, it becomes again turbid, and apt to run into a fermentative or putrefactive state. Clarification with whites of eggs renders the compound juices more perfectly fine; but there are few that will bear this treatment without a manifest injury to their flavour, taste, and virtue.

The most effectual method of purifying and preserving these liquors, is to let the strained juices stand in a cool place till they have deposited their greater feces, and then gently pass them several times through a fine strainer till perfectly clear; when about a fourth part of their weight of good spirit of wine may be added, and the whole suffered to stand as before; a fresh sediment will now be deposited, from which the liquor is to be poured off, strained again, and put into small bottles which have been washed with spirit and dried. A little oil is to be poured on the surface, so as very nearly to fill the bottles, and the mouths closed with leather, paper, or lopped with straw, as the flasks in which Florence wine is brought to us. This process of time arises from all vegetable liquors, to escape; which air would otherwise endanger the burfting of the bottles; or, being imbibed air, render their contents rapid and foul. The bottles are to be kept on the bottom of a good cellar or vault, placed up to the necks in sand. By this method some juices may be preferred for a year or two; and others for a much longer time.

It has already been observed, that there are great difference in juices, in regard to their being accompanied in the expression with the virtues of the subjects. There are equal differences in regard to their preferring those virtues, and this independently of the volatility of the active matter, or its disposition to exsahle. Even the volatile virtue of fuvvy-grafs may by the above method be preferred almost entire in its juice for a considerable time: while the active parts of the juice of the wild cucumber quickly separate and settle to the bottom, leaving the fluid part inert. Juices of arum root, iris root, bryony root, and sundry other vegetables, throw off in like manner their medicinal parts to the bottom.

**Compound juice of Fuvvy-grafts.**

Take of the juice of garden fuvvy-grafts two pints; brooklime and water-cresses, of each one pint; Seville oranges, twenty ounces by measure. Mix them, and, after the feeces have subfided, pour off the liquor, or strain it. L.

Take of juice of garden fuvvy-grafts, water-cresses, both expressed from the fresh herbs, Seville oranges, of each two pounds; spirituous nutmeg-water, half a pound. Mix them and let them stand till the feeces have subfided, then pour off the clear liquor. E.

By this formula the Edinburgh college have rejected the brooklime and the fugar of their former editions. The fugar was certainly a very improper addition; for though it may preserve dry vegetable matters, yet when added to juices largely impregnated with watery and mucilaginous matter, it would no doubt furnish that very principle most favourable to the production of the vinous fermentation. For the compound horis radfth water they have substituted the spirituous water of nutmegs: Besides, that, this water has the same property,
Take of juice of ripe elder-berries, five pounds: purée it, with the fugar, one pound. Evaporate with a gentle heat, till it become to the confidence of pretty thick honey.

This preparation, made with or without fugar, keeps well, and proves a medicine of considerable importance as an aperient, generally promoting the natural excretions by flush, urine, or sweat. The dose is from a dram or two to an ounce or more. A spoonful, diluted with water, is usually taken in common colds at bed-time.

Infusiated juice of wolfsbane. E.

Brine the fresh leaves of aconitum; and including them in a hemp bag, strongly comprize them in a pref, so that they may give out their juice; let the juice be evaporated in open vessels in a water bath, to the confidence of pretty thick honey: An empyreuma is to be avoided by constantly ftriting the mixture towards the end of the process.

After the matter has become cold, let it be put up in glazed earthen vessels, and moistened with rectified spirit of wine.

In the same manner are prepared infusiated juices of belladonna or deadly nightshade, and hyocynamus or hembane.

In these infusiated juices, the active parts of the plant are obtained in a concentrated state, and in a condition which admits of preperation for a considerable length of time. They furnifh, therefore, a convenient form for exhibiting these articles which, in the prafice of medicine, are perhaps more frequently used in the state of infusiated juice than any other.

This is particularly the cafe with the hyocynamus, which may often be advantageously employed when opium is indicated, but disagrees with the patient.

But aconite and belladonna in general, with greater advantage, be exhibited under the form of powder made from the dried leaves.

"It is very remarkable that the London college have given no place to these articles. We cannot however help thinking, that their pharmaopeia would be enriched by introducing not only the articles themselves, but likewise these preparations, especially as they are not unfrequently prescribed by British practitioners.

Infusiated juice of hemlock. E.

Having expressed the juice of the leaves and stalks of hemlock when flowering, in the fame manner as directed for that of the aconitum, evaporate it to the confidence of pretty thin honey; when it is cooled, add of the powder of the dried leaves of the plant as much as to make it into a mass fit for forming pills. Care, however, is to be taken, that the evaporation proceed only to such length, that as much of the powder can be mixed with the infusiated juice as shall make up about a fifth part of the whole mass.

A preparation similar to this was published in Vienna by Dr Stoerk, who recommends it as an efficacious resolvent in many obilinate disorders, where the common remedies avail nothing. He observes, that small doses should always be begun with, as two grains, made into a pill twice a day; and that by gradually increasing
increasing the dose, it may be given to two, three, or even four drams a-day, and continued in such quantities for several weeks: that it may be used in safety in infancy, old age, and pregnancy: that it neither accelerates nor disturbs the circulation; neither heats, nor cools, nor affects the animal functions: that it increases the secretions, and renders the mouth moist; seldom purges; very rarely vomits; sometimes augments perspiration; often produces a copious discharge of viscid urine; but in many patients does not increase any of the sensible evacuations: that it removes obstructions and their consequences; relieves rheumatic pains, though of long continuance; cures febrile symptoms, both internal and external; and cures dropies and consumptions proceeding from sthenities: that it often dissolves catarrhs, or stops their progress, and has sometimes removed the gutta percha: that inverte cutaneous eruptions, scald heads, malignant ulcers, cancers, the malignant flor albus indicate any of its having caused any ill effects. A few persons will find relief; that he met with some persons who could not bear its effects; and that consequently there must be some latent difference in the habit, the diagnostic signs of which are at present unknown: that though it is by no means infallible any more than other medicines, yet the great number of deplorable cases that have been happily cured by it, is sufficient to recommend it to further trials. The efficacy of this medicine is confirmed by many eminent practitioners abroad; though the trials hitherto made of it in this country have not been attended with much success. Somewhat, perhaps, may depend on the time of the plant's being gathered, and the manner of the preparation of the extract.

Dr Storck himself takes notice of some mistakes committed in this respect: some have left the herb in a heap for several days, whence it is gathered, and they have become thick and mucilaginous; others have taken a very large quantity of the juice, and boiled it down in copper vessels with a great heat; by which means a strong fetor was diffused to a considerable distance, and the most efficacious parts dispersed: others, with officious care, have clarified the juice, and thus obtained a black tenacious extract, retaining but a small degree of the specific smell of the plant. The extract duly prepared, according to the above prescription, is of a greenish brown colour, and a very disagreeable smell, like that of mice. But though there be reason to believe that much of the extract used here had been ill prepared, we can by no means admit that its general inefficacy was owing to this cause: for though there are not many instances of its discovering any valuable medicinal powers, there are several of its having activity enough, even in small doses, to produce alarming symptoms.

Modern practice, however, seems to hold a middle place; being neither influenced by the extravagant encomiums of Dr Storck, nor frightened by the wary suspicions of Dr Lewis. The infused juice of the hemlock is accordingly given with freedom in a great variety of complaints, without our experiencing the wonderful effects ascribed to it by the former, or the baneful consequences dreaded by the latter. Like other preparations of this valuable herb, it is no doubt a very useful addition to our pharmacopoeia; nor does its use seem to be more hazardous than that of opium and some other narcotics.

The London college direct the infused juice of cicuta to be prepared in the same manner as that of the elder-berry, and without the addition of any of the powder. This is the most pure extract; and the powder may easily be occasionally added. They direct the cicuta to be collected as soon as the flowers appear: and at that time the leaves are most fully impregnated with their active powers.

Infused juice of black currants. L.
Infused juice of lemons. L.

These two the London college also direct to be prepared in the same manner with the elder-berry juice. And under this form the agreeable and useful acid of these vegetables, in a concentrated state, may be preserved for a considerable length of time.

**Observations on Extracts with Water.**

These extracts are prepared by boiling the subject in water, and evaporating the strained decoction to a thick consistence.

This process affords us some of the more active parts of the plants, free from the useless indissoluble earthy matter, which makes the largest share of their bulk. There is a great difference in vegetable substances, with regard to their fitness for this operation; some yielding to it all its virtues, and others scarce any. Those parts in which the sweet glutinous, emollient, cooling, bitter, astringent virtues reside, are for the most part totally extracted by the boiling water, and remain almost entire on evaporating it; whilst those which contain the peculiar odour, flavour, and aromatic quality, are either not extracted at all, or exhaled along with the menstrual. Thus gentian root, which is almost imeagably bitter, yields an extract possessing in a small volume the whole taint and virtues of the root.—Wormwood, which has a degree of warmth and strong flavour joined to the bitter, loses the first in the evaporation, and gives an extract not greatly different from the foregoing: the aromatic quality of cinnamon is dissipated by this treatment, its astringency remaining; while an extract made from the flowers of lavender and rosemary discovers nothing either of the taint, smell, or virtues of the flowers.

**General Rules for making Extracts with Water.**

1. It is indifferent, with regard to the medicine, whether the subject be used fresh or dry; since nothing that can be preferred in this process will be lost by drying. With regard to the facility of extraction, there is a very considerable difference; vegetables in general giving out their virtues more readily when moderately dried than when fresh.

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2. Very compact dry substances should be reduced into exceeding small parts, previous to the affusion of the menstruum.

3. The quantity of water ought to be no greater than is necessary for extracting the virtues of the subject. A difference herein will sometimes occasion a variation in the quality of the product; the larger the quantity of the liquor, the longer time will be requisite for evaporating it, and consequentially the more volatile parts of the subject will be dilipated. A long-continued heat likewise makes a confiderable alteration in the matter which is not volatile. Sweet substances, by long boiling with water, become nauseous; and the draffie purgatives lose their virulence, though without any remarkable separation of their parts.

4. The decoctions are to be depurated by colature; and afterwards suffered to stand for a day or two, when a confiderable quantity of sediment is usually found at the bottom. If the liquor poured off clear be boiled down a little, and afterwards suffered to cool again, it will depurate a fresh sediment, from which it may be decanted before you proceed to finish the evaporation. The decoctions of very refulnous substances do not require this treatment, and are rather injured by it; the refin subsiding along with the inactive dregs.

5. The evaporation is most conveniently performed in broad shallow vessels; the larger the surface of the liquor, the sooner will the aqueous parts exhale: This effect may likewise be promoted by agitation.

6. When the matter begins to grow thick, great care is necessary to prevent its burning. This accident almost unavoidable if the quantity be large, and the fire applied as usual under the evaporating pan, may be effectually provided against, by carrying on the infillation after the common manner, no farther than to the confluence of a syrup, when the matter is to be poured into shallow tin or earthen pans, and placed in an oven with its door open, moderately heated; which acting uniformly on every part of the liquid, will tend to reduce it to any degree of confidence required. This may likewise be more securely done, by setting the evaporating vessel in boiling water, but the evaporation is in this way very tedious.

Observations on Extracts with Rectified Spirit.

Rectified spirit of wine dissolves the essential oils and refins of vegetables, and does not readily carry off the oil in its exhalation; the heat suficient to exhale pure spirit being much less than that in which water evaporates to any considerable degree, or most essential oils distil. Hence a refulnous or spiritious extract of wormwood, contrary to that made with water contains the warmth and flavour, as well as bitterness, of the herb; one made from cinnamon possesses its aromatic virtue, as well as its astringency; and one from lavender and rosemary flowers, retains great part of their flavour and virtues; the volatile parts, which are carried off by water in its evaporation, being left behind by the spirit.

The spirit employed for this purpose should be perfectly free from any ill flavour, which would be communicated in part to the preparation; and from any admixture of phlegm or water, which would not only vary its dissolving power, but likewise evaporating towards the end of the infillation would promote the dilipation of the volatile parts of the subject. Hence also, the subject itself ought always to be dry; these substances which lose their virtue by drying, lose it equally on being submitted to this treatment with the pure spirit.

The infillation should be performed from the beginning, in the gentle heat of a water bath. It is not needful to suffer the spirit to evaporate in the air; great part of it may be recovered by collecting the vapour in common distilling vessels. If the diffilled spirit be found to have brought over any flavour from the subject, it may be advantageously referred for the same purposes again.

It is observable, that though rectified spirit be the proper menstruum of the pure volatile oils, and of the grosser refuluous matter of vegetables, and water of the mucilaginous and saline; yet these principles are, in almost all plants, so intimately combined together, that whichever of these liquors is applied at first, it will take up a portion of what is directly soluble only in the other. Hence sundry vegetables, extremely refuluous, and whose virtues consist chiefly in their resin, afford nevertheless very useful extracts with water, though not equal to those which may be obtained by a prudent application of spirit. Hence also the extracts made from most vegetables by pure spirit, are not mere refins; a part of the gummy matter, if the subject contained any such, is taken up along with the refin; an admixture of great advantage to it in a medicinal view. The spiritious extracts of several vegetable substances, as mint leaves, rhubarb, saffron, dissolve in water as well as in spirit.

Pure refins are prepared by mixing, with spiritious tincture of very refuluous vegetables, a quantity of water. The refin, incapable of remaining dissolved in the watery liquor, separates and falls to the bottom; leaving in the menstruum such other principles of the plant as the spirit might have extracted at first along with it.

Observations on Extracts with Spirit and Water.

There are sundry vegetables, particularly those of a refuluous nature, which are treated to better advantage with a mixture of water and spirit, than with either of them singly. The virtues of refuluous woods, barks, and roots, may indeed be in great part extracted by long boiling in fresh portions of water; but at the same time they suffer a considerable injury from the continued heat necessary for the extraction, and for the subsequent evaporation of so large a quantity of the fluid. Rectified spirit of wine is not liable to this inconvenience; but the extracts obtained by it from the substances here intended, being almost purely refuluous, are less adapted to general use than those in which the refin is divided by an admixture of the gummy matter, of which water is the direct menstruum.

There are two ways of obtaining these compounds or gummy-refuluous extracts: one, by using proof spirit, that is, a mixture of about equal parts of spirit and water, for the menstruum; the other, by digelling the subject first in pure spirit and then in water, and afterwards uniting into one mass the parts with:

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the two menstrua have separately extracted. In some cases, where a sufficiency of gummy matter is wanting in the subject, it may be artificially supplied, by infusing the spirituous tincture to the consistence of a balsam, then thoroughly mixing with it a thick solution of any simple gum, as mucilage of gum-arabic, and drying the compound with a gentle heat. By this method are obtained elegant gummy refins, extemporaneously miscible with water into milky liquors.

Observations on extracts by long digestion.

It has been observed, that the virtues of vegetable decoctions are altered by long boiling. Decoctions or infusions of draffic vegetables, by long continued boiling or digestion, lose more and more of their virulence; and at the same time deposit more and more of a gross sediment, resulting probably from the decomposition of their active parts. On this foundation it has been attempted to obtain safe and mild preparations from fiindry virulent drugs; and some of the chemists have strongly recommended the process, though without specifying, or giving any intimation of the continuance of boiling requisite for producing the mildness in different subjects. M. Beaumé in his *Elements de pharmacie*, lately published, has given a particular account of an extract of opium prepared on this principle; of which extract, as it is alleged to be very useful in practice, it may not be improper to give a short description: And this we shall accordingly subjoin to our account of the opium purificatum of the London college.

Observations on particular extracts.

Extract of chamomile. broom tops, gentian, liquorice, black hellebore, rue, fparin. L.

Boil the article in distilled water, press out the decoction, strain it, and set it apart that the feces may subside: then boil it again in a wafer-bath saturated with sea-salt to a consistence proper for making pills.

The same kind of bath is to be used in the preparation of all the extracts, that the evaporation may be properly performed.

Extract of gentian. E.

Take of gentian root as much as you please. Having cut and bruised it, pour upon it four times its quantity of water. Boil to the consummation of one half of the liquor; and from the tincture, strain. Evaporate the decoction to the consistence of thick honey in vessels exposed to the vapour of hot water.

In preparing this and every other extract, it is necessary to keep up a constant flirring towards the end of the process, in order to prevent an empyreuma, and that the extract may be of an uniform consistence, and free of clots.

In the same manner are prepared,

Extract of the roots of black hellebore; leaves of the pulsatilla nigricans; leaves of rue; leaves of white poppies; imperfectly ripe seeds of hemlock.

All the above extracts contain the virtues of the vegetable in a state of tolerable perfection.

The extract of chamomile loses in its formation the specific flavour of the plant; but it is said to furnish a bitter remarkably antityptic, and to be given with advantage in different stomach ailments to the extent of a scruple or two, either by itself, or in conjunction with other remedies. The extract of broom tops is chiefly employed in hydropic cases; and when taken to the quantity of about a dram, is said to operate as a powerful diuretic.

The mode of preparing these extracts directed by the London and Edinburgh colleges is not essentially different: but some advantage will arise from employing the distilled water directed by the former; and the directions given by the latter with regard to the quantity of water to be used, and the degree of boiling to be employed before expression, are not without some use.

The extract is the only preparation of the pulsatilla nigricans, and it seems sufficiently well suited to be brought into this form. The extract of the white poppy-heads is not perhaps superior in any respect to opium; but to those who may think otherwise, it is convenient to preserve them in this form for preparing the syrup occasionally. The seeds of hemlock have by some been thought stronger, or at least that they produce giddiness sooner, than the leaves; but this extract has not hitherto come into general use.

Compound extract of coloquinida. L.

Take of pith of coloquinida, cut small, six drams; bocotone aloea, powdered, an ounce and a half; scammony, powdered, half an ounce; smaller cardamom seeds, husked and powdered, one dram; proof-spirit, one pint. Digest the coloquinida in the spirit, with a gentle heat, during four days. To the expressed tincture add the aloea and scammony; when these are dissolved, distill off the spirit, so that what remains may be of a consistence proper for making pills, adding the seeds towards the end of the process.

This composition answers very effectually as a cathartic, so as to be relied on in cases where the patient's life depends on that effect taking place; the dose is from fifteen grains to half a dram. The proof-spirit is a very proper menstruum for the purgative materials; disolving nearly the whole substance of the aloea and scammony, except the impurities; and extracting from the colocynth, not only the irritating resin, but great part of the gummy matter. In the former pharmacopoeias three spices were employed in this composition, cinnamon, mace, and cloves; the cardamom seeds, now introduced, are preferable on account of their aromatic matter being of a less volatile nature; though a considerable part of the flavour, even of these, is distilled during the evaporation of the phlegmatic part of the proof-spirit.

*Elaterium*. L.

Slit ripe wild cucumbers, and pass the juice, very lightly
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Extract of Peruvian bark. L.

Take of Peruvian bark, coarsely powdered, one pound; distilled water, 12 pints. Boil it for one or two hours, and pour off the liquor, which, while hot, will be red and pellicul; but, as it grows cold, will become yellow and turbid. The same quantity of water being again poured on, boil the bark as before, and repeat this boiling until the liquor, being cold, remains clear. Then reduce all these liquors, mixed together and strained, to a proper thickness, by evaporation.

This extract must be prepared under two forms: one, steep, and fit for making pills; the other hard, that it may be reducible to a powder.

Extract of Peruvian bark with the resin. L.

Take of Peruvian bark, reduced to coarse powder, one pound; rectified spirit of wine, four pints. Digest it for four days, and pour off the tincture; boil the residuum in 10 pints of distilled water to two; then strain the tincture and decoction separately, evaporating the water from the decoction, and distilling off the spirit from the tincture, until each begins to be thickened. Lastly, mix the resinous with the aqueous extract, and make the mass fit for forming into pills.

Extract of Peruvian bark. E.

The Edinburgh college, who have not given a place to any pure watery extract of the bark, direct their extract of this medicine to be prepared in the same manner as their extract of jalap, that is, almost precisely in the same manner as the extract with resin of the London college. It is, however, we think with propriety, that the London college have given a place to both extracts; for neither is without its use.

Peruvian bark is a refined drug; the resin melts out by the heat, but is not perfectly dissolved by the water; hence, in cooling, it separates, renders the liquor turbid, and in part falls to the bottom, as appears manifestly upon examining the sediment by spirit of wine. This extract might be made to better advantage by the assistance of spirit of wine, after the same manner as that of jalap; and this method the Edinburgh college have directed. But all the spirits which can be expected to be employed for this process among us, are accompanied with some degree of bad flavour; this adheres most strongly to the phlegmatic part of the spirit, which evaporating last, must communicate this ill flavour to the extract; a circumstance of very great consequence, as this medicine is designed for those whose stomachs are too weak to bear a due quantity of bark in fululence. Ten or twelve grains of the hard extract are reckoned equivalent to about half a dram of the bark itself.

In the Peruvian bark, however, we may readily distinguish two different kinds of taints, an arcingent and a bitter one; the former seems to reside principally in the resinous matter, and the latter chiefly in the gum. The watery extract is moderately strong in point of bitterness, but of the arcingency it has only a small degree. The pure resin, on the other hand, is strong in arcingency, and weak in bitterness. Both qualities.
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are united in the extract with the resin; which appears to be the best preparation of this kind that can be obtained from this valuable drug.

Extract of cascara. L.

This extract, which is now for the first time introduced into the Pharmacopoeia of the London college, and which has not yet obtained a place in that of Edinburgh, is directed to be prepared by spirit and water in the same manner as the extract of bark with the resin. It potshes, in a concentrated state, the active constituent parts of the cascara, and has accordingly been already received into several of the best foreign pharmacopoeias. In some of these, as the Pharmacopoeia Suecica, it is a mere watery extract: but in others, as the Pharmacopoeia Rossica, the aid both of spirits and water are conjoined; and this we consider as the best preparation.

Extract of jalap. L.

Take of jalap root one pound; rectified spirit of wine, four pounds. Digest four days, and pour out the tincture. Boil the remaining magma in ten pounds of water to two pounds; then strain the decoction, and evaporate it to the consistence of pretty thin honey. Draw off the spirit from the tincture by distillation till what remains becomes thick. Then mix the liquors thus impregnated; and keeping them constantly diverted, evaporate to a proper consistence.

This extract is of useful purgative; by some thought preferable to the crude root, as being of more uniform strength, and as the dose, by the rejection of the woody parts, is rendered smaller: the mean dose is 12 grains. If the spirituous tincture were impregnated by itself, it would afford a resinous mass, which, unless thoroughly divided by proper admixtures, occasions violent griping, and yet does not prove sufficiently cathartic: the watery decoctions yield an extract which operates very weakly: both joined together, as in this preparation, compose an effectual and safe purge. This method of making extracts might be advantageously applied to several other resinous substances, as the dry woods, roots, bark, &c. A small quantity of spirit takes up the resin; and much less water than would otherwise be necessary, extracts all the other soluble parts.

In a former edition of the Edinburgh Pharmacopoeia, little fixed alkaline salt was ordered to be added to the water in which the jalap is boiled after the action of spirit: on a supposition that this would enable the water to extract more from the root than it would by itself. But, so far as the quantity of the alkaline salt could go, it had the opposite effect, impeding the action of the water. The resinous parts of the jalap are dissolved by the spirit; and little other than the gummy matter remains for water to extract. Now, if pure gum arabic be put into water along with any alkaline salt, the salt will render the water incapable of dissolving the gum; if the gum be dissolved, the addition of any alkaline salt will precipitate it.

Extract of fenna. L.

Take of fenna, one pound; distilled water, one gallon. Boil the fenna in the distilled water, adding after its decoction a little rectified spirit of wine. Evaporate the strained liquor to a proper thickness.

This extract had no place in our former pharmacopoeias, but may be considered as an useful addition.

The resinous parts of fenna are in so small a proportion to the gummy, that they are readily boiled out together. The spirit may be added when the decoction is reduced to one half or three pints. This extract is given as a gentle purgative from 10 grains to a scruple; or, in less quantity, as an affiant to the milder laxatives.

Purified opium. L.

Take of opium, cut into small pieces, one pound; proof spirit of wine, 12 pints. Digest the opium with a gentle heat, stirring now and then till it be dissolved, and filter through paper. Dilute the tincture so prepared, to a proper thickness.

Purified opium must be kept in two forms; one soft, proper for forming into pills; the other hard, which may be reduced into powder.

Opium was formerly purified by means of water; and in this state it had the name in our pharmacopoeia of extractum thebaicum. But proof spirit has been found, by experiments, to be the best menstruum for opium, having dissolved three-fourths of dried opium, which was much more than was taken up either by rectified spirit or water. Hence we thus reduced more entirely the constituents of opium free from any adhering impurities: but it has been imagined that some particular advantages arise from the parts which are extracted by water, especially after long digestion; and accordingly the following extract of opium has been recommended by Mr Beaumé.

Extract of opium prepared by long digestion.

Let five pounds of good opium, cut in pieces, be boil-ed about half an hour, in 12 or 15 quarts of water: strain the decoction, and boil the remainder once or twice in fresh water, that so much of the opium as is dissoluble in water may be got out. Evaporate the strained decoction to about six quarts; which being put into a tin censer, placed in a sand-bath, keep up such a fire as may make the liquor nearly boil, for three months together if the fire is continued day and night, and for six months if it is intermitted in the night; filling up the vessel with water in proportion to the evaporation, and scraping the bottom with a wooden spatula from time to time, to get off the sediment which begins to precipitate after some days digestion. The sediment needs not to be taken out till the boiling is finished; at which time the liquor is to be strained when cold, and evaporated to an extract of a due consistence for being formed into pills.

The author observes, that by keeping the liquor strongly boiling, the tedious process may be considerably expedited, and the six months digestion reduced.
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to four months; that in the beginning of the digestion, a thick, viscous, oily matter rises to the top, and forms a tenacious skin as the liquor cools; this is supposed to be analogous to crystals. As the liquid cools: that the quantity of resins matter precipitated during the digestion, he obtained a dram of the liquor being then further evaporated in a water-bath to a proper consistence. In this extract, we have one of the Strongest vegetable bitters in its most concentrated state: and though, it is not perhaps to be considered as superior to the extract of gentian, yet it furnishes a good variety, and is a more agreeable form for exhibiting the wormwood than that of strong tincture.

Extract of wormwood. Succ.

This is directed to be prepared from the roots of the dandelion, collected early in the spring, or late in the autumn, in the same manner as the extractum abedfthinii. And as far as the dandelion really possesses a resolvent, aperient, or diuretic power, it furnishes a convenient form for obtaining these effects from it. But as the dandelion is well known to abound with a milky juice, it is probable that the activity of the medicine would be increased from employing spirit also in the extraction of its medical virtues.

Water extract of aloes. Succ.

Take of hepatic aloes one pound ; cold spring-water, four pounds; juice of citrons, one pound. Macerate them in a glass vessel for one or two days, shaking the vessel from time to time. When the resinous and succulent parts have subsided, pour off the liquor: and to the residuum add fresh water, till by this treatment it obtains a little impregnation. Let the strained liquors be then evaporated in a warm bath to the consistence of honey.

Although aloes are perhaps upon the whole a better medicine, in their crude state, where the gummy and resinous matters are united, than in those preparations where either is retained separately, yet the gummy extract which is thus obtained is at least less disagreeable having little smell or taste, while at the same time, it is a very powerful purgative: hence it may be usefully employed at least, on some occasions.

Gummy extract of myrrh. Brun.

Take of myrrh, half a pound; spring water, four pounds. Let the myrrh be dissolved by gentle digestion and repeated agitation of the vessel for four or five days: let the water simmer above the myrrh be then poured off, strained, and evaporated to the consistence of an extract.

This
This watery extract of myrrh may be useful in some cases, as being much deprived of the heating qualities which it has in its crude state; and if it furnishes us in phthisis pulmonary with that useful remedy which some imagine, it may probably be most advantageously exhibited under this form.

Refined liquorice. Dán.

Take all your quantity of Spanish liquorice, cut it into small fragments, disolve it in tepid water, and strain the solution. Let the liquor be poured off from the feculent part after it has subsided, and infused by a gentle heat.

The extract of liquorice already mentioned, when it is prepared with due skill and attention, is unquestionably an article superior to this; but it is very rarely met with in the shops of our druggists or apothecaries as prepared by themselves. In its place they very commonly employ either the extract brought from Spain, or that prepared by the makers of liquorice at home; both of which very commonly abound with impurities. It has even been said, that a portion of sand is not infrequently mixed with it to increase the weight; but whether the impurities arose from this cause, or from the slovenly mode of preparing it, considerable advantage must arise from freeing it from all these before it is employed for any purpose in medicine. And in modern practice it is frequently used, not only in troches and pills, but also for suspending powders in waters; such as the powder of Peruvian bark: and the powder of bark, when thus suspended, is in general taken more readily by children than in any other form. Hence considerable advantage must arise from a proper and easy mode of purifying it, which the above process affords. We are of opinion, therefore, that although a place be with propriety given to the extract of liquorice prepared by the apothecaries themselves, refined liquorice ought also to be introduced into our pharmacopoeias; and it would be very convenient to keep it in the shops in a soft condition fit for making pills, as it would not only answer that purpose but admit of a ready solution in water when requisite. To this convenience, indeed an objection occurs, from its being apt to grow mouldy; but this may be effectually prevented by the addition of a small proportion of spirit.

Besides the extracts which we have here selected from the foreign pharmacopoeias, many others also still retain a place in several of these; such, for example, as the extradum crinice, acenfie, bronia, cardui, centaurii, cocklebread, croi, &c. Several of these had formerly a place in our pharmacopoeias, but are now with propriety rejected; because, where these substances are to be employed, they may with much more advantage be exhibited under other forms. And, indeed, although under the form of extract we have a condensation of some active principles, yet by the action of fire others are very apt to be lost. Hence, where any article can be conveniently exhibited in substance, that form is in general preferable; and recourse should be had to extracts only with a view to some particular intention. Our colleges therefore have with propriety diminished the number of them; and even those which they have adopted are but seldom to be had recourse to in preference to other forms. In the formation of many of these extracts, retained by the foreign colleges, the most valuable principles are either entirely digested or destroyed by the fire. We think, however, that advantage may sometimes be obtained from adopting these which are here selected.

The chapter on extracts and refining in the London pharmacopoeia is concluded with the two following general directions:

1. All the extracts, during the time of infpissation must be gently agitated.
2. On all the softer watery extracts, a small quantity of spirit of wine must be sprinkled.

CHAP. V. Expressed Oils.

Expressed oils are obtained chiefly from certain feeds and kernels of fruits, by thoroughly pounding them in a stone mortar, or where the quantities are large, grinding them in mills, and then including them in a canvas bag, which is wrapped in a hair-cloth, and strongly pressed between iron plates. The canvas, if employed alone, would be squeezed to close the plates of the press as to prevent the oil from running down; by the interposition of the hair-cloth a free passage is allowed it.

Sundry machines have been contrived both for grinding the subject and pressling out the oil, in the way of business. To facilitate the expression, it is usual to warm either the plates of the press, or the subject itself after the grinding, by keeping it flitting in a proper vessel over the fire; the oil, liquefied by the heat separates more freely and more plentifully. When the oil is designed for medicinal purposes, this practice is not to be allowed; for heat, especially if its degree be sufficient to be of any considerable advantage for promoting the separation, renders the oil less soft and palatable, impresses a disagreeable flavour, and increases its disposition to grow rancid: hence the colleges both of London and Edinburgh expressly require the operation to be performed without heat.

Nor are the oils to be kept in a warm place after their expression. Exposed for a few days to heat no greater than that of the human body, they lose their emollient quality, and become highly rancid and acrimonious. Too much care cannot be taken for preventing any tendency to this acid irritating state in medicines, so often used for abating immoderate irritation.

So much are these oils disposed to this injurious alteration, that they frequently contradict an acrimony and rancidity while contained in the original subjects. Hence great care is requisite in the choice of the uncoarse feeds and kernels, which are often met with very rancid; almonds are particularly liable to inconveniences of this kind.

Expressed oils are prepared for mechanic uses from sundry different subjects, as nuts, poppy-seed, hemp-seed, rape-seed, and others. Those directed for medicinal purposes in the London and Edinburgh pharmacopoeias are the following:

Oil of almonds. L. E.

Pound fresh almonds, either sweet or bitter, in a mortar, then press out the oil in a cold press.
In the same manner is to be expressed oil of linseed and oil of mustard-seed.

The oil of almonds is prepared from the sweet and bitter almonds indifferently, the oils obtained from both sorts being exactly the same. Nor are the differences of the other oils very considerable, the distinguishing qualities of the subjects not residing in the oils that are thus obtained by expression. The oil of linseed acquires indeed some peculiarities from containing a portion of vegetable mucilage; but the oil of mustard-seed is as soft, insipid, and void of pungency, as that of sweet almonds, the pungency of the mustard remaining entire in the cake left after the expression. The several oils differ in some of their properties from each other; but in medicinal qualities they appear to be all nearly alike, and agree in one common emollient virtue. They soften and relax the solids, and obtund acrimonious humours; and thus become serviceable internally in pains, inflammations, heat of urine, heart-fails, tickling coughs, &c. in gleeters, for lubricating the integuments, and promoting the ejection of indurated fces; and in external applications, for tension and rigidity of particular parts. Their common dose is half an ounce; in some cases they are given to the quantity of three or four ounces. The most commodious forms for their exhibition we shall see hereafter in the chapter of Emulsions.

Cafier oil. L.

This oil is directed by the London college to be prepared in the same manner as that of almonds, the seeds or nuts being taken from the hulks before putting them into the mortar. Palm Chrifti, or caltor oil, (See Oleum Palma Chrifi, and Ricinus), is a gentle and useful purgative: it generally produces its effects without griping, and may be given with safety where acid purgatives are improper. With adults, from half an ounce to an ounce is generally requisite for a dose. This article, however, is very seldom prepared by our apothecaries, being in general imported under the form of oil from the West Indies: hence the Edinburgh college have not mentioned it among their preparations, but merely given it a place in their list of the materia medica. But when our apothecaries prepare it for themselves, they are more certain of obtaining a pure oil, and one too obtained without the aid of heat, which is often employed, and gives a much inferior oil. It is therefore with propriety that the London college have given directions for the preparation of it by the apothecary himself. But even the London college have not thought it necessary to give directions for the preparation of the expressed oils, which, as well as the oleum ricini, are also introduced into the list of the materia medica by the Edinburgh college.

Expressed oil of bay berries.

These also are principally considered as possessing only an emollient virtue; but as far as they have been supposed to exert any peculiar qualities, these we have

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oils almost pure, and nearly similar to those which are obtained from them by distillation. The essential oils, in which the fragrance and aromatic warmth of the fruits reside, are contained in numerous little vesicles, which may be distinguished by the naked eye, spread, all over the surface of the peel. If the rind be cut in slices, and the slices separately doubled or bent in different parts, and squeezed between the fingers, the vesicles burst at the bending, and discharge the oil in a number of fine slender jets. A glass plate being set upright in a glass or porcelain vessel, and the slices squeezed against the plates, the little jets unite into drops upon the plate, and trickle down into the vessel beneath. But though this process affords the true native oil in the same state wherein it existed in the subject, unaltered by fire or other agents, it is not practicable to advantage unless where the fruit is very plentiful, as only a small part of the oil it contains can thus be extracted or collected.

The oil is more perfectly separated by rubbing the rind upon a lump of sugar. The sugar, by the inequality of its surface, produces the effect of a rasp in tearing open the oily vesicles, and in proportion as the vesicles are opened the sugar imbibles the oil. When the outward part of the lump is sufficiently moistened, it is scraped off, and the operation continued on the fresh surface. The oil thus combined with the sugar is fit for most of the uses to which it is applied in a fluid state. Indeed the pure essential oils obtained by distillation are often purposely mixed with sugar to render their use the more commodious.

**Essential oils.**

Essential oils are obtained only from odoriferous substances; but not equally from all of this class, nor in quantity proportional to their degree of odour. Some, which, if we were to reason from analogy, should seem very well fitted for this process, yield extremely little oil, and others none at all. Roses and camomile flowers, whose strong and lasting smell promises abundance, are found upon experiment to contain but a small quantity; the violet and jasmine flower, which perfume the air with their odour, lose their smell upon the gentlest cohesion, and do not afford the least perceptible mark of oil on being distilled unless immense quantities are submitted to the operation at once; while faviol, whose disagreeable scent extends to no great distance, gives out the largest proportion of oil of almost any vegetable known.

Nor are the same plants equally fit for this operation when produced in different soils or seasons, or at different times of their growth. Some yield more oil if gathered when the flowers begin to fall off than at any other time. Of this we have examples in lavender and rue; others, as fage, afford the largest quantity when young, before they have sent forth any flowers; and others, as thyme, when the flowers have just appeared. All fragrant herbs yield a larger proportion of oil when produced in dry soils and warm summers than in opposite circumstances. On the other hand, some of the disagreeable strongly-scented ones, as wormwood, are said to contain most in rainy seasons and when growing in moist rich grounds.

Several of the chemists have been of opinion, that herbs and flowers, moderately dried, yield a greater quantity of essential oil than if they were distilled when fresh. It is supposed, that the oil being already blended in fresh plants, with a watery fluid, great part of it remains diffused through the water after the distillation, divided into particles too minute to unite and be collected; whereas in drying, the oily parts, on the exhalation of the moisture which kept them divided and dispersed, run together into globules, which have little disposition to mingle with watery fluids, and easily separate from the water employed in the distillation.

This theory, however, does not appear to be quite satisfactory; for though the oil is collected in the subject into distinct globules, it does not rise in that form, but is resolved into vapour, and blended and coagitated by the heat with the vapour of the water; and if the oil in a dry plant is less disposed to unite with aqueous fluids than in a fresh one, the dry ought to yield a weaker infusion than the fresh; the contrary of which is generally found to obtain. As the oil of the dry plant is most perfectly extracted and kept diffused by the water before the distillation, it is difficult to conceive any reason why it should have a greater tendency to separate from the water afterwards.

The opinion of dry plants yielding most oil seems to have arisen from an observation of Hoffman, who has probably been misunderstood: "A pound (he says) of dry spike flowers yields an ounce of oil, but if they were distilled fresh they would scarcely yield above half an ounce; and the cafe is the same in balm, fage, &c. The reason is, that in drying the watery humidity exhales; and as from two pounds of a fresh plant we do not obtain above one pound of dry, and little of the fubtile oil evaporates in the drying, it follows, that more oil ought to be afforded by the dry than by the fresh." The meaning of which seems to be no more than this, that if two pounds of a fresh plant are by drying reduced to one without any loss of the oil, then the one pound dry ought to be equivalent to the two fresh. A late writer quotes an experiment of Neumann, which appears to be misunderstood in the same manner; for Neumann, in the place referred to, says only that dry wormwood is found to yield much more oil than an equal weight of the fresh plant. Trials are yet wanting in which fresh and dry plants have been brought to a fair comparison, by dividing a quantity of the subject into two equal weights, and distilling one while fresh, and the other after it has been carefully and moderately dried.

But whatever may be the effect of moderate excitation, it is certain, that if the drying be long continued, the produce of oil will be diminished, its colour altered, and its smell impaired.

With regard to the proportion of water to be employed, if whole plants moderately dried are used, or the havings of wood, as much of either may be put into the vessel as, lightly prefled, will occupy half its cavity: and as much water may be added as will fill two thirds of it. The water and ingredients altogether should never take up more than three-fourths of the full; there should be liquor enough to prevent any danger of an empyreuma, but not so much as to be too apt to boil over into the receiver.
The maceration should be continued so long that the water may fully penetrate the parts of the subject. To promote this effect, woods should be thinly shaved across the grain or fawn, roots cut transversely into thin slices, barks reduced into coarse powder, and seeds slightly bruised. Very compact and tenacious substances require the maceration to be continued a week or two, or longer; for those of softer and looser structure, two or three days are sufficient; while some tender herbs and flowers not only stand in no need of maceration, but are even injured by it.

Whether the addition of sea-salt, which some have recommended, be of any real service, is much to be doubted. The ufs generally assigned to it are, to penetrate and unlock the texture of the subject; more effectually than simple water could do, and to prevent the fermentation or putrefaction which the matter is apt to run into during the length of time for which the maceration is often continued. But sea-salt seems rather to harden and condense, than to soften and resolve, both vegetable and animal substances; and if it prevents putrefaction, it must, on very strict account, be injurious rather than of service. The resolution here aimed at approaches near to a beginning putrefaction; and saline substances, by retarding this, prolong the maceration far beyond the time that would otherwise be necessary. It is in the power of the operator, when he perceives the process coming near this pitch, to put a stop to it at pleasure, by proceeding immediately to distillation. By this means the whole affair will be finished in a very little time, with at least equal advantage in every other respect provided the manual operations of pounding,揉ing, and the like, which are equally necessary in either case, be minutely complied with.

Bodies of a very viscous and compact texture were directed, in the Edinburgh pharmacopoeia, to be fermented for some days with a little yeast. Half their quantity of water is sufficient for performing the fermentation; as much more as is necessary is to be added afterwards before the distillation. This process undoubtedly promotes the resolution of the subject, and the extraction of the oil. It rarely happens, however, that affinities of this kind are perfect. Particular care must be had not to continue the fermentation too long; or to give a bad flavour to the oil by an ill-chozen ferment, or using too large a quantity of any.

Some chemists pretend, that by the addition of salts and acid spirits they have been enabled to gain more oil from certain vegetable matters than could possibly be got from them without such assistance. Experiments made on purpose to settle this point seem to prove the contrary: this at least is constantly found to be true, that where there is any reason to think the produce greater than usual, the quality of the oil is proportionally injured. The quantity of true essential oil in vegetables can by no means be increased, and what is really contained in them may be easily separated without any addition of this kind. All that saline matters can do in this respect is to make the water susceptible of a greater degree of heat than it can sustain by itself, and thus enable it to carry up a gross undigested matter not volatile enough to rise with pure water; this gross matter, mingling with the pure oil, increases the quantity, but at the same time must necessarily debase its quality. And indeed, when the pure water alone is used, the oil which comes over during the end of the operation is remarkably less fragrant, and of a thicker consistence, than that which rises at the beginning; distilled a second time, with a gentle heat, it leaves a large quantity of gross almost iniquitous refrinous matter behind.

The choice of proper instruments is of great consequence for the performance of this process to advantage. There are some oils which pass freely over the swan neck of the head of the common still; others, less volatile, cannot easily be made to rise so high. For obtaining these last, we should recommend a large low head, having a rim or hollow canal round it. In this canal the oil is detained on its first ascent, and thence conveyed at once to the receiver, the advantages of which are sufficiently obvious.

With regard to the fire, the operator ought to be expeditious in raising it at first; and to keep it up, during the whole process, of such a degree that the oil may freely distil; otherwise the oil will be exposed to an unnecessary heat; a circumstance which ought as much as possible to be avoided. Fire communicates to all these oils a disagreeable impregnation, as is evident from their being much less grateful when newly distilled, than after they have stood for some time in a cool place; the longer the heat is continued, the more alteration it must produce in them.

The greater number of oils require for their distillation the heat of water strongly boiling; but there are many also which rise with a heat considerably less; such as those of lemon and citron-peel, of the flowers of lavender and rosemary, and of almost all the more odoriferous kinds of flowers. We have already observed, that these flowers have their fragrance much injured, or even destroyed, by beating or bruising them; is impaired also by the immersion in water in the present process, and the more so in proportion to the continuance of the immersion and the heat: hence oils, distilled in the common manner, prove much less agreeable in smell than the subjécts themselves. For the distillation of substances of this kind another method has been contrived; instead of being immersed in water, they are exposed only to its vapour. A proper quantity of water being put into the bottom of the still, the odoriferus herbs or flowers are laid lightly in a basket, of such a size that it may enter into the still, and rest against its sides, just above the water. The head being then fixed on, and the water made to boil, the steam, percolating through the subjéct, imbibes the oil, without impairing its fragrance and carries it over to the receiver. Oils thus obtained preserve the odour of the subjéct in an exquisite degree, and have nothing of the disagreeable scent perceptible in those distilled by boiling them in water in the common manner.

It may be proper to observe, that those oils which rise with a less heat than that of boiling water, are generally called, by the chemical and pharmaceutical writers, light oils; and those which require the heat of water strongly boiling, are called ponderous. We have avoided these expressions, as they might be thought to relate to the comparative gravities of the oils; with which the volatility or fixedness have no connexion. Olive oil is lighter than most of the essential
Essential oils; but the heat requisite to make it distil, exceeds that in which the heaviest essential oil distils, considerably more than the heat of boiling water exceeds that of ice.

The water employed in the distillation of essential oils always imbibes some portion of the oil; as is evident from the smell, taste, and colour, which it acquires. It cannot, however, retain above a certain quantity; and therefore, such as has been already used and consequently saturated with oil, may be advantageously employed, instead of common water, in a second, third, or any future distillation of the same subject.

Some late chemical writers recommend, not the water which comes over, but that which remains in the still, to be used a second time. This can be of no service; as confining only of such parts of the vegetable as are incapable of arising in distillation, and which, therefore only to impede the action of the water as a menstruum, and to endanger an empyreuma.

After the distillation of one oil particular care should be taken to cleanse the worm before it be employed in the distillation of a different plant. Some oils, those of wormwood and aniseeds for instance, adhere to it so tenaciously, as not to be melted out by heat, or washed off by water; the best way of clearing the worm from these, is to run a little spirit of wine through it.

Essential oils, after they are distilled, should be suffered to stand for some days, in vials loosely covered with paper, till they have lost their disagreeable fiery odour, and become limpid; then put them up in small bottles, which are to be kept quite full, closely stopt, in a cool place: with these cautions, they will retain their virtues in perfection for many years.

When carefully kept, they in time gradually lose their flavour, and become gross and thick. Some endeavours to recover them after they have undergone this change, by grinding them with about three times their weight of common salt, then adding a large proportion of water, and distilling them afresh; the purer part flies thin and limpid, possessing a great degree of the pristine smell and taste of the oil, though inferior in both respects to the original oil. This rectification, as it is called, succeeds equally without the salt; the oils, when thus altered, are nearly in the same flat with the turpentine, and other thickened oily juices, which readily yield their purer oil in distillation with water alone.

When essential oils have entirely lost their smell, some recommend adding them in the distillation of a fresh quantity of the oil of the same plant; by which means they are said to fatiate themselves anew with the odorous matter, and become entirely renovated. This practice, however, ought doubtless to be disapproved, as being no other than a specious sophilication; for it can do no more than divide, between the old and the new, the active matter which belongs to the new alone.

Essential oils medically considered, agree in the general qualities of pungency and heat; in particular virtues, they differ as much as the subject from which they are obtained, the oil being the direct principle in which the virtues, or at least a considerable part of the virtues, of the several subjects reside. Thus the carminative virtue of the warm seeds, the diuretic of juniper-berries, the emmenagogue of fiesmus, the nervine of rosemary, the stomachic of mint, the antiscorbutic of seavy grafts, the cordial of aromatics, &c. are suppos'd to be concentrated in their oil.

There is another remarkable difference in essential oils, the foundation of which is less obvious, viz. the degree of their pungency and heat. These are by no means in proportion, as might be expected, to those of the subject they were drawn from. The oil of cinnamon, for instance, is very pungent and fiery; in its undiluted state it is almost caustic; whereas cloves, a spice which in substance is far more pungent than the other, yields an oil which is far less so. This difference seems to depend partly on the quantity of oil afforded, cinnamon yielding much less than cloves, and consequently having its active matter concentrated into a smaller volume; partly on a difference in the nature of the active parts themselves; for though essential oils contain always the specific odour and flavour of their subjects, whether grateful or ungrateful, they do not always contain the whole pungency; this resides frequently in a more fixed refrinous matter, and does not rise with the oil. After the distillation of cloves, pepper, and some other spices, a part of their pungency is found to remain behind; a simple tincture of them in rectified spirit of wine is even more pungent than their pure essential oils.

The more grateful oils are frequently used for reconciling to the stomach medicines of themselves difficult. It has been customary to employ them as correctors for the refrinous purgatives; an use which they do not seem to be well adapted to. All the service they can here be of, is to make the refin fit more easily at first on the stomach; far from abating the irritating quality on which the virulence of its operation depends, their pungent oils superadd a fresh stimulus.

Essential oils are never given alone, on account of their extreme heat and pungency; which in fome is so great, that a single drop let fall upon the tongue produces a gangrenous effchar. They are readily inhibited by pure dry sugar, and in this form may be conveniently exhibited. Ground with eight or ten times their weight of sugar, they become soluble in aqueous liquors, and thus may be diluted to any alligned degree. Mucilages also render them miscible with water into an uniform milky liquor. They dissolve like wine in spirit of wine; the more fragrant in an equal weight, and almost all of them in less than four times their own quantity; these solutions may be either taken on sugar, or mixed with syrups, or the like; on mixing them with water, the liquor grows milky, and the oil separates.

The more pungent oils are employed externally against paralytic complaints, numbness, pains, and aches, cold tumors, and in other cases where particular parts require to be heated or stimulated. The tooth-ach is sometimes relieved by a drop of these almost caustic oils, received on cotton, and cautiously introduced into the hollow-tooth.
P H A R M A C Y.

Part II. Preparations and Compositions.

Essential oil of aniseed. L. E.

This oil poizes the taste and smell of the aniseeds in perfection. It is one of the mildest of the distilled oils; 15 or 20 drops may be taken at a time without danger, though common practice rarely goes so far as half this number. Its smell is extremely durable and diffusive; milk drawn from the breast after taking it, is found impregnated with its odour; and possibly this may be, in part, the foundation of the pectoral virtues usually ascribed to it; in flatulences and colics, it is said by some to be less effectual than the seeds themselves.

It is remarkable of this oil, that it congeals, even when the air is not sensibly cold, into a butyrous confluence: and hence, in the distillation of it, the operator ought not to be over-solicitous in keeping the water in the refrigeratory too cool: it behoves him rather to let it grow somewhat hot, particularly towards the end of the process; otherwise the oil congealing may, if it happen, as to endanger blowing off the head of the still, or at least a considerable quantity of oil will remain in it.

Essential oil of caraway seeds. L.

The flavour of this exactly resembles that of the caraway itself. It is a very hot and pungent oil: a single drop is a moderate dose, and five or six is a very large one. It is not unfrequently used as a carminative; and suppos'd by some to be peculiarly serviceable for promoting urine, to which it communicates some degree of its smell.

Essential oil of lavender flowers. L. E.

This oil, when in perfection, is very limpid, of a pleasant yellowish colour, extremely fragrant; poising in an eminent degree the peculiar smell generally admired in the flowers. It is a medicine of great use, both externally and internally, in paralytic and lethargic complaints, rheumatic pains, and debilities of the nervous system. The dose is from one drop to five or six.

Lavender flowers yield the most fragrant oil, and consideribly the largest quantity of it, when they are ready to fall off spontaneously, and the leaves begin to flow themselves: the seeds give out extremely little the flowers may be separated from the root of the plant, by drying it a little, and then gently beating it: they should be immediately committed to distillation, and the procès conducted with a well-regulated gentle heat; too great heat would not only change the colour of the oil, but likewise make a disagreeable alteration in its smell.

Essential oil of the leaves of peppermint. L. E.

This poises the smell, taste, and virtues of the peppermint in perfection; the colour is a pale greenish yellow. It is a medicine of great pungency and subtility; and diffuses, almost as soon as taken, a glowing warmth through the whole system. In colics, accompanied with great coldness, and in some hysterical complaints, it is of excellent service. A drop or two are in general a sufficient dose.

Essential oil of the leaves of common mint. L. E.

This oil smells and tastes strongly of the mint, but is in both respects somewhat less agreeable than the herb itself. It is an useful stomacical medicine; and not unfrequently exhibited in want of appetite, weakness of stomach, retching to vomit, and other like disorders, when not accompanied with heat or inflammation: two or three drops, or more are given for a dose. It is likewise employed externally for the same purposes; and is an useful ingredient in the stomacical plaster of the fluxes.

Essential oil of the leaves of origanum. L.

This oil has a very pungent acrimonious taste, and a penetrating smell. It has been chiefly employed externally as an erthine and for easing pains of the teeth.
**PHARMACY.**

**Essential oil of the leaves of pennyroyal.** L.

This oil, in smell and taste, resembles the original plant; the virtues of which it likewise possesses. It is given in hyberic doses, from one to four or five drops.

**Essential oil of rosemary.** L. E.

The oil of rosemary is drawn from the plant in flower. When in perfection, it is very light and thin, pale, and almost colourless; of great fragrancy, though not quite so agreeable as the rosemary itself. It is recommended, in the dose of a few drops, in nervous and hyberic complaints. Boerhaave holds it in great esteem against epilepsies and suppressions of the ureter purgatives occasioned by weakneds and inactivity.

**Essential oil of juniper-berrics.** L. E.

This oil is a very warm and pungent one; of a strong flavour, not unlike that of the berries. In the dose of a drop or two, it proves a serviceable carminative and stomachic; in one of six, eight, or more, a stimulating, detergent, diuretic, and emmenagogue; it seems to have somewhat of the nature of the turpentine, or their distilled oil; like which it communicates a violent smell to the urine.

The oil of these berries refides partly in vessels spread through the substance of the fruit, and partly in little cells contained in the seeds: when the berry is dry, and the oil hardened into a resinous substance, it becomes visible, on breaking the seeds, in form of little transparent drops. In order therefore to obtain this oil to advantage, we ought previous to the distillation, to bruise the berry thoroughly, so as to break the seeds, and entirely lay open the oily receptacles.

**Essential oil of saffron.** L. E.

This is the most ponderous of all the known essential oils, but rises in distillation with sufficient ease: it appears limpid as water, has a moderately pungent taste, a very fragrant smell, exactly resembling that of the saffron. It stands greatly commended as a digestive, and for purifying the blood and juices; it is likewise supposed to be of service in humoral athmas and coughs. The dose is from one drop to eight or ten; though Geoffroy goes as far as twenty.

The decoction remaining after the distillation of the oil, affords by infipidation an useful extract, of a mild, bitterish, subastringent taste. Hoffman says, he has given it with great benefit, in dosis of a scruple, as a corroborative in cachectic cases, in the decline of intermitting fevers, and for abating hypochondriacal pains.

**Essential oil of savin leaves.** L. E.

Savin is one of the plants which, in former editions of the Edinburgh pharmacopoeia, were directed to be lightly fermented before the distillation: this, however, is not very necessary; for savin yields, without fermentation, and even without any such maceration, a very large quantity of oil. The oil of savin is a celebrated ureteric and emmenagogue: in cold phlegmatic habits, it is undoubtedly a medicine of great service, though not capable of performing what it has been often represented to do. The dose is, two or three drops, or more.

**Essential oil of Jamaica pepper.** E.

This is a very elegant oil, and may be used as a succedaneum to those of some of the dearer spices. It is of a fine pale colour; in flavour more agreeable than the oil of cloves, and not far short of that of nutmegs. It sinks in water, like the oils of some of the eastern spices.

**Oil of tall turpentine.** L.

Take of common turpentine five pounds; water four pints. Distil the turpentine with the water from a alembic of copper. After the distillation of the oil, what remains is yellow resin.

**Rectified oil of turpentine.** L.

Take of oil of turpentine one pound; water four pints. Distil.

The process here proposed for rectifying this oil, is not only tedious but accompanied with danger. For unless the luting be very close, some of the vapour will be apt to get through; and if this catch fire, it will infallibly burst the vessels. This rectified oil, which in many pharmacopoeias is styled zoilium, does not considerably differ in specific gravity, smell, taste, or medical qualities, from the former.

The spirit of turpentine, as this essential oil, has been styled, is not unfrequently taken internally as a diuretic and sudorific. And in these ways it has sometimes a considerable effect when taken even to the extent of a few drops only. It has, however been given in much larger doses, especially when mixed with honey. Recourse has principally been had to such doses in cases of chronic rheumatism, particularly in those modifications of it which are styled sciatica and lumbago. But they have not been often successful, and sometimes they have had the effect of inducing bloody urine.

**Animal oil.**

Take of oil of thornthorn one pound. Distil three times.

**Rectified oil of horns, or animal oil.** E.

Take of empyreumatic oil, newly distilled from the horns of animals, as much as you will. Distil with a gentle heat, in a mattras furnished with a head, as long as a thin colourless oil comes over, which is to be freed of alkaline salt and spirit by means of water.
of water. That this oil may remain limpid and good, it ought to be put up in small phials, completely filled and inverted, having previously put into each phial a few drops of water, that on inverting it the water may interpose itself between the oil and the mouth of the phial.

The quantity of oil employed in this process should be considerable: for it leaves so much black matter behind in the several distillations, that it is reduced at last to a small portion of its original quantity. It is said, that the product is rendered more limpid by mixing the oil with quicklime into a soft paste; the lime keeping down more of the gross matter than would remain without such an addition. The quicklime may here also perhaps act by extracting fixed air; to the absorption of which we are disposed to refer in some measure the spoiling of the oil on exposure to the atmosphere.

The oil was first introduced by Dippelius, whose name it has since generally borne.

Animal oils thus rectified, are thin and limpid, of a subtile, penetrating, not disagreeable smell and taste. They are strongly recommended as anodynes and antispasmodics, in doses from 15 to 20 drops. Hoffman reports, that they procure a calm and sweet sleep which continue often for 20 hours, without being followed by any languour or debility, but rather leaving the patient more alert and cheerful than before; that they procure likewise a gentle sweat, without increasing the heat of the blood: that given to 20 drops or more on an empty stomack, six hours before the accession of an intermittent fever, they frequently remove the disorder; and that they are likewise a very gentle remedy in inveterate and chronical epilepsies and in convulsive motions, especially if given before the usual time of the attack, and preceded by proper evacuations.

The empyreumatic oils of vegetables, rectified in the same manner by repeated distillations, suffer a like change with the animal losing their dark colour and offensive smell, and becoming limpid, penetrating, and agreeable: in this state they are fupposed, like the animal oil, to be anodyne, antispasmodic, and diaphoretic or sudorific. It is observable, that all the empyreumatic oils diffuse in spirit of wine, and that the oftener they are rectified or redistilled, they diffuse the more readily; a circumstance in which they differ remarkably from essential oils, which, by repeated distillations, become more and more difficult of solution.

How far these preparations really possess the virtues that have been ascribed to them, has not yet been sufficiently determined by experience; the tediousness and trouble of the rectification having prevented their coming into general use, or being often made. They are liable also to a more material inconvenience, in regard to their medicinal use, precariousness in their quality; for how perfectly ever they be rectified, they gradually lose in keeping the qualities they had received from that process, and return more and more towards their original fetid state.

Oil of salt of amber. E.

Take equal parts of amber reduced to a powder and of pure sand. Mix them and put them into a glass retort, of which the mixture may fill on half: then adapt a large receiver, and distil in a sand furnace, with a fire gradually increased. At first a spirit will come over, with some yellow oil; then more yellow oil, along with a little salt; and on raising the heat, more of the salt, with a reddish and black coloured oil. When the distillation is finished, empty the liquor out of the receiver; and having collected together the salt which adheres to the fides, dry it by gentle preheur between the folds of blotting paper; then purify it by solution in warm water and by crystallization.

Rectified oil of amber.

Distil the oil in a glass retort with six times its quantity of water till two thirds of the water have passed into the receiver; then separate the rectified oil from the water, and keep it for use in close flate vessels. E.

Take of oil of amber one pound. Distil three times L.

The London college introduce their directions for the preparation of the salt and oleum succini at an after part of their work, under the head of fates. Here we may only observe, that they direct it to be prepared from the amber alone, without the intervention of sand. But this makes no essentia difference in the article when prepared.

The Edinburgh college have rejected what was formerly called the spirit, as being nothing else than the watery parts, fraught with the inert impurities of the bitumen and a very small portion of the salt. In the distillation of amber, the fire must for some time be continued gentle, scarce exceeding the degree at which water boils, till the aqueous phlegm and thin oil have arisen; after which it is to be slowly increased. If the fire were urged hastily, the amber would swell up, and rise in its whole substance into the receiver, without undergoing the required decomposition or separation of its parts. When sand or similar intermedias are mixed with it, it is less subject to this rarefaction, and the fire may be raised somewhat more expeditiously; though this little advantage is perhaps more than counterbalanced by the room which the sand takes up in the retort.

Our chemists generally leave the receiver unluted, that it may be occasionally removed as the salt rises and concretes in the neck of the retort; from whence it is every now and then scraped out to prevent the oil from carrying it down into the receiver. When a gros thick oil begins to arise, and no more salt appears, the distillation is ftopt, though it might perhaps be continued longer to advantage.

Mr Pott informs us (in a curious dissertation on the salt of amber, published in the ninth volume of the Memoirs of the Academy of Sciences of Berlin), that the Prussian workmen, who prepare large quantities of this salt for exportation, from cuttings and small pieces of amber, perform the distillation without any intermediate, and in an open fire: that sweeping out the salt from the neck of the retort being found too troublesome, they suffer the oil to carry it down into the receiver, and afterwards separate it by means of bibulous paper, which imbibles the oil, and leaves the salt dry; which paper is afterwards squeezed and distilled; that they continue the distillation till all that can be forced...
forced over has arisen, taking care only to catch the last thick oil in a separate receiver; and that from this they extract a considerable quantity of salt, by shaking it in a strong vessel with three or four fresh portions of hot water, and evaporating and crystallizing the filtered waters.

The spirit of amber, so called, is no more than a solution of a small proportion of the salt in phlegm or water; and therefore is very properly employed for dissolving the salt in order to its crystallization.

The salt, freed from as much of the oil as spongy paper will imbibe, retains so much as to appear of a dark brown colour. Mr Pott says, the method he has found to succeed best, and with least loss, is to dissolve the salt in hot water, and put into the paper, through which the solution is to be filtered, a little cotton slightly moistened with oil of amber: this, he says, detains a good deal of the oil of the salt, and the solution passes through the more pure. The liquor being evaporated with a very gentle heat, of about twenty times its own weight; of boiling purified by a reflux-bath, and then to shoot, the first crystals prove transparent, with a slight yellowish tinge; but those which follow, are brown, oily, and bitter, and are therefore to be further separated in the same manner. The whole quantity of crystals amounts to about one thirtieth of the weight of the crude amber employed. By sublimation from this salt, as directed in former editions of the Edinburgh pharmacopoeia, the salt is thought to be more perfectly and more expeditiously purified: Mr Pott objects to sublimation, that a part of the salt is decomposed by it, a coaly matter being left behind, even though the salt was previously purified by crystallization; it may be presumed, however, that this coal proceeds rather from the burning of some remnants of the oily matter, than from the decomposition of any part of the true salt.

Pure salt of amber has a penetrating, subastringent, acrid, taste. It dissolves both in water and in rectified spirit; though not readily in either, and scarcely at all in the latter without the assistance of heat; of cold water in summer, it requires for its solution about twenty times its own weight; of boiling water only about twice its weight. Exposed in a glass vessel, to a heat little greater than that of boiling water, it first melts, then rises in a white fume, and concretes again in the upper part of the glass into fine white flakes, leaving, unleas it was perfectly pure, a little coaly matter behind. It effervesces with alkalis both fixed and volatile, and forms with them neutral compounds much resembling those compouded of the same alkalis and vegetable acids. Mixed with acid liquors, it makes no sensible commotion. Ground with fixed alkali salts it does not exhale any unionous odour. By these characters, it is conceived this salt may be readily distinguished from all the other matters that have been mixed with or vended for it. With regard to its virtue, it is accounted aperient, diuretic, and, on account of its retaining some portion of the oil, antihysteric: Boerhaave gives it the character of diureticum et antihystericum princeps. Its great price, however, has prevented its coming much into use; and perhaps its real virtues are not equal to the opinion generally entertained of them.

The rectified oil has a strong bituminous smell, and a pungent acid taste. Given in a dose of ten or twelve drops, it heats, stimulates, and promotes the fluid secretions: It is chiefly celebrated in hysterical disorders, and in deficiencies of the uterine purgations. Sometimes it is used externally, in liniments for weak or paralytic limbs and rheumatic pains. This oil differs from all those of the vegetable kingdom, and agrees with the mineral petroleum, in not being soluble either in its rectified or unrectified state, by spirit of wine, fixed alkaline licitria, or volatile alkaline spirits; the oil, after long digestion or agitation, separating as freely as common oil does from water.

Oil of wine. L.

Take alcohol, vitriolic acid, of each one pint. Mix them by degrees, and distil; taking care that no black form passes into the receiver. Separate the oily part of the distilled liquor from the volatile vitriolic acid. To the oily part add as much water of pure kali as is sufficient to take away the phosphoric smell: then dilute the ether with a gentle heat. The oil of wine remains in the retort, swimming on the watery liquor, from which it is to be separated.

Some caution is requisite in mixing the two liquors, that the consequent heat and ebullition, which would not only dissipate a part of the mixture, but hazard the breaking of the vessel and the hurt of the operator, may be avoided. The securest way is to add the vitriolic acid to the spirit of wine by a little at a time, waiting till the first addition be incorporated before another quantity be put in. By this, the ensuing heat is inconsiderable, and the mixture is effected without inconvenience.

Essential oil of wormwood. Roff.

Let the fresh leaves of wormwood slightly dried be macerated with a sufficient quantity of water, and then subject to distillation; and let the oil which comes over be separated from the water which accompanies it.

This is one of the more ungrateful oils: it smells strongly of the wormwood, and contains its particular nauseous taste, but has little or nothing of its bitterness, this remaining entire in the decoction left after the distillation: its colour, when drawn from the fresh herb is dark green; from the dry, a brownish yellow. This oil is recommended by Hoffman as a mild anodyne in phasmoid contractions; for this purpose, he directs a dram of it to be dissolved in an ounce of rectified spirit of wine, and seven or eight drops of the mixture taken for a dose in any convenient vehicle. Boerhaave greatly commends, in tertian fevers, a medicated liquor composed of about seven grains of this oil ground first with a dram of sugar, then with two draughts of the fluid of wormwood, and afterwards dissolved in fix ounces of the distilled water of the same plant: two hours before the fit is expected, the patient is to bathe his feet and legs in warm water, and then to drink two ounces of the liquor every quarter of an hour till the two hours are expired: by this means, he says, all cases of this kind are generally cured with ease and safety; provided there be no feverishness or dampness.

The oil of wormwood is employed chiefly as a vermifuge; and for this purpose is sometimes applied both externally to the belly, and taken
PHAR

MACY.

Preparations and Compositions.

Part II.

taken internally; it is most conveniently exhibited in
the form of pills, into which it may be reduced by
mixing it with crumb of bread.

In the same manner with the oil of wormwood, the
following oils, mentioned on the authority of the
pharmacopoeia Rossica, are also directed to be prepa-
red.

Essential oil of orange flowers. Ross.

Essence of lemons.

Of these essential oils, as existing in a separate state
in the growing vegetable, we have already offered
some observations. They are obtained in a very pure
state by distillation. They are now rejected from our
pharmacopoeias, being employed rather as perfumes
than as medicines. This is particularly the case with
the essence of lemons, which is a pleasant oil, of a fine
smell, very nearly as agreeable as that of the fresh peel;
it is one of the lightest and most volatile essential oils
we have, perfectly limpid, and almost colourless. It
is taken in doses of two or three drops, as a cordial, in
weakness of the stomach, &c; though more frequently
for external application; but the essential oil is meant
to be used internally.

It is a very pungent oil, of a strong not ungrateful
smell, resembling that of the flowers: its colour is yel-
low, with a cast of greenish or brown. It is sometimes
given in the dose of a few drops, as a carminative, in
hysterical disorders, and likewise as a vermifuge; it may
be conveniently made into pills with crumb of bread.

Oil of cinnamon. Ross.

This valuable oil is extremely hot and pungent, of a
most agreeable flavour, like that of the cinnamon it-
self. In cold langui[es, and debilities of the ner-
vous system, it is one of the most immediate cordials
and restoratives. The dose is one, two, or three drops;
which must always be carefully diluted by the medita-
tion of sugar, &c: for so great is the pungency of this
oil, that a single drop let fall upon the tongue, undi-
luted, produces as Boerhaave observes, a gangrenous
either. In the distillation of this oil, a smart fire is
required; and the low head, with a channel round it,
recommended for the distillation of the less volatile
oils, is particularly necessary for this, which is one of
the least volatile, and which is afforded by the spice
in exceeding small quantity. The distilled water retains
no small portion of the oil; but this oil being very
pungent, great part of it sublimes from the water,
on standing for two or three weeks in a cool place.

Essential oil of fennel seeds. Ross.

The oil obtained from sweet fennel seeds is much
more elegant and agreeable than that of the common
fennel. It is one of the mildest of these preparations;
it is nearly of the same degree of warmth with that
of aniseeds; to which it is likewise similar in flavour,
though far more grateful. It is given from two or
three drops to ten or twelve, as a carminative, in cold
indispositions of the stomach; and in some kinds of
coughs for promoting expectoration.

Essential oil of rhodium. Ross.

This oil is extremely odoriferous, and principally
employed as a perfume in scenting pomatums, and the
like. Custom; as not yet received any preparation of
this elegant aromatic wood into internal use among
us.

Essential oil of mace. Ross.

The essential oil of mace is moderately pungent,
very volatile, and of a strong aromatic smell, like that
of the spice itself. It is thin and limpid, of a pale
yellowish colour, with a portion of thicker and dark-
er coloured oil at the bottom. This oil, taken inter-
ally to the extent of a few drops, is celebrated in
vomiting, flegelitis, and colic pains; and in the same
complaints it has also been advised to be applied exter-
ally to the umbilical region. It is however, but rare-
ly to be met with in the shops.

Essential oil of marjoram. Ross.

This oil is very hot and penetrating, in flavour not
near so agreeable as the marjoram itself: when in per-
fection, it is of a pale yellow colour; by long keeping,
Essential oil of nutmegs. Ross.

The essential oil of nutmegs possesses the flavour and aromatic virtues of the spice in an eminent degree. It is similar in quality to the oil of mace, but somewhat less grateful.

Essential oil of rue. Ross.

The oil of rue has a very acid taste, and a penetrating smell, resembling that of the herb, but rather more unpleasant. It is sometimes made use of in hysterical disorders and as an anthelmintic; and also in epilepsy proceeding from a relaxed state of the nerves. Rue yields its oil very sparingly. The largest quantity is obtained from it when the flowers are ready to fall off, and the seeds begin to show themselves; suitable maceration, previous to the distillation, is here extremely necessary.

Essential oil of sassafras. Ross.

Savory yields on distillation a small quantity of essential oil, of great subtilty and volatility; and it is unquestionably an active article, but among us it is not employed in medicine.

Essential oil of tansy. Ross.

Tansy yields on distillation an oil of a greenish colour inclining to yellow. It smells strongly of the herb, and possesses at least its aromatic property in a concentrated state.

Oil of wax. Dan.

Melt yellow bees wax with twice its quantity of sand, and distil it in a retort placed in a sand-furnace. At first an acid liquor rises, and afterwards a thick oil, which sticks in the neck of the retort, unless it be heated by applying live coal. This may be rectified into a thin oil, by distilling it several times, without addition, in a sand-heat.

Boerhaave directs the wax, cut in pieces, to be put into the retort first, so as to fill one half of it; when as much sand may be poured thereon as will fill the remaining half. This is a nearer, and much less troublesome way, than melting the wax, and mixing it with the sand before they are put into the retort. The author above-mentioned highly commends this oil against roughnefs and chaps of the skin, and other like purposes: the college of Strasburgh speak also of it being given internally, and say it is a powerful diuretic (ingent diureticum) in doses from two to four or more drops: but its disagreeable smell has prevented its coming into use among us.

The number of essential oils which have now a place in the London and Edinburgh pharmacopoeias, and likewise in the foreign ones of modern date, is much less considerable than formerly; and perhaps those still retained afford a sufficient variety of the more active and useful oils. Most of the oils mentioned above particularly those which have a place in the London and Edinburgh pharmacopoeias, are prepared by our chymists in Britain, and are easily procurable in a tolerable degree of perfection; but the oils from the more pure and expensive spices, though still introduced among the preparations in the foreign pharmacopoias, are, when employed amongst us, usually imported from abroad.

These are frequently so much adulterated, that it is not an easy matter to meet with such as are fit for use. Nor are these adulterations easily discoverable. The grozer abusers, indeed, may be readily detected: thus, if the oil be mixed with spirit of wine, it will turn milky on the addition of water; if with expressed oils, rectified spirit will dissolve the essential, and leave the other behind; if with oil of turpentine, on dipping a piece of paper in the mixture, and drying it with a gentle heat, the turpentine will be betrayed by its smell. But the more subtle artists have contrived other methods of sophification, which elude all trials of this kind.

Some have looked upon the specific gravity of oils as a certain criterion of their genuineness: and accordingly we have given a table of the gravity of several. This, however, is not to be absolutely depended on: for the genuine oils, obtained from the same subjects, often differ in gravity as much as those drawn from different ones. Cinnamon and cloves, whose oils usually sink in water, yield, if slowly and warily distilled, an oil of great fragrancy, which is nevertheless specifically lighter than the aqueous fluid employed in the distillation of it, while, on the other hand, the last runnings of some of the lighter oils prove sometimes to ponderous as to sink in water.

As all essential oils agree in the general properties of solubility in spirit of wine, indissolubility in water, miscibility with water by the intervention of certain intermediaries, solubility in the heat of boiling water, &c., it is plain that they may be variously mixed with each other, or the dearer sophificated with the cheaper, without any possibility of discovering the abuse by any trials of this kind. And indeed it would not be of much advantage to the purveyor, if he had infallible criteria of the genuineness of every individual oil. It is of as much importance that they be good as that they be genuine; for genuine oils, from inattentive distillation and long careless keeping, are often weaker both in smell and taste than the common sophificated ones.

The smell and taste seem to be the only certain test of which the nature of the thing will admit. If a bark should have in every respect the appearance of good cinnamon, and should be proved indisputably to be the genuine bark of the cinnamon-tree; yet if it want the cinnamon flavour, or has it but in a low degree, we reject it; and the case is the same with the oil. It is only from use and habit, or comparisons with specimens of known quality, that we can judge of the goodness either of the drugs themselves or of their oils. Most of the essential oils, indeed, are too hot and pungent to be tasted with safety; and the smell of the subject is so much concentrated in them, that a small variation in this respect is not easily distinguished; but we can readily dilute them to any assignable degree. A drop of the oil may be diffolved in spirit of wine, or received on a bit of sugar, and diffolved by that intermedium in water. The quantity of liquor which it thus impregnates with its flavour, or the degree of flavour
flavour which it communicates to a certain determinate quantity, will be the measure of the degree of goodness of the oil.

We shall here subjoin the result of some experiments, showing the quantity of essential oil obtained from different vegetables, reduced into the form of a table. The first column contains the names of the respective vegetable substances; the second, the quantity of each which was submitted to the distillation; and the third, the quantity of oil obtained. In every other part of this article, where pound weights are mentioned, the Troy pound of 12 ounces is meant: but these experiments having been all made by a pound of 16 ounces, it was thought expedient to set down the matter of the oil in the original weights; especially as the several materials, in the large quantity commonly required for the distillation of oils, are purchased by weights of the same kind. But to remove any ambiguity which might arise from hence, and to enable the reader to judge more readily of the product, a reduction of the weights is given in the next column; which shows the number of parts of each of the subjects from which one part of oil was obtained. To each article is affixed the author's name from whom the experiment was taken. The different distillations of one subject, several of which are inserted in the table, show how variable the product of oil is, and that the exotic spices, as well as our indigenous plants, do not always yield the same proportion of this active principle; though it must be observed, also, that part of the differences may probably arise from the operation itself having been more or less carefully performed.

**TABLE of the Quantity of Essential Oil obtained from different Vegetables.**

<table>
<thead>
<tr>
<th>Substance</th>
<th>lb</th>
<th>4 dra.</th>
<th>320</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agallochum wood</td>
<td>10 lb.</td>
<td>1 dra.</td>
<td>Hoff</td>
</tr>
<tr>
<td>Angelica root</td>
<td>1 lb.</td>
<td>4 dra.</td>
<td>128</td>
</tr>
<tr>
<td>Aniseed</td>
<td>1 lb.</td>
<td>4 oz.</td>
<td>32</td>
</tr>
<tr>
<td>Anisefeed</td>
<td>3 lb.</td>
<td>1 oz.</td>
<td>48</td>
</tr>
<tr>
<td>Anisefeed</td>
<td>4 lb.</td>
<td>1 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Afaefetida</td>
<td>4 lb.</td>
<td>1 dra.</td>
<td>64</td>
</tr>
<tr>
<td>Calamus aromaticus</td>
<td>5 lb.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Calamus aromaticus</td>
<td>50 lb.</td>
<td>1 cwt.</td>
<td>185</td>
</tr>
<tr>
<td>Caraway seeds</td>
<td>1 lb.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Caraway seeds</td>
<td>4 lb.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Caraway seeds</td>
<td>2 lb.</td>
<td>9 dra.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Caroline thistle roots</td>
<td>1 lb.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cardamom seeds</td>
<td>1 oz.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Carrot seeds</td>
<td>2 lb.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cafiurala</td>
<td>1 lb.</td>
<td>83 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Camomile flowers</td>
<td>1 lb.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Camomile flowers</td>
<td>6 lb.</td>
<td>5 dra.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Wild camomile flowers</td>
<td>1 lb.</td>
<td>5 dra.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Wild camomile flowers</td>
<td>6 lb.</td>
<td>20 gra.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Chervil leaves, fresh</td>
<td>9 lb.</td>
<td>30 gra.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cedar wood</td>
<td>1 lb.</td>
<td>30 gra.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cinnamon</td>
<td>1 lb.</td>
<td>30 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cinnamon</td>
<td>1 lb.</td>
<td>30 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cinnamon</td>
<td>1 lb.</td>
<td>30 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cinnamon</td>
<td>1 lb.</td>
<td>30 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Clary seeds</td>
<td>4 lb.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Clary in flower, fresh</td>
<td>130 lb.</td>
<td>3 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cloves</td>
<td>1 lb.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cloves</td>
<td>2 lb.</td>
<td>5 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cloves</td>
<td>1 lb.</td>
<td>6 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Copaiba balsam</td>
<td>1 lb.</td>
<td>8 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Copaiba balsam</td>
<td>1 lb.</td>
<td>8 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Cummin-seed</td>
<td>1 buf.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Dictamnus Creticus</td>
<td>1 lb.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Dill-seed</td>
<td>4 lb.</td>
<td>2 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Elecampane root</td>
<td>2 lb.</td>
<td>3 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Elemi</td>
<td>1 lb.</td>
<td>1 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Fennel-seed, common</td>
<td>2 oz.</td>
<td>1 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Fennel-seed, sweet</td>
<td>1 buf.</td>
<td>18 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Galangal, or Gill</td>
<td>1 lb.</td>
<td>1 dra.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Garlic root, fresh</td>
<td>2 lb.</td>
<td>3 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Ginger</td>
<td>1 lb.</td>
<td>1 dra.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Horse-radish root, fresh</td>
<td>8 oz.</td>
<td>1 oz.</td>
<td>Lewis</td>
</tr>
<tr>
<td>Hyssop leaves</td>
<td>2 lb.</td>
<td>1 dra.</td>
<td>Lewis</td>
</tr>
</tbody>
</table>

*Note: The yield of essential oil is shown separately for each substance.*
<table>
<thead>
<tr>
<th><strong>Preparations and Composition</strong></th>
<th><strong>Pharmacy</strong></th>
<th><strong>Part II.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyssop leaves</td>
<td>1 lb.</td>
<td>14 dra.</td>
</tr>
<tr>
<td>Hyssop leaves</td>
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<td>2 dra.</td>
</tr>
<tr>
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<td>2 cwt.</td>
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</tr>
<tr>
<td>Hyssop leaves, fresh</td>
<td>10 lb.</td>
<td>3 dra.</td>
</tr>
<tr>
<td>Hyssop leaves, fresh</td>
<td>2 lb.</td>
<td>9 dra.</td>
</tr>
<tr>
<td>Juniper-berries</td>
<td>8 lb.</td>
<td>3 oz.</td>
</tr>
<tr>
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<td>3 dra.</td>
</tr>
<tr>
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<td>48 lb.</td>
<td>12 oz.</td>
</tr>
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</tr>
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<td>13 lb.</td>
<td>60 oz.</td>
</tr>
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</tr>
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</tr>
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</tr>
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</tr>
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<td>2 dra.</td>
</tr>
<tr>
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<td>1 lb.</td>
<td>1 dra.</td>
</tr>
<tr>
<td>Lovage root</td>
<td>1 lb.</td>
<td>6 dra.</td>
</tr>
<tr>
<td>Mace</td>
<td>1 lb.</td>
<td>5 dra.</td>
</tr>
<tr>
<td>Marjoram in flower, fresh</td>
<td>81 lb.</td>
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</tr>
<tr>
<td>Marjoram in flower, fresh</td>
<td>133 lb.</td>
<td>3 oz.</td>
</tr>
<tr>
<td>Marjoram in flower, fresh</td>
<td>34 lb.</td>
<td>1 oz.</td>
</tr>
<tr>
<td>Marjoram leaves, fresh</td>
<td>17 lb.</td>
<td>4 dra.</td>
</tr>
<tr>
<td>Marjoram leaves, dried</td>
<td>4 lb.</td>
<td>1 oz.</td>
</tr>
<tr>
<td>Marjoram leaves, dried</td>
<td>1 lb.</td>
<td>30 gra.</td>
</tr>
<tr>
<td>Lovage root</td>
<td>1 lb.</td>
<td>2 dra.</td>
</tr>
<tr>
<td>Lovage root</td>
<td>1 lb.</td>
<td>3 dra.</td>
</tr>
<tr>
<td>Mint in flower, fresh</td>
<td>6 lb.</td>
<td>1 oz.</td>
</tr>
<tr>
<td>Mint leaves, dried</td>
<td>4 lb.</td>
<td>3 dra.</td>
</tr>
<tr>
<td>Peppermint, fresh</td>
<td>4 lb.</td>
<td>3 dra.</td>
</tr>
<tr>
<td>Myrrh</td>
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</tr>
<tr>
<td>Myrrh</td>
<td>1 lb.</td>
<td>3 dra.</td>
</tr>
<tr>
<td>Nutmegs</td>
<td>1 lb.</td>
<td>4 dra.</td>
</tr>
<tr>
<td>Nutmegs</td>
<td>1 lb.</td>
<td>6 dra.</td>
</tr>
<tr>
<td>Nutmegs</td>
<td>1 lb.</td>
<td>5 dra.</td>
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<tr>
<td>Nutmegs</td>
<td>1 lb.</td>
<td>1 dra.</td>
</tr>
<tr>
<td>Parsley seeds</td>
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<tr>
<td>Parsley leaves, fresh</td>
<td>23 lb.</td>
<td>2 oz.</td>
</tr>
<tr>
<td>Parsley leaves, fresh</td>
<td>8 lb.</td>
<td>6 dra.</td>
</tr>
<tr>
<td>Pennyroyal in flower, fresh</td>
<td>13 lb.</td>
<td>6 dar.</td>
</tr>
<tr>
<td>Black pepper</td>
<td>2 lb.</td>
<td>6 dra.</td>
</tr>
<tr>
<td>Black pepper</td>
<td>1 lb.</td>
<td>2 dra.</td>
</tr>
<tr>
<td>Black pepper</td>
<td>1 lb.</td>
<td>4 fcr.</td>
</tr>
<tr>
<td>Black pepper</td>
<td>1 lb.</td>
<td>1 dra.</td>
</tr>
<tr>
<td>Black pepper</td>
<td>6 lb.</td>
<td>3 dra.</td>
</tr>
<tr>
<td>Pimento</td>
<td>1 oz.</td>
<td>30 gra.</td>
</tr>
<tr>
<td>Rhodium wood</td>
<td>1 lb.</td>
<td>3 dra.</td>
</tr>
<tr>
<td>Rhodium wood</td>
<td>1 lb.</td>
<td>2 dra.</td>
</tr>
<tr>
<td>Rhodium wood</td>
<td>1 lb.</td>
<td>3 dra.</td>
</tr>
<tr>
<td>Rhodium wood</td>
<td>1 lb.</td>
<td>4 dra.</td>
</tr>
<tr>
<td>Rhodium wood</td>
<td>1 lb.</td>
<td>4 dra.</td>
</tr>
<tr>
<td>Rosmarry in flower</td>
<td>1 cwt.</td>
<td>8 oz.</td>
</tr>
<tr>
<td>Rosmarry leaves</td>
<td>1 lb.</td>
<td>2 dra.</td>
</tr>
<tr>
<td>Rosmarry leaves</td>
<td>1 lb.</td>
<td>3 dra.</td>
</tr>
<tr>
<td>Rosmarry leaves</td>
<td>3 lb.</td>
<td>3 oz.</td>
</tr>
<tr>
<td>Rosmarry leaves</td>
<td>1 lb.</td>
<td>1 dra.</td>
</tr>
<tr>
<td>Rosmarry leaves</td>
<td>1 lb.</td>
<td>1 dra.</td>
</tr>
<tr>
<td>Rosmarry leaves, fresh</td>
<td>79 lb.</td>
<td>5 oz.</td>
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<tr>
<td>Rosmarry leaves</td>
<td>100 lb.</td>
<td>4 dra.</td>
</tr>
<tr>
<td>Rosmarry leaves</td>
<td>100 lb.</td>
<td>1 oz.</td>
</tr>
<tr>
<td>Rosmarry leaves</td>
<td>12 lb.</td>
<td>30 gra.</td>
</tr>
<tr>
<td>Rue</td>
<td>4 lb.</td>
<td>2 dra.</td>
</tr>
<tr>
<td>Rue</td>
<td>10 lb.</td>
<td>4 dra.</td>
</tr>
<tr>
<td>Rue</td>
<td>4 lb.</td>
<td>1 dra.</td>
</tr>
<tr>
<td>Rue in flower</td>
<td>60 lb.</td>
<td>2 oz.</td>
</tr>
</tbody>
</table>

*Note: The table contains information about the yields of essential oil for various ingredients.*
**Part II. Preparations and Compositions.**

<table>
<thead>
<tr>
<th>Rue with the feeds</th>
<th>PHARMACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saffron</td>
<td>72 lb.</td>
</tr>
<tr>
<td>Sage leaves</td>
<td>1 lb.</td>
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<tr>
<td>Sage in flower, fres</td>
<td>34 lb.</td>
</tr>
<tr>
<td>Sage of virtue in flower</td>
<td>27 lb.</td>
</tr>
<tr>
<td>Sage of virtue in flower</td>
<td>8 lb.</td>
</tr>
<tr>
<td>Saffras</td>
<td>6 lb.</td>
</tr>
<tr>
<td>Savin</td>
<td>6 lb.</td>
</tr>
<tr>
<td>Saunders, yellow</td>
<td>2 lb.</td>
</tr>
<tr>
<td>Smallage seeds</td>
<td>1 lb.</td>
</tr>
<tr>
<td>Stechas in flower, fres</td>
<td>1 lb.</td>
</tr>
<tr>
<td>Thyme in flower, fres</td>
<td>5 lb.</td>
</tr>
<tr>
<td>Thyme in flower, dry</td>
<td>2 cwt.</td>
</tr>
<tr>
<td>Lemon-thyme in flower, fres</td>
<td>3 lb.</td>
</tr>
<tr>
<td>Lemon-thyme in flower, fres</td>
<td>5 lb.</td>
</tr>
<tr>
<td>Lemon-thyme, a little dried</td>
<td>98 lb.</td>
</tr>
<tr>
<td>Wormwood leaves, dry</td>
<td>104 lb.</td>
</tr>
<tr>
<td>Wormwood leaves, dry</td>
<td>4 lb.</td>
</tr>
<tr>
<td>Wormwood leaves, dry</td>
<td>18 lb.</td>
</tr>
<tr>
<td>Zedoary</td>
<td>25 lb.</td>
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<tr>
<td></td>
<td>1 lb.</td>
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</tbody>
</table>

| DILUTED OR WEAK VITRIOL ACID. |

196 Take of vitriolic acid, one ounce by weight; distilled water, 8 ounces by weight. Mix them by degrees.

Weak vitriolic acid, common called weak spirit of vitriol. E.

Take of vitriolic acid, one part; water, seven parts. Mix them in the former editions of our pharmacopoeias, directions were given for the preparation of the vitriolic acid by the apothecary himself, under the heads of spirit and oil of vitriol, spirit or oil of sulphur by the bell, &c.: but as it is now found that all these modes are expensive, and that this acid may be furnished at a cheaper rate from the trading chemists preparing it on a large scale, it is with propriety that both colleges have now rejected it from the preparations, and introduced it only into the list of the materia medica.

When, however, it is of the degree of concentration there required, it can be employed for very few purposes in medicine. The most simple form in which it can be advantageously employed internally, is that in which it is merely diluted with water; and it is highly proper that there should be some fixed standard in which the acid in this state should be kept. It is, however, much to be regretted, that the London and Edinburgh colleges have not adopted the same standard in respect to strength: for in the one, the strong acid constitutes an eighth; and in the other, only a ninth of the mixture. The former proportion, which is that of the Edinburgh college, we are inclined to prefer, as it gives exactly a dram of acid to the ounce; but the dilution by means of distilled water, which is directed by the London, is preferable to spring-water: which, even in its purest state, is rarely free from impregnations in part affecting the acid.

The acid of vitriol is the most ponderous of all the liquors we are acquainted with, and the most powerful of the acids. If any other acid be united with a fixed alkaline salt or earth, on the addition of the vitriolic, such acid will be dislodged, and arise on applying a moderate heat, leaving the vitriolic in possession of the alkali; though without this addition it would not yield to the most vehement fire. Mixed with water, it instantly creates great heat, insomuch that glass vessels are apt to crack from the mixture, unless it be very slowly performed: exposed to the air, it imbues moisture, and looses a remarkable increase of weight. In medicine, it is employed chiefly as subservient to other preparations: it is also frequently mixed with juleps and the like, in such quantity as will be sufficient to give the liquor an agreeable tartness, and its pleasant taste is a cooling antiseptic, a restringent, and a stomachic.

It is particularly useful for allaying inordinate actions of the stomach, when under the form of finguistus or vomiting. For its medical properties, see Acids and Vitriol.

**Nitrous acid.**

Take of purified nitre, by weight, 60 ounces; vitriolic acid, by weight, 29 ounces. Mix and distil. The specific gravity of this is to the weight of distilled water as 1550 to 1000.

Nitrous acid commonly called Glauber's spirit of nitre. E.

Take of purest nitre, bruised, two pounds; vitriolic acid, one pound. Having put the nitre into a glass retort, pour on it the spirit; then distil in a sand-heat, gradually increasing the fire, till the sand-pot becomes of a dull red colour.

Hence the vitriolic acid expels the nitrous, in red corosive vapours, which begin to issue immediately on mixture; and which the operator ought cautiously to avoid. A pound of acid of vitriol is sufficient to expel all the acid from about two pounds of nitre, not from more: some direct equal parts of the two. The spirit, in either case, is of equal the same; the difference, in this respect, affecting only the residuum. If two parts of nitre be taken to one of volatile acid, the remaining alkaline basis of the nitre is completely saturated with the vitriolic acid; and the result is a neutral salt, the same with vitriolated tartar, as we shall
shall fee hereafter. If more nitre be used, a part of the nitre in substance will remain blended with this neutral salt; if less nitre, it cannot afford alkali enough to saturate the vitriolic acid, and the residuum will not be a neutral salt, but a very acid one. In this latter case there is one convenience; the acid salt being readily soluble in water, so as to be got out without breaking the retort, which the others are not.

**Diluted or weak nitrous acid.** L.

Take of nitrous acid, distilled water, each one pound. Mix them.

**Weak nitrous acid.** E.

Take of nitrous acid, water, equal weights. Mix them, taking care to avoid the noxious vapours.

In the old editions both of the London and Edinburgh pharmacopoeas, directions were given for the preparation of aquafortis simplex and duplex; but these were no more than different forms of preparing an impure nitrous acid, unfit for medical purposes. They are therefore, with propriety, superceded by the more simple formulæ of nitrous acid and diluted or weak nitrous acid, mentioned above. In making the diluted acid, distilled water is preferable to common water.

The vapour separated during the mixing of nitrous acid and water, is the permanently elastic fluid called nitrous acid air, which is deleterious to animal life.

The acid of nitre is next in strength to the vitriolic, and dillodes all others from alkaline salts or earths. It differs from all the other acids in dissolving with inflammable matters: it's a solution of any inflammable substance, as burnthorn, &c. in this acid, be let to evaporate, as soon as the matter approaches to dryness, a violent detonation ensues. The chief use of this acid is as a menstruum for certain minerals, and as the basis of some particular preparations to be mentioned hereafter. It has been given likewise, diluted with any convenient vehicle, as a diuretic, from 10 to 50 drops.

**Muriatic acid.** L.

Take of dry sea-salt, 10 pounds; vitriolic acid, six pounds; water, five punds. Add the vitriolic acid first mixed with the water by degrees, to the salt; then distil.

The specific gravity of this acid is to distilled water as 1170 to 1000.

**Muriatic acid, commonly called spirit of sea-salt.** E.

Take of sea-salt, two pounds; vitriolic acid, water, each one pound. Let the salt be first put into a pot, and brought to a red heat, that the oily impurities may be conformed; then put it into the retort. Next mix the acid with the water, and when the mixture has cooled, pour it upon the salt. Lastly, distil in a sand heat with a middling heat, as long as any acid comes over.

The marine, or muriatic acid, arises, not in red fumes like the nitrous, but in white ones. The addition of water is more necessary here than in the foregoing processes; the marine vapours being so volatile, as scarcely to condense without some adventitious humidity. The acid of vitriol is most conveniently mixed with the water in an earthen or flint-ware vessel; for unless the mixture be made exceedingly slow, it grows so hot as to endanger breaking a glass one.

The spirit of sea-salt is the weakest of the mineral acids, but stronger, than any of the vegetable; it requires a greater fire to distil it than that of nitre, yet it is more readily diffipated by the action of the air. It is used chiefly as a menstruum for the making of other preparations; sometimes, likewise, it is given, properly diluted, as an antiphlogistic, aperient, and diuretic, from 10 to 60 or 70 drops.

**Diluted vinegar.**

Take of vinegar five pints. Dilute with a gentle fire, in glass vessels, so long as the drops fall free from exposure.

Let eight pounds of vinegar be distilled in glass vessels with a gentle heat. Let the two first pounds that come over be thrown away as containing too much water; let four pounds next following be reserved as the distilled vinegar. What remains is a still stronger acid, but too much acted on by the heat.

This process may be performed either in a common still with its head, or in a retort. The better kinds of wine-vinegar should be used; those prepared from malt liquors, however fine and clear they may seem to be, contain a large quantity of a viscid substanee, as appears from the slimmeries and ropyness to which they are very much subject; this not only hinders the acid parts from rising freely, but likewise is apt to make the vinegar boil over into the recipient, and at the same time disposes it to receive a disagreeable impression from the fire. And indeed, with the best kind of vinegar, if the distillation be carried on to any great length, it is extremely difficult to avoid an empyreuma.

The best method of preventing this inconvenience is, if a retort be used, to place the sand but a little way up its sides, and when somewhat more than half the liquor is come over, to pour on the remainder a quantity of fresh vinegar equal to the liquor drawn off. This may be repeated three or four times; the vinegar supplied at each time being previously heated. The addition, of cold liquor would not only prolong the operation, but also endanger the breaking of the retort. If the common still be employed, it should likewise be occasionally supplied with fresh vinegar in proportion as the spirit runs off; and this continued until the process can be conveniently carried no farther: the distilled spirit must be rectified by a second distillation in a retort or glass alembic; for although the head and receiver be of glass or flint ware, the acidi will contract a metallic taint from the pewter worm.

The residuum of this process is commonly thrown away as useless, although if skillfully managed, it might be made to turn to good account; the molten acid parts of the vinegar still remaining in it. Mixed with about three times its weight of fire-dry sand, and committed to distillation in a retort, with a well-regulated fire, it yields an exceeding strong acid spirit, together with an empyreumatic oil, which taints the spirit with a disagreeable odour. This acid is nevertheless, without any rectification, better for some purposes (as a little...
Part II. PHARMA CY.

Preparations and Compositions.

The spirit of vinegar is a purer and stronger acid than vinegar itself, with which it agrees in other respects. (See Vinegar). Their principal difference from the mineral acid consists in their being milder, less stimulating, less disposed to affect the kidneys and promote the urinary excrescences, or to corurate the animal juices. The matter left after the distillation in glass vessels, though not used in medicine, would doubtless prove a serviceable dentergent sapnaceous acid; and in this light sunds recommended by Boerhaave.

Concentrated vinegar. Sucr.

201 Let white wine vinegar be frozen in a wooden vessel in cold winter weather; and let the fluid separated from the ice be preferred for use. It may be considered as sufficiently strong, if one dram of it be capable of saturating a scruple of the fixed vegetable alkali.

This is a very easy mode for obtaining the acid of vinegar in a concentrated state, and freed from a considerable portion of its water. But at the same time we do not thus obtain the acid either so much concentrated, or in so pure a state as by the following process.

Acetous acid. L.

202 Take of verdigris, in coarse powder, two pounds. Dry it perfectly by means of a water-bath saturated with sea-salt; then distil it in a sand-bath, and after that distil the liquor. Its specific gravity is to that of diluted water as 1050 to 1000.

By this process, it may be readily concluded that we obtain the acetous acid in its most concentrated state, and with the least admixture of water. And after the re-distillation, it may also be supposed that it will be free from all mixture of the copper. But the internal use of it has been objected to by some, on the supposition that it may fill retain a portion of the metal; and hitherto it has, we believe, been but little employed.

Crystallized acid of tartar. Sucr.

203 Take of prepared chalk, frequently washed with warm water, two pounds; spring water, 32 pounds. After flight boiling, by degrees add of cream of tartar 7 pounds, or as much as is sufficient for saturation. Removing the vessel from the fire, let it stand for half an hour, then cautiously pour off the clear liquor into a glass vessel. Wash the residuum or tartaraceous felenites by pouring water on it three or four times. To this residuum afterwards add of weak vitriolic acid 16 pounds, let it be digested for a day, frequently stirring it with a wooden spatula. After this pour the acid liquor into a glass vessel; but with the residuum mix 16 pounds of spring water; strain it through paper, and again pour water on the residuum till it become infused. Let the acid liquors mixed together in a glass vessel be boiled to the confinence of a thin syrup; which being strained, must be set apart for the formation of crystals. Let the crystals collected after repeated distillations be dried on paper, and afterwards kept in a dry place.

If before crystallization a little of the impregnated acid liquor be diluted with four times its quantity of pure water, and a few drops of vinegar of litharge be put into it, a white sediment will immediately be deposited. If a few drops of the diluted nitrous acid be then added, the mixture will become limpid, if the tartaraceous liquor be pure and entirely free from the vitriolic acid; but if it be not, it will become white. This fault, however, may be corrected, if the acid of tartar be diluted with fix pounds of water and a few ounces of the tartaraceous felenites be added to it. After this it may be digested, strained, and crystallized.

By this process, the acid of tartar may be obtained in a pure solid form. It would, however, be perhaps an improvement of the process, if quicklime were employed in place of chalk. For Dr Black has found that quicklime absorbs the whole of the tartaraceous acid, and then the supernatant liquor contains only the alkaline part of the tartar; whereas, when chalk is employed, it contains a solution of soluble tartar, the chalk taking up only the superabundant acid. By this method then a greater quantity of tartaraceous acid might be obtained from the sediment. The tartaraceous acid has not hitherto been much employed in its pure state. But besides being useful for some purposes in medicine, for which the cream of tartar is at present in use, and where that superfaturated neutral may be less proper, there is also reason to suppose, that from the employment of the pure acid, we should arrive at more certainty in the preparation of the antimonial tartarizatum, on tartar emetic, than by employing the cream of tartar, the proportion of acid in which varies very much from different circumstances. The pure acid of tartar might also probably be employed with advantage for bringing other metallic substances to a stable state.

Distilled acid of tar tar. Sucr.

204 Let pounded crude tartar be put into a tubulated earthen or iron retort till it fills about two-thirds of it, and let distillation be performed by gradually increasing the heat. Into the recipient, which should be very large, an acid liquor will pass over together with the oil; which being separated from the oil, must again be distilled from a glass retort. If the residuum contained in the earthen or iron retort be diluted with water, strained through paper, and boiled to dryness, it gives what is called the alkali of tartar. If this do not appear white, it may be made so by burning, solution, straining, and evaporation.

This is another mode of obtaining both the acid and alkali of tartar in a pretty pure state; and, as well as the former, it is not unworthy of being adopted into our pharmacopoeias.

Aerated water. Roff.

205 Let spring water be saturated with the fixed air, or aerial acid, arising from a solution of chalk in vitriolic acid, or in any similar acid. Water may also be impregnated by the fixed air rising from fermenting liquors.

The aerial acid, on which we have already occasion to
to make some observations, besides the great influence which it has as affecting different saline bodies into whose composition it enters, is also frequently employed in medicine, with a view to its action on the human body. The late ingenious Dr. Dobson, in his Commentary on Fixed Air, has pointed out many purposes for which it may be usefully employed, and several different forms under which it may be used. But there is no form under which it is at present more frequently had recourse to than that of aerated or mephitic water, as it has often been called. And although not preparative on Fixed Air, has pointed out properties of a well known and sufficiently simple apparatus, contrived by that ingenious philosopher Dr. Nootz. Such a machine ought, we think, to be kept in every shop for the more ready preparation of this fluid. Water properly impregnated with the aerial acid has an agreeable acidulous taste. It is often employed with great advantage in the way of common presence, and by calculous patients. But besides this, it furnishes an excellent vehicle for the exhibition of many other medicines.

Besides the simple aerated water, the Pharmacopoeia Rosica contains also an aqua aérea fixi martialis, or ferruginous aerated water. This is prepared by suspending iron wires in that water till the water be fully saturated with the metal. And in consequence of this acid, simple water becomes a menstruum both for different metallic and earthy substances. But water in this state may be considered rather as fitted for those purposes for which chalybeates are in use, than as a preparation of the aerial acid.

Still oil of amber. L.

Take of amber two pounds. Distil in a sand heat, gradually augmented; an acid liquor, oil, and salt impregnated with oil, will ascend.

On this article we have already offered some observations under the head of Effential Oils. The directions here given by the London college differ chiefly from those of the Edinburgh college formerly mentioned, in no sand being employed: But when care is taken that the sand be pure, it can give no improper impregnation to the medicine, and may prevent some inconveniences in the distillation, particularly that of the amber rising in sub stance into the receiver.

Purified salt of amber. L.

Take of salt of amber half a pound; distilled water, one pint. Boil the salt in the distilled water, and let aside the solution to crystallize.

Salt of amber, when perfectly pure, is white, of an acid taste, and not un grateful. It requires, for its solution, of cold water, in summer, about twenty times its weight; and of boiling water about twice its weight; it is scarcely soluble in redistilled spirit without the assistance of heat.

PHARMACY.

It is given as a cooling diuretic in doses of a few grains, and also in hysterical compositions.

Flowers of benzoin.

Take of benzoin, in powder, one pound. Put it into an earthen pot, placed in sand; and, with a flow fire, sublime the flowers into a paper cone fitted to the pot.

If the flowers be of a yellow colour, mix them with white clay, and sublime them a second time. L.

Put any quantity of powdered benzoin into an earthen pot, to which, after fitting it with a large conical paper cap, apply a gentle heat that the flowers may sublime. If the flowers be impregnated with oil, let them be purified by solution in warm water and crystallization. E.

Benzoin, exposed in a retort to a gentle fire, melts, and sends up into the neck white, fuming crystalline flowers, which are followed by an oily substance. These flowers, which are at present considered as a peculiar acid, are by some termed acidum benzoeicum. On raising the heat a little (a recipient being applied to the neck of the retort), a thin yellow oil comes over, intermixed with an acid liquor, and afterwards a thick butyrous substance: this last, liquified in boiling water, gives out to it a considerable quantity of fatty matter (separable by filtration and proper evaporation), which appears in all respects similar to the flowers.

It appears, therefore, that the whole quantity of flowers which benzoin is capable of yielding, cannot be obtained by the above processes, since a considerable portion arises after the time of their being discontinued. The greatest part of the flowers arise with a less degree of heat than what is necessary to elevate the oil; but if the operation be hastily conducted, or if the fire be not exceedingly gentle, the oil will arise along with the flowers, and render them foul. Hence in the way of trade, it is extremely difficult to prepare them of the requisite whiteness and purity; the heat which becomes necessary, when large quantities of the benzoin are employed, being too great as to force over some of the oil along with them.

In order, therefore, to obtain these flowers in perfection, only a small quantity of benzoin should be put into the vessel at a time; and that this may not be any impediment to the requisite dispatch, a number of shallow, flat bottomed, earthen dishes may be employed, each fitted with another vessel inverted over it, or a paper cone. With these you may fill a sand furnace; having fresh dishes charged in readiness to replace those in the furnace, as soon as the process shall appear finished in them: the residuum of the benzoin should be scraped out of each of the vessels before a fresh parcel be put in.

These flowers, when made in perfection, have an agreeable taint and fragrant smell. They totally dissolve in spirit of wine; and likewise by the assistance of heat, in water; but separate again from the latter upon the liquor's growing cold, floating into saline fatty, which unite together into irregular masses. By the mediation of sugar they remain suspended in cold water, and thus form an elegant balsamic syrup. Some have held them in great esteem as pectoral and

fudorific
Take of tartar, what quantity you please. Roll it up in a piece of moist bulbus paper, or put it into a crucible, and surrounding it with live coals, burn it to a coal; next, having beat this coal, calcine it in an open crucible with a moderate heat, taking care that it do not melt, and continue the calcination till the coal becomes of a white, or at least of an ash, colour. Then dissolve it in warm water; strain the liquor through a cloth, and evaporate it in a clean iron vessel; diligently stirring it towards the end of the process with an iron spatula, to prevent it from sticking to the bottom of the vessel. A very white salt will remain, which is to be left a little longer on the fire, till the bottom of the vessel becomes almost red. Lastly, when the salt is grown cold, let it be put up in glass vessels well that.

Native tartar is a saline substance, compounded of an acid, of a fixed alkali, and of oily visous, and colouring matter. The purpose of the above process is, to free it from every other matter but the fixed alkali. From the mistaken notion that tartar was essentially an acid mixed only with impurities, it has been generally supposed that the effect of this operation was the conversion of an acid into an alkali by means of heat. But since Mr Scheele has discovered that the proper matter of tartar, freed from the oily and colouring parts is really a salt compounded of an acid, which is predisminant, and a fixed alkali, we have no farther need of such an obscure theory. The acid of the tartar by this process is dissipated by means of the heat; and the oily, visous, and colouring matters, are partly dissipated, and partly brought to the state of inflammable earthy matter, easily separable by the future dissimulation from the alkali, wherewith they were loosely combined. But by the last of these processes, something farther is carried on than the separation of the more palpable foreign matters. By allowing the salt, freed from the water of the lixivium, to remain on the fire till the bottom of the vessel become almost red, any oily matter that may still be present seems to be decomposed by the united action of the heat and fixed alkali, forming with a part of the latter, by their reciprocal action, a volatile alkali salt, which is forthwith discharged in elastic vapours. Besides the complete discharge of the above principles, the remaining fixed alkali also suffers a considerable loss of its fixed air, or aerial acid; with which, when fully saturated, it forms the imperfect neutral salt, denominated by Dr Black mild fixed alkali: on this account it is somewhat caustic, considerablv deliquecant, and in proportion to its poofeering these properties more or less, it more or less nearly approaches to the state of pure alkali. It is not, however,

ever, so essentially deprived of fixed air as to be sufficiently caustic for a number of purposes. Where causticity is not required, the salt thus purified is abundantly fit for most pharmaceutical purposes; but as native tartar generally contains small portions of neutral salts besides the foreign matters already noticed, it is necessary if we wish to have a very pure alkali for nice operations, to employ crystallization and other means, besides the process here directed.

The white and red sorts of tartar are equally fit for the purpose of making fixed salt; the only difference is, that the white affords a somewhat larger quantity than the other; from 16 ounces of this sort, upwards of four ounces of fixed alkaline salt may be obtained. The use of the paper is to prevent the smaller pieces of the tartar from dropping down into the ash-hole, through the interstices of the coals, upon first injecting it into the furnace.

The calcination of the salt (if the tartar was sufficiently burnt at first) does not increase its strength so much as is supposed; nor is the greenish or blue colour any certain mark either of its strength, or of its having been, as was formerly supposed, long exposed to a vehement fire: for if the crucible be perfectly clean, close covered, and has stood the fire without cracking, the salt will turn white, though kept melted and reverberated ever so long; while, on the other hand, a slight crack happening in the crucible, or a spark of coal falling in, will in a few minutes give the salt the colour admired. The colour in reality is a mark rather of its containing some inflammable matter than of its strength.

The vegetable alkali prepared from tartar has now no place in the London pharmacopœia, or at least it is included under the following article.

Prepared kali. L.

Take of pot-ash, two pounds; boiling distilled water, three pints. Dissolve and filter through paper; evaporate the liquor till a pellicle appears on the surface; then set it aside for a night, that the neutral-salts may crystallize; after which pour out the liquor, and boil away the whole of the water, constantly stirring, lest any salt should adhere to the pot. In like manner is purified impure kali from the ashes of any kind of vegetable. The same salt may be prepared from tartar burnt till it becomes of an ash-colour.

Fixed vegetable alkaline salt purified. E.

Let the fixed alkaline salt, called in English pearl-ash, be put into a crucible, and brought to a somewhat red heat, that the oily impurities, if there be any, may be consumed; then having beat and agitated it with an equal weight of water, let them be well mixed. After the feces have fubided, pour the ley into a very clean iron pot, and boil to dryness, diligently stirring the salt towards the end of the process, to prevent its sticking to the vessel. This salt, if it hath been rightly purified, though it be very dry, if rubbed with an equal weight of water, may be dissolved into a liquor void of colour or smell.

The potash used in commerce is an alkali mixed with a considerable quantity of remaining charcoal; U u sulphur,
sulphur, vitriolated tartar, and oily matter. In the large manufactures, the alkaline part is indeed confi-
doubtedly freed from impurities by mixing the weed-
ishes with water, evaporating the clear ley, and burn-
ing the residuum in an oven; but besides that this pro-
cess is insufficient for the complete separation of the
impurities, it also superadds a quantity of fliny mat-
ter, giving to the alkali the pearl appearance (whence
its name), and rendering it altogether unfit for phar-
macetical purposes. By the processes here directed,
the alkali is effectively freed from all these hetro-
geous matters, excepting perhaps a small proportion
of vitriolated tartar, or other neutral salts, which may
generally be neglected. As in the process no af-
ter calcination is directed, it is probable that the fix-
ced alkali thus prepared will not prove so caustic, that
to be, is not to be considerably deprived of fixed air,
as in the process directed for preparing the salt of tar-
tar. It is, however sufficiently pure for most purp-
oposes; and we consider the above processes as the most
convenient and cheap method of obtaining the vege-
table fixed alkali in its mild state.

The purified vegetable alkali has been known in our
pharmaceuticals under the different names of salt of
warm wood, salt of tartar, &c. But all these being now
known to be really the same, the terms, as leading to
error, have been with justice expunged; and it has been
a defideratum to discover some short name equally ap-
licable to the whole. The term employed by the
Edinburgh college is too long, being rather a descrip-
tion than a name; but to that employed by the Lon-
don college, Kali, objections have also been made.
And it must be allowed, that besides the inconvenience
which arises from its being an indeclinable word, the
foillf alkali is equally intitled to the same appellation.
Besides this, as a considerable portion of the foiff
alkali is prepared from burning a vegetable growing on
the sea coasts, which has the name of kali, the Kali
phosphatium of Linne, some apparent contradiction and
ambiguity may therefore arise. And the London col-
lege would perhaps have done better, if they had
adopted the term Potash; a name which has been ap-
propriated to this salt by some of the most eminent mo-
 dern chemists.

The purified potash is frequently employed in me-
dicine in conjunction with other articles, particularly
for the formation of saline neutral draughts and mix-
tures: But it is used also by itself in doses from three
or four grains to 15 or 20; and it frequently ope-
rates as a powerful diuretic, particularly when aided by
proper dilution. See Pearl-Ash and Pot-Ash.

Water of kali. L.

Take of kali, one pound, fet it by in a moist place
until it be dissolved, and then strain it.

This article had a place in former editions of our
pharmaceuticals under the titles of lay of tartar or oil
of tartar per dilution, &c. It is now considered as a
merely watery solution of the mild vegetable alkali,
formed by its attracting moisture from the air; and therefore it is with propriety styled the
water of kali.

The solutions of fixed alkaline salts, made by ex-
posing them to a moist air, are generally considered
as being purer than those made by applying water
directly; for though the salt be repeatedly dissolved
in water, filtered, and extirpated; yet, on being li-
quified by the humidity of the air, it will still de-
posite a portion of earthy matter: but it must be ob-
erved, that the extirpated salt leaves always an earthy
matter on being dissolved in water, as well as on be-
ing deliquated in the air. Whether it leaves more in
the one way than in the other, is not determined with
precision. The deliquated lixivium is said to contain
nearly one part of alkaline salt to three of an aque-
ous fluid. It is indifferent, in regard to the lixivium
itself, whether the white ashes of tartar, or the salts
extracted from them, be used; but as the ashes leave
a much greater quantity of earth, the separation of the
ley proves more troublesome.

The water of kali of the present edition of the Lon-
don pharmacopoeia, may then be considered as an im-
provement of the lixivium tatar of their former edi-
tion. But the Edinburgh college, considering this fo-
lution as being in no respect different from that made
by pure water, have entirely rejected this preparation
from their pharmacopoeia, and probably with justice.

Water of pure kali. L.

Take of kali, four pounds; quicklime, six pounds;
diluted water four gallons. Put four pints of water
to the lime, and let them stand together for an hour;
after which, add the kali and the rest of the water;
them boil for a quarter of an hour: sufter the liquor to cool, and strain. A pint of this
liquor ought to weigh 16 ounces. If the liquor effervesces with any acid, add more lime.

A preparation similar to this had a place in the
former edition of the London pharmacopoeia, un-
der the title of soap-ley. Quicklime, by depriving
the mild alkali of its aerial acid, renders it caustic;
hence this ley is much more acrimonious, and ade-
pt more powerfully as a menstruum of oils, fats, &c.

The soap ley should be used fresh from the kettle;
by long keeping, even in close vessels, it loses its strength; such should be made choice of as is thoroughly burnt or calcined,
which may be known by its comparative lightness.

All the instruments employed in this proceed
should be either of wood, earthen ware, or glass; the
common metallic ones would be corroded by the ley,
sO as either to discolor or communicate disagreeable
qualities to it. If it should be needful to filter or strain
the liquor, care must be taken that the filter or strainer
be of vegetable matter: woollen, silk, and that
sort of filtering paper which is made of animal sub-
stances, are quickly corroded and disioded by it.

The liquior is most conveniently weighed in a nar-
row-necked glass bottle, of such a size, that the mea-
sure of a wine pint way arise some height into its neck;
the place to which it reaches being marked with a
diamond. A pint of the common leys of our soap-
makers weighs more than 16 ounces: it has been
found that their soap-ley will be reduced to the stan-
dard here proposed, by mixing it with something
less than an equal measure of water.

Although this liquor is indeed pure alkali dissolved
in water, yet we are inclined to give the preference
Part II.  

PHARMACY.

Preparations and Compotions.

To the name employed by the Edinburgh college, as well as to the modes of preparing it, directed in the following formula.

**Caustic ley.** E.

214 Take of fresh burnt quicklime, eight ounces; purified fixed vegetable alkaline salt, six ounces. Throw the quicklime, with 28 ounces of warm water, into an iron or earthen vessel. The ebullition, and extinction of the lime being perfectly finished, instantly add the alkaline salt, and having thoroughly mixed them, let the vessel till it cool. Stir the cooled matter, and pour out the whole into a glass funnel, whose throat must be filled up with a piece of clean rag. Let the upper mouth of the funnel be covered, while the tube of it is inserted into a glass vessel, so that the ley may gradually drop through the rag into that vessel. When it first gives over dropping, pour into the funnel some ounces of water; but cautiously, and in such a manner, that the water shall swim above the matter. The ley will again begin to drop, and the affusion of water is to be repeated in the same manner, until three pounds have dropped, which takes up the space of two or three days; then agitating the inferior and interior parts of the ley together, mix them, and put up the liquor in a well flat vessel.

If the ley be rightly prepared, it will be void of colour or smell: nor will it raise an effervescence with acids except perhaps a very slight one. Colour and odour denote the salt not sufficiently calcined; and effervescence, that the quicklime has not been good.

The reasons and propriety of the different steps in the above process will be best understood by studying the theory on which it is founded. The principle of mildness in all alkaline salts, whether fixed or volatile, vegetable or fossil, is very evidently fixed air, or the aerial acid: But as quicklime has a greater attraction for fixed air than any of these salts, so if this substance be presented to any of them, they are thereby deprived of their fixed air, and forthwith become caustic. This is what precisely happens in the above process. The propriety of closely shutting the vessels through almost every step of the operation, is sufficiently obvious; viz. to prevent the absorption of fixed air from the atmosphere, which might defeat our intentions. When only a piece of cloth is put into the throat of the funnel, the operation is much more tedious, because the pores of the cloth are soon blocked up with the wet powdery matter. To prevent this, it may be convenient to place above the cloth a piece of fine Fly's wirework; but as metallic matters are apt to be corroded, the method used by Dr. Black is the most eligible. The doctor first drops a rugged stone into the tube of the funnel, in a certain place of which it forms itself a firm bed, while the inequalities on its surface afford interstices of sufficient size for the passage of the filtering liquor. On the upper surface of this stone he puts a thin layer of lint or clean tow; immediately above this, but not in contact with it, he drops a stone similar to the former and of a size proportioned to the swell in the upper part of the tube of the funnel. The interstices between this second stone and the funnel are filled up with flint of a less dimension, and the graduation uniformly continued till pretty small flint is employed. Finally, this is covered with a layer of earthen hand and small flint to sustain the weight of the matter, and to prevent its being invad in the minute interstices of the flask. The throat of the funnel being thus built up, the flinty fabric is to be freed of clay and other adhering impurities, by making clean water pass through it till the water seems clear and transparent from the extremity of the funnel. It is obvious, that in this contrivance, the author has, as usual copied nature in the means he employs to deprive watery matters in the bowels of the earth; and it might be usefully applied for the filtration of various other fluids.

It is a very necessary caution to pour the water gently into the funnel; for if it be thrown in a forcible stream, a quantity of the powdery matter will be washed down, and render all our previous labour useless. That part of the ley holding the greatest quantity of salt in solution will no doubt be heaviest, and will consequently sink lowest in the vessel: the agitation of the ley is therefore necessary, in order to procure a solution of uniform strength through all its parts. If the salt has been previously freed of oily and other inflammable matters, this ley will be colourless and void of smell. If the quicklime has been so effectually deprived of its own fixed air, as to be able to absorb the whole of that in the alkali, the ley will make no effervescence with acids, being now deprived of fixed air, to the discharge of which by acids this appearance is to be ascribed in the mild or aerated alkalis.

The caustic ley is therefore to be considered as a solution of pure alkali in water. See the article Fixed Air.

It may be proper to observe, for the sake of understanding the whole of the theory of the above process, that while the alkali has become caustic, from being deprived of fixed air by the quicklime, the lime has in its turn become mild and insoluble in water from having received the fixed air of the alkali.

The caustic ley, under various pompous names, has been much used as a lithontriptic; but its fame is now beginning to decline. In acridities in the stomach, attended with much flatulence and laxity, the caustic ley is better adapted than mild alkalis; as in its union with the acid matter it does not separate air. When covered with mucilaginous matters, it may be safely taken into the stomach: and by stimulating, it coincides with the other intentions of cure; by some dyspeptic patients it has been employed with advantage.

**Pure kali.** L.

Take of water of pure kali, one gallon. Evaporate it to dryness; after which let the salt melt on the fire, and pour it out.

*The strongest common caustic.* E.

Take of caustic ley, what quantity you please. Evaporate it in a very clean iron vessel on a gentle fire, till,
PHARMACY.

The effect of the above processes is simply to discharge the water of the solutio, whereby the cauticinity of the alkali is more concentrated in any given quantity. These preparations are strong and funded caulitics. The cautic prepared in this way has an inconvenience of being apt to liquify too much on the part to which it is applied, so that it is not easily confined within the limits in which it is intended to operate; and indeed the suddenness of its action depends on this disposition to liquify.

Lime with pure kali. L.

Take of quicklime, five pounds and four ounces; water of pure kali, 16 pounds by weight. Boil away the water of pure kali to a fourth part; then sprinkle in the lime, reduced to powder by the af-fusion of water. Keep it in a vessel close floped.

The milder common cautic. E.

Take of cautic ley, what quantity you please. Evaporate in an iron vessel till one third remains; then mix with it as much new flaked quicklime as will bring it to the consistencie of pretty solid pap, which is to be kept in a vessel closely sloped.

These preparations, do not essentially differ from each other, while the chief difference between the present formula, and that which is adopted in the London Pharmacopoeia, is in the name. It was then styled the strongest common cautic.

Here the addition of lime in substance renders the preparation left apt to liquify than the foregoing, and consequently it is more easily confined within the intended limits, but proportionally flower in its operation. The design of keeping or of flaking the lime is, that its acrimony may be somewhat abated.

Exposed long to the air, these preparations gradually renew their power of effervescence, and lose proportionally the additional activity which the quicklime had produced in them.

Prepared natron. L.

Take of barilla, powdered, two pounds; distilled water, one gallon. Boil the barilla in four pints of water for half an hour, and strain. Boil that part which remains after draining with the ret of the water, and strain. Evaporate the mixed liquors to two jints, and let them by for eight days; strain this liquor again; and, after due boiling, let it aside to crystallize. Dissolve the crysials in distilled water; strain the solution, boil, and set it aside to crystallize.

The name of natron, here used by the London college for the fixed soflalkali, has, as well as their name for the vegetable alkali, been objected to. And though they are here supported by the authority of the ancients, yet perhaps they would have done better in following the best modern chemists by employing the term salt of soda. This article differs in name only from the following.

Fixed soflalkali salt purified. E.

Take of ashes of Spanish kali, commonly called soda or barilla, as much as you please. Bruise them; then boil in water till all the salt be dissolved. Strain this through paper, and evaporate in an iron vessel, so that after the liquor has cooled the salt may con­crete into crysials.

By the above processes, the soflalkali is obtained sufficiently pure, being much more disposed to crys­tallize than the vegetable alkali; the admixture of this last, objected to by Dr. Lewis, is hereby in a great measure prevented.

It is with great propriety, that in this, as well as many other processes, the London college directs the use of distilled water, as being free from every impreg­nation.

The natron, or soflalkali, is found lying on the ground in the island of Tenerife, and some other count­ries. The native productions, of this alkali seem to have been better known to the ancients than to late naturalists; and it is, with good reason, supposed to be the nitre of the Bible. How far the native natron may supersede artificial means to procure it from mixed bod­ies, we have not been able to learn with certainty.

The soflalkali is not only a constituent of different neutrals, but is also sometimes employed as a medicine by itself. And in its purified state it has been by some reckoned useful in affections of the scrofulous kind. See NATRUM.

Prepared ammoniac. L.

Take of sal ammoniac, powdered one pound; prepared chalk, two pounds. Mix and sublame.

Water of ammoniac. L.

Take of sal ammoniac, one pound; pot-ash, one pound and a half; water, four pints. Draw off two pints by distillation, with a low fire.

Volatile alkali from sal ammoniac, commonly called vola­tilis sal ammoniacus.

Take of ammoniac, one pound; chalk, very pure and dry, two pounds; mix them well, and sublimate from a retort into a refrigerated receiver.

Spirit of Sal ammoniacus. E.

Take sal ammoniac, purified vegetable fixed alkali, of each sixteen ounces; water, two pounds. Having mixed the salts, and put them into a glass retort, pour in the water; then distil dryness with a sand-bath, gradually raising the heat.

These articles, which in the last edition of the London Pharmacopoeia were styled the volatile salt and spirit of sal ammoniacus, were then directed to be prepared in the same manner.

Sal ammoniacus is a neutral salt, composed of volatile alkali and marine acid. In these processes the acid is absorbed by the fixed alkali or chalk; and the volatile alkali is of course set at liberty.

The volatile alkali is, however, in its mild state, being
being combined with the fixed air, or discharged from the fixed alkali or chalk on their uniting with the mutriastic acid.

The fixed alkali begins to act on the salt ammoniac, and extricates a pungent urinous odour as soon as they are mixed. Hence it is most convenient not to mix them till put into the distilling vessel. The two salts may be dissolved separately in water, the solutions poured into a retort, and a receiver immediately fixed on. An equal weight of the fixed salt is fully, perhaps more than sufficient to extract all the volatile.

Chalk does not begin to act on the salt ammoniac till a considerable heat be applied. Hence they may be without inconvenience, and indeed ought to be thoroughly mixed together before they are put into the retort. The surface of the mixture may be covered with a little more powdered chalk, to prevent such particles of the salt ammoniac as may happen to lie uppermost from subliming unchanged. Though the fire must here be much greater than when fixed alkaline salt is used, it must not be strong, nor suddenly raised; for if it be, a part of the chalk (though of itself not capable of being elevated by any degree of heat) will be carried up along with the volatile salt. M. du Hamel experienced the justness of this observation. He relates in the Memoirs of the French Academy of Sciences for the year 1735, that he frequently found his volatile salt, when a very strong fire was used in the sublimation, amount to more, sometimes by a half, than the weight of the crude salt ammoniac employed; and although not three fourths of this concrete are pure volatile salt, yet the fixed earthy matter, when once volatilized by the alkali, rose along with it again on the gentle sublimation, dissolved with it in water, and exhaled with it in the air.

When all the salt has sublimed, and the receiver grown cool, it may be taken off, and luted to another retort charged with fresh materials. This process may be repeated till the recipient appears lined with volatile salt to a considerable thickness of the vessel must then be broken in order to get out the salt.

The volatile salt and spirit of salt ammoniac are the purest of all the medicines of this kind. They are somewhat more acrimonious than those produced directly from animal substances, which always contain a portion of the oil of the subject, and receive from thence some degree of a pungent quality. These salt may be reduced to the same degree of purity by combining them with acids into ammoniacal salts, and afterwards recovering the volatile alkali from these compounds by the processes above directed.

The matter which remains in the retort after the distillation of the spirit, and sublimation of the volatile salt ammoniac, is found to confine of marine acid united with the fixed alkali or chalk employed. When fixed alkaline salt has been used as the intermediate, the residuum, or caput mortuum as it is called, yields, on solution and crystallization, a salt exactly similar to the spirit of sea-salt coagulated afterwards described; and hence we may judge of the extraordinary virtues formerly attributed to this salt under the names of sal antiphisfericium, antiphosphoricium, fœbrisfæcum, digestfæcum Sylvia, &c.

The caput mortum of the volatile salt, where chalk is employed as an intermediate, exposed to a moist air, runs into a pungent liquor, which proves nearly the same with a solution of salt made directly in the marine acid. It is called by some oleum creat, oil of chalk. If calcined shells, or other animal limes, be mingled with salt ammoniac, a mass will be obtained, which likewise deliquesces in the air, and forms a liquor of the same kind.

**Water of pure ammonia.**

Take of salt ammoniac, one pound; quicklime, two pounds; water one gallon. Add to the lime two pints of the water. Let them stand together an hour; then add the salt ammoniac and the other fix pints of water, boiling, and immediately cover the vessel. Pour out the liquor when cold, and distil off with a slow fire one pint.

**Caustic volatile alkali, commonly called spirit of salt ammoniac with quicklime.**

Take of quicklime, fresh burnt, two pounds; water, one pound. Having put the water into an iron or fire-ware vessel, add the quicklime previously heated, cover the vessel for 24 hours; when the lime has fallen into a fine powder, put it into the retort; then add 16 ounces of salt ammoniac, diluted with four times its weight of water; and, shutting the mouth of the retort, mix them together by agitation. Lastly, distil it into a refrigerated receiver, with a very gentle heat, so that the operator can easily bear the heat of the retort applied to his hands. Twenty ounces of liquor are to be drawn off. In this distillation the vessels are to be so luted as thoroughly to exclude the vapours, which are very penetrating. After the distillation, however, they are to be opened, and the alkali poured out before the retort hath altogether cooled.

The theory of this process is precisely the same with that directed for the preparation of caustic ley. The effect of the quicklime on the salt ammoniac is very different from that of the chalk and fixed alkali in the foregoing process. Immediately on mixture a very penetrating vapour exhaled; and in distillation the whole of the volatile salt arises in a liquid form, no part of it appearing in a concrete state, how gently forever the liquor be re-distilled. This spirit is far more pungent than the other both in smell and taste; and, like fixed alkalis rendered caustic by the same intermedium, it raises no effervescence on mixture with acids. The whole of the phenomena are to be ascribed to the absorption of fixed air from the alkali by means of the quicklime; and from being thus deprived of the aerial acid the volatile alkali is brought to a caustic state.

This spirit is held to be too acrimonious for internal use, and has therefore been chiefly employed for smelting to in fainings, &c. though when properly diluted it may be given inwardly with safety. It is a powerful menstruum for some vegetable substances, as Peruvian barks, from which the other spirits extract little. It is also most convenient for the purpose of rendering oil miscible with water, as in the preparation of what is called in extemporaneous practice the oily mixture.

Some have mixed a quantity of this with the official spirits both of salt ammoniac and of hartshorn; which thus become more pungent, so as to bear an addition.
addition a considerable quantity of water, without any danger of the discovery from the taste or smell. This abuse would be prevented, if what has been formerly laid down as a mark of the strength of these spirits, some of the volatile salt remaining undissolved in them, were attended to. It may be detected by adding to a little of the suspected spirit about one-fourth its quantity or more of rectified spirit of wine; which, if the volatile spirit be genuine, will precipitate a part of its volatile salt, but occasions no visible separation or change in the caustic spirit, or in those which are sophificated with it.

Others have substitutted for the spirit of sal ammoniac a solution of crude sal ammoniac and fixed alkaline salt mixed together.

This mixture deposits a saline matter on the addition of spirit of wine, like the genuine spirit; from which, however, it may be distinguished, by the salt which is thus separated not being a volatile alkaline, but a fixed neutral salt. The abuse may be more readily detected by a drop or two of solution of silver in aquafortis, which will produce no change in the appearance of the true spirit, but will render the counterfeit turbid and milky.

The volatile liquor, salt, and oil of hartshorn. L.

Take of hartshorn, ten pounds. Distill with a fire gradually increased. A volatile liquor, salt, and oil, will ascend. The oil and salt being separated, distill the liquor three times. To the salt add an equal weight of prepared chalk, and sublimate thrice, or till it become white.

The same volatile liquors, salt and oil, may be obtained from any parts (except the fat) of all kinds of animals.

The volatile alkali obtained from hartshorn, whether in a solid or fluid state, is precisely the same with that obtained from sal ammoniac. And as that proceeds is the easiest, the Edinburgh college have entirely rejected the present. While, however, the names of spirit and salt of hartshorn are still in daily use, ammonia, or the volatile alkali, is still prepared from bones and other animal substances by several very extensive traders.

The dealers have very large pots for the distillation of hartshorn, with earthen heads almost like those of the common still; for receivers, they use a couple of oil jars, the mouths of which are luted together; the pipe that comes from the head enters the lowermost jar through a hole made on purpose in its bottom. When a large quantity of the subject is to be distilled, it is customary to continue the operation for several days successively; only unloosening the head occasionally to put in fresh materials.

When only a small quantity of spirit or salt is wanted, a common iron pot, such as is usually fixed in tand furnaces, may be employed, an iron head being fitted to it. The receiver ought to be large, and a glass, or rather tin adoptor, inserted between it and the pipe of the head.

The distilling vessel being charged with pieces of the horn, a moderate fire is applied, which is slowly increased, and raised at length almost to the utmost degree. As first a watery liquor arises, the quantity of which will be smaller or greater according as the horns were more or less dry; this is succeeded by the salt and oil; the salt at first dissolves as it comes over in the phlegm, and thus forms what is called spirit. Preparations.

When the phlegm is saturated, the remainder of the volatile alkali, is a solid form to the fides of the recipient. If it be required to have the whole of the salt solid and undissolved, the phlegm should be removed as soon as the salt begins to arise, which may be known by the appearance of white fumes; and that this may be done the more commodiously, the receiver should be left unloosed till this first part of the process be finished. The white vapours which now arise sometimes come with such vehemence as to throw off or burst the receiver. To prevent this accident, it is convenient to have a small hole in the luting, which may be occasionally stopped with a wooden peg, or opened, as the operator shall find proper. After the salt has all arisen, a thick dark-coloured oil comes over. The process is now to be discontinued; and the vessels, when grown cold, unloosed.

All the liquid matters being poured out of the receiver, the salt which remains adhering to its sides is to be washed out with a little water and added to the reil. It is convenient to let the whole stand for a few hours, that the oil may the better disengage itself from the liquor, so as to be first separated by a funnel, and afterwards perfectly by filtration through wet paper. The salt and spirit are then to be farther purified as above directed.

The spirit of hartshorn met with in the shops is extremely precarious in point of strength; the quantity of salt contained in it (on which its efficacy depends) varying according as the distillation in rectifying it is continued for a longer or shorter time. If after the volatile salt has arisen, so much of the phlegm or watery part be driven over as is just sufficient to dissolve it, the spirit will be fully saturated, and as strong as t can be made. If the process be not at this instant stopped, the phlegm, continuing to arise, must render the spirit continually weaker and weaker. The distillation therefore ought to be discontinued at this period, or rather while some of the salt still remains undissolved; the spirit will thus prove always equal, and the buyers be furnished with a certain criterion of its strength. Very few have taken any notice of the abovementioned inconvenience of these kinds of spirits; and the remedy is first hinted at in the Pharmacopoeia Reformata. The purity of the spirit is easily determined from its clearness and grateful odour.

Volatile alkaline salts, and their solutions called spirits, agree in many respects with fixed alkalis, and their solutions or leys; as in changing the colour of blue flowers to a green; effervescing, when in their cold state, with and neutralizing acids: liquefying the animal juices; and corroding the fleshly parts, so as, when applied to the skin, and prevented from exhaling by a proper covering, to act as caustics; dissolving oils and sulphur, though less readily than the fixed alkalis, on account probably of their not being able to bear any considerable heat, by which their activity might be promoted. Their principal difference from the other alkalis seems to consist in their volatility. They exhale or emit pungent vapours in the coldest state of the atmosphere; and by their stimulating smell they prove serviceable in langours and faintings. Taken internally, they discover a greater colliquating effect as well as stimulating power: the blood drawn from a vein
vein after their use has been continued for some time, is said to be remarkably more fluid than before; they are likewise more disposed to operate by perpiration, and to act on the nervous system. They are particularly useful in lethargic cases; in hysterical and hypochondriacal disorders; and in the languid, headachy, inflations of the stomach, flatulent colics, and other symptoms which attend them. They are generally found more serviceable to aged persons, and in phlegmatic habits, than in the opposite circumstances. In some fevers, particularly those of the low kind, accompanied with a cough, hoarseness, and a redundancy of phlegm, they are of great utility, raising the vital force, and exciting a salutary diaphoretic; but in putrid fevers, scurvy, and wherever the man of blood is thin and acrimonious, their use is ambiguous. As they are more powerful than the fixed in liquefying tenacious humour, so they prove more hurtful where the fluids are already in a colliquated state. In vernal intermitents, particularly those of the low kind, they are often the most efficacious remedy. Dr. Biflet observes, in his Essay on the Medical Constitution of Great Britain, that though many cafes occur which will yield to no other medicine than the bark, yet he has met with many which were only improved from time to time by the bark, but were completely cured by alkaline spirits. He tells us, that these spirits will often carry off vernal intermitents without any previous evacuation: but that they are generally more effectual if a purge be premised; and in plethoric or inflammatory cafes, or where the fever peritonea remittent, venefication is necessary.

These salts are most commodiously taken in a liquid form, largely diluted: or in that of a bolus, which should be made up only as it is wanted. The dose is from a grain or two to ten or twelve. Ten drops of a well made spirit, or saturated solution, are reckoned to contain about a grain of the salt. In intermitents, 15 or 20 drops of the spirit are given in a tea-cupful of cold spring water, and repeated five or six times in each intermission.

The volatile salts and spirits prepared from different animal substances, have been found to be capable of producing different effects on the human body, and to receive specific virtues from the subject. The salt of vipers has been esteemed particularly serviceable in disorders occasioned by the bite of that animal; and a falt drawn from the human skull, in diseases of the head. But modern practice acknowledges no such different effects from these preparations; and chemical experiments have shown their identity. There is indeed when not sufficiently purified, a very perceptible difference in the smell, taste, degree of pungency, and volatility of these salts; and in this state their medicinal virtues vary considerable enough to deserve notice; but this difference they have in common, according as they are more or less loaded with oil, not as they are produced from this or that animal substance. At first distilled, they may be looked on as a kind of volatile soap, in which the oil is the prevailing principle; in this state they have much less of the proper alkaline acrimony and pungency than when they have undergone repeated distillations, and such other operations as divest the oil from the salt; for by those means they lose their saponaceous quality, and acquiring greater degrees of acrimony, become medicines of a different class. These preparations therefore do not differ so much from each other, as they do from themselves in different states of purity.

To which may be added, that when we consider them as loaded with oil, the virtues of a distilled animal oil itself are likewise to be brought into the account. These oils, as first distilled, are highly fetid and offensive, of an extremely heating quality, and of such activity, that, according to Hoffman's account, half a drop dissolved in a dram of spirit of wine is sufficient to raise a copious sweat. By repeated rectifications, they lose their offensiveness, and at the same time become mild in their medicinal operation. The rectified oils may be given to the quantity of twenty or thirty drops, and are said to be anodyne and antiphlogistic, to procure a calm sleep and gentle sweat, without heating or agitating the body, as has been observed in treating of the animal oil. It is obvious, therefore, that the salts and spirits must differ, not only according to the quantity of oil they contain, but according to the quality of the oil itself in its different states.

The volatile salt and spirits, as first distilled, are of a brown colour, and a very offensive smell; by repeated rectification, as directed in the processes above set down, they lose great part of the oil on which these qualities depend, the salt becomes white, the spirit limpid as water, and of a grateful odour; and this is the mark of sufficient rectification.

It has been objected to the repeated rectification of these preparations, that, by separating the oil, it renders them similar to the pure salt and spirit of ammoniac, which are procurable at an easier rate. But the intention is not to purify them wholly from the oil, but to separate the graver part, and to sublimate the rest, so as to bring it towards the same state as when the oil is rectified by itself. The rectification of spirit of hart-thorn has been repeated twenty times successively, and found still to participate of oil, but of an oil very different from what it was in the first distillation.

The rectified oils, in long-keeping, become again fetid. The salt and spirits also, however carefully rectified, suffer in length of time the same change; re-uniting their original brown colour and ill smell; a proof that the rectification is far from having divested them of oil. Any intentions however, which they are thus capable of answering, may be as effectually accomplished by a mixture of the volatile alkali with the animal oil, in its rectified state, to any extent that may be thought necessary.

**Phlrazilated kali.**

Take of the salt which remains after the distillation of the nitrous acid, two pounds. Distilled water, two gallons. Burn out the superfluous acid with a strong fire in an open vessel: then boil it a little while in the water; strain and let the liquor aside to crystallize.

The salt thus formed is the same with the vitriolated tartar of the last edition of the London pharmacopoeia; but it is now prepared in a cheaper and easier manner, at least for those who distill the nitrous acid. In both ways a neutral is formed, confiding of the fixed vegetable.
table alkali, united to the vitriolic acid. But a similar
compound may also be obtained by the following
process of the Edinburgh pharmacopoeia.

Vitriolated fixed vegetable alkali, commonly called vitri-
olated tartar. E.

Take of vitriolic acid, diluted with six times its
weight of water, as much as you please. Put it into a ca-
cious glass vessel, and gradually drop it into, of
purified fixed vegetable alkali, diluted with six times its
weight of water, as much as is sufficient thoro-
guously to neutralize the acid. The effervescence
being finished, strain the liquor through paper;
and after proper evaporation, let it abide to crys-
tallize.

The operator ought to take care that the vapour
separated during the effervescence shall not be applied
to his nostrils; as fixed air, when applied to the olfac-
tory nerves, is highly deleterious to life.

This is an elegant and one of the least troublesome
ways of preparing this salt. The Edinburgh college,
in their former editions, ordered the acid liquid to be
dropped into the alkali; by the converse procedure
now received, it is obviously more easy to secure a
again a redundance of acidity; and for the greater
certainty in this point it may be expedient, as in the
foregoing process, to drop in a little more of the alka-
line ley than the cessation of the effervescence seems to
require.

In a former edition of the same pharmacopoeia, the
acid was directed to be diluted only with its equal
weight of water, and the alkali with that quantity of
water which is capable of imbiping from the atmo-
sphere. By that imperfection there was not water
enough to keep the vitriolated tartar dissol'ved; on
which account, as fast as the alkali was neutralized
by the acid, a great part fell to the bottom in a
powdery form. In order to obtain perfect and well
formed crystals, the liquor should not be set in the
cold, but continued in moderate heat, such as the
hand can fearfully bear, that the water may slowly eva-
porate.

It is remarkable, that although the vitriolic acid
and fixed alkaline salt do each readily unite with wa-
ter, and strongly attract moisture, even from the air,
yet the neutral resulting from the combination of these
two, vitriolated tartar, is one of the salts most diffi-
cult of solution, very little of it being taken up by cold
water.

Vitriolated tartar, in small doses, as a frupule or half
a dram, is an useful aperient; in large ones, as four or
drines, a mild cathartic, which does not pass so
harmfully as the bitter cathartic salt or salt of Glauber, and
seems to extend its action further. The whole sale deal-
ers in medicines have commonly substitued for it an
article otherwise almost ufeles in their shops, the re-
fuldium of Glauber's spirit of niter. This may be
looked on as a venal fraud, if the spirit has been pre-
pared as formerly directed, and the residuum dissolved
and crystallized: but it is a very dangerous one if the
vitriolic acid has been used in an over proportion, and
the caput mortuum employed without crystallization;
the salt in this case, instead of a mild neutral one, of
a moderately bitter taste, proving highly acid. The
 purchaser ought therefore to infall on the salt being in
a crystalline form. The crystals when perfect are ob-
long, with fix flat sides, and terminated at each end
by a fix- sided pyramid; some appear composed of two
pyramids joined together by the bases; and many, in
the most perfect crystallizations we have seen, are very
irregular. They decrepitate in the fire, somewhat like
those of sea-salt, for which they have sometimes been
miftaken.

Salt of many virtues. E.

Take nitre in powder, flowers of sulphur, of each
equal parts. Mix them well together, and inject the
mixture by little and little at a time into a red-
hot crucible; the deflagration being over, let the
salt cool, after which it is to be put up in a glass
vefel well shut. The salt may be purified by dis-
folving it in warm water, filtering the solution, and
exhaling it to dryness, or by crystallization.

This is another method of uniting the vitriolic acid
with the common vegetable fixed alkali. Both the
nitre and the sulphur are decomposed in the opera-
tion: the acid of the nitre, and the inflammable prin-
ciple of the sulphur, detene together, and are disfi-
pated; while the acid of the sulphur, (which, as we
have already seen, is no other than the vitriolic acid)
remains combined with the alkaline basis of the nitre.
The shops accordingly have substituted the foregoing
preparation for the sad pocheylest.

Vitriolated natron. L.

Take of the salt which remains after the distillation of
the muriatic acid, two pounds; distilled water,
two pints and an half. Burn out the superfluous
acid with a strong fire in an open vessel; then boil
it for a little in the water; strain the solution, and
set it by to crystallize.

Vitriolated fods, commonly called cathartic salt of
Glauber. E.

Dissolve in warm water the mass which remains after
the distillation of spirit of sea-salt: filter the solution,
and crystallize the salt.

The directions given for the preparation of this falls,
long known by the name of fal mirabile Glaubers, are
nearly the same in the pharmacopoeias of both colleges;
but those of the London college are to be preferred, as
being most accurate and explicit.

In a former edition of the Edinburgh pharma-
copoeia, it was ordered, that if the crystals (obtained as
above) proved too sharp, they should again be dissolved
in water, and the filtered liquor evaporated to such a
pitch only as may dispose the salt to crystallize. But
there is no great danger of the crystals proving too
sharp, even when the spirit of salt is made with the
largest proportion of oil of vitriol directed under that
proces. The liquor which remains after the crys-

tallization is indeed very acid; and with regard to this
preparation, it is convenient it should be f; for oth-
erwise the crystals will be very small, and likewise in a
small quantity. Where a sufficient proportion of oil
of vitriol has not been employed in the distillation of the
spirit, it is necessary to add some to the liquor, in
order to promote crystallization of the salt.

The title of cathartic falls, which this salt has often
had, exp refles its medical virtues. Taken from half
an ounce to an ounce, or more, it proves a mild and useful purgative; and in smaller doses, largely diluted, a serviceable aperient and diuretic. The flaps frequently substitute for it the bitter cathartic salt, which is nearly of the same quality, but somewhat more unpleasant, and, as is said, less mild in operation. They are very easily diluting by each other, by the effect of alkaline salts upon solutions of them. The solutions of Glauber's salt suffer no visible change from this addition, its own basis being a true fixed alkali; but the solution of the bitter cathartic salt grows instantly white and turbid; its basis, which is an earth, being extruded copiously by the alkaline salt.

Purified nitre. L.

Take of nitre two pounds; distilled water, four pints. Boil the nitre in the water till it be dissolved; strain the solution, and let it abide to crystallize. Common nitre contains usually a considerable portion of a feeble salt, which in this process is separated, the feeble salt remaining dissolved after the greatest part of the nitre has crystallized. The crystals which float after the first evaporation are large, regular, and pure: but when the remaining liquor is further evaporated, and this repeated a second or third time, the crystals prove at length small, imperfect, and tipt with little cubical crystals of feeble salt.

When rough nitre, in the state wherein it is first extracted from the earths impregnated with it, is treated in this manner, there remains at last a liquor called mother-liquor, which will no longer afford any crystals. This appears to participate of the nitrous and carbonic acids, and to contain an earthy matter dissolved by these acids. On adding alkaline lixivium, the earth is precipitated; and when thoroughly washed with water, proves infipid. If the liquor be evaporated to dryness, a bitterish saline matter is left; which being strongly calcined in a crucible, part with the acids, and becomes, as in the other case, infipid.

This earth has been celebrated as an excellent purgative, in the dose of a dram or two; and in smaller doses, as an alterative in hypochondriacal and other disorders. This medicine was for some time kept a great secret, under the name of magnesia alba, nitrous pumice, Count Pomat's powder, il poire albo Romano, puder de Scentiti, &c. till Lannehi made it public in his notes on the Metalllographia Vaticana. It has been supposed, that this earth is no other than a portion of the lime commonly added in the elixir of the nitre at the European nitre works: but though the specimens of magnesia examined by Neumann, and some of that which has lately been brought hither from abroad, gave plain marks of a calcareous nature; yet the true magnesia must be an earth of a different kind, calcareous earths being rather astringent than purgative. The earthy basis of the bitter cathartic salt is found to have the properties ascribed to the true magnesia of nitre, and appears to be the very same species of earth: from that salt therefore this medicine is now prepared, as will be seen hereafter. The magnesia alba differs from calcareous earths, in having a less powerful attraction for fixed air, and in not becoming caustic by calculation.

Acetated kali. L.

Take of kali one pound; boil it with a slow fire in four or five times its quantity of distilled vinegar; the effervescence ceasing, let there be added at different times more distilled vinegar, until the last vinegar being nearly evaporated, the addition of fresh will excite no effervescence, which will happen when about twenty pounds of distilled vinegar are consumed: afterwards let it be dried slowly. An impure salt will be left, which melts for a little while with a flow fire; then let it be distilled in water, and filtered through paper. If the fusion has been rightly performed, the strained liquid will be colourless; if otherwise, of a brown colour. Lastly, evaporate this liquor, with a fire, in a very shallow glass vessel; frequently stirring the mass, that the salt may be more completely dried, which should be kept in a vessel close stopped. The salt ought to be very white, and diffusive wholly, both in water and spirit of wine, without leaving any feces. If the salt although white, should deposite any feces in spirit of wine, that solution in the spirit should be filtered through paper, and the salt again dried.

Acetated fixed vegetable alkali, commonly called regenerat-ed tartar. E.

Take of salt of tartar one pound; boil it with a very gentle heat in a four or five times its quantity of distilled vinegar; and more distilled vinegar at different times, till on the water part of the former quantity being nearly dissipated by evaporation, the new addition of vinegar ceases to raise any effervescence. This happens when about twenty pounds by weight of distilled vinegar has been consumed. The impure salt remaining after the evaporation, is to be liquefied with a gentle heat for a short time, and it is proper that it should only be for a short time; then desolve it in water, and strain through paper. If the liquefaction has been properly performed, the strained liquor will be limpid, but if otherwise, of a brown colour. Evaporate this liquor with a very gentle heat in a shallow glass vessel, occasionally stirring the salt as it becomes dry, that its moisture may sooner be dissipated. Then put it up into a vessel very closely stopped, to prevent it from liquefying in the air.

This salt had formerly the name of diuretic salt in the London pharmacopoeia; but that which they now employ, or in preference to it, the name of continena acetata, gives a clearer idea of its nature.

The purification of this salt is not a little troublesome. The operator must be particularly careful, in melting it, not to use a great heat, or to keep it long liquefied; a little should be occasionally taken out, and put into water; and as soon as it begins to part freely with its black colour, the whole is to be removed from the fire. In the last drying, the heat must not be so great as to melt it; otherwise it will not prove totally soluble. If the solution in spirit of wine be exsiccated, and the remaining salt liquefied with a very gentle fire, it gains the leafy appearance which has procured it the name terra foliata.

X x
In the fourth volume of the Memoirs of the correspondents of the French Academy, lately published, Mr Cadet has given a method of making the salt white at the first evaporation, without the trouble of any farther purification. He observes that the brown colour depends on the oily matter of the vinegar being burnt by the heat commonly employed in the evaporation: and his improvement consists in diminishing the heat at the time that this burning is liable to happen. The process he recommends is as follows:

Dissolve a pound of salt of tartar in a sufficient quantity of cold water; filter the solution, and add by degrees as much distilled vinegar as will sature it, or a little more. Set the liquor to evaporate in a stone-ware vessel in a gentle heat, not so strong as to make it boil. When a pellicle appears on the surface, the rest of the process must be finished in a water-bath. The liquor acquires by degrees an oily confluence, and a pretty deep brown colour; but the pellicle or scum on the top looks whitish, and when taken off and cooled, appears a congeries of little brilliant silver-like plates. The matter is to be kept continually stirring, till it be wholly changed into this white flaky matter; the complete drying of which is most conveniently effected in a warm oven.

We shall not take upon us to determine whether the pure or impure salt is preferable as a medicine; observing only, that the latter is more of a papyraceous nature, the former more acid, though somewhat more agreeable to the stomach. Mr Cadet reckons the salt prepared in his method superior both to the brown and white sorts made in the common way, as possetting both the oily quality of the one and the agreeableness of the other, and as being always uniform or of the same power; whereas the others are liable to vary considerably, according to the degree of heat employed in the evaporation. They are all medicines of great efficacy, and may be so dosed and managed as to prove either mildly cathartic, or powerfully diuretic; few of the saline deobstruents comes up to them in virtue. The dose is from half a scruple to a dram or two. A bare mixture, however, of alkaline salt and vinegar, with excitation, is not perhaps much inferior as a medicine to the more elaborate salt.

Two drams of the alkali, saturated with vinegar, have been known to occasion ten or twelve fiools in hydroptic females, and a plentiful discharge of urine, without any inconvenience.

Tartarized salt. L.

Take of kali one pound; crystals of tartar, three pounds; distilled water, boiling, one gallon. To the salt, dissolved in water, throw in gradually the crystals of tartar, powdered; filter the liquor, when cold, through paper; and, after due evaporation, set it apart to crystallize.

Tartarized vegetable fixed alkali, commonly called soluble tartar. E.

Take of purified fixed vegetable alkaline salt one pound; water, 15 pounds. To the salt dissolved in the boiling water gradually add crystals of tartar in fine powder, as long as the addition thereof raises any effervescence, which almost ceases before three times the weight of the alkaline salt hath been injected; then strain the cooled liquor through paper, and after due evaporation let it abide to crystallize.

Common white tartar is perhaps preferable for this operation to the crystals usually met with. Its impurities can here be no objection; since it will be sufficiently depurated by the subsequent filtration.

The preparation of this medicine by either of the above methods is very easy; though some chemicalists have rendered it sufficiently troublesome, by a nicety which is not at all wanted. They insist upon hitting the very exact point of saturation between the alkaline salt and the acid of the tartar; and caution the operator to be extremely careful, when he comes near this mark, left by imprudently adding too large a portion of either, he renders the salt too acid or too alkaline. If the liquor be suffered to cool a little before it be committed to the filter, and then properly exhausted and crystallized, no error of this kind can happen, though the saturation should not be very exactly hit: for since crystals of tartar are very difficultly soluble even in boiling water, and when dissolved therein concreta again upon the liquor's growing cold, if any more of them has been employed than is taken up by the alkali, this superfusious quantity will be left upon the filter; and, on the other hand, when too much of the alkali has been used, it will remain uncryllalized. The crystallization of this salt indeed cannot be effected without a good deal of trouble: it is therefore most convenient to let the acid salt prevail at first; to separate the superfusious quantity, by suffering the liquor to cool a little before filtration; and then proceed to the total evaporation of the aqueous fluid, which will leave behind it the neutral salt required. The most proper vessel for this purpose is a stone-ware one; iron discolors the salt.

This is an excellent aperient saline liquor. Taken warm in bed, it proves commonly a powerful diaphoretic or sudorific; and as it operates without heat, it has place in febrile and inflammatory disorders, where medicines of the warm kind, if they fail of procuring sweat, aggravate the dilatation. Its action may likewise be determined to the kidneys, by walking about in a cool air. The common dose is half an ounce, either by itself, or along with other medicines adapted to the intention. Its strength is not a little precarious, depending much on that of the vinegar: an inconvenience which cannot easily be obviated, for the saline matter is not reducible to the form of a concrete salt.
Soluble tartar, in doses of a scruple, half a dram, or a dram, is a mild cooling aperient; two or three drams commonly loosen the belly; and an ounce proves pretty strongly purgative. It has been particularly recommended as a purgative for maniacal and melancholic patients. Malouin says, it is equal in purgative virtue to the cathartic salt of Glauber. It is an useful addition to the purgative of the refining kind, as it promotes their operation, and at the same time tends to correct their griping quality. But it must never be given in conjunction with any acid; for all acids decompose it, absorbing its alkaline salt, and precipitating the tartar. On this account it is improper to join it to tamarinds, or such like acid fruits; which is too often done in the extemporaneous practice of those physicians who are fond of mixing different cathartics together.

**Tartarized natron. L.**

Take of natron, 20 ounces; crys\(\text{t}a\)ls of tartar, powdered, 2 pounds; distilled water, 8 drams. Dissolve the natron in the water, and gradually add the crys\(\text{t}a\)ls of tartar: filter the liquor through paper: evaporate and set it aside to crystallize.

**Tartarized sod., commonly called Rochel salt. E.**

The Rochel salt may be prepared from purified fossil alkaline salt and crys\(\text{t}a\)ls of tartar, in the same manner as directed for the soluble tartar. This is a species of soluble tartar, made with the salt of kali or f\(\text{d}\)a, which is the same with the mineral alkali, or baits of sea salt. It crystallizes far more easily than the preceding preparation, and does not, like it, grow moist in the air. It is also considerably less purgative, but is equally decomposed by acids. It appears to be a very elegant salt, and begins now to come into esteem in this country, as it has long been in France.

**Purification of alum. L.**

Take of alum, one pound; chalk one dram by weight; distilled water, one pint. Boil them a little, strain, and let the liquor aside to crystallize.

We have already offered some observations on alum (see Alu\(\text{m}\)); and in general we may say that it comes from the alum works in England in a state of such purity as to be fit for every purpose in medicine; accordingly we do not observe that the purification of alum has a place in any other pharmacopoeias: but by the present process it will be freed, not only from different impurities, but also from superabundant acid.

**Burnt alum. L. E.**

Take of alum, half a pound. Burn it in a earthen vessel so long as it bubbles.

This, with strict propriety, ought rather perhaps to be called dried alum than burnt alum: for the only effect of the burning here directed is to expel the water. In this state it is so acid as to be frequently employed as an elixiratic; and it is with this intention chiefly that it has a place in our pharmacopoeias: but it has sometimes also been taken internally, particularly in cases of cholic.

**Salt or sugar of milk. Suc.**

Take of the whey of milk, prepared by runnet, any quantity; let it be boiled over a moderate fire to the confluence of a syrup; then put it in a cold place, that crys\(\text{t}a\)ls may be formed. Let the fluid which remains be again managed in the same manner, and let the crys\(\text{t}a\)ls formed be washed with cold water.

It has been by some imagined, that the superiority of one milk over another depends on its containing a larger proportion of this saline or succharine part; and particularly that upon this the reputed virtues of afs milk depend. Hence this preparation has been greatly celebrated as disorders of the breast, but it is far from an\(\text{f}i\)ng what has been expected from it. It has little sweetness, and is difficult of solution in water. A saline substance, much better deferving the name of sugar, may be obtained by evaporating new milk, particularly that of the afs, to dryness,digesting the dry matter in water till the water has extracted its soluble parts, and then infusing the filtered liquor. This preparation is of great sweetness, though neither white nor crystalline; nor is it perhaps in the pure crystallizable parts of milk that its medicinal virtues reside; and so little reliance is put on it as a medicine, that it has no place in the London or Edinburgh pharmacopoeias; although it long has stood, and still stands, in the foreign ones.

**Salt of forrel. Suc.**

Take any quantity of the express'd juice of the leaves of wood forrel; let it boil gently, that the succulent matter may be separated; then strain it till it be clear, and after this boil it on a moderate fire to the confluence of a syrup. Put it into long-necked glass vessels, and place it in a cold situation that it may crystallize. Let these crys\(\text{t}a\)ls be dissolved in water, and againformed into purer ones.

To make the forrel yield its juice readily, it should be cut to pieces, and well bruised in a small mortar, before it be committed to the press. The magma which remains in the bag still retaining no inconsiderable quantity of saline matter, may be advantageously boiled in water, and the decoction added to the express'd juice. The whole may be afterwards depurated together, either by the method above directed, or by running the liquor several times through a linen cloth.

In some cases the addition of a considerable portion of water is necessary, that the juice, thus diluted may part the more freely with its fecularities; on the separation of which the success of the process much depends.

The evaporation should be performed either in shallow glass basins, or in such earthen ones as are of a compact close texture; such are those usually called stone ware. The common earthen vessels are subject to have their glazing corroded, and are so extremely porous, as readily to imbibe and retain a good quantity of the liquor; metallic vessels are particularly apt to be corroded by these acid kinds of juices.

These juices are so vi\(\text{v}\)id, and abound so much with heterogeneous matter, of a quite different nature from any thing saline, that a pellicle, or pure saline incrustation upon the surface, is in vain expected. Boerhaave, therefore, and the more expert writers in pharmaceutical chemistry, with great judgment directed the evaporation of the superfluous moisture to be continued...
until the matter has acquired the consistence of cream. If it be now suffered to stand for an hour or two in a warm place, it will, notwithstanding the former de- purations, deposite a fresh sediment, from which it should be warily decanted before it be put into the vege-

tal in which it is designed to be crystallized.

Some recommend an unglazed earthen vessel as preferable for this purpose to a glass one; the smoothness of the latter being supposed to hinder the salt from sticking thereto; while the juice easily infiltrating itsel{ into the pores of the former, has a great advantage of shooting its fatty fpecula to the sides. Others

slightly inculcate the sides and bottom of whatever vessel they employ with a certain mineral salt, which greatly dilutes the juice to crystallize, to which of itsel{ it is very averse; but this addition is, with regard to its medical virtue, quite different from the falt here intended.

The liquor which remains after the crystallization may be depurated by a gentle colature, and after due infipillation fett to shoot again; when a farther produce of crystals will be obtained.

The proceeds for obtaining this falt is very tedious; and the quantity of falt which the juices afford is extremely small: hence they are hardly ever made or exported in the fshops. They may be somewhat fooner separated from the mucilage and other feculencies, by clarification with whites of eggs, and by adding very pure white clay.

In the manner above described, falts may also be obtained from other acid, auflere, and bitter plant, which contain but a small quantity of oil.

The virtues of the effential falts have not been sufficiently determined from experience. This much, however, is certain, that they do not, as has been supposed, possess the virtues of the fubjects entire, excepting only the acids and fweets. The others seem to be almost all of them nearly similar, whatever plant they were obtained from. In watery extracts of worm-

wood, carduus, cannoline, and many other vegetables, kept for some time in a fett flate, there may be ob-

erved fine fatty effulences on the surface, which have all nearly the fame taste, somewhat of the nitrous kind. They are fuppofed by fome to be in reality no more than an impure fpecies of volatile nitre (that is, a falt compos'd of the nitrous acid and volatile alkali): those which were examined by the chemists of the French academy defigilated in the fire, and being tri-

turated with fixed alkali, exhaled an urinous odour; plain marks of their containing those two ingredients.

Acid falt of borax. Succ.

Take of borax an ounce and a half; warm spring-

water, one pound. Mix them in a glafs veftel, that the borax may be disfolved; then pour into it three

drums of the concentrated acid of vitriol; evaporate the liquor till a pellicle appears upon it; after this let it remain at reft till the crystals be formed. Let them be washed with cold water, and kept for use.

This falt, which has long been known by the title of the fuddative falt of Homberg, is not unfrequently formed by fublimation: but the proceeds by crystallization here direcled is lefs troublesome, though the falt proves generally less white, and is apt likewise to re-

tain a part of Glauber's falt, especiall if the evapo-

ration be long protracted.

The falt of borax to the taste appears to be a neutral; but when it is examined by alkalis, it shows the properties of an acid, effervescing, uniting, and crysfalizing with them, and it destroys their alkaline quality. It diibolves both in water and spirit of wine, although not very readily in either.

The virtues attributed to it may in some degree be inferred from the name of fudative, by which it was long distinguished. It has been supposed to be a mild antifeptic, to diminish febrile heat, to prevent or remove delirium, and to allay, at least for fome time, spafmodical affections, particularly those which are the attendants of hypochondria and hysteric. It may be given in doses from two to twenty grains.

Purified falt ammoniac. Succ.

Difolve falt ammoniac in fpring water; strain the li-

quor through paper; evaporate it to dryness in a glafs veftel by means of a moderate fire.

The falt ammoniac imported from the Mediterranean often contains fuch impurities as to render the above proceeds neceffary; but that which is prepared in Britifh from foot and sea-falt, is in general brought to market in a flate of very great purity. Hence this proceeds is now altogether omitted both in the London

and Edinburgh Pharmacopoeias. It furnifhes, however, when neceffary, an easy and effective mode of obtaining a pure ammonia muriata.

CHAP. VIII. Magnesia.

White magnesia.

Take of bitter purging falt, kali, each two pounds; disfolved water, boiling, 20 pints. Disolve the bit-

ter falt and the kali separately in 10 pints of water, and fifter through paper; then mix them. Boil the liquor a little while, and strain it while hot through linen, upon which will remain the white magnesia: then wash away, by repeated affufions of disfolved water, the vitriolated kali. I.

Take of bitter purging falt, and purified fixed vegetable alkali, equal weights. Disolve them separately in double their quantity of warm water, and let the liquor be strained or otherwise freed from the feces; then mix them, and infantly add eight times their quantity of warm water. Let the liquor boil a little, thirring it very well at the fame time; then let it reft till the heat be somewhat diminished; af-

ter which strain it through a cloth: the magnesia will remain upon the cloth, and it is to be washed with pure water till it be altogether void of faltine faltls. E.

The feries here directed by the London and Ed-

inburgh colleges are nearly the fame; but the former feem to have improved fomewhat on the latter, both in simplifying the proceeds, and in the employment of disfolved water.

The bitter cathartic falt, or Ephym falt, is a com-

bination of the vitriolic acid and magnesia. In this pro-

cess, then, a double elecive attraction takes place: the vitriolic
Part II.

PHARMACY.

Magnesia is the same species of earth with that obtained from the mother-leaf of nitre, which was for several years a celebrated secret in the hands of some particular persons abroad. Hoffman, who describes the preparations of the nitrous magnesia, gives it the character of an useful antacid, a safe and inoffensive laxative in doses of a dram or two, and a diaphoretic and diuretic when given in smaller doses of 15 or 20 grains. Since his time, it has had a considerable place in the practice of foreign physicians; and is now in great esteem among us, particularly in heart-burns, and for preventing or removing the many disorders which children are so frequently thrown into from a redundance of acid humours in the first paffages; it is preferred, on account of its laxative quality, to the common aborments, which, unless gentle purgatives be occasionally given to carry them off, are apt to lodge in the body, and occasion a coffiveness very detrimental to infants.

Magnesia alba, when prepared in perfection, is a white and very soluble earth, perfectly void of smell or taste, of the class of those which dissolve in acids. It diffolves freely even in the vitriolic acid; which, in the common way of making solutions, take up only an incon siderable portion of other earths. Combined with this acid, it forms the bitter purgative or Epsom salt, very easily soluable in water: while the common aborments form with the same acid almost infipid con cretes, very difficult of solution. Solutions of magnesia in all acids are bitter and purgative, while those of the other earths are more or less dull and astringent. A large dose of magnesia, if the stomach contain no acid to dissolve it, does not purge or produce any fermentable effect; a moderate one, if an acid be lodged there, or if acid liquors be taken after it, procures several stools; whereas the common aborments, in the same circumstances, instead of loosing, bind the belly. It is obvious, therefore, that magnesia is specifically different from the other earths, and that it is applicable to several useful purposes in medicine.

Magnesia was formerly made with the mother-water of nitre evaporated to dryness, or precipitated by a fixed alkalii. It has gone under different names, as the white Powder of the Count of Palma, powder of ferniate, psychris, laxative powder, &c. It seems to have got the character of a substance to distinguish it from the dark coloured mineral called sile magnesia or mangane: a substance possessing very different proprieties. We have not heard that pure native magnesia has been found in its uncombined state. A combination of it with sulphur has been discovered to cover a stratum of coal at Littry in Lower Normandy. It has also been found in certain serpentine earths in Saxony, and in marly and alun earths.

Calced magnesia.

Take of white magnesia, four ounces. Expose it to a strong heat for two hours; and, when cold, set it by. Keep it in a vessel closely stoped. L.

Let magnesia, put into a crucible, be continued in a red heat for two hours; then put it up in clofe glass vessels. E.

By this process the magnesia is freed of fixed air; which, according to Dr Black's experiments, 

1/4
PHARMACY.

Part II.

Preparations and Compilations.

Tinctures about \( \frac{3}{4} \) ths of its weight. A kind of opaque foggy vapour is observed to escape during the calcination, which is nothing else than a quantity of fine particles of magnesia buoyed off along with a stream of the difengaged air. About the end of the operation, the magnesia exhibits a kind of luminous or phosphorescent property; and this may be considered as a pretty exact criterion of its being deprived of air.

Calcined magnesia is equally mild as when satured with fixed air; and this circumstance is sufficient to establish a difference between it and calcareous earths, all of which are converted by calcination into caustic quicklime.

The calcined magnesia is used for the same general purposes as the magnesia combined with fixed air. In certain affections of the stomach, accompanied with much flatulence, the calcined magnesia is found preferable, not only as containing more of the real earth of magnesia in a given quantity, but as being also deprived of its air. It neutralizes the acid of the flomach without that extirpation of air which is often troublesome consequence in employing the aerated magnesia in these complaints. It is proper to observe, that magnesia, whether combined with or deprived of fixed air, is similar to the mild calcareous earths in promoting and increasing putrefaction. The fame has even been observed with respect to the Epson and some other salts which have this earth for their base.

CHAP. IX. Preparations of Sulphur.

Washed flowers of Sulphur.

Take of flowers of sulphur, one pound; distilled water, four pints. Boil the flowers of sulphur a little while in the distilled water; then pour off this water, and wash off the acid with cold water; lastly, dry the flowers.

In the former editions of our pharmacopoeias directions were given for the preparation of the flowers of sulphur themselves; but as a large apparatus is necessary for doing it with any advantage, it is now scarcely ever attempted by the apothecaries. When the flowers are properly prepared, no change is made on the qualities of the sulphur. Its impurities only are separated; and at the same time it is reduced to a finer powder than it can easily be brought to by any other means. But as the flowers of sulphur are generally sublimed in very capacious rooms, which contain a large quantity of air, or in vessels not perfectly close, some of those that strike at first are apt to take fire, and thus are changed into a volatile acid vapour, which mingling with the flowers that sublimate afterwards, comminutes to them a considerable degree of acidity. In this case the sublimation here directed is for the general use of the medicine absolutely necessary; for the flowers thus tainted with acid sometimes occasion gripes, and may in other respects be productive of effects different from those of pure sulphur. There are, however, some particular combinations to which they are supposed to be better adapted when unwashed, such as their union with mercury into calathia mineral; and accordingly for that preparation the unwashed flowers are directed by the London college.

Sulphurated kali. L.

Take of flowers of sulphur, one ounce; kali, five ounces. Mix the salt with the melted sulphur, by frequently stirring, until they unite into an uniform mass.

This preparation, in the former editions of our pharmacopoeias, had the name of hepar sulphur or liver of sulphur.

It is much more convenient to melt the sulphur first by itself, and add the salt of tartar by degrees, as here directed, than to grind them together, and afterwards endeavour to melt them, as ordered in former editions; for in this last case the mixture will prove insufficiently thin to be properly united by stirring; and the sulphur either takes fire or sublimes in flowers, which probably has been the reason why so large a proportion of it has been commonly directed. Even in the present method a considerable part of the sulphur will be diffipated; and if it were not, the hepar would not be of its due quality: for one part of sulphur requires two of the alkaline salt to render it perfectly soluble in water, which this preparation ought to be.

The hepar sulphurhas a fetid smell and a nauseous taste. Solutions of it in water, made with sugar into a fyrup, have been recommended in coughs and other diffidays of the breath. Our pharmacopoeias, nevertheless, have delievred rejected this fyrup, as common practice has aimed it done the balsams. Solutions of the hepar in water have also been recommended in herpetic and other cutaneous affections. Some physicians have even employed this solution, in a large quantity, as a bath for the cure of psores; and in cases of tinea capitis it has often been used by was of the hepar.

The hepar, digested in refrig'd spirit of wine, imparts a rich gold colour, a warm, somewhat aromatic taste, and a peculiar, not ungrateful smell. A tincture of this kind is kept in the shops under the name of another mineral. The hepar sulphurhas been by some strongly recommended to prevent the effects of mineral poison.

Sulphurated oil and sulphurated petroleum.

Take of flowers of sulphur, four ounces; olive oil, sixteen ounces. Boil the flowers of brimstone with the oil, in a pot lightly covered, until they be united. In the same manner is made sulphurated petroleum.

These articles are analogous to what had formerly a place in our pharmacopoeias under the titles of balsamum sulphuris simplex, crassum, et Barbadum iuf. And besides there a place was also given to the balsamum sulphuris o-fideum, tercbentinum, &c. While these articles, however, are now banished from our pharmacopoeias, even those retained are left in the same name, as formerly.

These preparations are more conveniently and safely made in a tall glass body, with the mouth at least an inch in diameter, than in the circulatory or clofe vefels in which they have commonly been directed to be prepared: for when the sulphur and oil begin to act vehemently upon each other, they not only rarify into a large volume, but likewise throw out impetuously great quantities of an elastic vapour; which, if the vefels be clofed, or the orifices not sufficient to allow it
it a free exit, will infallibly burst them. Hoffman relates a very remarkable history of the effects of an accident of this kind. In the vessel above recommended the procès may be completed, without danger, in four or five hours, by duly managing the fire, which should be very gentle for some time, and afterwards increased so as to make the oil just bubble or boil; in which state it should be kept till all the sulphur appears to be taken up.

Effential oils, employed as menstrua for sulphur, undergo a great alteration from the degree of heat necessary for enabling them to diffuse the sulphur; and hence the balsams have not nearly so much of their flavour as might be expected. It should therefore seem more eligible to add a proper quantity of the effential oils to the simple balsam: these readily incorporate by a gentle warmth, if the vessel be now and then shaken. We may thus compose a balsam more elegant than those made in the manner formerly recommended, and which retains so much of the flavour of the oil as is in some measure sufficient to cover the taste of the sulphur, and render it supportable.

The balsams of sulphur have been strongly recommended in coughs, consumption, and other disorders of the breath and lungs; but the reputation which they have had in these cases does not appear to have been built on any fair trial or experience of their virtues. They are manifestly hot, acrimonious, and irritating; and therefore should be used with the utmost caution. They have frequently been found to injure the appetite, offend the stomach and vitreous, parch the body, and occasion thirst and febrile heats. The dose of the simple balsam is from ten to forty drops: those of effential oils are not given in above half these quantities. Externally, they are employed for cleansing and healing foul running ulcers. Boerhaave conjectures that their use in these cases gave occasion to the virtues attributed to them when taken internally.

Precipitated sulphur. L.

Take of sulphurated kali, fix ounces; distilled water one pound and a half; vitriolic acid, diluted, as much as is sufficient. Boil the sulphurated kali in the distilled water until it be diffolved. Filter the liquor through paper, to which add the vitriolic acid. With the precipitated powder by often pouring on water till it becomes fluid.

This preparation is not so white as that of the last pharmacopoeia, which was made with quicklime; and which in some pharmacopoeias had the name of milk of sulphur.

Pure milk of sulphur is not different in quality from pure sulphur itself; to which it is preferred in unguents, &c., only on account of its colour. The whiteness does not proceed from the sulphur having lost any of its parts in the operation, or from any new matter superadded: for if common sulphur be ground with alkaline salts, and set to sublime, it rises of a white like colour, the whole quantity of the alkali remaining unchanged; and if the milk be melted with a gentle fire, it returns into yellow sulphur again.

It may be observed, that the name lae sulphuris, or milk of sulphur, applied among us to the precipitate, is by the French writers confined to the white liquor before the precipitate has fallen from it.

**Precipitated sulphur. L.**

Take of sulphurated kali, six ounces; distilled water one pound and a half; vitriolic acid, diluted, as much as is sufficient. Boil the sulphurated kali in the distilled water until it be diffused. Filter the liquor through paper, to which add the vitriolic acid. With the precipitated powder by often pouring on water till it becomes fluid.

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It may be observed, that the name lae sulphuris, or milk of sulphur, applied among us to the precipitate, is by the French writers confined to the white liquor before the precipitate has fallen from it.
If similar delicate effects have been observed, that when diaphoretic powder is taken by such operations as do not destroy or calcine the metal, the remaining snifs becomes proportionally more active.

The sulphur of antimony may be expelled by deflagration with nitre: the larger the quantity of nitre, to a certain point, the more of the sulphur will be dissipated, and the preparation will be the more active.

If the quantity of nitre be more than sufficient to consume the sulphur, the rest of it, deflagrating with the inflammable principle of the regulus itself, renders it again mild.

The sulphur of antimony is likewise absorbed in fusion by certain metals and alkaline fables. The last, when united with sulphur, prove a menstrum for all the metals (zinc excepted), and hence, if the fusion be long continued, the regulus is taken up, and rendered soluble in water.

From these particulars with respect to antimony, it may naturally be concluded, that it not only furnishes us with an useful and active medicine, but that it may also be exhibited for medical purposes under a great variety of different forms, and that the effects of these will be considerably diversified. And this has in reality been the case. For further information respecting antimony, and its uses in medicine, we refer our readers to the articles Antimony; Materia Medica, p. 653, &c.; and Chemistry-Index. But although there is perhaps no preparation there mentioned, which is not fitted to serve some useful purpose; yet the colleges of London and Edinburgh have now reduced the number of preparations in their pharmacopoeias to a few only. And it is highly probable, that from the proper employment of them, every useful purpose to be answered by antimony may be accomplished.

Calculated antimony. L.

Take of antimony, powdered, eight ounces; nitre, powdered, two pounds. Mix them, and cast the mixture by degrees into a red hot crucible. Burn the white matter about half an hour; and, when cold, powder it; after which wash it with distilled water.

In the last edition of the London Pharmacopoeia, this preparation had the name of calx of antimony; and it may be considered as at least very nearly approaching to some other antimonials of the old pharmacopoeias, particularly to the nitrated diaphoretic antimony, washed ditto, and filiated nitre; none of which are now received as separate formulas of the Edinburgh Pharmacopoeia, and indeed even the calx of antimony itself, as last as thus prepared, has now no place in that pharmacopoeia.

The calx of antimony, when freed by washing from the saline matter, is extremely mild, if not altogether inactive. Hoffman, Lemeroy, and others, affirme us, that they have never experienced from it any such effects as its usual title imports: Boerhave declares, that it is a mere metallic earth, entirely delusive of all medicinal virtue: and the committee of the London college admit that it has no sensible operation. The common dose is from five grains to a dram; though Wilton relates, that he has known it given by half ounces, and repeated two or three times a day, for several days together.

Some report that this calx, by keeping for a length of time, contracts an emetic quality: From whence it has been concluded, that the powers of the regulus part are not entirely destroyed; that the preparation has the virtues of other antimonials which are given as alternatives; that is, in small doses as not to stimulate the prime vices; and that therefore diaphoretic antimony, or calculated antimony, as it is now more properly styled, is certainly among the mildest preparations of that mineral, and may be used for children, and similar delicate constitution where the stomach and intestines are easily affected. The observations, however, from which these conclusions are drawn, do not appear to be well founded: Ludovici relates, that after keeping the powder for four years, it proved as mild as at first: and the Strasburgh Pharmacopoeia, with good reason, suspects, that where the calx has proved emetic, it had either been given in such cases as would of themselves have been attended with this symptom (for the great alexipharmic virtues attributed to it have occurred to it to be exhibited even in the more dangerous malignant fevers, and other disorders which are frequently accompanied with vomiting); or that it had not been sufficiently calcined, or perfectly freed from such part of the regulus as might remain uncalcined. The uncalcined part being grooser than the true calx, the separation is effected by often washing with water, in the same manner as directed for expasting earthly powders from the groser parts.

It has been observed, that when diaphoretic antimony is prepared with nitre abundantly with three parts, of which all the common nitre contains some portion, the medicine has proved violently emetic. This effect is not owing to any particular quality, of the false, but to its quantity, by which the proportion of the nitre to the antimony is rendered less.

The nitrum filiatum, as it was called, produced by the deflagration of the sulphur of the antimony with the nitre in the same manner as the ful polycrebri, from which it differs no otherwise than in retaining some portion of the antimonial calx.

Notwithstanding the doubts entertained by some respecting the activity of the antimonium calxantium, yet the London college have in our opinion done right in retaining it. For while it is on all hands allowed that it is the mildest of our antimonials, there are some accurate observers who consider it by no means indifferent. Thus Dr. Heale tells us, that he has been in the habit of employing it in upwards of 40 years, and is much deceived, if when genuine, it be not productive of good effects.

Nitrated calx of antimony. E.

Take of antimony calculated for making the galls of antimony, and nitre, equal weights. Having mixed, and put them into a crucible, let them be heated, so that the matter shall be of a red colour for an hour; then let it be taken out of the crucible, and, after beating it, wash it repeatedly with warm water till it be infipid.

Although this preparation agrees nearly in name with
the preceding, and has been considered as being nearly
a complete calx of antimony, yet there can be no
doubt that it is a medicine of a much more active
nature than the former; and in place of being one
of the mildest of the antimonials, it often operates
with great violence when given in doses of a few
grains only.

But as the effects of every preparation of antimony,
not already conjoined with an acid, must depend on
the quantity and condition of the acid in the fomach,
so the ablution of the base of the nitre in this process
gives full power to the acid of the fomach to act as
far as possible on the calx, whereas, when the un-
washed calx is employed, a great quantity of the acid
in the fomach is neutralized by the alkaline base
of the nitre adhering to the calx. The nitrated calx of
antimony is supposed to be nearly the fame with the article
which has been so much celebrated, and has had such
an extensive sale under the title of Dr James's fever-
powder. And it was as an article which might be
employed in the place of James's powder, that the
Edinburgh college introduced this into their pharma-
copoeia. There is, however, reason to believe, that
the preparation of James's powder is somewhat dif-
ferent from that here directed; but their effects, as far
as our observation goes, appear to be very nearly the
fame.

The nitrated calx of antimony has been thought by
some preferable to emetic tartar, where the permanent
effects of a long continued nausea are required, and
where we with our antimonials to pass the pylorus and produce purging. But, like every other preparation
where the reguine part is only rendered active by the
acid in the fomach, the nitrated calx of antimony is in
all cafes of uncertain operation: sometimes proving per-
fectly inert, and at other times very violent in its ef-
efts. The dose is generally 10 or 12 grains, and
this is often given all at once; an inconvenience not
attending the emetic tartar; the quantity and effects
of which we can generally measure with surprising mi-
nutenefs.

There is, however reason to believe, that by means
of James's powder, and the nitrated calx, an artificial
termination of fever is sometimes accomplished, and
that too more frequently than by emetic tartar. This
perhaps may sometimes be the consequence of the vio-
ience with which they operate. At the fame time it
must be admitted, that even the most violent operation
by no means ensuring an immediate recovery, but that
on the contrary it is sometimes manifeftly attended
with bad effects.

Crocus of antimony.

Take of antimony, powdered; nitre, powdered, of
each one pound; tefalt, one ounce. Mix, and
put them by degrees into a red hot crucible, and
melt them with an augmented heat. Pour out the
melted matter; and, when cold, separate it from the
fcoriure. L

Equal parts of antimony and nitre are to be injected
by degrees into a red-hot crucible; when the de-
composition is over, separate the reddish metallic
matter from the whitish cuttle; beat it into a powder,
and add to it by repeated washings with hot
water, till the water comes off impid. E.

Vol. XIV.
the former edition of the London pharmacopoeia, is extremely dangerous, inasmuch that even the life of the operator, though tolerably verified in common pharmacy, may be much endangered for want of due care. Boerhaave relates, that one who from the title he gives him is not to be supposed inexpert in chemical operations, or unacquainted with the danger attending this, was suffocated for want of proper care to prevent the bursting of the retort. The fumes which arise, even upon mixing the antimony with the sublimate, are highly noxious, and sometimes inflame copiously and suddenly, as very difficultly to be avoided. The utmost circumspection therefore is necessary.

The caustic, or butter as it is called, appears to be a solution of the metallic part of the antimony in the marine acid of the sublimate: the sulphur of the antimony and the mercury of the sublimatic remain at the bottom of the retort united into an ethiop. This solution does not succeed with spirit of salt in its liquid state, and cannot be effected, unless (as in the case of making sublimate) either the acid be highly concentrated, and both the ingredients strongly heated; or when the antimony is exposed to the vapours of the acid diffused from the black calx of manganite. By this last process a perfect solution of the regulus of antimony in the muriatic acid is effected. Of this more simple, more safe, and less expensive method of preparing muriated antimony, an account is given by Mr Ruffell in the Transactions of the Royal Society of Edinburgh.

If regulus of antimony were added in the distillation of spirit of sea-salt without water, a solution would also be made.

The method however, now directed by the London college, in which vitriolic acid and sea-salt are employed to give a double elective attraction, is perhaps to be considered as preferable to any of the others. In this they have followed very nearly the directions given in the pharmacopoeia Suecica, which are taken from the process of Mr Scheele.

When the congealed matter that arises into the neck of the retort is liquified, by the moisture of the air, it proves less corrosive than when melted down and rectified by heat; though it seems, in either case, to be sufficiently strong for the purposes of consuming fungous flesh and the callous lips of ulcers. It is remarkable, that though this saline concrete readily and almost entirely dissolves by the humidity of the air, only a small quantity of white powder separating, it nevertheless will not dissolve on putting water to it directly; even when previously liquefied by the air; the addition of water will precipitate the solution. And accordingly, by the addition of water is formed that one celebrated article known by the title of muriatus vitri, or Algeorth's powder. This preparation, though never used by itself, is employed both by the Edinburgh and by London colleges, in the preparation of muriatic antimony; in the formation of emetic tartar, the most useful of all the antimonials. And although chemists are not altogether agreed with regard to the best mode of making the tartarized antimony, yet we shall afterwards have occasion to observe, when treating of that article, that the preparation of it from the muriated antimony, or rather from its precipitate (Algeroth's powder), is perhaps the best mode which has yet been practised. And were it even with no other intention than this; a safe, easy, and cheap method of forming a muriated antimony, may be considered as an important improvement in our pharmacopoeia.

Antimonial powder. L.

Take of antimony, coarsely powdered, harthorn shavings, each two pounds; mix, and put them into a wide red hot iron pot, stirring constantly till the mass acquires a grey colour. Powder the matter when cold, and put it into a coated crucible. Lute to it another crucible inverted, which has a small hole in its bottom: augment the fire by degrees to a red heat, and keep it so for two hours. Lastly, reduce the matter, when cold, to a very fine powder.

In this preparation the metallic part of the antimony in a flake of calx will be united with that part of the harthorn which is indestructible by the action of fire, viz. its absorbent earth. If this powder be properly prepared, it is of a white colour. It is a mild antimonial preparation, and is given as an alternative from three to six grains for a dose. In this quantity, however, it sometimes creates nausea, and even vomits. In larger doses it proves emetic, and operates by stool.

Precipitated sulphur of antimony. L.

Take of antimony, powdered, two pounds; water of pure kali, four pints; distilled water, three pints; mix, and boil them with a slow fire for three hours, constantly stirring, and adding the distilled water as it shall be wanted: strain the hot ley through a double linen cloth, and into the liquor, whilst yet hot, drop by degrees as much diluted vitriolic acid as is sufficient to precipitate the sulphur. Wash off, with warm water, the vitriolated kali.

Golden sulphur of antimony. E.

Boil, in an iron pot, four pounds of caustic ley distilled with three pints of water, and throw in by degrees two pounds of powdered antimony; keeping them continually stirring with an iron spatula for three hours, over a gentle fire, and occasionally supplying more water. The liquor loaded with the sulphur of antimony being then strained through a woolen cloth, drop into it gradually, while it continues hot, so much spirit of nitre, diluted with an equal quantity of water, as shall be sufficient to precipitate the sulphur which is afterwards to be carefully washed with hot water.

The foregoing preparations are not strictly sulphurs; they contain a considerable quantity of the metallic part of the antimony, which is reducible from them by proper fluxes. These medicines must needs be liable to great variation in point of strength; and in this respect they are, perhaps the most precarious, though some have affirmed that they are the most certain, of the antimonial medicines.

They prove emetic when taken on an empty stomach, in a dose of four, five, or six grains; but at present they are scarcely prescribed with this intention; being chiefly used as alterative debubrents, particularly in cutaneous disorders. Their emetic quality is easily blunted, by making them up into pills with re-
Part II.

PHARMACY.

Preparations and Compositions,

Tartarized antimony. L.

Take of crocus of antimony, powdered, one pound and an half; crystals of tartar, two pounds; distilled water two gallons: boil in a glass vessel about a quarter of an hour; filter through paper, and set aside the strained liquor to crystallize.

Emetic tartar. E.

Take of the butter of antimony what quantity you choose; pour it into warm water, in which is much of the purified vegetable fixed alkali has been previously dissolved, that the antimonial powder may be precipitated, which, after being well washed, is to be dried. Then to five pounds of water add of this powder nine drams, of crystals of tartar, beat into a very fine powder, two ounces and a half, boil for a little till the powders be dissolved. Let the strained solution be slowly evaporated in a glass vessel to a pellicle; so that crystals may be formed.

We have here two modes of making the most common, and perhaps we may add the most useful, of all the antimonial preparations, long known in the shops under the name of emetic tartar. These modes differ considerably from each other; but in both, the reguline part of the antimony is united with the acid of the tartar. It is perhaps difficult to say to which mode of preparation the preference is to be given: for on this subject the best chemists are still divided in their opinion. The mode directed by the London college is nearly the same with that in the former editions of their pharmacopoeia, while that now adopted by the Edinburgh college, in which they have nearly followed the Pharmacopoeia Rhetica, is of later date. That in both ways a good emetic tartar may be formed, is very certain: but in our opinion, it is formed of the precipitate from the muriatic acid or the prepuce del Algemeen, as it has been called, is the least chance of its being certain in its operation: and this method comes recommended to us by the authority of Bergman, Schenck, and some other of the best names in chemistry. Bergman states, that the calx be precipitated, by simple water, as being least liable to variation; and this is the direction followed in the Pharmacopoeia Rhetica. But when the calx is precipitated by an alkaline ley, as is directed by the Edinburgh college, it is more certainly freed from the muriatic acid, and will of course be better.

In the latter part of the process, whether precipitate or crocus have been used, the quantity of the antimonial ought always to be some drams more than is absolutely necessary for saturating the acid of tartar, so that no crystals may shoot which are not impregnated with the active metallic part of the antimony. And in order to secure an uniform strength, some attention is necessary in collecting the crystals, as some may contain more metal than others. After they are all separated from the liquor, they ought to be beat together in a glass mortar into a fine powder, that the medicine may be of uniform strength.

Emetic tartar, of all the preparations of antimony, the most certain in its operation.

It will be sufficient, in considering the medicinal effects of antimonials, that we should observe, once for all, that their emetic property depends on two different conditions of the reguline part: the first is where the reguline part is only active, by being rendered fo from meeting with an acid in the stomach: the second is where the reguline part is already joined with an acid, rendering it active. It is obvious, that those preparations, reducible to the first head, must always be of uncertain operation. Such then is the equal uncertainty in the chemical condition and medicinal effects of the croc, the hepata, and the calces; all of which proceed from different steps or degrees of freeing the reguline part from sulphur and phlogiston. It is equally plain, that the preparations coming under the second head must be always constant and certain in their operation. Such a one is emetic tartar, the dose and effects of which we can measure with great exactness.

The title of this medicine expresses its principal operation. It is one of the best of the antimonial emetics, acting more powerfully than the quantity of crocus contained in it would do by itself, though it does not so much muffle the constitution. And indeed antimonials in general, when thus rendered soluble by vegetable acids, are more safe and certain in their effects than the violent preparations of that mineral exhibited by themselves; the former never varying in their action from a difference in the food taken during their use, or other similar circumstances; which occasioning more or less of the others to be dissolved, make them operate with different degrees of force. Thus, crude antimony, where acid food has been liberally taken, has sometimes proved violently emetic; whilst in other circumstances it has had no such effect.

The dose of emetic tartar, when designed to produce the full effect of an emetic, is from two to four grains. It may likewise be advantagiously given in much smaller doses as a nauseating and sedative medicine.

Purified antimony. L.

Take of powdered antimony, four ounces. Calxine in a broad earthen vessel, with a fire gradually raised, till it no longer emits a fulphureous smoke. Put this powder into a crucible, to as to fill two third of it. Aever being fired Y 2 on,
PHARMACY.

Preparations and Compositions.

Glafs of antimony. E.

Strew antimony, beat into a coarse powder like sand, upon a shallow unglazed earthen vessel, and apply a gentle heat underneath, that the antimony may be heated slowly; keeping it at the same time continually stirring to prevent it from running into lumps. White vapours of a fulphureous smell will arise from it. If they cease to exhale with the degree of heat first applied, increase the fire a little, so that vapours may again arise: go on in this manner, till the powder, when brought to a red heat, exhales no more vapours. Melt the calx in a crucible with an intense heat, till it assumes the appearance of melted glafs; then pour it out on a heated brass plate or dish.

The calcination of antimony, in order to procure transparent glafs, succeeds very slowly, unless the operator be not a little circumspect in the management of it. The most convenient vessel is a broad shallow dish, or a smooth flat tile, placed under a chimney. The antimony should be the purer sort, such as is usually found at the apex of the cones; this, grossly powdered, is to be evenly spread over the bottom of the pan, so as not to lie above a quarter of an inch thick on any part. The fire should be at first no greater than is just sufficient to raise a fume from the antimony, which is to be now and then stirred: when the fumes begins to decay, increase the heat, taking care not to raise it so high as to melt the antimony, or run the powder into lumps; after some time the vessel may be made red-hot, and kept in this state until the matter will not, upon being stirred, any longer fuse. If this part of the process be duly conducted, the antimony will appear in an uniform powder, without any lumps, and of a grey colour.

With this powder fill two-thirds of a crucible, which is to be covered with a tile, and placed in a wind-furnace. Gradually increase the fire till the calx be in perfect fusion, when it is to be now and then examined by dipping a clean iron wire into it. If the matter which adheres to the end of the wire appears smooth and equally transparent, the vitrification is completed, and the glafs may be poured out upon a hot smooth stone or copper-plate, and suffered to cool slowly to prevent its cracking and flying in pieces. It is of a transparent yellowish red colour.

The glafs of antimony usually met with in the shops, is said to be prepared with certain additions; which may, perhaps, render it not so fit for the purpose here designed. By the method above directed, it may be easily made of the requisite perfection without any addition.

As antimony may be rendered nearly or altogether inactive by calcination, it might be expected that the calx and glafs of the present process would be likewise inert. But here the calculation is far less perfect than in the other case, where the inflammable principle of the regulus is totally burnt out by deflagration with nitre; there the calx is of perfect whiteness, and a glafs made from that calx (with the addition of any saline flux, for of itself it will not vitrify) has little colour:

but here so much of the inflammable principle is left, that the calx is grey, and the glafs of a high colour.

The calcined antimony is said by Boerhaave to be violently emetic. Experience has shown that the glafs is so insomuch as to be unsafe for internal use. At present it is chiefly employed in forming some other antimonial preparations, particularly the cerated glafs of antimony, the next article to be mentioned; and the wine of antimony, afterwards to be treated of under the head of wines. It is also not unfrequently employed in the formation of emetic tartar; and it was directed for that purpose in the last edition of the Edinburgh pharmacopoeia, being perhaps even superior to the crocus of antimony.

Cerated glafs of antimony. E.

Take of yellow wax, a dram; glafs of antimony, reduced into powder, an ounce. Melt the wax in an iron vessel, and throw into it the powdered glafs: keep the mixture over a gentle fire for half an hour, continually stirring it; then pour it out on paper, and when cold grind it into powder.

The glafs melts in the wax with a very gentle heat: after it has been about twenty minutes on the fire, it begins to change its colour, and in ten more comes near to that of Scotch snuff; which is a mark of its being sufficiently prepared; the quantity set down above loses about one dram of its weight in the process.

This medicine was for some time much esteemed in dysereties: several influences of its good effects in those cases may be seen in the fifth volume of the Edinburgh Essays, from which the above remarks on the preparations are taken. The dose is from two or three grains to twenty, according to the age and strength of the patient. In its operation, it makes some persons sick and vomit; it purges almost everyone; though it has sometimes effected a cure without occasioning any evacuation or sickness. It is now, however, much less used than formerly.

Mr Geoffroy gives two pretty singular preparations of glafs of antimony, which seem to have some affinity with this. One is made by distilling the glafs, very finely levigated, with a solution of mastic made in spirit of wine, for three or four days, now and then shaking the mixture; and at last evaporating the spirit so as to leave the mastic and glafs perfectly mixed. Glafs of antimony thus prepared, is said not to prove emetic, but to act merely as a cathartic, and that not of the violent kind. A preparation like this was first published by Hartman, under the name of Clysta.

The other preparation is made by burning spirit of wine on the glafs three or four times, the powder being every time exquisitely rubbed upon a marble. The dose of this medicine is from ten grains to 20 or 30: it is said to operate mildly both upwards and downwards and sometimes to prove sudorific.

Cerus of antimony. Brun.

Take of regulus of antimony, one part; nitre, three parts. Deflagrate them together; in the manner directed for the calcined antimony.

The result of this process and that formerly directed for the calcined antimony are nearly the same.

It is not necessary to use so much nitre here as when antimony
antimony is employed: for the sulphur which the crude mineral contains, and which requires for its dissipation nearly an equal weight of nitre to the antimony, is here already separated. Two parts of nitre to one of the regulus are sufficient. It is better, however, to have an over, than an under, proportion of nitre, lest some parts of the regulus should escape being sufficiently calcined.

It may be proper to observe, that though crude antimony and the regulus yield the same calces, yet the calces separated in washing the calces are very different. As crude antimony contains common sulphur, the acid of the sulphur unites with the alkaline basis of the nitre, and the result is a neutral salt. As the regulus contains the phlogistic, or inflammable principle, but no sulphur, the nitre is alkalified, and the fire kept up strongly for an hour or more, the salt will prove more caustic than even the potential caustic of the flops. But the causticity of the salt will still be far greater, if, instead of the simple regulus of antimony, the martial regulus be used.

**Kerme Mineral.**

Take of crude antimony, powdered, half a pound; fixed vegetable alkali, two pounds; boiling water, eight pounds. Boil them together in an iron pot for a quarter of an hour, continually stirring the mixture with an iron spatula, and filter as speedily as possible while it is hot. The filtered liquor, set in cool places, will soon deposit a powder, which must be repeatedly washed, first with cold and afterwards with warm water, until it be perfectly inus. This medicine has of late been greatly esteem in France, especially under the names of **Kerme Mineral, pulvis Carthusians, poeder des Chartreux.**

It was originally a preparation of Glauber, and for some time kept a great secret, till at length the French king purchased the preparation from M. de la Ligerie, for a considerable sum, and communicated it to the public in the year 1720. In virtue, it is not different from the sulphurs abovementioned; all of them owe their efficacy to a part of the regulus of the antimony, which the alkaline salt, by the mediation of the sulphur, renders soluble in water.

Chemists are, however, divided in their opinions, with respect to the precise chemical condition of the regulus part in the preparations called *bpota of antimony.* Some have alleged that they contain not a particle of alkaline salt: it is at any rate certain, that the quantity and condition of the regulus part must vary according to the different proportions of the ingredients, the time of the precipitation, the greater or less degree of causticity of the alkali employed, and several other circumstances. At best the whole of them are liable to the same uncertainty in their operation as the calces of antimony.

**Panacea of antimony.**

Take of antimony, six ounces; nitre, two ounces; common salt, an ounce and a half; charcoal, an ounce of white sugar candy, and made up into a mafs with mucilag of Gum Gugganath, may be divided into an hundred small pills; of which one, two or three, taken at a time, are said to work gently by food and vomit. The compact liver-coloured fulphur, which lies immediately above the regulus, operates more fiercely. This pill appears to be nearly of the same nature with the crocus of antimony, and the former with the golden sulphur.

**Chap. XI. Preparations of Silver.**

**Nitrated Silver. L.**

Take of silver, one ounce; diluted nitrous acid, four ounces. Dissolve the silver in the nitrous acid, in a glass vessel, over a sand-heat; then evaporate with an heat gently raised: afterwards melt the residuum in a crucible, that it may be poured into proper forms, carefully avoiding too great a heat.

**Salt of Silver, commonly called Lunar Caustic. E.**

Take of purest silver, beat into plates, and cut in pieces, four ounces; weak nitrous acid, eight ounces; purest water, four ounces. Dissolve the silver in the phial with a gentle heat, and evaporate the solution to dryness. Then put the mafs into a large crucible, and apply the heat, at first gently, but augment it by degrees till the mafs flows like oil; then pour it into iron moulds, previously heated, and greased with tallow. These processes do not differ in any material particular. But the name of *nitrated Silver* is preferable to the more indefinite one of *Salt of Silver.*

Strong spirit of nitre will dissolve somewhat more than half its weight of pure silver; and the weaker of the aquafortis formerly described, proportionally less, according to their quantity of pure nitrous acid. Sometimes this spirit contains a portion of the vitriolic or marine acids; which, however minute, renders it unfit for dissolving this metal, and should therefore be carefully separated before the solution be attempted. The method which the refiners employ for examining the purity of their aquafortis, and purifying it if necessary, is to let fall into it a few drops of a perfect solution of silver already made: if the liquor remain clear, and grow not in the least turbid or whitish, it is fit for use; otherwise they add a small quantity more of the solution, which immediately turns the whole of a milky white colour; the mixture being then suffered to reft for some time, deposits a white sediment; from which it is warily decanted, examined afresh, and,
The silver beat into thin plates, as directed in the secon of the above proceed, needs not be cut in pieces; the solution will go on the more speedily if they latterly turned round into spiral circumvolutions, so as to be conveniently got into the glass, with care that the paral surfaces do not touch each other. By this management, a greater extent of the surface is exposed to the action of the menstruum, than when the plates are cut in pieces and laid above each other. Good aquafortis will dissolve about half its weight of silver; and it is not advisable to use a greater quantity of the menstruum than is sufficient for effecting the solution, for all the surplus must be evaporated in the subsequent fusion.

It is necessary to employ very pure water; for if hard water were used in this process, the nitrous acid would forfeit a part of the silver to join with the calcareous earth of the imperfect nitrous saltpetre; but a part of the silver would be precipitated.

The crucible ought to be large enough to hold five or six times the quantity of the dry matter; for it bubbles and swells up greatly, and is consequently apt to run over. During this time, also, little drops are now and then spat up, whose causticity is increased by their heat, against which the operator ought therefore to be on his guard. The fire must be kept moderate till this ebullition ceases, and till the matter becomes consistent in the heat that made it boil before; then quickly increase the fire till the matter flows thin at the bottom like oil, when it is to be immediately poured into the mould, without waiting till the fumes cease to appear; for when this happens, the preparation proves not only too thick to run freely into the mould, but likewise less corrosive than it is expected to be.

For want of a proper iron mould, one may be formed of tempered tobacco-pipe clay, not too moist, by making in a lamp of it, with a smooth flieck first greased, as many holes as there is occasion for: pour the liquid matter into these cavitities, and when congealed, take it out by breaking the mould. Each piece is to be wiped clean from the grease, and wrapped up in soft dry paper, not only to keep the air from acting on them, but likewise to prevent their corroding or discolouring the fingers in handling.

This preparation is a strong caustic; and is frequently employed as such for consuming warts and other fibrous excrescences, keeping down fungous flesh in wounds or ulcers, and other similar ills. It is rarely applied where a deep cauch is required, as in the laying open of imposthumes and tumours; for the quantity necessary for these purposes, liquefying by the moisture of the skin, spreads beyond the limits, within which it is intended to operate.

The lunar pills.

Dissolve pure silver in aquafortis, as in the foregoing proceed; and after due evaporation, let the liquor aside to crystallize. Let the crystals be again dissolved in common water, and mixed with a solution of equal weight of nitre. Evaporate this mixture to dryness, and continue the exsiccation with a gentle heat, keeping the matter constantly stirring till no more fumes arise.

Here it is necessary to continue the fire till the fumes entirely cease, as more of the acid is required to be dissipated than in the preceding proceed. The preparation is, nevertheless, in taste very sharp, intensely bitter and nauseous: applied to ulcers, it acts as a caustic, but it is much milder than the foregoing. Boerhaave, Boyle, and others, commend it highly in hydropic cases. The former assures us, that two grains of it made into a pill with crumb of bread and a little sugar, and taken on an empty stomach (some warm water, sweetened with honey, being drank immediately after), purge gently without griping, and bring away a large quantity of water, albeit without the patient’s perceiving it; that it kills worms, and cures many inveterate ulcerous disorders. He neverthelefs cautions against using it too freely, or in too large a dose; and observes, that it always proves corrosive and weakening, especially to the stomatch.

**Part II. Preparations and Composition.**

**Ammoniacal iron.**

Take of iron filings, one pound; sal ammoniac, two pounds. Mix, and fablime. What remains at the bottom of the vessel mix by rubbing together with the sablum matter, and again sublime.

**Martial flowers, commonly called Ens Veneris. E.**

Take of colchochar of martial vitriol, washed and well dried; sal ammoniac, equal weights. Having mixed them well, sublime.

Though the mode of preparation directed by the two colleges is here different, yet the preparation is fundamentally the same; and it is perhaps difficult to say which mode of preparation is to be preferred as the easiest and best.

The name of *Ens veneris* has by some been very improperly applied to this preparation, as it contains not a particle of copper. The proper *Ens veneris* is prepared from the blue vitriol; but, as we shall soon see, is often not materially different from the martial flowers.

The succees of this proceed depends principally on the fire being hastily raised, that the sal ammoniac may not sublime before the heat be sufficient to enable it to carry up a sufficient quantity of the iron. Hence glafs vessels are not to proper as earthen or iron ones: for when the former are used, the fire cannot be raised quickly enough, without endangering the breaking of them. The most convenient vessel is an iron pot: to which may be luted an inverted earthen jar, having a small hole in its bottom to suffer the elastic vapours, which arise during the operation, to escape. It is of advantage to thoroughly mix the ingredients together, molten them with a little water, and then gently dry them; and to repeat the pulverization, humecation, and exsiccation, two or three times, or oftener. If this method be followed, the sal ammoniac may be in-creased to two or three times the quantity of the iron, or farther; and a single sublimation will often be sufficient to raise flowers of a very deep orange colour.

This preparation is fuppofed to be highly aperient and
and attenuating; though no otherwise so than the rest of the chalybeates, or at most only by virtue of the saline matter joined to the iron. It has been found of service in hysterical and hypochondriacal cafes, and in diltempers proceeding from a laxity and weakness of the folds, as the rickets. It may be conveniently taken in the form of a bolus, from two or three grains to ten; it is nauseous in a liquid form (unless in spirituous tincture); and occasions pills to swell and crumble, except such as are made of the gums.

**Ruff of iron** L.

Take of iron filings, one pound; expose them to the air, often moistening them with water, until they be corroded into rust; then powder them in an iron mortar, and wash off with distilled water the very fine powder. But the remainder, which cannot by moderate rubbing be reduced into a powder capable of being easily washed off, must be moistened, exposed to the air for a longer time, and again powdered and washed as before. Let the washed powder be dried.

**Rust of iron, commonly called prepared iron fillings.** E.

Set purified filings of iron in a moist place, that they may turn to rust, which is to be ground into an impalpable powder.

The cleansing of iron fillings by means of a magnet is very tedious, and does not answer so well as might be expected: for if they be rusty, they will not be attracted by it, or not sufficiently; nor will they by this means be entirely freed from brass, copper, or other metallic substances which may adhere to them. It appears from the experiments of Henckel, that if iron be mixed by fusion with even its own weight if any of the other metals, regulus of antimony alone excepted, the compound will be vigorously attracted by the lodestone. The rust of iron is to be procured at a moderate rate from the dealers in iron, free from any impurities, except such as may be washed off by water.

The rust of iron is preferable as a medicine to the calces or croci, made by a strong fire. Hoffman relates that he has frequently given it with remarkable success in obdurate chlorate de accommodis with excessive headaches and other violent symptoms; and that he usually joined it with pimpinella, arum root, and falt of tartar, with a little cinnamon and sugar. The dose is from four or five grains to twenty or thirty. Some have gone as far as a dram; but all the preparations of this metal answer best in small doses, which should rather be often repeated than enlarged.

**Tartarised iron.** L.

Take of filings of iron, one pound, powdered crystals of tartar, two pounds. Mix them with distilled water into a thick paste. Expose it to the air in an open earthen vessel for eight days; then grind the matter, dried in a lath of sand, to a very fine powder.

This is an useful preparation of iron in which that metal is chiefly brought to a saline state by means of the cream of tartar. It has now for the first time a place in the London pharmacopeia; but it had before been introduced into some of the foreign ones, particularly the pharmacopoeia Genesewiensis under the title of *mors tartaratus*; and indeed it is almost precisely the same with the *mors fulminating* of the old editions of the Edinburgh pharmacopoeia.

**Vitriolated iron.** L.

Take of filings of iron, vitriolic acid, each eight ounces; distilled water, three pints. Mix them in a glass vessel, and when the effervescence has ceased, place the mixture for some time upon hot sand; then pour off the liquor, draining it through paper: and after due exhalation set it aside to crystallize.

**Vitriol of iron, or salt of steel.** E.

Take of purified filings of iron, six ounces; vitriolic acid, eight ounces; water, two pounds and a half. Mix them; and when the effervescence ceases, let the mixture stand for some time upon warm sand; then strain the liquor through paper, and after due evaporation set it aside to crystallize.

During the dilution of the iron an elastic vapour rises, which on the approach of flame catches fire and explodes, as sometimes to burst the vessel. To this particular therefore the operator ought to have due regard.

This vapour is also noxious to animal life. It is the inflammable air of Dr Priestly.

The chemists are seldom at the trouble of preparing this salt according to the directions above given; but in its lead substitue common green vitriol, purified by solution in water, filtration, and crystallization. The only difference between the two is, that the common vitriol contains somewhat more metal in proportion to the acid; and hence in keeping, its green colour is much sooner debased by a rusty brownish cast. The superfusional quantity of metal may be easily separated by suffuring the solution of the vitriol to stand for some time in a cold place, when a brownish yellow ochery sediment will fall to the bottom; or it may be perfectly dissolved, and kept suspended by a suitable addition of oil of vitriol. If the vitriol be suspended to contain any cuprous matter, which the common English vitriol seldom does, though almost all the foreign vitriols do, the addition of some bright iron wire to the solution will both discover, and effectually separate, that metal: for the acid quits the copper to dissolve a proportionable quantity of the iron; and the copper, in its separation from the acid, adheres to the undissolved iron, and forms a skin of a true copper colour on its surface. Even a vitriol of pure copper may on this principle, be converted into a small vitriol of iron.

But though the vitriolic acid appears in this operation to have so much stronger a disposition to unite with iron than with copper, that it totally rejects the latter when the former is presented to it; the operator may nevertheless give a dangerous impregnation of copper to the purest and most saturated solution of iron in the vitriolic acid, by the use of copper vessels. If the martial solution be boiled in a copper vessel, it never fails to dissolve a part of the copper, distinguishable by its giving a cupreous film to a piece of bright iron immersed in it. By the addition of the iron, the
copper is separated; by boiling it again without iron, more of the copper is dissolved; and this may in like manner be separated by adding more iron.

The salt of steel is one of the most efficacious preparations of this metal; and not unfrequently made use of in caustic and chlorotic cases for exciting the uterine purgations, strengthening the tone of the vessels, and destroying worms. It may be conveniently taken in a liquid form, largely diluted with water: Borehawe directs it to be dissolved in an hundred times its weight of water, and the solution to be taken in the dose of twelve ounces on an empty stomach, walking gently after it. Thus managed, he says, it opens the body, provokes diuresis and expels worms, tingles the excrements black, or forms them into a matter like clay, strengthens the fibres, and thus cures many different distempers. The quantity of vitriol in the above dose of the solution is fifty-seven grains and a half; but in common practice, such large doses of this strong chalybeate are never ventured on. Four or five grains, and in many cases half a grain, are sufficient for the intention in which chalybeate medicines are given. Very dilute solutions, as that of a grain of the salt in a pint of water, may be used as succedanea to the natural chalybeate waters, and will in many cases produce similar effects.

Colocbar of vitriol. E.

Let calcined vitriol be urged with a violent fire till it becomes of a very red colour.

In this preparation, the iron which had been brought to a fine line by means of the acid of vitriol, is again deprived of that acid by the action of fire. It may be cooled, three or four as differing and expels worms from the residuum which remains in the retort, when vitriolic acid is diffused from martial vitriol. The colocbar is very early employed by itself for medical purposes; but it is used in the preparation of some other chalybeates, particularly the medicinal flowers, when prepared according to the method directed by the Edinburgh college.

Martial athips. Gen.

Take of the rust of iron, as much as you please: olive oil, a sufficient quantity to make it into a paste. Let this be diffused in a retort by a strong fire to dryness. Keep the residuum reduced to a fine powder in a clove vessel.

An article under this name had formerly a place in some of the old pharmacopoeias, and is described by Lernery in the Memoirs of the French Academy; but it was formed by a tedious process, continued for several months by the aid of water. Here the process is much shorter, and is supposed to give nearly the same product. Some have recommended it, on the supposition that the iron has here obtained in a very subtle state; but it is not in general supposed to have any advantage over the other more common chalybeates.

Open and asftringent crocus of iron.

These are prepared by mixing iron filings with twice their weight of powdered sulphur, degrading in a red-hot crucible; and in the one case keeping the preparation over the fire till it assumes a red colour: in the other, by reverberating it for a long time in the most extreme degree of heat.

Preparations under these names still retain a place in some of the foreign pharmacopoeias, but they are variously prepared. They may, however, be considered as polishing the same medical powers: and although the preparations mentioned above probably differ from each other in their virtues, yet that difference is not of such a nature as is imported by the titles by which they are usually distinguished. For all the preparations of iron probably act by an astringent quality; and that which is above denominated the asftringent crocus has probably least effect in that way. At one period, these preparations were not unfrequently in use; and they were given in the form of bolus, clefsbury, or pill, from a few grains to a scruple; but among us they are at present so little in use as to have no place in our pharmacopoeias.

Chap. XIII. Preparations of Mercury.

We have already treated of mercury in various parts of our work, as we found occasion, and what we have already discussed is unnecessary to repeat. See MERCURY, CHEMISTRY-Index, MATERIAL MEDICA, p. 553. METALLURGY, and QUICKSILVER. On the whole, it appears evident that there is no article which has been employed for medical purposes in a greater variety of forms. The colleges of London and Edinburgh have admitted into their pharmacopoeias only a few of these; but from the selection they have made, there is reason to believe that every useful purpose for which mercury has been employed may be answered; and these purposes are both numerous and considerable. For it is at least very generally allowed among intelligent practitioners, that there are few articles kept in the shops of our apothecaries which can be considered as so extensively useful.

Mercury or quicksilver, in its crude state, is a ponderous metallic fluid, totally volatile in a strong fire, and calcinable by a weaker one (though very difficultly) into a red powdery substance. It dissolves in the nitrous acid, is corroded by the vitriolic, but not acted on by the marine in its liquid state: it nevertheless may be combined with this last skillfully applied in the form of fume. Quicksilver unites by triturating with earthy, unctuous, retinous, and other similar substances, so as to lose its fluidity: triturated with sulphur, it forms a black mafs, which by sublimation changes into a beautiful red one.

For the general virtues of the mercurial preparations, see some of the articles above referred to, and MEDICINE. Here we shall only observe, that while in certain circumstances they act as stimulants, and even as corrosives, to the parts to which they are applied, under a different management, when introduced into the habit, they seem to forward circulation through even the smallest and most remote vessels of the body; and may be so managed as to promote all the excretions. But while they thus operate as a powerful stimulus to the sanguiferous, and probably also to the lymphatic system, they seem to exert but little influence on the nervous system. By this means they proveeminently serviceable in some inveterate chronic disorders, proceeding from obliterative obstructions of the glands. Crude mercury has
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has no effect this way. Resolved into fume, or divided into minute particles, and prevented from returning by the intervention of other substances, it operates very powerfully, unless the dividing body be ful, hur, which reunites its action. Combined with a small quantity of the mineral acids, it acts effectually, though in general mildly; with a larger it proves violently corrosive.

Purified quicksilver. L.

Take of quicksilver, filings of iron, each four pounds.

Rub them together, and diffil from an iron vessel.

As in the dilution of quicksilver glafs retorts are very liable to be broken, an iron one is here with propriety directed; and by the addition of the filings of iron, matters which might otherwise arise with the quicksilver will be more apt to be detained in the retort. But still this happens so readily, even merely with that degree of heat which is necessary to elevate the mercury, that it is very doubtful whether much advantage be obtained from this process; and accordingly it has now no place in the pharmacopoeia of the Edinburgh college. A

Actuated quicksilver. L.

Take of purified quicksilver, one pound; diluted nitrous acid, two pounds; water of kali, as much as is sufficient. Mix the quicksilver with the acid in a glass vessel, and diffuse it in a sand-bath; then drop in by degrees the water of kali, that the calx of quicksilver may be precipitated; wash this calx with plenty of diffiluted water, and dry it with a gentle heat. These things being done, take of the calx of quicksilver, above described, one pound; acetic acid, as much as is necessary to diffuse the calx. Mix them in a glass vessel; and the solution being completed, strain it through paper; then evaporate it till a pellicle appears; and let it affide to crystallize. Keep their crystalls in a vessel close stoped.

Of all the saline preparations of mercury, it has long been the opinion of the best chemists, that those in which it was brought to a saline form, by means of acetic acid, would be the mildest; and such a preparation was conjectured to be the basis of a celebrated pill, prepared and sold by Mr Keyser. It was, however, found to be a very difficult matter to imitate his pill, or to obtain a combination of mercury with the acetic acid; but not long since, the process for preparing these pills was published by authority at Paris after being purchased by the French king. The process here described though in some particulars much less operose than that of Mr Keyser, yet nearly approaches to it, and furnishes us with the mildest of the saline mercurials.

Calcined quicksilver. L.

Take of purified quicksilver, one pound; expose the quicksilver in a flat-bottomed glass crucible, to an heat of about 600 degrees in a sand-bath, till it becomes a red powder.

This preparation may now be made in a shorter time than by the process formerly directed in the London pharmacopoeia, which in general required several months; for the access of air, without which calcina-

tion cannot be performed, was then very much ex-

cluded. Still, however, the process is a tedious one, and might perhaps be improved. A vessel might be so contrived, as to occasion a continual flux of air over the surface of the mercury.

This preparation is highly esteemed in venereal cases, and supposed to be the most efficacious and certain of all the mercurials. It may be advantageously given in conjunction with opiates: a bolus or pill, containing from half a grain to two grains of this calx, and a quarter or half a grain or more of opium, with the addition of some warm aromatic ingredient, may be taken every night. Thus managed it acts mildly, though powerfully, as an alterative and diaphoretic: given by itself in larger doses, as four or five grains, it proves a rough emetic and cathartic.

Afhl-coloured powder of mercury. E.

Take of quicksilver, weak nitrous acid, equal weights.

Mix them so as to dissolve the quicksilver; dilute the solution with pure water, and a spirit of sal ammoniac as much as is sufficient to separate the mercury perfectly from the acid; then wash the powder in pure water, and dry it.

In this process the mercurial nitre is decomposed; the precipitate, therefore, is a calx of mercury, and the clear liquor a solution of nitrous ammoniac. From the great attraction which the nitrous acid has for phlogiston, or from its ready diffusion to part with pure air, the precipitates of mercury from its solution in this acid are more completely in the state of a calx than those from any other menstruum. There are, however, several niceties to be observed in conducting this process. If we employ too small a proportion of acid, and affil the solution by heat, the solution will contain an excess of calx capable of being separated by the water; and the whole precipitate from such a solution would be of a white colour. If, on the other hand, we employ too large a proportion of acid, the mercury is then so far calcined as to be capable of being dissolved by the volatile alkali; and this might happen in proportion as the quantity should be superabundant to the neutralization of the acid. The use of the water is to dissolve the nitrous ammoniac as fast as it is formed, and thereby prevent it from falling down and mixing with the precipitate. It is necessary to employ the purest water. If such be used, as contains a nitrous selenite, not only a part of the mercury may be precipitated by the base of the selenite, but this last might also be deposited by the preceding addition of the alkali.

The ashl-coloured powder of mercury has of late years been much celebrated for the cure of venereal affections. It was first prepared by Dr Saunders to be made by precipitating the mercury from calomel, as the belt substitute for the tedious and expensive process of the precipitate per f_., and of the grey powder produced by trituration with gum arabic. From the testimony of Dr Home, and several other practitioners, we have no doubt of its being a very valuable preparation of mercury. It may be given in a bolus or wafer, in the quantity of from one fix or seven grains: the dose being gradually increased according to its effects upon the person.
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Take of purified quicksilver, three ounces; powdered chalk, five ounces. Rub them together until the globules disappear.

In this preparation, as well as the two former, we have also the mercury in a state of calx; but in place of being brought to that state by the aid of fire or of acids, what may here be considered as calcination is effected by triturate.

This preparation, had no place in the former editions of the London pharmacopoeia. A preparation nearly similar indeed, under the title of mercarius alkalifatus, in which crabs eyes were employed instead of chalk, had a place in the old editions of the Edinburgh pharmacopoeia, but was rejected from the edition of 1744, and has never again been restored. One reason for rejecting it was its being liable to gross abuse in the preparation, by the addition of some intermediate, facilitating the union of mercury with the absorbent earth, but diminishing or altering its power. The present preparation is liable to the same objection. Some, however, are of opinion that when duly prepared, it is an useful alterative. But there can be little doubt, that the absorbent earth, by decoying acid in the alimentary canal, will diminish the activity of the mercurial calx.

Muriated quicksilver. L.

Take of purified quicksilver, vitriolic acid, each two pounds; dried sea-salt, three pounds and an half. Mix the quicksilver with the acid in a glass vesse, and boil in a sand heat until the matter be dried. Mix it, when cold, with the sea-salt, in a glass vesse; then sublime in a glasse cucurbit, with a heat gradually raised. Lastly, let the sublimed matter be separated from the former.

Sublimate corrosive mercury. E.

Take of quicksilver, weak nitrous acid, each four ounces; calcined sea-salt, calcined vitriol, of each five ounces. Difioe the quicksilver in the nitrous acid, and evaporate the solution to a white and thoroughly dry mass; then add the sea-salt and vitriol. Having ground and mixed them well together, put the whole into a phial, one half of which they ought to fill; then sublime in sand, first with a gentle, but afterwards with an increased heat.

The sublimed prepared by either of these methods is the same, they both contain only of mercury and the acid of the sea-salt united together. In the process directed by the Edinburgh college, the materials being mixed and exposed to the fire, first the vitriol parts with its acid, which, dissolving those of the nitre and marine salt, takes their place. The marine acid, resolved into fume and aflisted by the nitrous, dissolves the mercury, now also strongly heated. This acid, though it very difficulty acts on mercury, yet when thus once united with it, is more strongly retained thereby than any other acid. The nitrous spirit, therefore, having nothing to retain it (for its own bases, and that of the sea-salt are both occupied by the vitriolic, and that which the vitriolic forsook to unite with these, is now scarcely combinable with it), arifes; leaving the mercury and marine acid to sublime together when the heat shall be strong enough to elevate Preparations. Some small portion of the marine spirit arises along with the nitrous: and hence this compound acid has been usually employed instead of the compound aquare, to which it is similar, for making the red corrosive.

It appears therefore that the vitriol, and the bases of the nitre and sea-salt, are of no farther use in this process, than as convenient intermediates for facilitating the union of the mercury with the marine acids. They likewise serve to afford a support for the sublimate to rest upon, which thus assumes the form of a placenta or cake.

This processes, however, now adopted by the London college, is a better and more simple one. There the mercury corroded by the vitriolic acid into a white mass, is mixed with about an equal quantity of sea-salt, and let to sublume; the vitriolic acid quits the mercury to unite with the bases of the sea-salt; and the acid of the sea-salt, now let at liberty, unite with the mercury, and sublimes with it into the compound required. The discovery of this method is generally attributed to Boulduc, though it is also given in Knuckel's Laboratorium Chymicum. When the process is conducted in this way, the residual matter is a pure Glauber's salt, and the sublimate is still free of ferruginous matter; a greater or less quantity of which is very generally carried up along with the mercury when vitriol of iron is employed. Boulduc's method has therefore the advantage in this, that the proportion of mercury in a given quantity of sublimate must be less liable to variation.

If the mercury be corroded by the nitrous acid instead of the vitriolic, the event will be the same; that is, equally quitting the mercury, and setting loose the marine; and the sublimate made by this method is the same with the foregoing; but as the quantity of fixed matter is smaller, it more difficulty assumes the form of a cake. It requires indeed some skill in the operator to give it this appearance when either process is followed. When large quantities are made, this form may be easily obtained, by placing the masses no deeper in the sand than the surface of the matter contained in it; and removing a little of the sand from the sides of the glass, as soon as the flowers begin to appear in the neck; when the heat should likewise be somewhat lowered, and not at all raised during the whole process. The sublimation is known to be completed by the edges of the crystalline cake which will form on the surface of the caput mortuum, appearing smooth and even, and a little removed from it.

Our apothecaries rarely, and few even of the chemists, attempt the making of this preparation themselves; greatest part of what is used among us comes from Venice and Holland. This foreign sublimate has been reported to be adulterated with arsenic. Some affirm, that this dangerous fraud may be discovered by the sublimate turning black on being moistened with alkaline ley; which by others is denied. As this point seemed of some importance to be determined, fundry experiments have been made with this view, which proves the inefficiency of alkalis for discovering arsenic. Alkaline leys, poured into a solution of pure arsenic, and into a mixture of the two solutions in different proportions, produced no blackness in any; and though...
though the pure sublimate, and the mixtures of it with
an end, exhibited some differences in these trials, yet
these differences were neither so constant nor so
strongly marked as to be laid down universally for criteria
of the presence or absence of arsenic; different speci-
mens of sublimate, known to be pure, have been found
to differ considerably in this respect; probably from
holding a little more or less mercury in proportion
to the acid, or from their retaining some small
portion of those acids which were employed in the prepa-
ration as intermediate.

Some chemists deny the practicability of this adul-
teration. There is a process common in books of che-
metry, wherein sublimate and arsenic being mixed to-
gether, and set to sublime, do not arise in one mass,
or yield any thing similar to the preparation here
intended: the arsenic absorbs the acid of the sublimate,
and is reduced thereby into a liquid or butyrous con-
fluence; while the mercury thus freed from the
acid diffuses in its fluid form; if the quantity of ar-
senic be insufficient to decompound the whole of
the sublimate, the remainder of the sublimate concretes
diftinct from the arsenical butter. From whence they
conclude, that arsenic and sublimate cannot be united
in the form in which this preparation is brought to
us.

The above experiment is not altogether decisive;
for though arsenic and sulphur do not assume the re-
quired form by the common processes, it is possible they
may by some other management. It will therefore be
proper to point out means for the satisfaction of those
who may be desirous of convincing themselves of the
genuineness of this important preparation. Let some
of the sublimate, powdered in a glass mortar, be well
mixed with twice its weight of black flux, and a little
slagging or filings of iron; put the mixture into a crucible
capable of holding four or five times as much;
give a gradual fire till the ebullition ceases, and then
haftily increase it to a white heat. If no fumes of a gar-
ic smell can be perceived during the process, and if
the particles of iron retain their form without any
of them being melted, they may be sure that the mix-
ture contained no arsenic.

Sublimate is a most violent corrosive, soon corrupting
and destroying all the parts of the body it touches.
A solution of it in water, in the proportion of about
a dram to a quart, is useful for keeping down proud
fever, and cleaning foul ulcers; and a more diluted solution
as a constrictor, and for destroying cutaneous infections.
But a great deal of caution is requisite even in these
external uses of it.

Some have nevertheless ventured to give it inter-
ally, in the dose of one-tenth or one-eighth of a grain,
Boerhaave relates, that if a grain of it be dissolved in
an ounce or more of water, and a dram of this solu-
tion, sweetened with syrup of violets, be taken twice
or three a day, it will prove efficacious in many dis-
tempers though incurable; but he particularly cau-
ses us not to venture upon it, unless the method of
managing it be well known.

Sublimate dissolved in vinous spirit has of late been
given internally in larger does; from a quarter of a
grain to half a grain. This method of using it was
brought into repute by Baron Van Swieten at Vienna,
especially for venereal maladies; and several trials of
it have also been made in this kingdom with success.

Take of corrosive sublimate mercury, fix grains; sal
ammoniac, twelve grains. Dissolve in a pound of dis-
tilled water. If hard water be used for this purpose,
the solution suffers a kind of decomposition from the
nitrous felenite of the water.

The solution of corrosive sublimate in water is very
muchavored by sal ammoniac. There was a practice
some years ago, of mixing up this solution with wheat
flour into the confluence of pills for internal use: and
the quantity of sublimate in each pill was easily ascer-
tainable.

This solution may also be used for washing venereal
and other sores; but in many instances it will be found
too acid for that purpose, and will require to be weak-
ened by the addition of a portion of water.

Take of muriated quicksilver, one pound; purified
quicksilver, nine ounces. Rub them together till
the quicksilver ceases to appear. Put the
solution into a glass mortar, four ounces; pure quicksilver,
three ounces and a half. Mix them well together,
by long triturating in a glass or marble mortar, until
the quicksilver ceases to appear. Put the
solution into an oblong phial, of such a size that only
one-third of it may be filled; and set the phial in
fand, that the mass may sublime. After the sub-
limation, break the glass; and the red powder which
stands in its bottom, with the whitish one that
sticks about the neck, being throwaway, let the
white mercury be sublimed again three or four times,
and reduce it to a very fine powder.

Take of corrosive mercury sublimate reduced to a pow-
der in a glass mortar, four ounces; pure quicksilver,
three ounces and a half. Mix them well together,
by long triturating in a glass or marble mortar until
the quicksilver ceases to appear. Put the powder
into an oblong phial, of such a size that only
one-third of it may be filled; and set the phial in
sand, that the mass may sublime. After the sub-
limation, break the glass; and the red powder which
stands in its bottom, with the whitish one that
sticks about the neck, being throwaway, let the
white mercury be sublimed again three or four times,
and reduce it to a very fine powder.
The trituration of corrosive sublimate with quicksilver is a very noxious operation: for it is almost impossible, by any care, to prevent the lighter particles of the former from rising so as to affect the operator's eyes and mouth. It is nevertheless of the utmost consequence, that the ingredients be perfectly united before the sublimation is begun. It is necessary to pulverize the sublimate before the mercury is added to it: but this may be safely performed with a little caution; especially if during the pulverization the matter be now and then sprinkled with a little spirit of wine: this addition does not at all impede the union of the ingredients, or prejudice the sublimation: it will be convenient not to clore the top of the subliming vessel with a cap of paper at first (as is usually practised), but to defer this till the mixture begins to sublime, that the spirit may escape.

The rationale of this process deserves particular attention; and the more so, as a mistaken theory herein has been productive of several errors with regard to the operation of mercurials in general. It is supposed, that the *dulci fication*, as it is called, of the corrosive mercury is owing to the fucile or sharp points, on which its corrosiveness depends, being broken and worn off by the frequent sublimations. If this opinion were just, the corrosive would become mild, without any addition, barely by repeating the sublimation; but this is contrary to all experience. The abatement of the corrosive quality of the sublimate is entirely owing to the combination of as much fresh mercury as is capable of being united with it; and by whatever means this combination be effected, the preparation will be sufficiently dulced. Triture and digestion promote the union of the two, while sublimation tends rather to disunite them. The prudent operator, therefore, will not be solicitous about separating such mercurial globules as appear distinct after the first sublimation: he will endeavour rather to combine them with the reft, by repeating the trituration and digestion.

The college of Wurtemberg require their sweet mercury to be only twice sublimed, and the Augsflan but once; and Neumann proposes making it directly by a single sublimation from the ingredients of the corrosive sublimate, by only taking the quicksilver in a larger proportion.

Mr Selle of Berlin has lately proposed a method of making sweet mercury, nearly similar to that of Neumann. He directs, that to four ounces of true quicksilver there should be added as much strong vitriolic acid. These are to be mixed over a strong fire till they become a solid hard mass. This mass is to be triturated in a stone mortar with two ounces and half of quicksilver and four ounces and half of dried common salt. And by a single, or at most two, sublimations, he assures an excellent sweet mercury is obtained.

If this medicine made after either of these methods should prove in any degree acid, water boiled on it for some time will diffuse and separate that part in which its acrimony consists. The marks of the preparation being sufficiently dulced are, its being perfectly insipid to the taste, and indiffoluble by long boiling in water. Whether the water in which it has been boiled has taken up any part of it may be known by dropping into the liquor a ley of any fixed alkaline salt, or any volatile alkaline spirit. If the decoction has any mercurial impregnation, it will grow turbid on this addition; if otherwise, it will continue limpid. But here care must be taken not to be deceived by any extraneous saline matter in the water itself. Most of the common spring waters turn milky on the addition of alkalis; and therefore, for experiments of this kind, distilled water or rain water ought to be used.

This name of *calomel*, though for a considerable time banished from our bills pharmacopoeias, is again restored by the London college. But we cannot help thinking, that they might easily have invented a name better expressing the constituent parts and nature of the preparation.

Calomel, or sweet mercury, may be considered as one of the most useful of the mercurial preparations; and it may be esteemed as holding an intermediate place between the acetated quicksilver, one of the mildest of the saline preparations, and the muriated quicksilver, or corrosive sublimate, one of the most acid of them.

*Mild muriated quicksilver.* L.

Take purified quicksilver, diluted nitrous acid, of each half a pound. Mix in a glass vessel, and let it aside until the quicksilver be dissolved. Let them boil, that the salt may be dissolved. Pour out the boiling liquor into a glass vessel into which another boiling liquor has been put before, containing sea-salt, four ounces; distilled water, eight pints. After a white powder has subsided to the bottom of the vessel, let the liquor swimming at the top be poured off, and the remaining powder be washed till it becomes insipid with frequent affusions of hot water; then dried on blotting paper with a gentle heat.

This preparation had a place in former editions of the London and Edinburgh pharmacopoeias under the name of *mercurius dulcis precipitatus*. But the process as now given is somewhat altered, being that of Mr Scheele of Sweden, who has recommended this as an easy and expeditious method of preparing sweet mercury or calomel.

It appears from several tests that this precipitate is equal in every respect to that prepared by the preceding processes. It is less troublesome and expensive, and the operator is not exposed to the noxious dust arising from the trituration of the quicksilver with the corrosive sublimate, which necessarily happens by the common method. The powder is also finer than can be made from the common sublimed sweet mercury by any trituration whatever. The clear liquor standing over the precipitate is a solution of cebic or rhomboidal nitre.

Sweet mercury, which may be considered as precisely the same with the calomel and mild muriated quicksilver, appears to be one of the best and safest preparations of this mineral, when prepared as a quick and general stimulant. Many of the more elaborate processes are no other than attempts to produce from mercury such a medicine as this really is. The dose recommended by some for raising a salivation, is ten or fifteen grains taken in the form of a bolus or pill, every night or oftener, till the ptyalism begins. As an alterant and diaphoretic, it has been given in doses of five or six grains; a purgative being occasionally
We sometimes indeed receive considerable quantities of it from Holland: but this depends on the ingredients being commonly cheaper there than with us, and not on any secret in the manner of the preparation.

This precipitate is, as its title imports, an escharotic; and with this intention is frequently employed by the surgeons with balsamum and other dressings, for containing ftagous flesh in ulcers and the like purposes. It is subject to great uncertainty in point of strength, more or less of the acid exhaling according to the degree and continuance of the fire. The best criterion of its strength, as already observed, is its brilliant appearance: which is also the mark of its genuineness: if mixed with minium, which it is sometimes said to be, the duller hue will discover the aline. This admixture may be more certainly detected by means of fire: the mercurial part will totally evaporate, leaving the minium behind.

Some have ventured to give this medicine internally in venereal, phthisial, and other obdurate chronic disorders, in doses of two or three grains or more. But certainly the milder mercurials, properly managed, are capable of answering all that can be expected from this: without occasioning violent anxieties, torments of the bowels, and similar ill consequences, which the belt management can scarcely prevent this corrosive preparation from sometimes inducing. The chemists have contrived fundry methods of correcting and rendering it milder, by dissolving a portion of the acid: but to no very good purpose, as they either leave the medicine still too corrosive, to render it similar to others which are procuring at an earlier rate.

White cake of quicksilver.

Take of muriated quicksilver, sal ammoniac, water of kali, each half a pound. Dissolve first the sal ammoniac, afterwards the muriate quicksilver in distilled water, and add the water of kali. Wash the precipitated powder until it becomes fluid.

White precipitate of mercury.

Dissolve corrosive sublimate mercury in a sufficient quantity of hot water, and gradually drop into the solution hse spirit of sal ammoniac as long as any precipitation ensues. Wash the precipitated powder with several fresh quantities of warm water. These preparations are used chiefly in ointments, with which intention their fine white colour is no small recommendation to them. For internal purposes they are rarely employed, nor is it at all wanted; they are nearly similar to sweet mercury, but less certain in their effects.

Though the processes directed by the London and Edinburgh colleges be here somewhat different, yet the preparations are ultimately the same. The proc described by the Edinburgh college is the most simple but is liable to some objections.

Corrosive sublimate, as we have already seen, consists of mercury united with a large portt of acid. It is there deluted by adding as much fresh mercury as is sufficient to saturate all the acid; here, by separating all the acid that is not saturated. This last way seems an unfrugal one, as account not only of the loss of the acid, but of the volatile spirit necessary for absorbing it. The operator may, however, if it should be thought

Red nitrate quicksilver. L.

Take of purified quicksilver, nitrous acid, each one pound; muriatic acid, one dram. Mix in a glass vessel, and dissolve the quicksilver in a fand baw: then raise the fire until the matter be formed into red crystals.

Red corrosive commonly called red precipitated mercury. E.

Take of quicksilver, weak nitrous acid, each one pound. Let the quicksilver be dissolved in the acid, and then let the soltion be evaporated to a white dry ond. This being bow in a powder, must be put into a glass retort, and subjected to a fire gradually increased, till a small quantity of it, taken out in a glass stop, and allowed to cool, affumes the form of fming red squares. Let the vessel be then removed from the fire. During the proces the matter must be carefully agitated by a glass rod, that it may be equally heated.

The marine acid in the menilurn ordered in the first process dispenses the mercurial calx to assume the bright sparkling look admired in it; which, though perhaps no advantage to it as a medicine, ought nevertheless to be infilled on by the buyer as a mark of its goodness and strength. As soon as the matter has gained this appearance, it should be immediately removed from the fire; otherwise it will soon lose it again. The preparation of this red precipitate, as it is called, in perfection, is supponed by fine to be a secret not known to our chemists, infomuch that we are under the necessity of imprising it from abroad. This reflection seems to be founded on misinformation,
thought worth while, recover the volatile salt from the liquor, by adding to it, after the precipitate has been separated, a proper quantity of potash, and distilling with a gentle heat, in the same manner as for the spirit of volatile salt of sal ammoniac; for a true sal ammoniac is regenerated, in the precipitation, from the union of the volatile spirit with the marine acid of the sublimate. It is by no means advisible to use the liquor itself as a solution of sal ammoniac, or to separate the sal ammoniac from it by evaporation and crystallization, as a part of the mercury might be retained, and communicate dangerous qualities: but the volatile salt separated by distillation may be used with out fear of its containing any mercury; none of which will arise with the heat by which the volatile salts are distilled.

Fixed alkalis answer as effectually for precipitating solutions of sublimate as the volatile; but the precipitate obtained by means of the former, instead of being white, as with the latter, is generally of a reddish yellow or orange colour. If sal ammoniac be dissolved along with the sublimate, the addition of fixed alkalis will, by extracting the volatile alkalii of the sal ammoniac, occasion as white a precipitation as if the volatile salt had been previously separated and employed in its pure state; and this compendium is now allowed by the London college in the process which they have adopted.

There the sal ammoniac, besides its use in the capital intention, to make a white precipitation, promotes the solution of the sublimate; which of itself is difficult, and scarcely at all totally, solubile by repeated boiling in water: for however skillfully it be prepared, some part of it will have an under proportion of acid, and consequently approach to the state of sweet mercury. A good deal of care is requisite in the precipitation; for if too large a quantity of the fixed alkaline solution be imprudently added, the precipitate will lose the elegant white colour for which it is valued.

**Quicksilver with sulphur.** L.

Take of purified quicksilver, flowers of sulphur, each one pound. Rub them together until the globules disappear.

**Æthiops mineral.** E.

Take of quicksilver, flowers of sulphur, each equal weights. Grind them together in a glass or stone mortar, with a glass pestle, till the mercurial globules totally disappear. An Æthiops is made alo with a double quantity of mercury.

We need hardly remark, that these preparations, though new differing in name, are in reality the same. Nor need we add that the direction given by the Edinburgh college, of using a glass or stone mortar and pestle, is necessary and proper.

The union of the mercury and sulphur might be much facilitated by the affillence of a little warmth. Some are accustomed to make this preparation in a very expeditious manner, by melting the sulphur in an iron ladle, then adding the quicksilver, and stirring them together till the mixture be completed. The small degree of heat here sufficient cannot reasonably be supposed to do any injury to substances which have already undergone much greater fires, not only in the extraction from their ores, but likewise in the purifications of them directed in the pharmacopœia. In the following process they are exposed in conjunction to a strong fire, without suspicion of the compound receiving any ill quality from it. This much is certain, that the ingredients are more perfectly united by heat than by the degree of triture usually bestowed on them. From the Æthiops prepared by triture, part of the mercury is apt to be inqueezed out on making it into an eleuticary or pills; from that made by fire no separation is observed to happen.

Æthiops mineral is one of the most inactive of the mercurial preparations. Some practitioners, however, have represented it as possessing extraordinary virtues; and most people imagine it a medicine of some efficacy. But what benefit is to be expected from it in the common doses of eight or ten grains, or a scruple, may be judged from hence, that it has been taken in doses of several drams, and continued for a considerable time, without producing any remarkable effect. Sulphur eminently abates the power of all the more active minerals, and seems to be at the same time restrained by them from operating in the body itself. Boerhave, who is in general sufficiently liberal in the commendation of medicines, disapproves of the Æthiops in very strong terms. "It cannot enter the aborvent vessels, the lacteals, or lymphatics, but passes directly through the intestinal tube, where it may happen to destroy worms; if it operates luckily. They are deceived who expect any other effects from it; at least I myself could never find them. I am afraid it is unwarily given, in such large quantities, to children, and persons of tender constitutions, as being a foreign mass, unconquerable by the body; the more to be feared as it has continual fluxgall and inactive. It does not raise a salivation, because it cannot come into the blood. Who knows the effects of a sub stance, which, so long at it remains compound, seems no more active than a ponderous insipid earth?" The Æthiops, with a double proportion of mercury, now received into our pharmacopœias, has a greater chance, for operating as a mercurial; and probably the quantity of mercury might be still further increased to advantage.

**Red sulphurised quicksilver.** L.

Take of quicksilver, purified, forty ounces; sulphur, eight ounces. Mix the quicksilver with the melted sulphur; and if the mixture takes fire, extinguish it by covering the vessel; after which reduce the mass to powder, and sublimate it. It has been customary to order a larger quantity of sulphur than here directed; but smaller proportions answer better, for the less sulphur the finer coloured is the cinnabar.

As soon as the mercury and sulphur begin to unite, a considerable explosion frequently happens, and the mixture is very apt to take fire; especially if the process be somewhat hastily conducted. This a cident the operator will have previous notice of, from the matter swelling up, and growing suddenly con figent: as soon as this happens, the vessel must be immediately close covered.

During the sublimation, care must be had that the matter
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matter rise not in to the neck of the vessel, so as to block up and burst the glass. To prevent this, a wide-necked bolt head, or rather an oval earthen jar, coated should be chosen for the subliming vessel. If the former be employed, it will be convenient to introduce at times an iron wire, somewhat heated, in order to be the better assured that the passage is not blocking up; the danger of which may be prevented by cautiously raising the vessel higher from the fire.

If the ingredients were pure, no feces will remain: in such cases, the sublimation may be known to be over by introducing a wire a before, and feeling there-with the bottom of the vessel, which will then be perfectly smooth: if any roughness or inequalities are perceived, either the mixture was impure, or the sublimation is not completed; if the latter be the case, the wire will soon be covered over with the rising cinnabar.

The precautions of cinnabar in large quantity employ earthen jars, which in shape pretty much resemble an egg. These are of different size, according to the quantity intended to be made at one sublimation, which sometimes amounts to two hundred weight. The jar is usually coated from the small end almost to the middle, to prevent its breaking by the unevenness or irregularity of the fire. The greater part, which is placed uppermost, not being received within the furnace, has no occasion for this defence. The whole secret with regard to this process, is the management of the fire, which should be so strong as to keep the matter continually subliming to the upper part of the jar, without coming out at its mouth, which is covered with an iron plate; care should also be taken to put into the subliming vessel only small quantities of the mixture at a time.

The principal use of cinnabar is as a pigment. It was formerly held in great esteem as a medicine in cutaneous sores, scabies, and some other diseases, &c., but of late it has lost much of its reputation. It appears, to be nearly similar to the biops already spoken of, Carthaefer relates, that having given cinnabar in large quantities to a dog, it produced no sensible effect, but was partly voided along with the feces unaltered, and partly found entire in the stomach and intestines on opening the animal. The celebrated Frederic Hoffman, after bellowing high encomiums on this preparation, as having in many instances within his own knowledge perfectly cured epilepsies and vertigos from contusions of the head (where it is probably, however, that the cure did not so much depend on the cinnabar as on the spontaneous recovery of the parts from the external injury), observes, that the large repeated doses, necessary for having any effect, can be borne only where the fibres are strong; and that if the fibres of the stomach and intestines be loosed and flaccid, the cinnabar accumulated and concreted with the mucous matter of the parts, occasions great oppression; which seems to be an acknowledgment that the cinnabar is not subdued by the powers of digestion, and has no proper medicinal activity. There are indeed some infirmities of the daily use of cinnabar having brought on a salivation; perhaps from the cinnabar, mixed in those cases, having contained a lopsided proportion of sulphur than the forts commonly met with. The regula of antimony, and even white ar-

Cinnabar is sometimes used in fumigations against venereal ulcers in the nose, mouth, and throat. Half a dram of it burnt, the fume being imbied with the breath, has occasioned a violent salivation. This effect is by no means owing to the medicine as cinnabar: when set on fire, it is no longer a mixture of mercury and sulphur, but mercury resolved into fume, and blended in part with the volatile vitriolic acids; in either of which circumstances this mineral as we have already observed, has very powerful effects.

Vitriolated quicksilver. L.

Take of quicksilver, purified, vitriolic acid, each one pound. Mix in a glass vessel, and heat them by degrees until they unite into a white mass, which is to be perfectly dried with a strong fire. This matter, on the addition of a large quantity of hot distilled water, immediately becomes yellow, and falls to powder. Rub the powder carefully with this water in a glass mortar. After the powder has subided, pour off the water; and, adding more distilled water several times, with the matter till it become inimip.

Yellow mercury commonly called Turbitis mineral. E.

Take of quicksilver, four ounces; vitriolic acid, eight ounces. Cautiously mix them together and distill in a retort, placed in a sand furnace, to dryness: the white cells, which is left at the bottom, being ground to powder, must be thrown into warm water. It immediately assumes a yellow colour, but must afterwards be purified by repeated ablations.

The quantity of oil of vitriol, formerly directed, was double to that now employed by the Edinburgh college. The reduction made in this article greatly facilitates the process; and the proportions of the London college are perhaps preferable.

Boerhaave directs this preparation to be made in an open glass, slowly heated, and then placed immediately on burning coals; care being taken to avoid the fumes, which are extremely noxious. This method will succeed very well with a little address when the ingredients are in small quantity; but where the mixture is large, it is better to use a retort, placed in a sand furnace, with a recipient, containing a small quantity of water, luted to it. Great care should be taken, when the oil of vitriol begins to bubble, that the heat be steadily kept up, without at all increasing it, till the ebullition ceases, when the fire should be augmented to the utmost degree, that as much as possible of the redundant acid may be expelled.

If the matter be but barely excised, it proves a cautious fault, which in the ablation with water will almost all dissolve, leaving only a little quantity of tur-
bith the more of the acid that has been dissipated, the less of the remaining mercury will diffuse, and consequently the yield of turbith will be greater; fire expelling only such part of the acid as is not completely dissipated with mercury, while water takes up always, along with the acid, a proportional quantity of the mercury itself. Even when the matter has been strongly calcined, a part will still be soluble; this evidently appears on pouring into the washings a little solution of fixed alkaline salt, which will throw down a considerable quantity of yellow precipitate, greatly resembling the turbith, except, that it is less violent in operation.

From this experiment it appears, that the best method of edulcorating this powder is, by impregnating the water, intended to be used in its ablation, with a determined proportion of fixed alkaline salt; for by this means, the washed turbith will not only turn out greater in quantity, but, what is of more consequence, will have an equal degree of strength; a circumstance, which deserves particularly to be considered, especially in making such preparations as, from an error in the process, may prove too violently corrosive to be used with any tolerable degrees of safety. It is necessary to employ warm water if we are anxious for a fine colour. If cold water be used, the precipitate will be white.

It is observable, that though the superfluous acid be here absorbed from the mercury by the alkaline salt; yet in some circumstances this acid forms salts that fall to unite with mercury. If vitriolated tartar, or vitriolated kali, as it is now called, which is a combination of vitriolic acid with fixed alkali, be dissolved in water, and the solution added to a solution of mercury in aquafortis, the vitriolic acid will unite with the mercury, and form with it a turbith, which falls to the bottom; leaving only the alkali dissolved in the aquafortis, and united with its acid into a regenerated nitre. On this principle depends the preparation described by Wilson under the title of an excellent precipitate of mercury; which is no other than a true turbith, though not generally known to be such. It is made by dissolving four ounces of vitriolated kali in sixteen ounces of spirit of nitre; dissolving in this compound liquor four ounces of mercury; abrading the menstruum by a sand heat; and edulcorating with water the gold coloured mass which remains.

Turbith mineral is a strong emetic, and with this intention operates the most powerfully of all the mercurials that can be safely given internally. Its action, however, is not confined to the prime vice; it will sometimes excite a salivation, if a purgative be not taken soon after it. This medicine is used chiefly in virulent gonorrhœas, and other venereal cafes, where there is a great flux of humours to the parts. Its chief use at present is in swellings of the scrotum from a venereal affection; and it seems not only to act as a mercurial, but also, by the fever emitting it occasions, to perform the office of a diuretic, by accelerating the motion of the blood in the parts affected. It is said likewise to have been employed with success, in robust constitutions, against leprous disorders and obstinate glandular obstructions; the dose is from two grains to fix or eight. It may be given in doses of a grain or two as an alterative and diaphoretic, in the same manner as the calcined mercury already spoken of. Dr Hope has found that the turbith mineral is the most convenient emetic he has had occasion to employ.

This medicine was lately recommended as the most effectual preservative against the hydrophobia. It has been allowed, that there are several examples of its preventing madness in dogs which had been bitten; and some of its performing a cure after the madness was begun; from six or seven grains to a scruple may be given every day, or every second day, for a little time, and repeated at the two or three succeeding fulls and changes of the moon. Some few trials have likewise been made on human subjects bitten by mad dogs; and in these also the turbith, used either as an emetic or alterative, seemed to have good effects.

The washings of turbith mineral are used by some externally for the cure of the itch and other cutaneous foulneis. In some cases mercurial lotions may be proper, but they are always to be used with great caution: this is by no means an eligible one, as being extremely unequal in point of strength, more or less of the mercury being dissolved, as has been observed above, according to the degree of calcination. The pharmacopœia of Paris directs a mercurial wash free from this inconvenience, under the title of Aqua mercurialis; Mercurius Liquidus. It is composed of one ounce of mercury, dissolved in a sufficient quantity of spirit of nitre, and diluted with 30 ounces of distilled water. In want of distilled water, rain water may be used; but of spring waters there are very few which will mix with the mercurial solution without growing turbid and precipitating a part of the mercury.


Take of purest quicksilver, one dram; gum arabic, two grains. Beat them in a stone mortar, adding by little and little distilled water of fumitory till the mercury thoroughly disappear in the mucilage. Having beat and mixed them thoroughly, add by degrees, and at the same time rubbing the whole together, syrup of kermes, half an ounce, distilled water of fumitory, eight ounces.

This mixture was much celebrated by its author as an effectual preparation of mercury, unattended with the inconvenience of producing a salivation; and he imagined that this depended on a peculiar affinity existing between mercury and mucilage. Hence such a conjunction, the gummy quicksilver, as it has been styled, has been the foundation of mixtures, pills, syrups, and several other formulae, which it is unnecessary to dwell upon in this place.

By a long continued trituration, mercury seems to undergo a degree of calcination; at least its globular appearance is not to be ascertained by the best microscopes; its colour is converted into that of a greyish powder; and from the inactive sub stance in its globular form, it now becomes one of the most powerful preparations of this metallic body. The use of the gum seems to be nothing more than to afford the interposition of a vivid substantia to keep the particles at a distance from each other, till the trituration requisite to produce this change be performed. Dr Saunders has clearly proved, that no real solution takes place in this
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There are two preparations of lead, red and white. Preparations as they are commonly called, which are much more extensively employed in other arts than in medicine, and of course they are prepared in large quantities. These formerly flood among the preparations in our pharmacopoeias; but they are now referred to the materia medica. We shall not, therefore, on the present occasion, make any farther observations with respect to them, but shall here infer from the old editions of the Edinburgh pharmacopoeia the directions there given for preparing them.

Red lead.

Let any quantity of lead be melted in an unglazed earthen vessel, and kept stirring with an iron spatula till it falls into powder, at first blackish, afterwards yellow, and at length of a deep red colour, in which last state it is called minium; taking care not to raise the fire so high as to run the calx into a vitreous mass.

The preparation of red lead is so troublesome and tedious, as scarce ever to be attempted by the apothecary or chemist; nor indeed is this commodity expected to be made by them, the preparation of it being a distinct branch of business. The makers melt large quantities of lead at once, upon the bottom of a reverberatory furnace built for this purpose, and so contrived that the flame acts on a large surface of the metal, which is continually changed by means of iron rakes drawn backwards and forwards, till the fluidity of the lead is destroyed; after which, the calx is only now and then turned. By barely stirring the calx, as above directed, in a vessel over the fire, it acquires no redness; the reverberation of flame on the surface being absolutely necessary for this effect. It is said, that 30 pounds of lead gain, in the process, five pounds; and that the calx, being reduced into lead again, is found one pound less than the original weight of the metal.

These calxes are employed in external applications, for abating inflammations, cleansing and healing ulcers, and the like. Their effects, however, are not very considerable; nor are they perhaps of much further real use, than as they give confidence to the plasters, unguent, &c.

Ceruse or white lead.

Put some vinegar into the bottom of an earthen vessel, and supend over the vinegar very thin plates of lead, in such a manner that the vapour which arises from the acid may circulate about the plates. Set the containing vessel in the heat of horse-dung for three weeks; if at the end of this time the plates be not totally calcined, scrape off the white powder, and expel them again to the flame of vinegar, till all the lead be thus corroded into powder.

The making of white lead is also become a trade by itself, and confined to a few persons, who have large conveniences for this purpose. The general method which they follow is nearly the same with that above described. See the Philosophical Transactions, n° 127.

In this preparation, the lead is so far opened by the acid, as to discover, when taken internally, the
malignant quality of the metal; and to prove externally, when sprinkled on running fores, or ulcers moderately cooling, drying, and astringent.

**Acetate of ceruse.**

Take of ceruse, one pound; distilled vinegar, one gallon and an half. Boil the ceruse with the vinegar until the vinegar is saturated; then filter through paper; and, after proper evaporation, let it abide to crystallize.

Salt, commonly called sugar of lead. E.

Put any quantity of ceruse, into a cucumbe, and pour upon it ten times its quantity of distilled vinegar. Let the mixture stand upon warm sand till the vinegar becomes sweet; when it is to be poured off, and fresh vinegar added as often as it comes off sweet. Then let all the vinegar be evaporated in a glafs vessel to the confinement of pretty thin honey, and let it abide in a cold place, that crystals may be formed, which are to be afterwards dried in the shade. The remaining liquor is again to be evaporated, that new crystals may be formed; the evaporation of the residuous liquor is to be repeated till no more crystals concrete.

Ceruse (especialy that fort called flake lead, which is not, like the others, subject to adulteration) is much preferable either to minium or litharge, for making the sugar of lead: for the corroboration which it has undergone from the flem of the vinegar dispenses it to dissolve more readily. It should be finely powdered before the vinegar be put to it; and during the digestion, or boiling, every now and then stir up with a wooden spatula, to promote its dissolution, and prevent its concreting into a hard mafs at the bottom. The strong acied obtained from the caput morum of vinegar may be employed for this purpose to better advantage than the weaker, though purer acied, above directed. If a small quantity of rectified spirit of wine be prudently added to the solution as soon as it is duly exhaled, and the mixture suffered to grow cold by slow degrees, the sugar will concrete into very large and transparent crystals, which are scarcely to be obtained by any other method.

If the crystals be dried in funshine, they acquire a blackish or livid colour. This seems to happen from the absolution of light and its conversion into phlogiston. If it be owing to the escape of pure air, why are the rays of the sun necessary to this discharge? On whatever principles we account for it the fact is the same; that the crystals soon lose their saline condition and the lead gradually refumes its metallic form. From this property of lead readily absorbing phlogiston, or parting with pure air, a solution of the sugar of lead becomes a very convenient sympathetic ink; on the same grounds it is also used for a more important purpose. As lead communicates a sweatenes and astringency very similar to the product of the vinous fermentation, a practice formerly prevailed among fraudulent dealers, of correclling the too great sharpenes of acid wines by adulterating them with this metal. The aubnbe may be detected in two different ways: a piece of paper may be moistened with the liquor to be examinced, and then exposed to the vapours of liver of sulphur; the moistened paper will become of a livid colour, and this will happen though 200 or 300 leaves of a book were interpasted between the paper and the vapours; by this method, then, we make a kind of sympathetic ink. But the best way of making the tell is, to drop a small quantity of a solution of the liver of sulphur into the suspeced liquor; if there be any lead preent, this addition will instantly occasion the precipitation of a livid or dark coloured cloud.

The sugar of lead is much more efficacious than the foregoing preparations, in answering the several intentions to which they are applied. Some have ventured upon it internally, in doses of a few grains, as a lyptic in hemorrhagies, profuse coliqueative sweats, seminal fluxes, the fiow albus, &c. nor has it failed their expectations. It very powerfully restrains the discharge; but almost as certainly as it does this, it occations symptoms of another kind, often more dangerous than those removed by it, and sometimes fatal. Violent pains in the bowels or through the whole body, and obstinate conftipations, sometimes immediately follow, especially if the dose has been considerable: cramps, tremors, and weakness of the nerves, generally sooner or later ensue.

Boerhaave is of opinion, that this preparation proves malignant only as far as its acied happens to be absorbed in the body; for in such a cafe, he says, 'it reduces again into cerufe, which is violently poifonous.' On this principle it would follow, that in habits where acidities abound, the sugar of lead would be innocent. But this is far from being the cafe. Lead and its preparations act in the body only when they are combined with acid: cerufe possefles the qualities of the faccharum only in a low degree; and either of them freed from the acid has little, if any, effect at all. For the same reasons, the falt of lead is preferable to the pompous extract and vegeto-mineral water of Goulard, in which the lead is much less perfectly combined in a saline fiate. It is sometimes convenient to affift the solution of the sugar of lead in water, by adding a portion of vinegar. The effects of the external application of lead seems to differ from the ftrenght of the solution: thus a very weak solution seems to diminish directly the action of the vesfels, and is therefore more peculiarly proper in acute inflammations, of the eyes; whereas a strong solution operates as a direct stimulant, and is therefore more efficacous in putative ophthalmia.

**Water of acetated litharge.**

Take of litharge, two pounds and four ounces; distilled vinegar, one gallon. Mix, and boil to fix pints, confantly flirring; then set it abide. After the feces have subsided, strain.

This preparation may be considered as nearly the fame with the extract and vegeto-mineral water of Mr. Goulard, and it is probably from the circumstances of his preparations having come into a common use, that the London college have given this article a place in their pharmaepoecia. It may, however, be a matter of doubt whether it be really intituled to a place. For, as we have already observed, every purpose to be answered by it may be better obtained from the employment...
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CHAP. XV. Preparations of tin.

The easy melts in the fire, and calcines into a dully powder; which, by a farther continuance of the heat, becomes white. A mass of tin heated till it be just ready to melt, proves extremely brittle, so as to fall in pieces from a blow; and by dextrous agitation, into powder. Its proper menstrum is aqua regia; though the other mineral acids may also be made to dissolve it, and the vegetable ones in small quantity. It crystallizes with the vegetable and vitriolic acids; but with the others, deliquesces.

The virtues of this metal are little known. It has been recommended as an antimonial, antiseptic, &c. At present it is chiefly used as an anthelmintic.

Powdered tin. L.

Take of tin, six pounds. Melt it in an iron vessel, and stir it with an iron rod until a powder floats on the surface. Take off the powder, and, when cold, pass it through a sieve.

This preparation may be considered as nearly the same with the calx Jovis, which had a place in the former editions of the Edinburgh Pharmacopoeia; but from the late editions the calx has been expunged, and the filings or powder of tin, has a place only in their list of the materia medica. But although seldom prepared by the apothecary himself, it is not unfrequently employed as a remedy against worms, particularly the flat kinds, which too often elude the force of other medicines. The general dose is from a frupule to a dram; some confine it to a few grains. But Dr Allton affirms us in the Edinburgh Essays, that its success chiefly depends on its being given in much larger quantities; he directs an ounce of the powder on an empty stomasm, mixed with four ounces of molasses; next day, half an ounce; and the day following, half an ounce more; after which a cathartic is administered; he says the worms are usually voided during the operation of the purge, but that pains in the stomasm occasioned by them are removed almost immediately upon taking the first dose of the tin.

This practice is sometimes successful in the expulsion of tapia, but by no means so frequently as Dr Allton’s observations would lead us to hope.

Analgesia of tin. Dan.

Take of shavings of pure tin, two ounces; pure quick silver, three drams. Let them be rubbed to a powder in a stone mortar.

Some have imagined that tin thus acted on by mercury is in a more active condition than when exhibited in a flate of powder; and accordingly it has been given in worm cases. But as both are equally infallible in the animal fluids, this is not to be expected; and to obtain any peculiar properties which tin may possess to their full extent, it will probably be necessary to exhibit it in some saline flate.

Tears of zinc, broken into small pieces, eight ounces. Cast the pieces of zinc, at several times, into an ignited, large, and deep crucible, placed leaning, or half upright, putting on it another crucible in such a manner that the air may have free access to the burning zinc. Take out the calx as soon as it appears, and separates its white and lighter part by a fine sieve.

Flowers of zinc. E.

Let a large crucible be placed in a furnace, in an inclined situation, only half upright; when the bottom of the vessel is moderately red, put a small piece of zinc, about the weight of two drams, into it. The zinc soon flares, and is at the same time converted into a spongy calx, which is to be raked from the surface of the metal with an iron spatula, that the combustion may proceed the more speedily; when the zinc ceases to flame, take the calx out of the crucible. Having put in another piece of zinc, the operation may be repeated as often as you please. Lastly, the calx is to be prepared like antimony.

These flowers, as used externally, are preferable for medicinal purposes to tatty, and the more impure sublimes of zinc, which are obtained in the brass works; and likewise to calamine, the natural ore of this metal, which contains a large quantity of earth, and frequently a portion of heterogeneous metallic matter. But besides being applied externally, they have also of late been used internally. The flowers of zinc, in doses from one to seven or eight grains, have been much celebrated of late years in the cure of epilepsy and several spasmodic affections; and there are sufficient testimonies of their good effects, where tonic remedies in those affections are proper.

White vitriol. E.

Take of zinc, cut into small pieces, three ounces; vitriolic acid, five ounces; water, twenty ounces; having mixed the acid and water, add the zinc, and when the ebullition is finished drain the liquor; then after proper evaporation let it apart in a cold place, that it may shoot into crystals.

This salt is an elegant white vitriol. It differs from the common white vitriol, and the salt of vitriol of the shops, only in being purer, and perfectly free from any admixture of copper, or such other foreign metallic bodies as the others generally contain.

Purified vitriolated zinc. L.

Take of white vitriol, one pound; vitriolic acid, one dram; boiling distilled water, three pints. Mix, and filter through paper. After a proper evaporation, let it aside in a cold place to crystallize.

Although the Edinburgh college have given a formula for the preparations of white vitriol, yet their direction is very rarely followed by any of the apothecaries or chemists, who in general purchase it as obtained from the Goifar mines. When, however, it is got in this way, it is often very impure, and requires
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The process which has been judged most analogous to that of nature, is the following. The subject fresh gathered at the season of its greatest vigour, with the morning dew on it, is laid lightly and unbruised in a shallow vessel, to which is adapted a low head with a recipient; under the vessel a live coal is placed, and occasionally renewed, so as to keep up an uniform heat, no greater than that which obtains in the atmosphere in summer, viz. about 85 degrees of Fahrenheit's thermometer. In this degree of heat there arises exceeding slowly an invisible vapour, which condenses in the head into dewy drops, and falls down into the receiver; and which has been supposed to be the very sublimate that the plant would have spontaneously emitted in the open air.

But on submitting many kinds of odoriferous vegetables to this process, the liquors obtained by it have been found to be very different from the natural effluvia of the respective subjects: they have had very little smell, and no remarkable taste. It appeared that a heat, equal to that of the atmosphere, is incapable of rifting in close vessels those parts of vegetables which they emit in the open air. It may therefore be presumed that in this last case some other cause concurs to the effect: that it is not the sun's heat alone which raises and impregnates the air with the odoriferous principles of vegetables, but that the air itself, or the watery humidity with which it abounds, acting as a true solvent, extracts and imbibles them; so that the natural effluvia of a plant may be considered as an infusion of the plant made in air. The purgative virtue of the damask rose, and the astringency of the walnut-tree, which, as above observed, are in some degree communicated to the air, may be totally extracted by infusion both in watery and spirituous menstrua, but never rife in distillation with any degree of heat: and the volatile odours of aromatic herbs, which are diffused through the atmosphere in the lowest warmth, cannot be made to distil without a heat much greater than is ever found to obtain in a shaded air.

We apprehend, that the effluvia arising from growing vegetables are chiefly exhaled by the living energy of the plant; the odoriferous matter is a real secretion, which cannot be performed independent of active vessels, but it is as reasonable to allow the same powers for the exhalation of these effluvia, as for the transpiration of their watery parts.

The above process, therefore, and the theory on which it is built, appear to be faulty in two points: 1. In supposing that all these principles, which naturally exude from vegetables, may be collected by distillation; whereas there are many which the air extracts in virtue of its solvent power; some are also incapable of being collected in a visible and inelastic form; and some are artificially separable by solvents only: 2. In employing a degree of heat insufficient for separating even those parts which are truly exhalable by heat.

The foregoing method of distillation is commonly called distillation by the cold still; but those who have practised it have generally employed a considerable heat. A shallow leaden vessel is filled with the fresh herbs, flowers, &c. which are heaped above it; so that when the head is fitted on, this also may be filled a considerable way. A little fire is made under the vessel,
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Preliminary remarks.

In the distillation of essential oils, the water, as was observed in the foregoing section, imbues always a part of the oil. The distilled liquors here treated of are no other than water thus impregnated with the essential oil of the subject; whatever smell, taste, or virtue is here communicated to the water, or obtained in the form of a watery liquor, being fixed in a concentrated state in the oil. The essential oil, or some part of it, more or less attenuated and reduced than the ref, is the direct principle on which the title of spiritus rectificatus, or prefigured spirit has been bestowed.

All those vegetables therefore which contain an essential oil, will give over some virtue to water by distillation: but the degree of the impregnation of the water which a plant is capable of saturating with its virtue, are by no means in proportion to the quantity of its oil. The oil saturates only the water that comes over at the same time with it; if there be more oil than is sufficient for this saturation, the surplus separates, and concretes in its proper form, not miscible with the water that arises afterwards. Some odoriferous flowers, whose oil is, in small quantity, that scarcely any visible mark of it appears, unless fifty or an hundred pounds or more are distilled at once, give nevertheless as strong an impregnation to water as those plants which abound moit with oil.

Many have been of opinion, that distilled waters may be more and more impregnated with the virtues of the subject, and their strength increased to any assigned degree, by colobulation, that is, by redistilling them a number of times from fresh parcels of the plant. Experience, however, shows the contrary; a water initially drawn in the first distillation, proves on every repeated one not stronger but more disagreeable. Aqueous liquors are not capable of imbibing above a certain quantity of the volatile oil of vegetables; and this they may be made to take up by one as well as by any number of distillations: the oftener the process is repeated, the ungrateful impression which they generally receive from the fire, even at the first time, becomes greater and greater. Those plants, which do not yield at first waters sufficiently strong, are not proper subjects for this process, since their virtue may be obtained much more advantageously by others.

General rules for the distillation of the official simple waters.

1. Where they are directed fresh, fish only must be employed: but some are allowed to be used dry, as being easily procurable in this state at all times of the year, though rather more elegant waters might be obtained from them while green.

When fresh and juicy herbs are to be distilled, thrice their weight of water will be fully sufficient; but dry ones require much larger quantity. In general, there should be so much water, that after all intended to be distilled has come over, there may be liquor enough left to prevent the matter from burning to the fill.

Plants differ so much, according to the fill and season of which they are the produce, and likewise according to their own age, that it is impossible to fix.
PHARMACY.

Preparations and Compositions.

Preparations and Compositions.

Native water is seldom or never found pure, and generally contains earthy, saline, metallic, or other matters. Distillation is therefore employed as a means of freeing it from these heterogeneous parts. For some pharmaceutical purposes distilled water is absolutely necessary; thus, if we employ hard undistilled water for dissolving sugar of lead, instead of a perfect solution, we produce a milky-like cloud, owing to a real decomposition of parts.

Distilled water is now employed by the London college for a great variety of purposes; and there can be no doubt, that in many chemical and pharmaceutical processes, the employment of a heterogeneous fluid, in place of the pure element, may produce an essential alteration of qualities, or frustrate the intention in view. While the London college have made more use of distilled water than any other, their directions for preparing it seem to be the best. For as some impregnations may be more volatile than pure water, the water may be freed from them by throwing away what comes first over; and by keeping it afterwards in a close vessel, absorption from the air is prevented.

Dill-water L.

Take of dill-seeds, bruised, one pound; water, sufficient to prevent an empyreuma. Draw off one gallon.

Simple dill-seed water. E.

Take of dill-seeds, one pound; pour on as much water as when ten pounds have been drawn off by distillation there may remain as much as is sufficient to prevent an empyreuma. After proper maceration, let ten pounds be drawn off.

Although the dill-water holds a place, not only in the London and Edinburgh pharmacopoeias, but also in most of the foreign ones; yet it is not much employed in practice. It obtains, indeed, a pretty degree of the foreign ones; yet it

Cinnamon water. L. E.

Take of cinnamon, bruised one pound; water, sufficient to prevent and empyreuma. Macerate for 24 hours, and draw off one gallon.

From one pound of cinnamon, the Edinburgh college direct 10 pounds of water to be drawn off; and if the cinnamon employed be of good quality, it may yield that quantity with a strong impregnation: but what comes over first is unquestionably the strongest. This is a very grateful and useful water, possefing in an eminent degree the fragrance and aromatic cordial virtues of the spice. Where real cinnamon water is wanted, care should be had in the choice of the cinnamon. To avoid the too common imposition of cassia being substituted in its room. The two drugs may be easily distinguished from each other by a variety of marks, which it is needless to introduce in this place. See Cassia and Cinnamon. But the essential oils of the two approach to near, that after distillation it is perhaps impossible to distinguish the waters; and it is still more doubtful how far the one is in any degree preferable to the other.

T.
The oil of cinnamon is very ponderous, and arises more difficulty than that of any other of the vegetable matters from which simple waters are ordered to be drawn. This observation directs us, in the distillation of this water, to use a quick fire and a low vessel. For the same reason, the water does not keep so well as might be wished; the ponderous oil parting from it to time, and falling to the bottom, when the liquor loses its milky hue; its fragrant smell, and aromatic taste. Some recommend a small proportion of sugar to be added, in order to keep the oil united with the water.

**Caffia-water. E.**

314. From a pound and a half of the caffia bark, ten pounds of water are directed to be drawn off in the same manner as the dill-water. This distilled water, as we have already observed, when properly prepared, approaches so near to that of cinnamon, that it is almost, if not altogether, impossible to distinguish the difference between the two. And though the London college has given it no place in their pharmacopoeia, yet we may venture to assert, when properly prepared, approaches so near to that of cinnamon, that it is almost, if not altogether, if the water of the London college may be considered to be as strongly impregnated as that of the Edinburgh college.

This water smells and tastes very strongly of the mint; and proves in many cases an useful emollient. Boerhaave commends it (cohobated) as a pleasant and incomparable remedy for strengthening a weak stomach, and curing vomiting proceeding from cold vitious phlegm, and aifo in lineries.

**Fennel-water. L.**

325. Take of sweet fennel seeds, bruised, one pound; water, sufficient to prevent an empyreuma. Draw off one gallon.

The water of fennel seeds is not unpleasent. A water has also been distilled from the leaves. When these are employed, they should be taken before the plant has run into flower; for after this time they are much weaker and less agreeable. Some have observed, that the upper leaves and tops, before the flowers appear, yield a more elegant water, and a remarkably finer essential oil than the lower ones; and that the oil obtained from the one swims on the water, while that of the other sinks. No part of the herb, however, is equal in flavour to the seeds.

**Peppermint-water.**

326. Take of herb of peppermint, dried, one pound and an half; water, sufficient to prevent an empyreuma. Draw off one gallon.

From three pounds of the leaves of peppermint, ten pounds of water are to be drawn off. E.

This is a very elegant and useful water. It has a warm pungent taste, exactly resembling that of the peppermint itself. A spoonful or two taken at a time warm the stomach, and give great relief in cold fluent colics. Some have substituted a plain infusion of the dried leaves of the plant, which is not greatly different in virtue from the distilled water.

In the distillation of this water, a considerable quantity of essential oil generally comes over in its pure state. And it is not uncommon to employ this for impregnating other water, with which it may be readily mixed by the aid of a little sugar.

**Spearmint-water. L.**

327. Take of spearmint, dried, one pound and an half; water sufficient to prevent an empyreuma. Draw off one gallon.

The Edinburgh college directs this water to be made in the same proportion as the preceding. But probably three pounds of the fresh herb will not give a stronger impregnation than a pound and a half of the dried: so that the water of the London college may be considered as stronger in its virtues. This water smells and tastes very strongly of the mint; and proves in many cases an useful emollient. Boerhaave commends it (cohobated) as a pleasant and incomparable remedy for strengthening a weak stomach, and curing vomiting proceeding from cold vitious phlegm, and also in lineries.

**All-spice-water. L. E.**

328. Take of all-spice, bruised, half a pound; water, sufficient to prevent an empyreuma. Macerate for 24 hours, and draw off one gallon.

From half a pound of the pimento the Edinburgh college directs ten pounds of water to be drawn off; so that the impregnation is there somewhat weaker than the above.

This distilled water is a very elegant one, and has of late come pretty much into use; the hospitals employ it as a succedaneum to the more costly spice-waters. It is, however, inferior in gratefulness to the spirituous water of the fame spice hereafter directed.

**Pepperyroyal-water. L. E.**

329. Take of dried herb pepperyroyal, one pound and an half; water, sufficient to prevent an empyreuma. Draw off one gallon.

The pepperyroyal-water is directed to be prepared by the Edinburgh college in the same proportions as the mint and peppermint. Whether prepared from the recent or dried plant it poiffesses in a considerable degree the smell, taste, and virtues of the pepperyroyal. It is not unfrequently employed in hysterical cases, and sometimes with a good effect.

**Rose-water. L. E.**

330. Take of fresh petals of the damask rose, the white heels being cut off, six pounds; water sufficient to prevent an empyreuma. Draw off one gallon.

From the same quantity the Edinburgh college directs ten pounds to be drawn off. This water is principally valued on account of its fine flavour, which approaches to that generally admired in the rose itself. The purgative virtue of the roses remains entire in the liquor left in the still, which has therefore been generally employed for making the solutive honey and syrup, instead of a decoction or infusion of fresh roses prepared on purpose; and this
1. Take of camphor, an ounce and an half. Let it be distilled in half an ounce of the spirit of rosemary, then pour on it two pounds of spring-water, and draw off by distillation a pound and an half.

This distilled water, which has no place in our pharmacopoeias, is introduced into some of the foreign ones. And since camphor may be considered as a concrete essential oil, it naturally occurs as a form under which that medicine may be introduced with advantage in a diluted state.

2. Take of Ruffia calfor, one ounce; water, as much as will prevent burning. Draw off two pints.

Part II.

Caflor yields almost all its flavour in distillation of water, but treated in the same manner with spirit of wine gives over nothing. The spirit of caflor formerly kept in the shops had none of the smell or virtues of the drug; while the water here directed proves, when fresh drawn, very strong of it.

It is remarkable, that the virtues of this animal-substance reside in a volatile oil, analogous to the essential oils of vegetables. Some are reported to have obtained, in distilling large quantities of this drug, a small portion of oil, which smelt extremely strong of the caflor, and diffused its ungrateful scent to a great distance.

This water is used in hysterick cures, and some nervous complaints, though it has not been found to answer what many people expect from it. It loses greatly of its flavour in keeping.

And it is probably from this circumstance that it has no place either in our pharmacopoeias or in the modern foreign ones; but at the same time, as possessing in a high degree the sensible qualities of the caflor, it may be considered as justly deserving future attention.

Chervil-water. Gen.

Take of fresh leaves of chervil, one pound; spring-water as much as is sufficient for allowing eight pounds to be drawn off by distillation, at the same time avoiding empyreuma.

Although the chervil be but little employed in Britain, yet among some of the foreigners it is held in high esteem; and the distilled water is perhaps one of the most elegant forms under which its active parts can be introduced. But there is reason to believe that those diuretic powers, for which it has been chiefly celebrated, will be most certainly obtained from exhibiting it in substance, or under the form of the expressed juice of the recent plant.

Black-cherry water. Succ.

Take of ripe black cherries bruised with the kernels, 20 pounds; pure water, as much as is sufficient for avoiding empyreuma. Draw off 20 pounds by distillation.

This water, although now banished from our pharmacopoeias, has long maintained a place in the foreign ones, and even in Britain it is not unfrequently to be met with in the shops. It has often been employed by physicians as a vehicle, in preference to the other distilled waters; and among nurses who have the care of young children has been the first remedy against the convulsive disorders to which infants are so often subjected.

This water has nevertheless of late been brought into disrepute, and has been esteemed poisonous. They observe, that it receives its flavour principally from the cherry stones; and that these kernels like many others, bear a resemblance in taste to the leaves of the laurel-cress, which have been discovered to yield, by infusion or distillation, the most sudden poison known. Some physicians in England have lately found, by trial purposely made, that a distilled water very strongly impregnated with the flavour of the cherry kernels (no more than two pints being distilled from fourteen pounds of the cherry stones) proved in like manner poisonous.
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pejobos to brutes. The London college repeated the same experiment, and found the effects agreeable to those gentlemen's report.

It by no means follows from these trials, nor after such length of time can it be imagined, that black-cherry-water, when no stronger than the slops have been accustomed to prepare it, is unsafe. These kernels plainly resemble opium, and some other things, which poison only when taken in too great a quantity. The water from the last leaves is harm'eels when duly diluted; and even spirit of wine proves a poison of its kind not greatly different, if drank to a certain degree of excess. Nor can it be concluded, from the trials with the strong black-cherry water on dogs, &c., that even this will have the same effects in the human body; the kernels of many sorts of fruits being in substance poisonous to brutes, though innocent to man.

It is possible, however, that this water in any degree of strength may not be altogether safe to the tender age of infants, where the principles of life are but just beginning as it were to move. It is possible that it may there have had pernicious effects without being suspected; the symptoms it will produce, if it should prove hurtful, being such as children are often thrown into from the diurese which it is imagined to relieve. On these considerations, both the London and Edinburgh colleges have chosen to lay it aside; more especially as it has been too often counterfeited with a water distilled from bitter almonds, which are known to communicate a poisonous quality. It is, however, one of those active articles which may perhaps be considered as deferring farther attention.

CANNON-CIPLEX WAXLE. Dan.

Take of camomile flowers, dried in the shade, eight pounds; water, 72 pounds. Draw off by gentle distillation 48 pounds.

Camomile-flowered were formerly ordered to be fermented previously to the distillation, a treatment which they do not need; for they give over, without any fermentation, as much as that process is capable of enabling them to do. In either case the smell and peculiar flavour of the flowers arise without any of the bitterness, this remaining behind in the decoction; which, if duly depurated and infusitated, yields an extract similar to that prepared from the flowers in the common manner. The distilled water has been used in flatulent colics and the like, but is at present held in no great esteem.

STRAWBERRY WAKE. Succ.

From 20 pounds of strawberries 20 pounds of distilled water are drawn off, according to the same directions given for the preparation of the black cherry water. Water thus impregnated with the essential oil of the strawberries some people will think of a very agreeable flavour, but any considerable medical power is not to be expected from it.

HYSIIP-WATER. Succ.

From four pounds of the fresh leaves of hyssop six pounds of water are drawn off. Hyssop-water has been held by some in considerable esteem as an uterine and pectoral medicine. It was directed in a former edition of the Edinburgh pharmacopoeia for making up the black pectoral troches, but is now exchanged for common water. Few at present expect any singular virtues from it, nor is it often to be met with in our slops, being now expunged from our pharmacopoeias. It holds a place, however, in most of the foreign ones, and among ourselves there are still some practitioners who frequently employ it. But there can be no doubt that those medical properties which the hyssop contains may be more readily and effectually extracted by simple infusion.

WHITE-HY WATER. Brun.

LILY-OF-THE-WAVER WATER. Brun.

To any quantity of these flowers four times their weight of water is to be added, and water drawn off by distillation in the proportion of two pounds to each pound of the flowers.

These waters must obtain some impregnation of that elegant essential oil on which the odour of flowers in their growing state depends. But they do not possess any remarkable medical proprieties.

BALM-WATER. Brun.

The green leaves of the balm are to be macerated with double their weight of water; and from each pound of the plant a pound and a half of water is to be drawn off.

This water contains a considerable impregnation from the balm, which yields its essential oil pretty freely on distillation. Though now banished from our pharmacopoeias, it has still a place in most of the foreign ones. In the old editions of the Edinburgh pharmacopoeia, this water was ordered to be coagulated or redistilled from fresh quantities of the herb. This management seems to have been taken from Boerhaave, who has a very high opinion of the water thus prepared; he says, he has experienced in himself extraordinary effects from it taken on an empty stomach: that it has scarce its equal in hypochondriacal and hysterical cases, the chlorides, and palpitation of the heart, as often as those diseases proceed from a disorder of the spirits rather than from any collection of morbid matter.

But whatever virtues are lodged in balm, they may be much more perfectly and advantageously extracted by cold infusion in aqueous or spiritious menstrua; in this last process, the liquor suffers no injury from being returned on fresh parcels of the herb: a few repetitions will load it with the virtues of the subject, and render it very rich. The impregnation here is almost unlimited; but in distilled waters it is far otherwise.

RUE WATER. Roll.

From each pound of rue, with a sufficient quantity of spring-water to prevent empyreuma, two pounds of distilled water are to be drawn.

Rue gives over in this process the whole of its smell, and great part of its pungency. The distilled water stands recommended in epileptic cafes, the hysterical passion, for promoting perspiration, and other natural secretions. But though it is a good deal employed abroad, it is with us falling into disuse.
This is distilled from the fresh leaves of savin, after the same manner as the other already mentioned. This water is by some held in considerable esteem for the same purposes as the distilled oil of savin. Beers have relates, that he has found it (when prepared by cohabitation) to give an almost incredible motion to the whole nervous system: and that, when properly used, it proves eminently serviceable for promoting the same purposes and the humoral flux.

It has now, however, fallen so much into disrepute as to have no place either in our pharmacopoeias or in the best modern foreign ones: But at the same time, when we reflect how readily savin yields a large proportion of active essential oil on distillation, it may perhaps be considered as better entitled to attention than some other distilled waters which are still retained.

**Elder-flower water.**

This is distilled from fresh elder flowers, after the same manner as the white-lily water. This water smells considerably of the flowers; but is rarely used among us.

**Sage-water.**

This is directed to be prepared from the green leaves of the sage in the same manner as the balm-water. Sage leaves contain a considerable proportion of essential oil, which they yield pretty freely on distillation. But their whole medical properties may with still greater ease and advantage be extracted by simple infusion.

To the simple distilled waters the London college have annexed the following remarks. We have ordered the waters to be distilled from the dried herbs, because fresh are not ready at all times of the year. Whenever the fresh are used, the weights are to be increased. But, whether the fresh or dried herbs be employed, the operator may vary the weight according to the season in which they have been produced and collected.

Herbs and seeds kept beyond the space of a year are less proper for the distillation of waters.

To every gallon of these waters add five ounces, by measure, of proof-spirit.

**Chap. XVIII. Distilled Spirits.**

The flavours and virtues of distilled waters are owing, as was observed in the preceding chapter, to their being impregnated with a portion of the essential oil of the subject from which they are drawn. Spirit of wine, considered as a vehicle for these oils, has this advantage above water, that it is its proper menstruum, and keeps all the oil that rises with it perfectly dissolved into an uniform limpid liquor.

Nevertheless, many substances, which, on being distilled with water, impart to it its virtues in great perfection; if treated in the same manner with spirit of wine, scarcely give it any smell or taste. This difference proceeds from hence, that spirit is not susceptible of so great a degree of heat as water. Liquids in general when made to boil, have received as great heat as they are capable of sustaining; now, if the extent of heat between freezing and boiling water, as measured by thermometers, be taken for a standard, spirit of wine will be found to boil with less than four-fifths of that heat, or above one-fifth less than the heat of boiling water. It is obvious, therefore that substances may be volatile enough to rise with the heat of boiling water, but not with that of boiling spirit.

Thus, if cinnamon, for instance, be committed to distillation with a mixture of spirit of wine and water, or with a pure proof-spirit, which is no other than a mixture of about equal parts of the two: the spirit will rise first, clear, colourless, and transparent, and almost without any taint of the spice; but as soon as the more ponderous watery fluid begins to rise, the oil comes over freely with it, so as to render the liquor highly odorous,apid, and of a milky hue.

The proof-spirits usually met with in the shops are accompanied with a degree of ill flavour: which, though concealed by means of certain additions, plainly discovers itself in distillation. This nauscent relish does not begin to rise till after the purer spirituous part has come over: which is the very time that the virtues of the ingredients begin also most plentifully to distil: and hence the liquor receives an ungrateful taint. To this cause principally is owing the general complaint, that the cordials of the apothecary are less agreeable than those of the same kind prepared by the distiller: the latter being extremely curious in rectifying or purifying the spirits (when designed for what he calls fine goods) from all ill flavour.

**Ardent Spirit.** L.

Take of rectified spirit of wine, one gallon; kali, made hot one pound and an half; pure kali, one ounce. Mix the spirit of wine with the pure kali, and afterwards add one pound of the hot kali, and shake them, and digest for twenty-four hours. Pour off the spirit, to which add the rest of the kali, and distil in a water bath. It is to be kept in a vessel well stoped. The specific gravity of the alcohol is to that of distilled water as 815 to 1000.

We have already offered some observations on spirit of wine both in the state of what is called rectified and proof-spirit. But in the present formula we have ardent spirit fill more freed from an admixture of water than even the former of these. And in this state it is unquestionably best fitted for answering some purposes. It may therefore be justly considered as an omission in the present edition of the Edinburgh pharmacopia, that they have no analogous form. In former editions of this work, alcohol was directed to be prepared from French brandy. But this is rather too dear an article in this country for distillation; nor is the spirit obtained from it any wise preferable to one procurable from cheaper liquors. The coarser inflammable spirits may be rendered perfectly pure, and fit for the nicest purposes, by the following method.

If the spirit be exceedingly foul, mix it with about an equal quantity of water, and distil with a slow fire; discontinuing the operation as soon as the liquor begins to run milky, and discovers by its nauseous taint that the impure and phlegmatic part is rising. By this treat-
treatment, the spirit leaves a considerable portion of its foul oily matter behind in the water, which, now appears milky and turbid, and proves highly disagreeable to the palate. If the spirit be not very foul at first, this ablation is not necessary; if extremely so, it will be needful to repeat it once, twice, or oftener.

As vinous spirits arise with a less degree of fire than watery liquors, we are hence directed to employ, in the distillation of them, a heat left than that in which water boils; and in due regard be had to this circumstance, very weak spirits may, by one or two wary distillations, be tolerably well freed from their aqueous phlegm; especially if the distilling vessels are of such a height, that the spirit, by the heat of a water bath, may but just pass over them: in this case, the phlegmatic vapours which rise for a little way along with the spirit, will condense and fall back again before they can come to the head. Very pompous instruments have been contrived for this purpose, and carried in a spiral or serpentine form to an extraordinary height. The spirit ascending through these, was to leave all the watery parts it contained in its passage, and come over perfectly pure and free from phlegm. But these instruments are built upon erroneous principles, their extravagant height defeating the end it was designed to answer; if the liquor be made to boil, a considerable quantity of mere phlegm will come over along with the spirit; and if the heat be not raised to this pitch, neither phlegm nor spirit will distil. The most convenient instrument is the common still; between the body of which and its head an adaptor or copper tube may be fixed.

The spirit, being washed, as above directed, from its foul oil, and freed from the greatest part of the phlegm by gentle distillation in a water-bath, add to every gallon of it a pound or two of pure dry fixed alkaline salt. Upon digesting these together for a little time, the alkali, from its known property of attracting water and oils, will imbib the remaining phlegm, and such part of the disagreeable unctuous matter as may still be left in the spirit, and will stick with them to the bottom of the vessel. If the spirit be now again gently drawn over, it will rise entirely free from its phlegm and nauseous flavour; but some particles of the alkaline salt are apt to be carried up with it, and give what the workmen call an insipid refiefi: this may be prevented by adding, previous to the last distillation, a small proportion of calcined vitriol, alum or bitter cathartic salt; the acids of these salts will unite with and neutralize the alkali, and effectually prevent it from rising; while no more of the acid of the salt is extricated than what the salt absorbs.

The spirit obtained by this means is extremely pure, limpid, perfectly flavourless, and fit for the finest purposes. It may be reduced to the strength commonly understood by proof, by mixing twenty ounces of it with seventeen ounces of water. The distilled cordials made with these spirits prove much more elegant and agreeable, than when the common rectified or proof-spirits of the Shops are used.

If the rectified spirit be distilled afresh from dry alkaline salt with a quick fire, it brings over a considerable quantity of the salt; and in this state it is supposed to be a more powerful menstruum for certain substances than the pure spirit. This alkalized spirit is called 

**Pharmacy.**

The processes here described, which was long since recommended by Dr Lewis, will sufficiently explain the intention of the London college, in the directions they have now given for the preparation of alcohol. And there can be no doubt, that by their process a very pure alcohol may be obtained. Of this we have a sufficient test in the specific gravity of the fluid which comes over, which is to that of distilled water only as 815 to 1000, while the specific gravity of proper rectified spirit is as 835 to 1000.

**Spirit of vitriolic ether.**

Take of rectified spirit of wine, vitriolic acid, each one pound. Pour by a little at a time the acid on the spirit, and mix them by shaking; then from a retort through a tubulated receiver, to which another recipient is fitted, distil the spirit of vitriolic ether till fulphureous vapours begin to rise.

**Vinous vitriolic acid, commonly called dulcified spirit of vitriol.**

Take of vitriolic ethereal liquor, one part; rectified spirit of wine, two parts. Mix them.

The last of these processes is a very ready and convenient method of preparing the dulcified spirit of vitriol, which only differs from ether by the acid being more predominant, and leaves intimately combined.

In the first process, a good deal of caution is requisite in mixing the two liquors. Some direct the spirit of wine to be put first into the retort, and the oil of vitriol to be poured upon it all at once; a method of procedure by no means advisable, as a violent heat and ebullition always ensue, which not only dissipate a part of the mixture, but hazard also the breaking of the vessel, to the great danger of the operator. Others put the oil of vitriol into the retort first; then by means of a funnel, with a long pipe that may reach down just to the surface of the acid, pour in the spirit of wine; if this be done with sufficient caution, the vitrious spirit spreads itself on the surface of the oil of vitriol, and the two liquors appear distinct. On standing for a week or two, the vinous spirit is gradually imbibed, without any commixture, and the vessel may then be safely shaken to complete the mixture; but if the spirit be poured in too hastily at first, or if the vessel be moved before the two liquors have in some degree incorporated, the same effect ensues as in the foregoing case. The only secure way is, to add the oil of vitriol to the spirit of wine by a little quantity at a time, waiting till the first addition be incorporated before another quantity is put in; by this management the heat that ensues is inconsiderable, and the mixture is effected without any inconvenience.

The distillation should be performed with an equable and very gentle heat, and not continued so long as till a black froth begins to appear: for before this time the liquor will arise of a very different nature from the spirits here intended. The several products are most commodiously kept apart by using a tubulated receiver, so placed that its pipe may convey the matter which shall come over into a vial let underneath. The juncture of the retort and recipient is to be luted with a
paft made of lintseed meal, and further secured by a piece of wet bladder; the lower juncture may be closed only with some soft wax, that the vial may be occasionally removed with ease.

The true dulci/ed spirit arises in thin subtle vapours, which condense on the fides of the recipient in straight flixes. It is colourless as water, very volatile, inflammable, of an extremely fragrant smell, in taffe somewhat aromatic.

After the fire has been kept up for some time, white fumes arise; which eithet form irregular flixes, or are collected into large round drops like oil: On the flx appearance of these, the vial, or the receiver, if a common one is used, must be taken away. If another be substituted and the distillation continued, an acid liquor comes over, of an exceeding pungent smell, like the fumes of burning brimstone. At length a black frotch begins haftily to arise, and prevents carrying the process further.

On the surface of the sulphurous spirit is found swimming a small quantity of oil, of a light yellow colour, a strong, penetrating, and very agreeable smell. This oil seems to be nearly of the fame nature with the effential oils of vegetables. It readily and totally dissolved in rectified spirit of wine, and communicates to a large quantity of that mentrum the taffe and smell of the aromatic or dulci/ed spirit.

The matter remaining after the distillation is of a dark blackish colour, and still highly acid. Treated with fresh spirit of wine, in the fame manner as before, it yields the fame production: till at length all the acid that remains unvolatilized is saturated with the inflammable oily matter of the spirit, the compound proves a bituminous sulphureous mass; which, exposed to the fire in open veflils, readily burns, leaving a considerable quantity of fixed ashes; but in clofe ones it flames with violence; with fixed alkaline salts it forms a compound nearly fimilar to one composed of alkalis and sulphur.

The new names adopted by the London and Edinburgh colleges for this fluid, are expressive of its composition; the one employed the term of spiritus etheric vitriolor; the other of acidum vitriolicum vitriofum; the old term of spiritus vitriol dulcis is least properly fitted to diluting it from other fluids, and to convey a juft idea of its nature.

Dulci/ed spirit of vitriol has been, for some time greatly esteemed, both as a menstruum and a medicine. It difsolves fome reftless and bituminous ftances more readily than spirit of wine alone, and extracts elegant tinctures from fundry vegetables. As a medicine, it promotes perspiration and the urinary lecretion, expels flatulencies, and in many ca/ies abates fpanadifh fictures, cafei pains, and procures fleep. The dose is from ten to eighty or ninety drops in any convenient vehicle. It is not efientially different from the celebrated aqueous liquor of Hoffman; to which it is, by the author himfelf, not unfrequently directed as a fuccedaneum.

Of this fluid however, or at leat of an article still more nearly reftembling it, we hall afterwards have occasion to speak, when we treat of the vinous spirit of vitriolic ether.

Vitriolic ether. E.

Take of the spirit of vitriolic ether, two pounds; wa-
ter of pure kali one ounce. Shake them together, and distil, with a gentle heat, fourteen ounces by measure.

Vitriolic ethereal liquor. E.

Take of rectified spirit of wine, vitriolic acid, each thirty-two ounces. Pour the spirit into a glafs retort fit for retaining a fudden heat, and add to it the acid in an uniform stream. Mix them by degrees frequently faking them moderately; this done, infantly drill from fand previously heated for that purpofe, into a receiver kept cool with water or flom. But the heat is to be fo managed, that the liquor shall boil at firft, and continue to boil till 16 ounces are drawn off; then let the retort be falled out of the fand.

To the dilulted liquor add two drams of the commom bitter caufic; then drill again in a very high retort with a very gentle heat, into a cool receiver, until ten ounces have been drawn off.

If sixteen ounces of rectified spirit of wine be poured upon the acid remaining in the retort after the firft distillation, an ethereal liquor may be obtained by repeating the dilution. This may be done pretty often.

The preparation of this singular fluid, now-received into public pharmacopoeias, was formerly confined to a few hands; for though feveral procefses have been published for obtaining it, the fuccefs of most of them is precarious and some of them are accompanied alfo with danger to the operator. The principal difficulty consists in the firft part of the dilution.

It has been ufual to direct the heat to be kept up till a black frotch begins to appear: but if it is managed in the manner here directed, the quantity of ether which the liquor can afford will be formed and drawn off before this fulphurous frotch appears. The use of the caufic alkali is to engage any uncombined vitriolic acid which may be preffent in the firft dilutted liquor. If a mild alkali were employed for this purpofe, the separation of its air by the acid might endanger the burning of the veflils. The falt is indeed an inconvenient which attends the whole of this procefs. It might in a great measure be obviated by employing a range of receivers fuch as the adopter decribed in the firft part of this work.

The ether, or ethereal spirit, is the lighteft, moft volatile and inflammable of all known liquids. It is lighter than the moft highly rectified spirit of wine, in the proportion of about 7 to 8: a drop, let fall on the hand, evaporates almost in an instant, fiercely rendering the part moist. It does not mix, or only in a small quantity, with water, spirit of wine, alkaline lixivias, volatile alkaline spirits, or acids; but is a powerful diffiluent for oils, ballams, refins, and other analogous ftances; it is the only known ftance capable of diluting the elastic gum; it has a fragrant by the author himfelf, not unfrequently directed as a succedaneum.

Of this fluid however, or at least of an article still more nearly resembling it, we shall afterwards have occasion to speak, when we treat of the vinous spirit of vitriolic ether.
Take of rectified spirit of wine, two pints; nitrous acid, half a pound. Mix them, by pouring in the acid on the spirit, and distil with a gentle heat one pound ten ounces.

Vinous acid of nitre, commonly called dulcified spirit of nitre. E.

Take of rectified spirit of wine, three pounds; nitrous acid one pound. Pour the spirit into a capacious phial, placed in a vessel full of cold water, and add the acid by degrees, constantly agitating them. Let the phial be slightly covered, and laid by for seven days in a cool place; then distil the liquid with the heat of boiling water, into a receiver kept cool with water or snow, till no more spirit comes over.

By allowing the acid and rectified spirit to stand for some time, the union of the two is not only more complete, but the danger of the vessels giving way to the ebullition and heat consequent on their being mixed, is in a great measure prevented. By fixing the degree of heat to the boiling point, the supernumerary acid matter is left in the retorts, being too ponderous to be raised by that degree of heat.

Here the operator must take care not to invert the order of mixing the two liquors, by pouring the vinous spirit into the acid; for if he should, a violent effervescence and heat would ensue, and the matter be deprived in highly noxious red fumes. The most convenient and safe method of performing the mixture seems to be to put the inflammable spirit into a large glass bottle with a narrow mouth, placed under a chimney, and to pour into it the acid, by means of a glass funnel, in very small quantities at a time; shaking the vessel as soon as the effervescence ensues upon each addition ceases, before a fresh quantity is put in; by this means the glafs will be heated equally, and be prevented from breaking. During the action of the two spirits upon each other, the vessel should be lightly covered: if close stopped, it will burst; and if left entirely open, some of the more valuable parts will exhale. Lemeray directs the mixture to be made in an open vessel; by which unscientific procedure, he usually lofts, as he himself observes, half his liquor; and we may presume, that the remainder was not the medicine here intended.

Several methods have been contrived for obviating the inconveniences arising from the elastic fluid and violent explosions produced on the mixture of the nitrous acid and rectified spirit of wine: for preparing the nitrous ether they are absolutely necessary, and might perhaps be conveniently used for making the dulcified spirit. The method we judge to be the best, is that employed by Dr Black. On two ounces of the strong acid put into a phial, the doctor pours, slowly and gradually, about an equal quantity of water; which, by being made to trickle down the fides of the phial, floats on the surface of the acid without mixing with it: he then adds, in the same cautious manner, three ounces of highly rectified spirit of wine, which in its turn floats on the surface of the water. By this means the three fluids are kept separate on account of their different specific gravities, and a stratum of water is interposed between the acid and spirit. The phial is now set in a cool place: the acid gradually ascends and the spirit descends through the water, this last acting as a boundary to restrain their violent action on each other. By this method a quantity of nitrous ether is formed, without the danger of producing elastic vapours or explosion.

For the preparation of the dulcified spirit, the liquors, when mixed together, should be suffered to rest for some time as above directed, that the fumes may entirely subside, and the union be in some measure completed. The distillation should be performed with a very slow and well regulated fire; otherwise the vapour will expand with so much force as to burst the vessels. Willon seems to have experienced the justness of this observation, and hence directs the juncture of the retort and receiver not to be luted, or but slightly: if a tubulated recipient, with a sufficiently long pipe, be used, and the distillation performed with the heat of a water-bath, the vessels may be luted without any danger: this method has likewise another advantage, as it affirms the time when the operation is finished: examining the distilled spirit every now and then with alkaline falt, as directed above, is sufficiently troublesome; while in a water-bath we may safely draw over all that will rise; for this heat will elevate no more of the acid than what is dulcified by the vinous spirit.

Dulcified spirit of nitre has been long held, and not undervalued, in great esteem. It quenches thirst, promotes the natural secretions, expels flatulencies, and moderately strengthens the stomach; it may be given from 20 drops to a dram, in any convenient vehicle. Mixed with a small quantity of spirit of hartshorn, the volatile aromatic spirit, or any other alkaline spirit, it proves a mild, yet efficacious, diaphoretic, and often remarkably diuretic; especially in some febrile cafes, where such a salutary evacuation is wanted. A small proportion of this spirit added to malt spirits, gives them a flavour approaching to that of French brandy.

Spirit of ammonia. L.

Take of proof spirit, three pints; sal ammoniac, four ounces; pot ash, fix ounces. Mix and distil with a flow fire one pint and an half.

Vinous spirit of sal ammoniac. E.

Take of quicklime, 16 ounces; sal ammoniac, eight ounces; rectified spirit of wine, 32 ounces. Having slightly bruised and mixed the quicklime and ammoniacal falt, put them into a glass retort; then add the spirit, and distil in the manner directed for the volatile caustic alkali, till all the spirit has passed over. This spirit has lately come much into esteem, both as a medicine and a menstruum. It is a solution of volatile falt in rectified spirit of wine; for though proof spirit be used, its phlegmatic part does not rise in the distillation, and serves only to facilitate the action of the pure spirit upon the ammoniacal falt.
Rectified spirit of wine does not dissolve volatile alkaline salts by simple mixture: on the contrary, it precipitates them, as has been already observed, when they are previously dissolved in water: but by the present process, a considerable proportion of the volatile alkali is combined with the spirit. It might perhaps, for some purposes, be more advisable to use with this intention the volatile spirit made with quicklime; for this may be mixed at once with rectified spirit of wine, in any proportion, without the least danger of any separation of the volatile alkali.

The name here employed by the London college, particularly when put in contradistinction to the water of ammonia, conveys a clear idea of the article, and is, we think, preferable to that employed by the Edinburgh college.

As a menstruum, the spirit of ammonia is employed to dissolve essential oils, thus forming the volatile aromatic spirit, or compound spirit of ammonia, as it is now called by the London college, which again is employed in making the tinctures of guaiac, valerian, &c.

The chief medical virtues which the spirit of ammonia possesses, when exhibited by itself, are those of the volatile alkali.

*Fetid spirit of ammonia.*

Take of proof-spirit, fix pints; sal ammoniac, one pound; aafezetida, four ounces; pot-au, one pound and a half. Mix them, and draw off by distillation five pints, with a slow fire. 

Take of vinous spirit of sal ammoniac, eight ounces; aafezetida, half an ounce. Digest in a close vessel 12 hours; then distil with the heat of boiling water eight ounces. 

This spirit, the last formula of which is in our opinion the best, as being most easily prepared without any risk of being injured in the preparation, is designed as an antisyphilitic, and is undoubtedly a very elegant one. Volatile spirits, impregnated for these purposes with different fetids, have been usually kept in the shops; the ingredient here made choice of, is the best calculated for any general use, and equivalent in virtue to them all. The spirit is pale when newly distilled, but acquires a considerable tinge in keeping.

*Compound spirit of annised.*

Take aniseed, angelica-feed, of each bruised, half a pound; proof-spirit, one gallon; water, sufficient to prevent an empyreuma. Draw off one gallon by distillation.

This compound spirit is now directed to be prepared by the London college in the same manner as in their former editions. It has no place in the Edinburgh pharmacopoeia; but it may justly be considered as a very elegant anisised water. The angelica feeds greatly improve the flavour of the spirit. It is often employed with advantage, particularly in cases of flatulent cholic; but it has been alleged to be sometimes too frequently used with this intention as a domestic medicine, especially by old ladies: for unless it be prudently and cautiously employed, it may soon be attended with all the pernicious consequences of dram-drinking.

*Spirit of caraway.*

Take of caraway seeds, bruised, half a pound; proof-spirit, one gallon; water, sufficient to prevent an empyreuma. Draw off one gallon.

*Spirituous caraway-water.*

Take of caraway seeds, half a pound; proof-spirits nine pounds. Macerate two days in a close vessel; then pour on as much water as will prevent an empyreuma, and draw off by distillation nine pounds.

This spirit, it obtains in great perfection the flavour of the caraway-seeds; and with fome it is a cordial not uncommonly in use.

*Spirit of cinnamon.*

Take of bruised cinnamon one pound; proof-spirit, one gallon; water, sufficient to prevent an empyreuma. Draw off one gallon.

*Spirituous cinnamon-water.*

From one pound of cinnamon, nine pounds of spirit are to be drawn off, in the same manner as in the caraway-spirit.

This is a very agreeable and useful cordial, but not so strong of the cinnamon as might be expected; for very little of the virtues of the spice arise till after the pure spirituous part has distilled. Hence, in the former editions of the London pharmacopoeia, the distillation was ordered to be protracted till two pints more than here directed were come over. By this means, the whole virtue of the cinnamon was more frugally than judicially obtained: for the disagreeable liquor arising from cinnamon as well as other vegetables when their distillation is long continued, give an ill relish to the whole; at the same time that the oil which was extracted from the spice was by this acid thrown down.

In the Pharmacopoeia Reformata, it is proposed to make this spirit by mixing the simple cinnamon water with somewhat less than an equal quantity of rectified spirit: on shaking them together, the liquor loses its milky hue, soon becomes clear, and more elegant than the water distilled as above: it is equally firing of the cinnamon, and free from the nauseous taint with which the common proof-spirits are impregnated.

*Compound spirit of juniper.*

Take of juniper berries, bruised, one pound; caraway seeds, bruised, sweet-fennel seeds, of each one ounce and a half; proof-spirit, one gallon; water, sufficient to prevent an empyreuma. Draw off one gallon.

*Compound juniper water.*

Take of juniper berries, well bruised, one pound; seeds of caraway, sweet-fennel, each one ounce and a half; proof-spirit, nine pounds; macerate two days: and having added as much water as will prevent an empyreuma, draw off by distillation nine pounds.

This water, mixed with about an equal quantity of the rob of juniper-berries, proves a useful medicine.
Spirit of Lavender.  L.

Take of fresh flowers of lavender, one pound and an half; proof-spirit, one gallon. Draw off by distillation in a water-bath, five pints.

Simple Spirit of lavender.  E.

Take of flowering spikes of lavender, fresh gathered, two pounds; rectified spirit of wine, eight pounds. Draw off by the heat of boiling water seven pounds. This spirit, when made in perfection, is very grateful and fragrant; it is frequently rubbed on the temples, &c. under the notion of refreshing and comforting the nerves; and it probably operates as a powerful stimulant to their sensible extremities: it is likewise taken internally, to the quantity of a teaspoonful, as a warm cordial.

Spirit of peppermint.  L.

Take of the herb peppermint, dried, one pound and an half; proof-spirit, one gallon; water, sufficient to prevent an empyreuma. Draw off one gallon.

Spirituous peppermint water.  E.

From a pound and a half of these leaves nine pounds of spirit are drawn off, as from the caraway-seeds. This spirit receives a strong impregnation from the peppermint. It is employed in flatulent colics and similar disorders; and in these it sometimes gives immediate relief; but where it is indicated, there are few cases in which the peppermint-water is not preferable.

Spirit of spearmint.  L.

Take of spearmint, dried, one pound and an half; proof-spirit, one gallon; water, sufficient to prevent an empyreuma. Draw off one gallon.

This spirit has no place in the Edinburgh pharmacopoeia. It, however, turns out a very elegant one, and preferable, in weakness of the stomach, retching to vomit, and the like, to many more elaborate preparations. Where the disorder is not accompanied with heat or inflammation, half an ounce of this water may be given diluted with some agreeable aqueous liquor; but, as was already observed with regard to the preceding article, there are many cases in which the prudent practitioner will be disposed to give the preference to the simple distilled water.

Spirit of nutmeg.  L.

Take of bruised nutmegs, two ounces; proof-spirit, one gallon; water, sufficient to prevent an empyreuma. Draw off one gallon.

Spirituous nutmeg-water.  E.

By two ounces of the nutmeg, well bruised, nine pounds of spirit are impregnated.

This is an agreeable spirituous liquor, highly impregnated with the nutmeg flavour. It was formerly celebrated in nephritic disorders, and when combined with a few hawthorn flowers, it had even the title of nephritic water. At present it is employed only as a cordial liquor, and is not even very frequently in use.

Spirit of pimento, or all spice.  L.

Take of all-spice, bruised, two ounces; proof-spirit, one gallon; water, sufficient to prevent an empyreuma. Draw off one gallon.

Spirituous Jamaica-pepper water.  L.

By half a pound of pimento nine pounds of spirit are to be impregnated.

This water is far more agreeable than a simple water drawn from the same spice; and had long a place among the cordials of the distiller before it was received into any public pharmacopoeia; but although now adopted both by the London and Edinburgh colleges, it is not very frequently ordered from the shops of the apothecary.

Spirit of penny-royal.  L.

Take of the herb pennyroyal, dried, one pound and an half; proof-spirit one gallon; water sufficient to prevent an empyreuma. Draw off one gallon.

This spirit has no place in the Edinburgh pharmacopoeia. It possesses, however, a considerable share of the flavour of the pennyroyal, and very frequently it is employed as a carminative and anti-inflammatory.

Compound spirit of horse-radish.  L.

Take of fresh horse-radish root, dried outer rind of Seville oranges, each two pounds; fresh herb of garden four-rough-grass, four pounds; bruised nutmegs, one ounce; proof-spirit, two gallons; water, sufficient to prevent an empyreuma. Draw off two gallons.

This spirit has long been considered as an elegant one, and is perhaps as well adapted for the purposes of an antiscorbutic as any thing, that can be contrived in this form. It has been alleged, that the horse radish and four-rough-grass join very well together, giving a similar flavour, though not a little disagreeable; that the nutmeg soppresses this flavour very successfully, without superadding any of its own; and that to this, orange-peel adds a flavour very agreeable. Arum root had formerly a place in this water, but is here deferredly thrown out; for it gives nothing of its pungency over the helm, notwithstanding what is asserted by some pharmaceutical writers to the contrary. Mustard-feed, though not hitherto employed in these kinds of compositious, would seem to be an excellent ingredient; it gives over the whole of its pungency, and is likewise less pernicious than most of the other substances of this class: this feed wants no addition, excepting some aromatic material to furnish an agreeable flavour.

But although this process may furnish an agreeable compound spirit, yet it is much to be doubted, whether it possesses those antiscorbutic powers for which it was once celebrated. And with this intention the Edinburgh college place so little confidence in it, that they have now rejected it from their pharmacopoeia.
Take of fresh tops of rosemary, one pound and a half; proof-spirit, one gallon. Distil in a water-bath, five pints. L.

Take of flowering tops of rosemary, fresh gathered, two pounds; rectified spirit of wine, eight pounds. Distil in the heat of boiling water till seven pounds come over.

A spirit similar to this is generally brought to us from abroad, under the name of Hungarian water.

This spirit is very fragrant, so as to be in common use as a perfume: that brought from abroad is superior in fragrance to such as is generally made among us. In order to prepare it in perfection, the vinous spirit should be extremely pure; the rosemary tops gathered when the flowers are full blown upon them, and committed immediately to distillation, care being taken not to bruise or press them. The best method of managing the distillation, is that which was formerly recommended for the distillation of the more volatile essentia] oils and tinctures, viz. first to place the spirit in the still, and then set it, above the liquor either an iron hoop, with a hair cloth stretched over it, upon which the flowers are to be lightly spread, or rather a basket, supported on three pins, reaching down to the bottom. A gentle heat being applied, just sufficient to raise the spirit, its vapour rightly percolating through the flowers, will imbibe their finer parts, without making that disagreeable alteration, which liquors applied to such tender subjects, in their groser form, generally do. Probably the superiority of the French Hungarian water, to that prepared among us, is owing to some skilful management of this kind, or to employing a perfectly pure spirit.

In the Wirtemberg pharmacopoeia, some sage and ginger are added, in the proportion of half a pound of the former, and two ounces of the latter, to four pounds of the rosemary.

But the peculiar agreeable flavour of this water in all probability depends on the rosemary alone.

Carmelite water, or compound balm-distillate. Dan.

Take of fresh gathered leaves of balm, a pound and a half; the recent yellow rind of lemons, four ounces; nutmeg, coriander, each two ounces; cloves cinnamon, each one ounce. The ingredients being fleeced and bruised, pour upon them rectified spirit of wine, six pounds; balm water, three pounds. Digest for three days, then draw off six pounds by distillation.

This spirit has been a good deal celebrated, particularly among the French, under the title of Eau de Carmel. Mr Beaumé, in his Elements of Pharmacy, proposes some improvements on the process. After the spirit added to the ingredients has been drawn off in the heat of a water-bath, he orders the distilled liquor to be rectified by a second distillation, drawing off somewhat less than nine-tenths of it. He recommends, that all the aromatic spirits should be prepared in the same manner. When the common spirits of this kind are rubbed on the hands, &c. they leave after the more volatile parts have exhaled, a disagreeable empyreumatic smell; and when diluted with water, and taken medicinally, they leave, in like manner, a nauseous flavour in the mouth. To remedy these imperfections, he made many experiments, which showed, that in order to obtain these liquors of the desirable qualities, the spirit must not only be perfectly pure at first, but that the liquor ought also to be rectified after it has been distilled from the subjects. In this rectification, only the more volatile, subtil, aromatic parts of the ingredients arise: there remains behind a white liquor, acrid, bitter, loaded only with the groser oil, and deprived of all the specific flavour of the subjects. Indeed the very imperfection complained of naturally points out this second distillation as the remedy; for it shows the spirit to contain a grateful and ungrateful matter; the spirit which exhalés, while the other is left behind. The author says that when the aqua retificta is prepared as above directed, it has something in it more perfect than any of the odiferous spirits, whose excellence is cried up, and which have the reputation of being the best.

Aromatic spirituous liquors have in general left smell, when newly distilled, than after they have been kept about six months. M. Beaumé suspects that the preparations of this kind which have been melted in vogue, were such as have been thus improved by keeping; and found that the good effects of age might be produced in a short time by means of cold. He plunges quart bottles of the liquor into a mixture of pounded ice and sea salt; the spirit, after having suffered, for fix or eight hours, the cold thence resulting, proves as grateful as that which has been kept for several years. Simple waters also, after being frozen, prove far more agreeable than they were before, though they are always less so than those which have been drawn with spirit and exposed to a like degree of cold. This melioration of distilled waters by frost was taken notice of by Geoffroy.

Spirit of scorpy-gras. Sue.

Take of fresh scorpy gras, bruised, 10 pounds; rectified spirit of wine, eight pints. With the heat of a water-bath, distil off four pints.

This spirit is very strong of the scorpy gras; and has been given in those cases where the use of this herb is proper, from 20 to 100 drops. The virtues of scorpy gras reside in a very subtile, volatile oil, which arises in distillation both with water and pure spirit; and if the liquors are exposed to the air, foon exhales from both. The spirit, newly distilled, is extremely pungent; but if long kept, even in close vessels, it becomes remarkably lefs so; but it is not probable, that with such a pungent vehicle we can use a sufficient quantity of the herb to produce any permanent or considerable effect; it has been much recommended as a diuretic in dropsies.

The makers of this spirit have frequently added to the scorpy gras a quantity of horse-radish root, and sometimes substituated for it one drawn entirely from the horse radish: the flavour of these two simples being so much alike that their distilled spirits are scarcely distinguishable from each other. Here it may be observed, that though arum and dracunculus are usually ranked in the same class with the two foregoing vegetables, and confidered as similar to them; this process discovers a remarkable difference: while the former yield
yield all their pungency in distillation both to water and spirit; the latter give over nothing to either, and yet their virtues are destroyed in the operation.

Orange-peel water. Succ. Take of recent orange skins, one pound; proof-spirit, three pounds. Draw off two pounds by the heat of a water bath.

This spirit, which is now rejected from our pharmacopoeias, had formerly a place in them under the title of *aqua curtis actorterium spiritus*. It is considerably stronger of the orange-peel than the simple water; and it is used as an useful cordial, stomachic, and carminative.

_Aromatic spirit._ Succ. Take of the tops of rosemary, a pound and an half; tops of milfoil, thyme, each half a pound; proof spirit, 16 pounds; macerate for two days, and draw off by distillation eight pounds. If before distillation eight pounds of vinegar be added, it forms the accented aromatic spirit.

These preparations do not differ materially from the spirit of rosemary or Hungary water; for on the essential oil of the rosemary their medicinal properties may be considered as chiefly depending. They are often employed, particularly for external purposes, and for impregnating the air with their vapours, to destroy the influence of febrile contagions.

_Anti tertie spirit._ Gen. Take of spirit of turpentine, an ounce and an half; rectified spirit of wine, half a pound. Distil with a gentle heat. Let the oil swimming above in the receiver be separated from the saturated spirit, which is to be preferred for use.

It has been imagined, that this combination of oil of turpentine with ardent spirit will furnish an effectual solvent for biliary calculi. Hence the origin of the name here given it; but although it may have such an effect when copiously applied to the calculus in a glass vessel; yet this is not to be expected when it is taken into the stomach, and can only reach them in the course of circulation.

_WATERS_, the direct menstruum of gums and fats, extracts readily the gummy and saline parts of vegetables. Its action, however, is not limited to these; the resinous and oily principles being, in most vegetables, so intimately blended with the gummy and saline, as to be in part taken up along with them; some of the resinous cathartics, and most of the aromatic herbs, as well as bitters and astringents, yield to water the greatest part of their sweet taste, and medicinal virtue. Even of the pure essential oils, and odorous refining of vegetables, separated from the other principles, water imbibes a part of the flavour; and by the artificial admixture of gummy or saline matter, the whole substance of the oil or resin is made soluble in water.

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CHAP. XIX. Decoctions and infusious.

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this in proportion to the degree of heat: but as the liquor cools, this additional quantity separates, and the water retains no more than it would have dissolved without heat. With gummy substanccs, on the other hand, it unites unlimitedly, dissolving more and more of them till it loses its fluidity. Heat expedites the action of the water, but cannot enable it to take up more than it would do by allowing it longer time in the cold. The active parts extracted from most vegetables by water, and oils and resins made soluble in water by the artificial admixture of gum, partake of this property of pure gums, being soluble without saturation.

It has been imagined, that vegetables in a fresh state, while their oily, resinosous, and other active parts are already blended with a watery fluid, would yield their virtues to water more freely and more plentifully than when their native moisture has been dissipated by drying. Experience however, shows that dry vegetables in general give out more than fresh ones, water seeming to have little action upon them in their recent state. If, of two equal quantities of mint, one be infused fresh in water, and the other dried, and then infused in the like quantity of water for the same length of time, the infusion of the dry herb will be remarkably the strongest: and the cafe appears to be the same in all the vegetables that have been tried.

In all the preparations described in this chapter, it is to be understood that the subjects must be moderately and newly dried, unless when they are expressly ordered to be taken fresh; in which case it is to be judged that their virtues are destroyed or impaired by drying.

The native colours of many vegetables are communicated to water along with their medicinal matter; many impart a colour different from their own; and others, though of a beautiful and deep colour themselves, give scarcely any to the water along with their medicinal matter; some of the third sort of plants: of the third fome of the blue flowers, as those of cyanus and larkspur. Acid liquors change the infusions of moss flowers, the yellow ones excepted, to a red; and alkalis, both fixed and volatile to a green.

From animal substanccs water extracts the gelatinous and nutritious parts; whence glues, jellies, broths, &c.; and along with these, it takes up principles of more activity, as the acrid matter of cantharides. It dissolves also some portion of calcined calcareous earths, both of the animal and of the mineral kingdom, but has no action on any other kind of earthy matter.

The effect of boiling differs from that of infusion in some material particulars. One of the most obvious differences is, that as the essential oils of vegetables, in which their specific odours reside, are volatile in the heat of boiling water, they exhale in the boiling along with the watery steam, and thus are loft to the remaining decoction: whereas both in cold, and sometimes in hot infusions, they are preserved; although in the latter they are by no means perfectly so. Odorous substances, and those in general whose virtues depend on their volatile parts, are therefore unfit for this treatment. The soluble parts of these may, nevertheless, be united in this form with those bodies of a more fixed nature, by boiling the latter till their virtues
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Decotion of marshmallow. E.

Take of dried marshmallow roots, four ounces; raisins of the sun, floned, two ounces; water, seven pounds.

Boil to five pounds; place apart the strained liquor, till the feces have subsided, then pour out the clear liquor.

The Edinburgh college have subtilized this for the more complicated form of the Decotion ad Nepriticos of their former pharmacopoeia, and it fully answers the intentions of that preparation: it is intended chiefly as an emollient, to be liberally drank of in nephritic paroxysms; in which cases, by softening and relaxing the parts, it frequently relieves the pain, and procures an easy passage for the fabulous matter. This medicine is now made more simple than before, without any diminution of its virtue, by the rejection of wild carrot seed, redharrow-root, figs, linsfead, and liquorice. The carrot seeds were indeed unfit for this form, as they give out little of their virtue to watery liquors.

Decotion of hartshorn. L.

Take of burnt and prepared hartshorn, two ounces; gum arabic, fix drams; distilled water, three pints.

Boil constantly stirring, to two pints, and strain.

This decotion is used as common drink in acute discharges attended with a looseness; and where acrimonious humours abound in the prime vae. The gum is added, in order to render the liquor lightly glutinous, and thus enable it to sustain more of the calc; which is the ingredient on which the colour, but probably not the virtue, of the medicine depends. Calcined hartshorn has no quality from which it seems capable either of constringing and strengthening the veins, giving a greater degree of consistence to thin fluids, or obtunding acrimonious humours. It blunts and absorbs acid juices; but acrimony and acidity are very different: there are few (perhaps none of the acute) disorders of adults attended with the latter; and few of infants are unaccompanied therewith. Some have proposed starch as an ingredient in these kinds of decoctions; a small quantity of this soft, gelatious, farinaceous substansc would seem to be greatly preferable to the earthy calc. It may be observed, that the water is not enabled by the boiling to dissolve any part of the calc: and that in the decotion, the earth is only diffused in substance through the water, as it would be by agitation.

For these reasons, this formula is now rejected by the Edinburgh college, notwithstanding the reputation in which it was held by Dr. Sydenham, and other names of the first eminence. But as an aborsbent of a similar nature, the Edinburgh college have introduced the following formula.

Chalk julep. E.

Take of prepared chalk, one ounce; purest refined sugar, half an ounce; mucilage of gum arabic, two ounces; rub them together: and add by degrees, water, two pounds and a half; spirituous cinnamon water, two ounces. Mix them.

In the former edition of the Edinburgh pharmacopoeia,
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Common decoction. E.

Take of camomile flowers, one ounce; carry seeds, half an ounce; water, five pounds. Boil for a quarter of an hour, and strain.

This decoction is intended to answer the purposes of both the foregoing. It is left loaded with ingredients than either, but not perhaps for that reason the less useful.

It is indeed to be acknowledged, that these impregnations are for the most part unnecessary for the purpose of glysters; and in ordinary cases the weight of the water usually solicits a discharge before these medicines can produce any effect.

As to fomentations, their virtues in our opinion are totally to be ascribed to the influence of the warm water. And when the herbs themselves are applied, they act only as retaining heat and moisture for a longer time.

Decoction of hellobore. L.

Take of the root of white hellobore, powdered, one ounce; distilled water, two pints; rectified spirit of wine, two ounces. Boil the water with the root to one pint; and, the liquor being cold and strained, add to it the spirit.

White hellobore, as we formerly observed, is now very rarely employed internally; and the present formula is entirely intended for external use. Recourse is sometimes had to its advantage in cutaneous eruptions, particularly in tinea capitis. But where the irritations are entirely removed, leaving a very tender skin, it is necessary that the decoction should be diluted previous to its employment.

Decoction of barley. L.

Take of pearl barley, two ounces; distilled water, four pints. The barley being first washed with cold water from the adhering impurities, pour upon it about half a pint of water, and boil the barley a little time. This water being thrown away, add the distilled water, boiling, to the barley; boil it to two pints, and strain.

Compound decoction of barley. L.

Take of the decoction of barley, two pints; raisins, stoned, figs, sliced, each two ounces; liquorice-root, sliced and bruised, half an ounce; distilled water one pint. Boil to two pints, and strain.

Barley-water. E.

Take of pearl barley, two ounces; water, five pints. First wash the barley from the mealy matter that adheres to it with some cold water; then boil it a little with about half a pint of fresh water, which will acquire a considerable tinge from it. Throw away this tinged water; put the barley into the five pints of boiling water prescribed; and continue the boiling till half the water be wasted.

These liquors are to be drank freely as a diluter, in fevers and other disorders; hence it is of consequence that they should be prepared so as to be as elegant and agreeable as possible; for this reason they are infused in the pharmacopoeia; and the several circumstances which contribute to their elegance set down; if any one of them be omitted, the beverage will be less gratifying.
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This compound decoction is an elegant mode of preparing an article once highly celebrated under the title of the Lisbon diet drink. That formula, for a long time after its first introduction into Britain, was kept a secret; but an account of the method of preparation was at length published in the Physical and Literary Essays of Edinburgh, by Dr Donald Monro. And of the formula there given, which is in many respects an unchemical one, the present may justly be considered as an improvement. Even in its original form, but still more in the present state, there can be no doubt, that it furnishes us with a very useful medicine, particularly in those obstinate ulcers originating from venereal infection, which refit the power of mercury. And it is highly probable, that its good effects principally depend on the impregnation it receives from the mezereon. Perhaps, however, even thus improved, it is more complicated and expensive than is necessary: at least we are inclined to think, that every advantage derived from it may with equal ease and certainty be obtained from impregnating with the mezereon, in the manner here directed, a simple decoction of the guaiacum, bardana, or aloës, without having recourse to several articles, or employing one so expensive as the farfaparilla.

Decoction of farfaparilla. L.

Take of the root of farfaparilla, sliced, six ounces; distilled water, eight pints. Macerate for two hours, with an heat of about 195°; then take out the root, and bruise it; return the bruised root to the liquor, and again macerate it for two hours. Then, the liquor being boiled to four pints, press it out, and strain.

This decoction is an article in very common use, particularly in venereal affections. And there can be little doubt, that by this process the medical powers of the farfaparilla are fully extracted. But it has of late been much questioned, whether this article be in any degree intitled to the high character which was once given of it. Some, as we have already observed, are even disposed to deny its poifening any medical property whatever: but the general opinion is, that it has somewhat of a diaphoretic effect; and this effect is more readily obtained when it is exhibited under the form of decoction than under any other.

Compound decoction of farfaparilla. L.

Take of the root of farfaparilla, sliced and bruised, six ounces; bark of the root of fistsrapas, raafings of guaiacum-wood, liquorice root, bruised, of each one ounce; bark of the root of mezereon, three drams; distilled water, ten pints. Macerate, with a gentle heat, for six hours; then boil it down to five pints, adding, towards the end, the bark of the root of mezereon, and strain the liquor.

Decoction of the wood. E.

Take of guaiacum sawdust, three ounces; raisins of the sun, floned, two ounces; fistsrapas wood, flaved, liquorice sliced, each one ounce: water, ten pounds. Boil the guaiacum and raisins with the water, over a gentle fire, to the consummation of one half; adding, towards the end, the fistsrapas and liquorice. Strain out the liquor; and having suffered it to rest for some time, pour off the clear from the feces without expression.

This decoction is very well contrived; and if its use be duly continued, it will do great service in some cutaneous difeases, in what has been called foulness of the blood and juices, and in some disorders of the breath; particularly in phlegmatic habits. It may be taken by itself to the quantity of a quarter of a pint two or three times a-day, or used as an affilliant in a course of mercurial or antimonial alteratives; the patient in either case keeping warm, in order to promote the operation of the medicine. The saw-dust exposes a larger surface to the action of the water than the Ravings, directed in the former edition of the pharmacopoeia.

Decoction of mezereon. E.

Take of mezereon, and strain through linen.

The virtues of this decoction will be easily understood from those of the root from which it is prepared. The dose, in hydropic cafes, and rheumatic, or arthritic complaints, is two ounces, to be repeated three or four times a-day, according to its effect.

Mucilage of starch. L.

Take of starch, three drams; distilled water, one pint. Rub the starch, by degrees adding the distilled water; then boil it a little time.

The mucilage thus formed of starch is very useful for answering those purposes where a glutinous substance is required, and in particular it is often successfully employed under the form of glyster.

Mucilage of gum arabic.

Take of gum arabic, powdered, four ounces; boiling distilled water, eight ounces. Rub the gum with the water till it be dissolved. L.

Take of gum arabic, heat into powder, and warm water, each equal weights. Digest, and frequently stir them till the gum be dissolved, then press the solution through linen. E.
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It is very necessary to pass the mucilage through linen, in order to free it from pieces of wood and other impurities, which always adhere to the gum; the linen may be placed in a funnel.

Mucilage of gum tragacanth. E.

Take of gum tragacanth, powdered, one ounce; hot water, eight ounces. Macerate twenty-four hours; then mix them, by rubbing briskly, that the gum may be dissolvd; and pass the mucilage through linen cloth.

This gum is more difficulty soluble in water than gum arabic, and seems to be considerably more adhesive; it is therefore fitter for forming troches, and fuch like purposes. It has been thought to be more peculiarly what has been called a pectoral, than the other gums: but this does not seem to be certainly founded. This mucilage is perhaps preferable to the foregoing in those operations in pharmacy where much tenacity is required; as in the suspension of mercury, or other ponderous bodies.

Mucilage of quince-feed. L.

Take of seeds of the quince, one dram; distilled water, eight ounces, by measure. Boil with a slow fire until the water thickens; then pass it through linen.

This is a pleasant and mucilage, of a somewhat sweetish taste, and a light agreeable smell: in these respects, and in its easy solubility in water, it differs from the mucilage of gum tragacanth, to which some have supposed it similar; it has another difference, to its disadvantage, being apt to grow mouldy in keeping.

Compound infusion of gentian. L.

Take of the root of gentian, one dram; fresh outer-rind of lemons, half an ounce; dried outer rind of Seville oranges, one dram and an half. Boiling water, 12 ounces, by measure. Macerate for an hour, and strain.

Bitter infusion. E.

Take of gentian root, half an ounce; dried peel of Seville oranges, one dram; coriander seeds, half a dram; proof spirit, four ounces; water, one pound. First pour on the spirit, and three hours thereafter add the water; then macerate without heat for a night, and strain.

These formulae do not materially differ. That of the London college is the most expeditious mode of preparation; but that of the Edinburgh college possesses other advantages, which are in our opinion more than sufficient to outweigh that circumstance.

In the former edition of the Edinburgh pharmacopoeia the water was directed to be boiling; this was at least unnecessary, and was probably liable to the objections observed against decoctions. The proof spirit is also an useful addition to the bitter infusion, as it now stands in the Edinburgh pharmacopoeia; besides that it assists in extracting the resiny parts, and preparing the infusion for fermentation, it communicates an agreeable pungency to the liquor. To answer in some measure these intentions, it was formerly directed to be added to the filtrated liquor a quantity of aromatic water. This was certainly a piece of very bad pharmacy; for, besides that the spirit in this preparation, when diluted with the water of the infusion, was now no longer able to retain the suspended matter, it would also difpofe the infusion to part with its proper extractive matter; and in this way the resiny matter of the aromatic water, and the gummy parts of the bitter infusion, would both in some degree separate to the bottom of the vessel. By the formula now laid down, the infusion contains the different principles of the ingredients in a manner more nearly approaching to their natural and entire state.

Simple infusion of fenna. L.

Take of fenna an ounce and a half; ginger, powdered, one dram; boiling distilled water, one pint. Macerate them for an hour in a covered vessel; and the liquor being cold, strain it.

This, although a simple, is a very elegant infusion of fenna, the ginger acting as an useful corrigent. But if the fenna were employed to the quantity of a dram and an half or two drams only, with the same menstruum, in place of the quantity here ordered, it would be a no less useful medicine, and might be employed for one dose, as it is belt when fresh. Of the present infusion, an ounce or two is a sufficient dose.

Tartarized infusion of fenna. L.

Take of fenna, one ounce and a half; coriander seeds, bruiled, half an ounce; crystals of tartar, two drams; distilled water, one pint. Dissolve the crystals of tartar by boiling in the water; then pour the water, as yet boiling, on the fenna and seeds. Macerate for an hour in a covered vessel, and strain when cold.

In the last edition of the London pharmacopoeia this had the name of infusion senna communis.

Formerly an alkaline salt was used in the infusion of fenna instead of the acid one here directed. The salt was supposed to promote the operation of the medicine, by superadding a degree of pungitive virtue of its own, and by enabling the water to extract more of the capital ingredient than it would be capable of doing by itself; while acids were alleged to have rather a contrary effect. Experience however has sufficiently shown, that alkaline salts increase the offensiveness of the fenna, while crystals of tartar considerably improve the colour of the infusion, and likewise render the taste to some persons less disagreeable. Soluble tartar should seem a good ingredient to these kinds of compositions, as it not only improves the taste, but promotes the pungitive virtue of the medicine: this addition also renders the infusion less apt to gripe, or occasion flatulencies.

Infusion of tamarinds, with fenna. E.

Take of tamarinds, six drams; crystals of tartar, fenna, each one dram; coriander seeds, half a dram; brown sugar candy, half an ounce; boiling water, eight ounces. Macerate in a close earthen vessel which has not been vitrified with lead; stir the liquor now
and then, and after it has stood four hours strain it. It may also be made with double, triple, &c. the quantity of senna.

Both this and the former infusions might be made with cold water. By this means the aromatic quality of the coriander seeds would probably be extracted in a more perfect state; but the crystals of tartar are so difficultly soluble in cold water that for extraordi- nary use it is in some measure necessary to prepare them in the manner here directed. It is not indeed probable that when such soluble matters as acids and sugar are presented to water, the water shall be able to extract such a quantity of the finer volatile part of aromatics as to afford any considerable flavour to the liquor. Where an aromatic is required, we would therefore propose, that some agreeable aromatic water should be mixed with the liquor immediately before swallowing it; or that a quantity of aromatic oil should be incorporated with the cold infusion by means of gum, or a part of the sugar which might be reserved for that purpose. It is a very necessary caution not to make this infusion in vessels glazed with lead, otherwise the acid might corrode the lead, and communicate its poisonous effects to the infusion.

Both these infusions are mild and useful purges; the latter in particular is excellently suited for delicate stomachs at the same time that it is very much calculated for febrile and other acute diseases. It is observable, that sugar added to neutral salts rather increases than diminishes their nauscent properties; but when used along with an acid, such as tamarinds, or a salt wherein the acid predominates, as in crystals of tartar, it is found very much to improve their taste. The acid in this infusion, or rather the combination of acid and sweet, are found to cover the taint of the senna very effectually; the aromatic serves also the same purpose, but would perhaps be better applied in the way above proposed.

**Infusion of the roes.** L.

Take of red rose-buds, the heels being cut off, half an ounce; vitriolic acid, diluted three drams; boiling distilled water two-pints and a half; double-refined sugar one ounce and a half. To the water first poured on the petals in a glass vessel, add the diluted vitriolic acid and macerate for half an hour. Strain the liquor when cold, and add the sugar.

**Infusion commonly called tincture of roes.** E.

Take of red roes, dried, one ounce; boiling water, five pounds; vitriolic acid, one dram; white sugar, two ounces. Macerate the roes with the boiling water in an unglazed vessel four hours; then having poured on the acid, strain the liquor, and add the sugar.

Some have directed the vitriolic acid to be dropped upon the roes before the water is put to them; but this method is certainly faulty; for such of the roes as this caustic liquor falls on undiluted will be burnt up by it, and have their texture destroys. Others have made an infusion of the roes in water first, and then added the acid, from an apprehension, that if this acid be added to the water, it would weaken its power as a menstruum; but whatever the acid spirit will hinder the water from extracting, it must precipitate if added afterwards; though, in this preparation, the vitriolic acid bears such a small proportion to the water, that its effects in this respect will be very little; and it appears to be of little consequence which of the two ways be followed, only that by the above formula the vessels are exposed a shorter time to the action of the acid. The infusion should be made in a glass or flone- ware vessel, rather than glaze lead vessel; for the acid will be apt to corrode the glazing of the latter.

This infusion is of an elegant red colour, and makes a very grateful addition to juleps in hemorrhagies, and in all cases which require coolers and subaffirming. It is sometimes taken with boluses or electuaries of the bark, and likewise makes a good gargle. But although in our pharmacopoeias it has its name from the roes, yet its virtues are to be ascribed chiefly, or perhaps solely to the vitriolic acid.

**Infusion of rhubarb.** E.

Take of rhubarb half an ounce; boiling water, eight ounces; spirituous cinnamon water, one ounce. Macerate the rhubarb in a glas vessel with the boiling water for a night, then having added the cinnamon water, strain the liquor.

In this infusion cold water might perhaps be employed with advantage; we also object to the spirituous cinnamon-water on the same grounds as we did before to the aromatic water in the bitter infusion of the former Edition of the Edinburgh pharmacopoeia. This, however, appears to be one of the best preparations of rhubarb when designed as a purgative; water extracting its virtue more effectually than either vinous or spirituous menstrua. In this respect rhubarb differs from most of the other vegetable cathartics: and we think the London college might have given it a place in their pharmacopoeia as well as wine or tincture of rhubarb.

**Lime water.**

Take of quicklime, half a pound; boiling distilled water, twelve pints. Mix, and set it aside in a covered vessel for an hour; then pour off the liquor, which keep in a close vessel. L.

Take half a pound of fresh burnt quicklime, put it into an earthen vessel, and gradually sprinkle on it four ounces of water, keeping the vessel shut while the lime grows hot and falls into powder; then pour on it twelve pounds of water, and mix the lime thoroughly with the water by stirring. After the lime has subsided renew the stirring; and let this be done about ten times, always keeping the vessel shut (during the ebullition), that the access of the air may be the more effectually prevented. Lastly, let the water be filtered through paper placed in a funnel close shut at its top; and it must be kept in very close vessels. E.

The reason of adding the water by degrees to the lime is, that when poured on at once it reduces the external part to a kind of muddy subsstance, or soft paffe, which in some measure defends the internal part from being acted on by the water. It does not appear that the different proportions of water in the two above prescriptions occasion any sensible difference in the strength of the product: the quicklime is far from yielding all its soluble parts to either proportion; the remainder

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**Part II.**

**Preparations and Compotitions.**
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Take of squills, dried, one pound; vinegar fix pints; proof-spirit, half a pint. Macerate the squills in the vinegar with a gentle heat, in a glass vessel, for four-and-twenty hours; then press out the liquor, and for it by that the faces may, it may taste; left, preparatory, pour off the liquor, and add to it the spirit. L. Take of dried, root of squills, two ounces; distilled vinegar, two pounds and a half; rectified spirit of wine, three ounces. Macerate the squills with the vinegar eight days; then press out the vinegar, to which add the spirit; and when the faces have subdued, pour off the clear liquor. L.  

Vinegar of squills is a medicine of great antiquity; we find in a treatise attributed to Galen, an account of its preparation, and of many particular virtues then ascribed to it. It is a very powerful stimulant, aperient, and what is called an attenuant of tenacious juices; and hence it is frequently used, with great success, in disorders of the breast occasioned by a load of thick phlegm, and for promoting urine in hydroptic cases. The dose of this medicine is from a dram to half an ounce; where crudities abound in the first passages, it may be given at first in a larger dose, to evacuate them by vomiting. It is most conveniently exhibited along with cinnaemon, or other agreeable aromatic waters, which prevent the nausea it would otherwise, even in small doses, be apt to occasion.

Aromatic vinegar. Suec.

Take of tops of rosemary, leaves of sage, each four ounces; flowers of lavender, two ounces; cloves two drams; vinegar, eight pounds. Macerate for four days, express the liquor, and strain it.

This may be considered as an elegant improvement of what had formerly a place in the foreign pharmacopoeias, under the title of acetum prophylacticum, which contained not only the presentarticles, but also a con- fused farrago of others, as wormwood, rue, garlic, cinnamon, &c.  

It is said, that during the plague at Marseille, four persons, by the use of the acetum prophylacticum as a preservative, attended, unhurt, multitudes of those who were infected; that under colour of these services, they robbed both the sick and the dead; and that one of them being afterwards apprehended, saved himself from the gallowes by discovering the remedy. The preparation was hence called Vinaigre des quatre voleurs; "The vinegar, of the four thieves." It is not to be doubted that vinegar impregnated with antiseptic vegetables, will contribute greatly to prevent the effects of contagious air. And in the present aromatic vinegar we have a stronger and better impregnation, than from the numerousarticles which were before employed. We are far, however, from imagining that it will be able to counteract the contagion of the plague; but it may on different occasions be more powerful than vinegar in its simple state, for impregnating with antiseptic vapours the chambers of the sick.

Vinegar of rofs. Suec.

Take of the flowers of red roses dried, any quantity; add to them twelve times their weight of vinegar. Macerate for four days, and strain through paper. This has been chiefly used for embrocating the head and temples in some kinds of headache, &c. in which it has now and then been of service. It has also been used for certain cases of ophthalmia. But before it can
can be applied to the eyes, it will in general require to be diluted with water.

**Vinegar of lead.** Succ.

Take of lintharge, triturated, half a pound; vinegar, two pounds. Digest them together, frequently stirring the mixture with a wooden rod, till the colour of blue paper be not changed by the vinegar; preserve for use the clear liquor which is above the sediment.

This liquor is of the same nature with solutions of sugar of lead, or acetated ceruse, as it is now called. It is only externally against cutaneous eruptions, redness, inflammations, &c. But even in these cases some think it is not void of danger; and it is alleged, that there are examples of its continued use having occasioned sundry ill consequences. Of this, however, we are very doubtful. By means of the acetated ceruse every purpose to be answered by this may be accomplished. This liquor differs only in the proportions from the water of acetated lintharge of the London pharmacopoeia.

**Vinegar of colchicum.** Rofs.

Take of the recent root of colchicum cut into slices, one ounce; vinegar, one pound. Macerate with a gentle heat for two days: then strain after slight evaporation.

Although in our pharmacopoeias a place be given to the oxymel and syrup of colchicum, both of which are formed from the vinegar, yet the vinegar itself is not directed to be kept in its separate state; under this form, however, it may often be employed with advantage.

**Infusion of Peruvian bark.** Succ.

Take of Peruvian bark, bruised, an ounce and a half; river water, boiling, a pound and a half. Digest for two hours, shaking the vessel frequently; then strain the liquor with expression.

The Peruvian bark, as we have already had occasion to observe, gives out its medical properties to water not less readily in the way of infusion than of decoction. And in the former, the extractive matter is even more in a state of solution. An infusion, however not only more elegant, but stronger than the present, might be obtained, from employing cold instead of boiling water, and from continuing the maceration for a greater length of time. But in whatever manner it be formed, an infusion will often fit on the stomach, when the bark either in sublation or decoction cannot be retained.

**Tar-water.** Succ.

Take of tar two pounds; water, one gallon. Stir them strongly together with a wooden rod; and after standing to settle for twelve hours, pour off the water for use.

Tar-water has lately been recommended to the world as a certain and safe medicine in almost all diseases; a flow yet effectual alternative in cadies, scurvy, choleric, hysterical, hypochondriacal and other chronic complaints; and a sudden remedy in acute dis-tempers which demand immediate relief, as pleuritis, peripneumonies, the small-pox, and all kinds of fevers in general. The medicine, though certainly far inferior to the character that has been given of it, is doubtless in many cases of considerable utility: it feebly raises the pulse; and occasions some considerable evacuation, generally by perspiration or urine, though sometimes by floc or vomit. Hence it is fuppofed to act by increafing the vital force, and enabling nature to expel the morbid humours.

We shall here infer, from the first public recommender of this liquor (Bishop Berkeley), some obervations on the manner of using it. "Tar-water, when right, is not paler than French, nor deeper coloured than Spanish, white wine, and full as clear; if there be not a spirit very feebly perceived, in drinking, you may conclude the tar-water is not good. It may be drank either cold or warm. In colics, I take it to be best warm. As to the quantity, in common chronic al indispositions, a pint a day may suffice, taken on an empty stomach, at two or four times, viz. night and morning, and about two hours after dinner and breakfast; more may be taken by stronger stomachs. But those who labour under great and inverterate maladies, must drink a greater quantity, at least a quart every twenty-four hours. All of this class must have much patience and perseverance in the use of this, as well as of all other medicines, which, though sure, must yet in the nature of things be slow in the cure of inverterate chronic disorders. In acute cases, fevers of all kinds, it must be drank in bed warm, and in great quantity (the fever still enabling the patient to drink), perhaps a pint every hour, which I have known to work surprising cures. But it works so quick, and gives such spirits, that the patients often think themselves cured before the fever has quit left them."

Notwithstanding these encomiums, tar-water seems to be faltly losing its reputation. It is not probable that water can take up any of the more active principles of the tar; and it would perhaps be more convenient to separate its acid by distillation, and mix it with water occasionally: for it is pretty certain, that the water cannot only take up the acid of the tar, perhaps charged with a very small quantity of oily matter in the state of an acid lep.

**Decoction of catechu.** Gen.

Take of catechu, three drams: spring water, two pounds: boil it to one pound; and add to the strained liquor, of syrup of quinces, three ounces.

This decoction may be considered as nearly similar to the decoctum japonicum, and decoctum terre japonico of the former editions of our pharmacopoeia: and like thefe it will be found a very agreeable and useful medicine in fluxes that are not critical or symptomatitic, and in a weak lax state of the intestines. A spoonful or two may be taken every hour, or oftener: thus managed it produces much better effects than if larger doses are given at once. But for extracting the powers of the catechu, boiling is not requisite. By sufficient infusion in warm water, all its active parts are readily and completely dissolved. It may in this manner also be readily united with cinnamon or other aromatics. And an infusion japonicum is, we think, a formula judiciously intituled to a place in our pharmacopoeias.
Part II.

CHAP. XX. Medicated Wines.

The original intention of medicated wines was that medicines, which were to be continued for a length of time, might be taken in the most familiar and agreeable form: by this means a course of remedies was complied with, notwithstanding the repugnance and aversion which the sick often manifest to those directly furnished from the simples; and hence the inferior fort of people had their medicated ales. Nevertheless, as vinous liquors excellently extract the virtues of several simples, and are not ill fitted for keeping, they have been employed as official menstrua; and substances of the greatest efficacy are trodled in this form. As compounds of water and inflammable spirit, they take up such parts of vegetables and animals as are soluble in those liquors; though most of them abound at the same time with a mucilaginous or viscous substance, which renders them less effectual menstrua than purer mixtures of water and spirit. They contain likewise a fulble acid, which somewhat further obtrudes their action on certain vegetable and animal matters; but enables them in proportion to their quality, to dilute some bodies of the metallic kind, and thus impregnate themselves with the corroborating virtues of steel, the alternative and emetic powers of antimony, and the noxious qualities of lead.

To all the medicated wines, after they have been strained, you may add about one twentieth their quantity of proof spirit, to preserve them from fermentation. They may be conveniently kept in the same kind of glass bottles that wines generally are for common uses, which should likewise be corked with the same care.

Wine of aloes. L

Take of focotrine aloes, eight ounces; white canella, commonly called winter's bark, two ounces; Spanish white wine, fix pints; proof spirit, two pints.

Powder the aloes and white canella separately; when mixed, pour on them the wine and spirit; after wards digest for fourteen days, now and then shaking them; lastly, strain. It will not be amiss to mix white sand, cleaned from impurities, with the powder, in order to prevent the moistened aloes from getting into lumps.

Aloetic wine, or sacred tincture. E

Take of focotrine aloes, one ounce; lefuer cardamom seeds, ginger, each one dram; Spanish white wine, two pounds.

Digest for seven days, stirring now and then, and afterwards strain.

This medicine has long been in great esteem, not only as a cathartic, but likewise as a stimulant; the wine disseolving all that part of the aloes in which these qualities reside, a portion only of the less active medicinal matter being left. The aromatic ingredients are added to warm the medicine, and somewhat alleviate the ill flavour of the aloes; white canella, or cloves, are said, among numerous materials that have been tried, to answer this end the most successfully; hence the introduction of the former of these into the formula of the London college.
It has been chiefly used with this last intention, in some maniacal and apoplectic cases; and hence it gained the name of *emetic wine*.

The quantity of the reguline part must however, vary according to the proportions of the acid matter in different wines, and the operation of the medicine must be thereby less certain in degree; the vitrum is preferable to the crocus for making this preparation. See the different preparations of Antimony.

*Wine of tartarized antimony.*

Take of tartarized antimony, two scruples; boiling distilled water, two ounces; Spanish white wine, eight ounces; disolve the tartarized antimony in the boiling distilled water, and add the wine.

*Wine of antimonial tartar.*

Take of antimonial tartar, commonly called *emetic tartar*, twenty-four grains; and disolve it in a pound of Spanish white wine.

Watery solutions of emetic tartar, on standing, precipitate a part which is left completely in a saline state; by this means, and especially if the solution be not shaken before using it, the dose of that medicine is somewhat ambiguous: in the above formula, the acid matter of the wine increases the saline state of the antimony, and therefore its solubility, whereby the operation of the medicine is more certain, and in many cases more powerful. From the certainty of its effects, this preparation might be very convenient in large hospitals or armies, where great numbers of the sick, and inaccurate nursing frequently occasion an uncertain or dangerous practice.

In the formula employed by the Edinburgh college, each ounce of the wine contains two grains of the tartarized antimony; but in that of the London college, each ounce of the menstruum contains four grains: hence, while an ounce of the one may be employed for exciting full vomiting, the same quantity of the other would be too strong a dose. It is much to be regretted, that in articles of this active nature, the proportions employed by the two colleges should differ so considerably: that it would perhaps have been better, had the London college adopted the proportions employed by that of Edinburgh, as they have followed them in adopting this formula.

*Wine of iron.*

Take of filings of iron, four ounces; Spanish white wine, four pints. Digest for a month, often shaking the vessel and then strain.

This formula of the London pharmacopoeia is now not only simplified, but improved, when compared with their former *vinum chalybeatum*; for the cinworm and other articles which were then conjointed with the iron, were certainly rather prejudicial than otherwise; but at the same time, rhein wine, formerly employed, is perhaps to be considered as a better menstruum than the Spanish wine now directed. It may fill, however, be justly considered as a good chalybeate; and we think the Edinburgh college have done wrong in rejecting the formula from their pharmacopoeia.

By the London college it was formerly prepared by maceration, without heat; now, however, they direct digestion for the space of a month. Some have objected to the use of heat, that it impregnated the wine more strongly with the metal, and thus rendered it more unpleasant to the taste; but if this was the only inconvenience the remedy would be easy, diluting it with more wine. Heat has another effect, much less desirable, and which art cannot remedy: making a disagreeable alteration in the quality of the wine itself: hence it is necessary that it should be very moderate.

Steel wine is a very useful preparation of this metal, and frequently exhibited in chlorotic and other indispositions where chalybeates are proper. Boerhaave recommends it as one of the noblest medicines: he was acquainted with for promoting that power in the body by which blood is made, when weakened by a bare debility of the over-relaxed solids, and an indolent, cold, aqueous indisposition of the juices: for in this case, says he, no virtue of any vegetable or animal sub stance, no diet, nor regimen, can effect that which is effected by iron: but it proves hurtful where the vital powers are already too strong, whether this proceeds from the fluids or the solids. The dose is from a dram to half an ounce; which may be repeated two or three times a-day.

Some direct solutions of iron, made in wine or other vegetable acids, to be evaporated to the confinement of an extract, under the title of *extraudam marmi*. These preparations have no advantage, in point of virtue, above the common chalybeates: though in some forms, that of pills in particular, they may be rather more commodiously exhibited than most of the officinal chalybeates of equal efficacy. They may be made into pills by themselves, and are tenacious enough to reduce other substances into that form.

*Wine of ipecacuanha.*

Take of the root of ipecacuanha, bruised, two ounces; Spanish white wine, two pints. Digest for ten days, and strain. 

*Wine, or tincture, of ipecacuanha.*

Take of ipecacuanha, in powder, one ounce; Spanish white wine, fifteen ounces. After three days maceration, let the tincture be filtrated for use.

Both these wines are very mild and safe emetics, and equally serviceable in dysenteries also with the ipecacuanha in sub stance; this root yielding nearly all its virtues to the Spanish white wine here ordered, as it does a good share of them even to aqueous liquors. The common dose is an ounce, more or less, according to the age and strength of the patient. The college of Edinburgh added formerly a scruple of cochineal, which imparts a fine red colour to the liquor; this article is now omitted, on a complaint that the red colour of the matters evacuated sometimes alarmed the patient, as if it proceeded from a discharge of blood.

*Wine of millepeds.*

Take of five millepeds, bruised, one ounce; Rhenish wine, eight ounces. Inure them together for twelve hours, and afterwards press the liquor through a strainer.

This wine has been commended as an admirable cleanser of all the vies, yielding to nothing in the jaundice and obstructions of the kidneys or urinary passages,
passages, of excellent service in almost all chronic distempers, even in serofulous and floridous swellings, and in defatuons of rhum upon the eyes. But those who expected these extraordinary virtues from it have often been deceived; and at present there are few who have any great dependence on it; and hence it is omitted by the London college, probably without any loss. It is directed to be given from half an ounce to two ounces.

Wine of rhubarb. 1.

Take of dried rhubarb, two ounces and an half; lesser cardamom seeds, bruised and hol ked, half an ounce; saffron two drams; Spanish white wine, two pints; proof-spirit, eight ounces. Digest for ten days, and strain.

Rhubarb wine. E.
Take of rhubarb, two ounces; white canela, one dram; proof-spirit, two ounces; Spanish white wine, fifteen ounces. Macerate for seven days, and strain.

By affilting the solvent power of the menstruum, the proof-spirit in the above formula is a very useful addition. This is a warm, cordial, laxative medicine. It is used chiefly in weaknesses of the stomac and bowels, and some kinds of loofeneffes for evacuating the offending matter, and strengthening the tone of the vitre. It may be given from half a spoonful to three or four spoonfuls or more, according to the circumstances of the disorder, and the purposes it is intended to answer.

Tobacco-wine.

Take of the dried leaves of the best Virginian tobacco, one ounce; Spanish white wine, one pound. Macerate for four days, and then strain the liquor.

We have already, under the article Nicotiana, offered some observations on its late introduction into practice by Dr. Fowler, as a very useful remedy in the cure of dropsies and dysuries. From his treatise on that subject the present formula is taken; and we may observe, that while in practice we have frequently experienced from the tobacco those good effects for which Dr. Fowler recommends it, we are inclined to give the present formula the preference to every other which he has proposed. It seems to extract more fully the active principles of the tobacco than either water or spirit taken separately. For further observations on the medical virtues of tobacco, see the article Nicotiana.

Squill-wine. Succ.

Take of dried squills, one ounce; ginger, one dram; French white wine, two pounds. Macerate for three days, and then strain.

By the wine employed as a menstruum, the active properties of the squills may be readily extracted; and in some cases at least the present formula may justly be considered as intituled to a preference over either the vinegar or oxymel of squills, which have a place in our pharmacopoeias. The ginger here added to the squills operates as an useful corrigent; and on this account the present formula is preferable to the squill-wine of some other pharmacopoeias, where the squills alone are used: For it is chiefly used in those cases where it is intended that the squills should exert their effects, not on the alimentary canal, but on the kidneys or other excretories.

Zedoary wine. Dan.

Take of the root of zedoary, gently bruised, two pounds; spirit of wine, eight pounds. Let them be macerated for a month; then add spring water, eight pounds. Diffuse from hence twelve pounds.

Through this formula has the name of a wine, yet it is in reality a distilled spirit, nothing from the zedoary but a portion of its essential oil being united with the ardent spirit; and we are inclined to think, that the active powers of this article, both as depending on aroma and bitterness might be better obtained by a simple infusion in Spanish white wine.

Chap. XXI. Tinctures.

Rectified spirit of wine is the direct menstruum of the resins and essential oils of vegetables, and totally extracts these active principles from sundry vegetable matters, which yield them to water either not at all, or only in part. It dissolves likewise the sweet fagazine matter of vegetables; and generally those parts of animal-bodies in which their peculiar finell and taste reside.

The virtues of many vegetables are extracted almost equally by water and rectified spirit; but in the watery and spirituous tinctures of them there is this difference, that the active parts in the watery extractions are blended with a large proportion of inert gummy matter, on which their solubility in this menstruum in a great measure depends, while rectified spirit extracts them almost pure from gum. Hence, when the spirituous tinctures are mixed with watery liquors, a part of what the spirit had taken up from the subjiveau generally separates and subsides, on account of its having been freed from that matter which, being blended with it in the original vegetable, made it soluble in water. This, however, is not universal; for the active parts of some vegetables, when extracted by rectified spirit, are not precipitated by water, being almost equally soluble in both menstrua.

Rectified spirit may be tinged by vegetables of all colours except blue; the leaves of plants in general, which give out but little of their natural colour to watery liquors, communicate to spirit the whole of their green tincture, which for the most part proves elegant, though not very durable.

Fixed alkaline salts deepen the colour of spirituous tinctures; and hence they have been supposed to promote the dissolving power of the menstruum, though this does not appear from experience: in the trials that have been made to determine this affair, no more was found to be taken up in the deep-coloured tinctures than in the paler ones, and often not so much; if the alkali be added after the extraction of the tincture, it will heighten the colour as much as when mixed with the ingredients at first. Nor does the addition of these salts make tinctures unsightly only, but likewise prejudicial, as they in general injure the flavour of aromatic and soporific leaves, and superced the natural, sometimes contrary to the intention of the medicine. Volatile alkaline salts, in many cases, promote the action of the spirits. A.
Acids generally weaken it; unless when the acid has been previously combined with the vinous spirit into a compound or new qualities, called dulcified spirit.

Tincture of wormwood. E.

Take of the flowering tops of wormwood, properly dried, four ounces; rectified spirit of wine, two pounds. Macerate for two days; then press out the spirit, and pour it on two ounces of wormwood. Macerate again for four days; then press the tincture through a cloth, and afterwards strain it through paper.

The aromatic parts of wormwood are more especially found in the flowering tops, and its bitterness in the leaves: but as the latter are replete with a mucilaginous matter, which might impede the action of the menftruum on the aromatic parts in this very elegant formula, the flowering tops are infused first, and their tincture made to extract the bitter parts of the leaves and stalks. This preparation may therefore be considered as containing the active virtue of the tincture of wormwood we have one of the strongest of the vegetable bitters. It is sometimes used as an anthelmintic, and still more frequently in stomach ailments: But to most people it is a very disagreeable medicine.

Tincture of aloes. L.

Take of focotorine aloes, powdered, half an ounce; extract of liquorice, an ounce and a half; distilled water, proof-spirit, of each eight ounces. Digest in a sand vessel, now and then shaking the vessel, until the extract be dissolved, and then strain.

In this simple tincture all the active parts of the aloes, whether of a gummy or resinous nature, are suspended in the menftruum. The extract of liquorice serves both to promote the suspension and to cover the taste of the aloes; and in these cases where we wish for the operation of the aloes alone, without the aid of any of the myrrh or corrigens, this is perhaps one of the best formulæ under which aloes can be exhibited in a fluid state.

Compound tincture of aloes. L.

Take of tincture of myrrh, two pints; saffron, focotorine aloes, each of three ounces. Digest for eight days, and strain.

Elixir of aloes, commonly called Elixir proprietatis, E.

Take of myrrh in powder, two ounces; focotorine aloes, an ounce and a half; English saffron, one ounce; rectified spirit of wine, proof-spirit, of each one pound. Digest the myrrh with the spirit for the space of four days; then add the aloes in powder, and the saffron: continue the digestion for two days longer, sufler the feces to subside, and pour off the clear elixir.

These two formulæ, though the mode of preparation be somewhat varied, do not materially differ from each other; and both may be considered as being the elixir proprietatis of Paracelsus, improved with regard to the manner of preparations. The myrrh, saffron, and aloes, have been usually directed to be digested in the spirit together: by this method, the menftruum foons loads itself with the latter, so as scarcely to take up any of the myrrh; while a tincture, extracted first from the myrrh, readily dissolves a large quantity of the others. The alkaline salt, commonly ordered in these preparations with a view to promote the dissolution of the myrrh, we have already observed to be useless; and accordingly it is now omitted. Instead of employing the rectified spirit alone, the Edinburgh college have used an equal portion of proof-spirit, which is not only a more complete menftruum, but also renders the medicine less heating.

This medicine is highly recommended, and not undervalued, as a warm stimulant and aperient. It strengthens the stomach and other visceræ, cleanses the first passages from tenacious phlegm, and promotes the natural secretions in general. Its continued use has frequently done much service in cachetic and icteric cases, uterine obstructions, and other similar disorders; particularly in cold pale phlegmatic habits. Where the patient is of a hot bilious constitution and florid complexion, this warm stimulating medicine is less proper, and sometimes prejudicial. The dose may be from twenty drops to a tea-spoonful or more, two or three times a-day, according to the purposes which it is intended to answer.

Vitriolic elixir of aloes or proprietatis. E.

Take of myrrh, focotorine aloes, each an ounce and a half; English saffron, one ounce; dulcified spirit of vitriol, one pound. Digest the myrrh with the spirit for four days in a close vessel; then add the saffron and aloes. Digest again four days; and when the secures have subsided, pour off the elixir.

The Edinburgh college have reformed this preparation considerably; and especially by directing the myrrh to be digested first, for the same reasons as were observed on the preceding article. Here the dulcified spirit of vitriol is very judiciously substituted for the spirit of sulphur, ordered in other books of pharmacy to be added to the foregoing preparation; for that strong acid precipitates from the liquor great part of what it had before taken up from the other ingredients; whereas, when the acid is previously combined with the vinous spirit, and thereby dulcified, as it is called, it does not impede its dissolving power. This elixir poiffesses the general virtues of the preceding, and is, in virtue of the menftruum, preferred to it in hot constitutions and weaknefses of the stomach.

Aromatic tincture. E.

Take of cinnamon, six drams; lesser cardamom, one ounce; garden-angelica root, three drams; long pepper, two drams; proof-spirit, two pounds and an half. Macerate for seven days, and filter the tincture.

This preparation is improved from the preceding editions by the omission of some articles, either superfluous or foreign to the intention; galangal, gentian, zedoary, bay berries, and calamus aromaticus. As now reformed, it is a sufficiently elegant warm aromatic.

This very warm aromatic is too hot to be given without dilution. A tea-spoonful or two may be taken in wine or any other convenient vehicle, in languors, weak-
weakness of the stomach, flatulencies, and other familiar complaints; and in these cases it is often employed with advantage.

**Tincture of asafetida.** L.

Take of asafetida, four ounces; rectified spirit of wine, two pints. Digest with a gentle heat for six days, and strain.

**Fetid tincture.** E.

Take of asafetida, two ounces; vinous spirit of sal ammoniac one pound. Macerate for six days in a close flask, veiled, and strain. Of these two formulae, the last is perhaps most generally useful: The vinous spirit of sal ammoniac is not only a more powerful menstruum than the rectified spirit of wine, but also coincides with the general virtues of the remedy.

This tincture possesses the virtues of the asafetida itself; and may be given from ten drops to fifty or sixty. It was first proposed to be made with proof-spirit; this dissolves more of the asafetida than a rectified one; but the tincture proves turbid; and therefore rectified spirit, which extracts a transparent one is very justly preferred where ardent spirit is to be employed: and with this menstruum we can at least exhibit the asafetida in a liquid form to a greater extent.

**Tincture of balsam of Peru.** L.

Take of balsam of Peru, four ounces; rectified spirit of wine, one pint. Digest until the balsam be dissolved.

The whole of the Peruvian balsam is dissolved by spirit of wine; this therefore may be considered as a good method of freeing it from its impurities; while at the same time it is thus reduced to a state under which it may be readily exhibited: but at present it is very little employed, unless in composition, either under this or any other form.

**Tincture of balsam of Tolu.**

Take of balsam of Tolu, one ounce and an half; rectified spirit of wine, one pint. Digest until the balsam be dissolved and strain. E.

Take of balsam of Tolu, an ounce and an half; rectified spirit of wine, one pound. Digest until the balsam be dissolved, and then strain the tincture. E.

This solution of balsam of Tolu possesses all the virtues of the balsam itself. It may be taken internally, with the several intentions for which that valuable balsam is proper, to the quantity of a tea-spoonful or two, in any convenient vehicle. Mixed with the plain syrup of sugar, it forms an elegant balsamic syrup.

**Compound tincture of benzoin.** L.

Take of benzoin, three ounces; floarx strained, two ounces; balsam of Tolu one ounce; socotrine aloes, half an ounce; rectified spirit of wine, two pints. Digest with a gentle heat for three days, and strain.

**Traumatic balsam.** E.

Take of benzoin, three ounces; balsam of Peru, two ounces; hepatic aloes, half an ounce; rectified spirit of wine, two pounds. Digest them in a sand heat for the space of ten days, and then strain the balsam.

Although the London college have changed the name of this composition, yet they have made very little alteration on the formula which, in their last edition, had the name of *Traumatic balsam*; a name which it still retains in the Edinburgh pharmacopoeia; and both may be considered as elegant contractions of some very complicated compositions, which were celebrated under different names; such as Baume de Comman- deur, Wade's balsam, Friar's balsam, Jelliflui's drops, &c. These, in general, consisted of a confused far- rago of discordant substances. They, however deprived considerable activity from the benzoin and aloes; and every thing to be expected from them may readily be obtained from the present formula.

The compound tincture of benzoin, or traumatic balsam, stands highly recommended, externally, for cleansing and healing wounds and ulcers, for dissolving cold tumours, allaying gout, rheumatic, and other old pains and aches; and likewise internally, for warming and strengthening the stomach and intestines, expelling flatulences, and relieving colic complaints. Outwardly, it is applied cold on the part with a feather; inwardly, a few drops are taken at a time, in wine or any other convenient vehicle.

There is, however, reason to think that its virtues have been considerably over-rated; and at present it is much less employed than formerly, recourse being chiefly had to it in cases of recent wounds, with the view of stopping hemorrhages, and of promoting healing by the first intention, as it is called.

**Tincture of the Spanish fly.**

Take of bruised cantharides, two drams; cochineal, powdered, half a dram; proof-spirit one pint and an half. Digest for eight days and strain. L.

Take of cantharides, one dram; proof-spirit, one pound. Digest for four days, and strain through paper. E.

These tinctures possess the whole virtues of the fly, and are the only preparations of it designed for internal use: tinctures being by far the most commodious and safe form for the exhibition of this active drug. The two tinctures are scarcely different in virtue from each other. The cochineal is used only as a colouring ingredient: the gum-guaiacum, camphor, and effential oil of juniper-berries, which were formerly added, however well adapted to the intentions of cure, could be of little consequence in a medicine limited to so small a dose. If any additional substances should be thought requisite for promoting the effect of the cantharides, whether as a diuretic, as a detergent in ulcerations of the urinary passages, or as a specific reagent of seminal gleet and the flux albus, they are more advantageously joined contemporaneously to the tincture, or interposed by themselves at proper intervals. The usual dose of these tinctures is from ten to twenty drops; which may be taken in a glass of water, or any other more agreeable liquor, twice a day; and increased by two or three drops at a time according to the effect.

The tincture of cantharides has of late been highly celebrated as a successful remedy in diabetic cases; and
and in some instances of this kind, its use has been put to a very considerable extent, without giving rise to any strangurous affections: But we have not found it productive of a change for the better in any of these cases of diabetes in which we have tried it.

Tincture of cardamom.

Take of leffer cardamom seeds, husked and bruised, three ounces; proof spirit, two pints. Digit for eight days, and strain. L.

Take of leffer cardamom seeds, six ounces proof spirit, two pounds and a half. Macerate for eight days, and strain through paper. E.

Tincture of cardamom has been in use for a considerable time. It is a pleasant, warm cordial; and may be taken, along with any proper vehicle, from a dram to a spoonful or two.

Compound tincture of cardamom. L.

Take of leffer cardamom seeds, husked, caraway-seeds, cochineal, each, powdered, two drams; cinnamon, bruised, half an ounce; raisins, floned, four ounces; proof spirit, two pints. Digit for fourteen days, and strain.

This tincture contains so small a proportion of cardamoms as to be hardly intitled to derive its name from that article; and from the large proportion of raisins which it contains, the influence of the aromatics must be almost entirely prevented, while, at the same time, from these it cannot be supposed to obtain any active impregnation.

Tincture of cæfarilla. L.

Take of the bark of cæfarilla, powdered, four ounces; proof spirit two pints. Digit with a gentle heat for eight days, and strain.

Proof spirit readily extracts the active powers of the cæfarilla: and the tincture may be employed to answer most of these purposes for which the bark itself is recommended: But in the cure of intermitents, it in general requires to be exhibited in substance.

Tincture of caraffor. L.

Take of Ruffia caraffor, powdered, two ounces; proof spirit, two pints. Digit for ten days, and strain.

Take of Ruffia caraffor, an ounce and a half; rectified spirit of wine, one pound; digit them with a gentle heat for six days, and afterwards strain off the liquor. E.

An alkaline salt was formerly added in this last prescription which is here judiciously rejected, as being at least an useless, if not a prejudicial, ingredient. It has been disputed whether a weak or rectified spirit, and whether cold or warm digestion, are preferable for making this tincture. To determine this point, the following experiment has been mentioned. "Some fine Siberia caraffor having been infused in good French brandy without heat, for twenty days, the tincture proved very weak: On the same individual caraffor (the magma or residuum of the former tincture) the same quantity of rectified spirit was poured as before of brandy; and after a few hours warm digestion, a tincture was extracted much stronger than the other." But this experiment is not satisfactory: the effects of the two menstrua, and of heat, having been respectively compared in very different circumstances.

From other trials, it appears that caraffor, macerated without heat, gives out its finer and most grateful parts to either spirit, but most perfectly to the rectified. That heat enables both menstrua to extract greatest part of its greeter, and more nauseous matter; and proof-spirit extracts this last more readily than rectified.

The tincture of caraffor is recommended in most kinds of nervous complaints and hysterical disorders: In the latter it sometimes does service, though many have complained of its proving ineffectual. The dose is from twenty drops to forty, fifty, or more.

Compound tincture of caraffor. E.

Take of Ruffia caraffor one ounce; aafætæda, half an ounce; vinous spirit of sal ammoniac one pound. Digit for fixed days in a close stopped phial, frequently shaking the vessel; and then strain the tincture.

This composition is a medicine of real efficacy, particularly in hysterical disorders, and the several symptoms which accompany them. The spirit here used is an excellent menstruum, both for the caraffor and the aafætæda, and greatly adds to their virtues.

Tincture of catechu. L.

Take of catechu, three ounces; cinnamon, bruised, two ounces; proof spirit, two pints. Digit for three days, and strain.

Japonic tincture. E.

Take of Japan earth, three ounces; cinnamon, two ounces; proof spirit, two pounds and a half. After digestion for eight days, let the tincture be passed through a strainer.

A tincture of this kind, with the addition of Peruvian bark, ambergris, and musk, to the ingredients above directed, was formerly kept in the shops. The tincture here received is preferable for general use: where any other ingredients are required, tinctures of them may be occasionally mixed with this in extemporaneous prescription. The cinnamon is a very useful addition to the catechu, not only as it warms the stomach, &c., but likewise as it improves the roughness and astringency of the other.

The tincture is of service in all kinds of defluxions, catarrhs, loofenesses, uterine fluxes, and other disorders, where mild astringent medicines are indicated. Two or three tea-spoonfuls may be taken every now and then in red wine or in any other proper vehicle.

Tincture of cinnamon.

Take of cinnamon, bruised one ounce and an half; proof spirit, one pint. Digit for ten days, and strain. L.

Take of cinnamon, three ounces; proof spirit, two pounds and a half. Macerate for eight days, and strain. E.

The tincture of cinnamon possesses the astringent virtues of the cinnamon, as well as all its aromatic cordial ones; and in this respect it differs from the distilled waters of that spice.

Compound
Part II.

**Pharmacy.**

**Compound tincture of Cinnamon.** L.

Take of cinnamon, bruised, six drams; lefser cardamom-seeds, husked, three drams; long pepper, ginger, of each, in powder, two drams; proof spirit, two pints. Digest for eight days and strain.

From the different articles which this tincture contains it must necessarily be of a more hot and fiery nature than the former, though much less strongly imregnated with the cinnamon.

**Tincture of cinnamon.** L.

Take of cinnamon-root, powdered two ounces and an half: proof spirit, two pints. Digest for eight days and strain.

The cinnamon readily yields its active qualities to the menstruum here employed; and accordingly, under this form, it may be advantageously employed against bilious vomitings, and those different stomachal ailments, in which the cinnamon has been found useful; but where there does not occur some objection to its use in substanence, that form is in general preferable to the tincture, which is now for the first time introduced into the London pharmacopoeia.

**Tincture of orange peel.** L.

Take of the fresh exterior peel of Seville oranges, three ounces; proof spirit, two pints. Digest for three days, and strain.

By this menstruum, both the bitter quality of the orange skins, and likewise their peculiar essentail oil, are extracted; hence it may be employed for any purpose in medicine which these are capable of answering. It is, however, but rarely used; and, as well as the former, has now only for the first time a place in the London pharmacopoeia.

**Tincture of Peruvian-bark.**

Take of Peruvian bark, powdered four ounces; proof spirit, two pints. Digest with a gentle heat for eight days, and strain.

Take of Peruvian bark, four ounces; proof spirit, two pounds and a half. Digest for ten days, and strain.

A medicine of this kind has been for a long time pretty much in esteem, and usually kept in the shops, though but lately received into the pharmacopoeias. Some have employed highly rectified spirit of wine as a menstruum, which they have taken care fully to saturate, by digestion on a large quantity of the bark. Others have thought of affiling the action of the spirit by the addition of a little fixed alkaline salt, which does not however appear to be of any advantage; and others have given the preference to the vitriolic acid, which was supposd by giving a greater confidence to the spirit, to enable it to sublim more than it would be capable of doing by itself; at the same time that the acid improves the medicine by increasing the roughness of the bark. This last tincture, and that made with rectified spirit, have their advantages; though, for general use, that above directed is the most convenient of any, the proof spirit extracing nearly all the virtues of the bark. It may be given from a tea-spoonful to half an ounce, or an onzine, according to the different purposes it is intended to answer.

**Compound tincture of Peruvian-bark.** L.

Take of Peruvian bark, powdered, two ounces; exterior peel of Seville oranges, dried, one ounce and an half; Virginian magnes-root, bruised, three drams; saffron, one dram; cochineal, powdered, two scruples; proof spirit, twenty ounces. Digest for fourteen days, and strain.

This has been for a considerable time celebrated under the title of Huskam's tincture of bark.

The substances here joined to the bark, in some cases, promote its efficacy in the cure of intermittents, and not unfrequently are absolutely necessary. In some ill habits, particularly where the vitera and abdominal glands are obstructed, the bark, by itself, proves unuseful, if not injurious; while given in conjunction with stimulating stomachics and debritentia, it more rarely fails of the due effect. Orange peel and Virginian magnes-root are among the best additions for this purpose; to which it is thought by some necessary to join chalybeate medicines also.

A corroborative and stomachic, it is given in doses of two or three drams; but when employed for the cure of intermittents, it must be taken to a greater extent. For this purpose, however, it is rarely employed, unless with those who are averse to the use of the bark in substanence, or whose stomachs will not retain it under that form.

**Tincture of saffron.** E.

Take of English saffron, one ounce; proof spirit, fifteen ounces. After digesting them for five days, let the tincture be strained through paper.

This tincture is similar in virtue to the saffron wine. A spirituous menstruum is here preferred to the wine as a tincture drawn with the former retains its elegant colour longer, and is not apt to deposit in keeping any part of what it had taken up from the saffron. The hops have been accustomed to employ treacle-water as a menstruum for saffron, with a view to the promoting its efficacy with the intention of operating as an alexipharmac; but the acid in that compound water soon destroys the colour of the tincture.

**Tincture of muriated iron.** L.

Take of the rust of iron, half a pound; muriatic acid three pounds; rectified spirit of wine, three pints. Pour the muriatic acid on the rust of iron in a glass vessel; and shake the mixture now and then during three days. Set it by, that the feces may subside; then pour off the liquor: evaporate this to one pint, and, when cold, add to it the vinous spirit.

**Tincture of iron.** E.

Take of the scales of iron, purified and powdered, three ounces; muriatic acid, as much as is sufficient to dissolve the powder. Digest with a gentle heat; and the powder being dissolved, add of rectified spirit of wine as much as will make up of the whole liquor two pounds and a half.

Of these two formulæ, that of the Edinburgh college is, in our opinion, in several respects intituted to...
in obstructions of the menes; but its activity may be considered as depending much more on the aifaeftida than on the foot.

**Tincture of galbanum.** L.

Take of galbanum, cut into small pieces, two ounces; proof-spirit, two pints. Digest with a gentle heat for eight days, and strain.

This tincture is now for the first time introduced by the London college, and may be usefully employed for answering several purposes in medicine. Galbanum is one of the strongest of the folid gums; and although less active, yet much less disagreeable than aifaeftida; and under the form of tincture it may be successfully employed in cafes of inflammation and hysteria, where its effects are immediately required, particularly with those who cannot bear aifaeftida.

**Compound tincture of gentian.** L.

Take of gentian root, sliced and bruised, two ounces; exterior dried peel of Seville oranges, one ounce; leifer cardamom seeds, husked and bruised, half an ounce; proof spirit, two pints. Digest for eight days, and strain.

**Bitter tincture or fumacetic elixir.** E.

Take of gentian-root, two ounces; Seville orange-peel, dried, one ounce; white canella, half an ounce; cochineal, half a dram; proof-spirit, two pounds and a half. Macerate for four days, and strain through paper.

These are very elegant spirituous bitters. As the preparations are designed for keeping, lemon-peel, an excellent ingredient in the watery bitter infusions, has, on account of the perilable nature of its flavours, no place in these. The aromatics are here a very commodious ingredient, as in this spirituous menstruum they are free from the inconvenience with which they are attended in other liquors, of rendering them untransparent.

**Elixir of guaiacum.** E.

Take of gum guaiacum, one pound; balfam of Peru, three drams; rectified spirit of wine, two pounds and a half. Digest for ten days, and strain.

This tincture may be considered as nearly agreeing in medical virtues with the two following. It is, however, less in use; but it may be employed with advantage in those cafes where an objection occurs to the menstruum used in forming the others.

**Tincture of gum-guaiacum.** L.

Take of gum-guaiacum, four ounces; compound spirit of ammonia, a pint and a half. Digest for three days, and strain.

**Volatile elixir of guaiacum.** E.

Take of gum-guaiacum, four ounces; balfam of Peru, two drams; distilled oil of fassafras, half a dram; vinous spirit of falf ammoniae, a pound and an half. Macerate for six days in a clofe vessel, and strain.

In the laft of these formulæ, the vinous spirit of falf ammoniae is less acrimonious than the menstruum directed by the London college; and the balfam of Peru, and distilled oil of fassafras, are ufeful additions, by
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by increasing the permanence of its operation as a general stimulant, or more particularly as a diaphoretic.

These are very elegant and efficacious tinctures; the volatile spirit excellently dissolving the gum, and at the same time promoting its medicinal virtue. In rheumatic cases, a tea or even table spoonful, taken every morning and evening in any convenient vehicle, particularly in milk, has proved of singular service.

\textbf{Tincture of black hellebore. L.} 449

Take of black hellebore root, in coarse powder, four ounces; cochineal, powdered, two scruples; proof-spirit, two pints. Digest with a gentle heat for eight days, and strain.

\textbf{Tincture of melampodium, or black hellebore. E.} 449

Take of black hellebore root, four ounces; cochineal, half a dram; proof-spirit, two pounds and a half. Digest them together for eight days, and afterwards filter the tincture through paper.

This is perhaps the best preparation of hellebore when designed for an alternative, the menstruum here employed extracting the whole of its virtues. It has been found, from experience, particularly serviceable in uterine obstructions; in languid constitutions, where chalybeates are hurtful, it has been said that it seldom fails of exciting the menstural evacuations, and removing the ill consequences of their suppression. So great, according to some, is the power of this medicine, that wherever, from an ill conformation of the parts, or other causes, the expected discharge does not succeed on the use of it, the blood, as Dr Mead has observed, is so forcibly propelled, as to make its way through other passages. A tea spoonful of the tincture may be taken twice in a day in warm water or any other convenient vehicle.

The college of Edinburgh had formerly a tincture of this root with wine. Proof spirit is undoubtedly preferable, both as a menstruum, and as better fitted for keeping.

\textbf{Tincture of jalap.} 450

Take of powdered jalap root, eight ounces; proof-spirit, two pints. Digest with a gentle heat for eight days, and strain. E.

Take of jalap in coarse powder, three ounces; proof-spirit, fifteen ounces. Digest them for eight days, and strain the tincture. E.

Rectified spirit of wine was formerly ordered for the preparation of this tincture; but rectified spirit dissolving little more than the pure resinous parts of the jalap, rendered the use of the medicine somewhat less commodious than that of the tincture prepared with proof-spirit. Most of the tinctures made in rectified spirit, diluted with water, so as to be fit for taking, form a turbid white mixture. Many of them are safely taken in this form, without any further addition; but the cathartic ones are never to be ventured on without an admixture of syrup or mucilage to keep the resin united with the liquor; for if it separates in its pure undivided state, it never fails to produce violent gripes.

\textbf{Compound tincture of lavender. L.} 452

Take of spirit of lavender, three pints; rofmary, one pint; cinnamon bruised, nutmegs bruised, of each half an ounce; red sanders, one ounce. Digest for ten days, and strain.

\textbf{Compound spirit of lavender. E.} 452

Take of simple spirit of lavender three pounds; simple spirit of rofmary, one pound; cinnamon, one ounce; cloves, two drams; nutmege, half an ounce; red sanders, three drams. Macerate seven days, and strain.

These two compositions, although varying a little from each other, both with respect to their ingredients and names, may yet be considered as precisely the same. Although the London college, in the present edition of their pharmacopoeia, have made many useful alterations with respect to names, yet the propriety of the change here adopted may perhaps be doubted: For it cannot with justice be styled a tincture of lavender, when the distilled spirit of that plant is employed only as a menstruum. If, therefore, it seemed necessary to refer it to the head of tinctures, it ought to have been denominated from the cinnamon or nutmegs; but since the activity of this article very much depends on the spirit of lavender,
vender, the old name is in our opinion justly preferable to the new one.

The red fanders is of no farther use in these compositions than as a colouring ingredient. If a yellow spirit was liked, the yellow fanders would be an excellent article, as it not only communicates a fine colour, but likewise a considerable share of medicinal virtue. A spirit distilled from the flowers of lavender and fage, in due proportion, and digested in the cold for a little time with some cinnamon, nutmegs, and yellow fanders, proves a very elegant and grateful one. Where essential oils are employed, particular care must be had in the choice of them; for on their goodnes that of the medicine depends. The digestion of the spirit with the spices, &c. should be performed without heat, otherwise the flavour of the medicine will be injured. These spirits are grateful reviving cordials; though considerably more simple, they are not less elegant or valuable than many other more elaborate preparations. This medicine has long been held in great esteem, under the name of Puffy drops in all kinds of languors, weakness of the nerves, and decays of age. It may be conveniently taken on sugar, from ten to eighty or a hundred drops.

Tincture of myrrh. E.
Take of myrrh, two drams; rectified spirit of wine one pound. Digest for ten days, and strain.

Rectified spirit is the most complete menstruum for myrrh; but in this form it is often impossible to give such a quantity of myrrh as is necessary for our purpose; and hence this article is more frequently employed under the form of julep or bolus.

Tincture of myrrh. 454
Take of myrrh, bruised, three ounces; proof-spirit, a pint and an half; rectified spirit of wine, half a pint. Digest with a gentle heat for eight days, and strain.

Take of myrrh three ounces; proof-spirit two pounds and an half. After digestion for ten days strain off the tincture. E.

The pharmaceutical writers in general have been of opinion, that no good tincture can be drawn from myrrh by spirit of wine alone, without the assistance of fixed alkaline salts. But it appears from proper experiments, that these salts only heighten the colour of the tincture, without enabling the menstruum to dissolve any more than it would by itself. Rectified spirit extracts, without any addition, all that part of the myrrh in which its peculiar smell and taste reside, viz. the resin: and proof-spirit dissolves almost the whole of the drug, except its impurities; hence the combination of these two directed by the London college is perhaps preferable to either by itself.

Tinctures of myrrh is recommended internally for warming the habit, attenuating viscid juices, strengthening the solids, opening obstructions, particularly those of the uterine vessels, and rectifying putrefaction. Boerhaave greatly esteemed it in all languid cases proceeding from simple inactivity; in those female disorders which are occasioned by an aqueous, mucous, flaggish indigisposition of the humours, and a relaxation of the vessels; in the flor abus, and all diseases arising from a like cause. The dose is from fifteen drops to forty or more. The medicine may doubtless be given in these cases to advantage; though with us, it is more commonly used externally for cleansing foul ulcers and promoting the exfoliation of curious bones.

Tincture of opium. L.
Take of hard purified opium, powdered, ten drams; proof-spirit, one pint. Digest for ten days, and strain.

Tincture of opium, commonly called liquid laudanum. E.
Take of opium, two ounces; spirituous cinnamon-water, one pound and a half. Digest four days, and strain off the tincture.

These are very elegant liquid opiates, the menstrum in the last dissolves nearly the whole subfiance of the opium, and effectually covers its ill flavour. It were to be wished that the shops were furnished with a liquid opiate, in which the proportion of menstruum was fill much larger, so as to admit of the dose being determined by weight or measure; the method by drops seeming too precarious for a medicine of so powerful a kind. The following preparation is contrived with this view.

Take of the basic extract, half a dram; highly rectified spirit of wine, called alcohol, ten ounces; simple cinnamon-water twenty ounces. Digest them together until the opium be dissolvd, and then filter the solution through paper.

This preparation is apprehended to be free from all the inconveniences attending the common opiate tinctures. The menstruum dissolves the whole of the opium except the impurities, and consequently the tincture is not liable to any uncertainty in point of strength. The dose may be ascertained to the greatest exactness; one grain of opium is contained in one ounce by measure, which is equal nearly to seven grains by weight. Neither the tinctures in wine nor proof-spirit are so well adapted for keeping as could be wished; in long standing, a part of the opium is gradually thrown off from both, and consequently the tinctures become gradually weaker; the part which thus separates, amounts sometimes, it is said, to near one-fourth of the quantity of opium at first dissolved: it floats on the surface of the vinous tincture, and in the spirituous links to the bottom. In the preparation here recommended, it has not been observed that any separation happens.

Instead of the cinnamon-water, pure water may be employed in the mixture; and where aromatic additions are wanted, either with a medicinal intention or for covering the ill smell of the opium, any proper tincture or distilled water may be extemporaneously joined. Saffron, an addition once employed by the Edinburgh college, has been considered as a corrector of opium; but the qualities it was supposed to correct are merely imaginary; nor indeed can that article be of much importance with any intention in the small quantity that enters a dose of the tincture; a grain of opium being accompanied with only half a grain of saffron.

A preparation in some respects similar to that here recommended was introduced into the Edinburgh
Part II.  

P H A R M A C Y. 

Tincture of rhubarb.  

Take of rhubarb, sliced, two ounces; lessor cardamom seeds, hulked and bruised, half an ounce; saffron, two drams; proof-spirit, two pints. Digest for eight days, and strain. 

Take of rhubarb, three ounces; lessor cardamom seeds, half an ounce; proof-spirit two pounds and a half. Digest for seven days, and strain. 

Compound tincture of rhubarb.  

Take of rhubarb, sliced, two ounces; ginger powdered, saffron, each two drams; liquorice root, bruised; half an ounce; distilled water, one pint; proof-spirit twelve ounces. Digist for fourteen days, and strain.

Bitter tincture of rhubarb.  

Take of rhubarb two ounces; gentian-root, half an ounce; Virginian snake-root, one dram; proof spirit, two pounds and a half. Digist for seven days, and then strain the tincture.

Sweet tincture of rhubarb.  

It is made by adding to two pounds and a half of the strained tincture of rhubarb, four ounces of sugar-candy.

The last of these preparations is improved from the former editions. Two ounces of liquorice and one of raisins are supplied by an increase of the sugar-candy.

All the foregoing tinctures of rhubarb are designated as stomachics and carbolants, as well as purgatives; spirituous liquors excellently extract those parts of the rhubarb in which the two first qualities reside, and the additional ingredients considerably promote their efficacy. In weaknesses of the stomach, indigestion, laxity of the intestines, diarrhœas, colic, and other similar complaints, these medicines are frequently of great service: the second is also in many cases, an useful addition to the Peruvian bark, in the cure of intermittent, particularly in cachetic habits, where the vitæra are obstructed; with these intentions, a spoonful or two may be taken for a dose, and occasionally repeated.

Elixir of ales and rhubarb, commonly called sacraed elixir.  

Take of rhubarb, cut small, ten drams; foccorotone ales, in powder, six drams; lessor cardamom seeds, half an ounce; proof-spirit, two pounds and a half. Digist for seven days, and then strain the elixir.

This preparation is very much employed as a warming cordial purge, and for the general purposes of alectories; with which, however, it combines the medicinal properties of rhubarb.

Compound tincture of savin.  

Take extract of savin, one ounce; tincture of cafor, one pint; myrrh, half a pint. Digist till the extract of savin be dissolved, and then strain. 

This preparation had a place in the last edition of our pharmacopoeia, under the title of Elixir myrrhae compositum.
This preparation is improved from one described in some former dispensaries under the name of *aurea elixir*. It is a medicine of great importance in uterine obstructions, and in hypochondriacal cases; though, possibly, means might be contrived of superadding more effectually the virtues of fawin to a tincture of myrrh and castor. It may be given from five drops to twenty or thirty, or more, in pennyroyal water, or any other suitable vehicle.

**Tincture of squills. L.**

Take of squills, fresh dried, four ounces; proof spirit, two pints. Digest for eight days, and pour off the liquor.

For extracing the virtues of squills, the menstruum which has hitherto been almost solely employed is vinegar. There are however, cafes in which artid spirit may be more proper; and by the menstruum here directed its virtues are fully extraced. Hence it is with propriety that the London college have introduced this form, as well as the vinegar and oxymel. But, in general, the purposes to be answered by squills may be better obtained by employing it in substance than in any other form.

**Antiphthisical tincture. E.**

Take of sugar of lead an ounce and a half; vitriol of iron, one ounce; reduced spirit of wine, one pound. Let a tincture be extraced without heat.

The reducing of the salts separately into powder, and performing the digestion without heat, are very necessary circumstances: for if the ingredients be attempted to be pulverized together, they will grow soft and amolliquid; and if heat be used, scarce any tincture will be obtained.

This tincture is sometimes given in doses of twenty or thirty drops for restraining immediate secretions, particularly the colliquative sweats attending hectic fevers and phthisical disorders; whence the name antiphthisical tincture. It is undoubtedly a medicine of great efficacy in these cases, but too dangerous to be rashly ventured on. Some have supposed that it does not contain any of the sugar of lead; but experiments made for that purpose have shown the contrary.

We must however, consider the above preparation as unscientific. Both the acetous and vitriolic acid have a greater attraction for iron than for lead: and though the vitriolic be capable of discharging the acetous acid, yet it makes not only in its entire state a less perfect union with lead than the acetous acid, but it is now also combined with iron, for which it has a greater attraction, and can therefore only act on the salt of lead in proportion as it is superabundant in the salt of copperas; but in proportion as the vitriolic disengages the acetous acid from the lead, the latter, in its turn will attach itself to the iron. On the whole it is difficult to ascertain the precise nature of this preparation; it seems always, however, to contain a quantity of lead in a false state, sufficient to expunge it from prudent practice: or, at least, if in those cases in which it has hitherto been employed, lead be thought necessary, the salt of lead may with more safety and advantage be given in its solid state, particularly when combined with opium: and it is probably on this account that the present formula has now no place in the London pharmacopeia.

**Tincture of fenna. L.**

Take of fenna, one pound; caraway-seeds, bruised, one ounce and an half; clover cardamom-seeds, bruised, half an ounce; salins, floned, thirteen ounces; proof spirit, one gallon. Digest for fourteen days, and strain.

**Compound tincture of fenna, commonly called Elixir of health. E.**

Take of fenna leaves, two ounces; jalap root, one ounce; coriander seeds, half an ounce; proof spirit, two pounds and a half. Digest for seven days, and to the strained liquor add four ounces of sugar-candy.

Both these tinctures are useful carminatives and cathartics, especially to those who have accustomed themselves to the use of spirituous liquors; they oftentimes relieve flatulent complaints and colics, where the common cordials have little effect; the dose is from one to two ounces. Several preparations of this kind have been offered to the public under the name of *Daffy's elixir*: the two above are equal to any, and superior to most of them. The last in particular is a very useful addition to the cator oil, in order to take off its maw-kith-take; and as coinciding with the virtues of the oil, it is therefore much preferable to brandy, shrub, and such like liquors, which otherwise are often found necessary to make the oil fit on the stomach.

**Tincture of snake root.**

Take of Virginian snake-root, three ounces; proof spirit, two pints. Digest for eight days, and strain. L.

Take of Virginian snake-root, two ounces; cochineal, one dram; proof spirit, two pounds and a half. Digest in a gentle heat for four days, and then strain the tincture. E.

The tincture of snake-root was in a former pharmacopeia directed to be prepared with the tincture of salt or tartar, which being now expunged, it was proposed to the college to employ reduced spirit; but as the heat of this spirit prevents the medicine from being taken in so large a dose as it might otherwise be, a weaker spirit was chosen. The tincture made in this menstruum, which extracts the whole virtues of the root, may be taken to the quantity of a spoonful or more every five or six hours; and to this extent it often operates as an useful diaphoretic.

**Tincture of valerian. L.**

Take of the root of wild valerian, in coarse powder, four ounces; proof spirit, two pints. Digest with a gentle heat eight days, and strain.

The valerian root ought to be reduced to a pretty fine powder, other wise the spirit will not sufficiently extract its virtues. The tincture proves of a deep colour, and considerably strong of the valerian; though it has not been found to answer so well in the cure of epileptic disorders as the root in substance, exhibited in the form of powder, or bolus. The dose of the tincture is from half a spoonful to a spoonful or more two or three times a-day.
Part II.

PHAR

MACY.

Take of the root of wild valerian, four ounces; compound spirit of ammonia, two pints. Digest for eight days, and strain. L.

Take of wild valerian root two ounces; vinous spirit of sal ammoniac, one pound. Macerate for six days in a close vessel and strain. E.

Both the compound and vinous spirit of sal ammoniac are here excellent menstrua, and at the same time considerably promote the virtues of the valerian, which in some cafes wants an afflurance of this kind. The dose may be a tea spoonful or two.

Tincture of veratrum, or white hellebore. 466

Take of white hellebore root, eight ounces; proof spirit, two pounds and a half. Digest them together for ten days, and filter the tincture through paper.

This tincture is sometimes useful for acuating cathartics, &c. and as an emetic in apoplectic and maniacal disorders. It may likewise be so managed as to prove a powerful alternative and deobstruent in cafes where milder remedies have little effect. But a great deal of caution is requisite in its use: the dose at first ought to be only a few drops; if considerable, it proves violently emetic or cathartic.

Acid elixir of vitriol. E. 467

Take of rectified spirit of wine, two pounds; drop into it by little and little five ounces of vitriolic acid; Digest the mixture with a very gentle heat in a close vessel for three days, and then add of cinnamon, an ounce and a half; ginger, one ounce. Digest again in a close vessel for six days, and then filter the tincture through paper placed in a glass funnel.

The intention in this process is, to obtain a tincture of aromatic vegetables, in spirit of wine, combined with a considerabile proportion of vitriolic acid. When the tincture is first drawn with vinous spirit, and the acid added afterwards, the acid precipitates great part of what the spirit had before taken up: and on the other hand, when the acid is mixed with the spirit immediately before the extraction, it prevents the effusion of all that it would have precipitated by the former way of treatment: by previously uniting the acid and the vinous spirit together by digestion, the inconvenience is somewhat lessened.

This is a valuable medicine in weaknes and relaxations of the stomack and decays of constitution, particularly in those which proceed from irregularities, which are accompanied with flow bile symptoms, or which follow the suppression of intermittenit. It frequently succeeds after bitters and aromaticis by themselves had availed nothing; and indeed great part of its virtues depend on the vitriolic acid; which, barely diluted with water, has, in those cafes where the stomack could bear the acidity, produced happy effects.

Fuller relates (in his Medicina Gymnastica) that he was recovered by Mynsicht's elixir, from an extreme decay of constitution, and continual retchings to vomit. It may be given from 10 to 30 or 40 drops or more, according to the quantity of acid, twice or thrice a day, at such times as the stomack is most empty. It is very usefully conjoined with the bark, Preparations and Compositions, both as covering its disagreeable taste and coinciding with its virtues.

Sweet elixir of vitriol. E. 468

This is made of the fame aromatics, and in the same manner as the aromatic tincture; except that, in place of the vinous, the dulcified spirit of vitriol is employed.

This is designed for persons whose stomacks are too weak to bear the foregoing acid elixir; to the taste, it is gratefully aromatic, without any perceptible acidity. The dulcified spirit of vitriol, here directed, occasions little or no precipitation on adding it to the tincture.

A medicine of this kind was formerly in great esteem under the title of Vigani's volatile elixir of vitriol; the composition of which was first communicated to the public in the Pharmacopia reformata. It is prepared by digesting some volatile spirits of vitriol upon a small quantity of mint leaves curiously dried, till the liquor has acquired a fine green colour. If the spirit, as it frequently does, partakes too much of the acid, this colour will not succeed: in such case it should be rectified from a little fixed alkaline salt.

Camphorated spirit of wine. E. 469

Take of camphor, one ounce; rectified spirit of wine, one pound. Mix them together, that the camphor may be dissolved. It may also be made with a double, triple, &c. proportion of camphor.

This solution of camphor is employed chiefly for external uses, against rheumatic pains, paralytic numbness, inflammations, for dissolving tumours, preventing gangrene, or restraining their progress. It is too pungent to be exhibited internally, even when diluted, nor does the dilution succeed well; for on the admixture of aqueous liquors, the camphor gradually separates and runs together into little masses.

Hoffman, Rothen, and others, mention a camphorated spirit not subject to this inconvenience. It is prepared by grinding the camphor with somewhat more than an equal weight of fixed alkaline salt, then adding a proper quantity of proof spirit, and drawing off one half of it by distillation. This spirit was proposed to be received into our pharmacopoeias, under the title of Spiritus camphora tartaricatus. But on trial it did not answer expectation: some of the camphor rises with the spirit in distillation, though but a small quantity; whence, mixed with a large portion of water, it does not sensibly render it turbid; but in a proper quantity, it exhibits the same appearance as the more common camphorated spirit: it did not appear, that spirit distilled from camphor, with or without the alkaline salt, differed at all in this respect.

The most convenient method of uniting camphor with aqueous liquors, for internal use, seems to be by the mediation of almonds, or of mucilages; triturated with these, it readily mingles with water into the form of an emulsion, at the same time that its pungency is considerably abated. It may also be commodiously exhibited in the form of an oily draught, expressed oils totally dissolving it.

The anodyne liniment, commonly called Anodyne balm. E.

Take of opium, an ounce; white Calamine, four ounces;
In this formula the copper is brought to a saline state by means of the volatile alkali. It may therefore be considered as very analogous to the ammoniacal copper. And where recourse is had to it in practice, it is employed with the same intentions.

**Tincture of quassia.** Succ. 475

Take of quassia, bruised, two ounces; proof-spirit, two pounds and an half. Digest for three days, and then strain through paper.

By proof-spirit the medical properties, as well as the sensible qualities of the quasia are readily extracted. And under this form it may be advantageously employed for answering different purposes in medicine.

**Tincture of lac.** Succ. 476

Take of gum lac, powdered, one ounce; myrrh, three drams; spirit of styrvy-grains, a pint and an half. Digest in a sand heat for three days; after which, strain off the tincture for use.

This tincture is principally employed for strengthening the gums, and in bleedings and feverish excretions of them: it may be fitted for use with these intentions, by mixing it with honey of roses or the like. Some recommend it internally against feverish complaints, and as a corroborant in gleet, female weaknesses, &c. Its warmth, pungency, and manifestly astringent bitterness, point out its virtues in these cafes to be considerable, though common practice among us has not yet received it.

**Tincture of nux vomica.** Roff. 477

Take of nux vomica, an ounce and a half; proof-spirit, two pounds. Digest for some days, and then strain it.

The nux vomica, a very active vegetable, has of late as we have already had occasion to observe, been introduced into practice as taken internally, for the cure of intermittents and of contagious dysenteric. In these affections it may be employed under the form of tincture as well as in substance; and in this way it most readily admits of being combined with other articles, either as adjuvanta or corrigientia.

**Tincture of amber.** Succ. 478

Take of yellow amber, powdered, one ounce; vitriolic ether, four ounces. Digest for three days in a vessel accurately closed, frequently shaking the vessel, and after this strain through paper.

The tincture of amber was formerly prepared with rectified spirit of wine: but the menstruum here directed gives a more complete solution, and forms a more elegant and active tincture. It possesses the whole virtues of the concrete; and although it has no place in our pharmacopia, yet it is perhaps to be considered as one of the most valuable preparations of amber. It has been recommended in a variety of affections, particularly those of the nervous kind, as hysterical and epileptic complaints. It may be taken from a few drops to the extent of a tea-spoonful in a glass of wine or any similar vehicle.

**Volatile tincture of copper.** Gen. 474

Take of filings of copper, one dram; spirit of all amoniac, an ounce and a half. Mix them, and keep them in a vessel clofely flopped, which is to be frequently agitated, till the liquor becomes of a beautiful violet colour.
Take of camphor, one dram; rectified spirit of wine, ten drops; double-refined sugar, half an ounce; boiling distilled water, one pint. Rub the camphor first with the spirit of wine, then with the sugar; lastly, add the water by degrees, and strain the mixture.

While camphor is often exhibited in a solid state, it is frequently also advantageous to employ it as diffused in watery fluids. And with this intention the present formula is perhaps one of the most simple, the union being effected merely by the aid of a small quantity of spirit of wine and a little sugar. But perhaps the more common form of emulsion in which the union is effected naturally by the aid of a small quantity of spirit of wine and a little sugar. However, the present form is often useful in diarrhoea proceeding from, or accompanied by, acidity in the stomach; while the redundant acid in the colic kinds might serve to keep the chalk uniformly diffused, but also improves its virtues by heating the internal surface of the intestines. The dose of this medicine requires no nicety. It may be taken to the extent of a pound or two in the course of a day.

Musk mixture. L.

Take of musk, two scruples; gum-arabic, powdered, double refined sugar, of each one dram; roe-water, six ounces by measure. Rub the musk first with the sugar, then with the gum, and add the roe-water by degrees.

This had formerly the name of _julepum e nofoho_, and was intended as an improvement upon the hystric julep with musk of Bates. Orange-flower water is directed by that author; and indeed this more perfectly coincides with the musk than roe-water: but as the former is difficulty procurable in perfection, the latter is here preferred. The julep appears turbid at first: on standing a little time it deposites a brown powder, and becomes clear, but at the same time loses great part of its virtue. This inconvenience may be prevented by thoroughly grinding the musk with gum-arabic before the addition of the water; by means of the musk, the whole substance of the gum is made to suspend in the water. Volatile spirits are in many cases an useful addition to musk, and likewise enable water to keep somewhat more of the musk dissolved than it would otherwise retain.

Almond milk. L.

Take of sweet almonds, one ounce and an half; double-refined sugar, half an ounce; distilled water, two pints. Beat the almonds with the sugar; then, rubbing them together, add by degrees the water, and strain the liquor.

Common emulsion. E.

Take of sweet almonds, one ounce; bitter almonds, one dram; common-water, two pounds and a half. Beat the blanched almonds in a stone mortar, and gradually pour on them the common water, working the whole well together, then strain off the liquor.

Arabic emulsion. E.

This is made in the same manner as the preceding; only adding, while beating the almonds, of mucilage of gum-arabic, two ounces.

All these may be considered as posseting nearly the same qualities. But of the three the last is the most powerful demulcent.

Great care should be taken, that the almonds be not become rancid by keeping; which will not only render the emulsion extremely unpleasant, a circumstance of great consequence in a medicine that requires to be taken in large quantities, but likewise give it injurious qualities little expected from preparations of this class. The addition of the bitter almonds now ordered by the Edinburgh college in preparing these emulsions, may perhaps preserve them in some degree from suffering the above changes; but is much more useful as giving the emulsion an agreeable flavour. And although the substance of bitter almonds be of a deleterious nature, it is used in medicine with a view of counteracting the effects of the fatty oil.
Various nature, yet nothing is to be apprehended from the quantity here employed. These liquors are principally used for diluting and obducing acrimonious humours; particularly in heat of urine and franguries arising either from a natural sharpness of the juices, or from the operation of cantharides and other irritating medicines: in these cases, they are to be drank frequently, to the quantity of half a pint or more at a time.

Some have ordered emulsions to be boiled, with a view to deprive them of some imaginary crudity; but by this process they quickly cease to be emulsions, the oily matter separates and rises to the top, not in a pure form, but like thick cream. These experiments prove the composition of the emulsions made from the oily seeds of kernels, and at the same time point out some cautions to be attended to in their preparation and use.

Ammoniacum milk. L.

Take of ammoniacum, two drams; distilled water, half a pint. Rub the gum-refin with the water, gradually poured on, until it becomes a milk. In the same manner may be made a milk of asafoetida, and of the milk of the gum-refins.

The ammoniacum milk is used for attenuating tough phlegm, and promoting expectoration, in humoural affections, coughs, and obstructions of the viscera. It may be given to the quantity of two spoonfuls twice a-day.

The lac asafoetida is employed in spafmodical, hysterical, and other nervous affections. And it is also not unfrequently used under the form of injection. It answers the same purposes as asafoetida in substance.

Compound spirit. L.

Take of spirit of vitriol, two pounds; oil of wine, three drams. Mix them.

This is supposed to be, if not precisely the same, at least very nearly, the celebrated mineral anodyne liquor of Hoffman; as we learn from his own writings, that the liquor which he thus denominated was formed of dulcified spirit of vitriol and the aromatic oil which arises after it, but he does not tell us in what proportion these were combined. It has been highly extolled as an anodyne and anti-spasmodic medicine; and with these intentions it is not unfrequently employed in practice.

Compound spirit of ammonia. L.

Take of spirit of ammonia, two pints; essential oil of lemon, nutmeg, of each two drams. Mix them.

This differs almost only in name from the following.

Volatile aromatic spirits, commonly called volatile oily spirits, and saline aromatic spirits. E.

Take of vinous spirit of sal ammoniac, eight ounces; distilled oil of rosemary, one dram and a half; distilled oil of lemon-peat, one dram. Mix them that the oils may be dissolved.

By the method here directed, the oils are as completely dissolved as when distillation is employed.

Volatile salts, thus united with aromatics, are not only more agreeable in flavour, but likewise more acceptable to the stomach, and less acrimonious than in their pure state. Both the foregoing compositions turn out excellent ones, provided the oils are good, and the distillation skilfully performed. The dose is from five or six drops to sixty or more.

Medicines of this kind might be prepared extempore, by dropping any proper essential oil into the dulcified spirit of sal ammoniac, which will readily disolve the oil without the assistance of distillation. But it is perhaps preferable that they should be kept in the shops ready mixed.

Sucinated spirit of ammonia. L.

Take of alcohol, one ounce; water of pure ammonia, four ounces by measure; rectified oil of amber, one scruple; soap, ten grains. Digest the soap and oil of amber in the alcohol till they be dissolved; then add the water of pure ammonia, and mix them by shaking.

This composition is extremely penetrating, and has lately come into esteem, particularly for smelling to lowness and faintings, under the name of eau de luce. It has been hitherto brought from France. It is not quite limpid, for the oil of amber dissolves only imperfectly in the spirit: if the volatile spirit be not exceedingly strong, scarcely any of the oil will be imbibed.

The eau de luce is not only used with the view of making an impression on the nose, but is taken internally in the same cafes. It has likewise been celebrated as a remedy for the bite of the rattlesnake, when used internally, and applied externally to the wounded part.

Camphorated spirit. L.

Take of camphor, four ounces; rectified spirit of wine, two pints. Mix them, so that the camphor may be dissolved.

Of this we have already had occasion to speak in the preceding chapter under the title given to it by the Edinburgh college.

Simple oily emulsion. Gen.

Take of almond oil, one ounce; syrup of althea, an ounce and a half; gum arabic, half an ounce; spring-water, fix ounces. Mix, and make an emulsion according to art.

Volatile oily emulsion. Gen.

Take of almond oil, an ounce and a half; syrup of althea one ounce; gum arabic, half an ounce; volatile alkaline falt, one dram; spring water seven ounces. Mix them according to art.

Both these are elegant and convenient modes of exhibiting oil internally. And under these forms it is often advantageously employed in cafes of cough, hoarfeness, and similar affections. By means of the alkali, a more intimate union of oil with water is obtained than can be had with the intermediate either of syrup or vegetable mucilage; and in some cafes,
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the alkali both contributes to answer the intention in view, and prevents the oil from exciting sickness at home: But in other infirmities, the pungency which it imparts is disagreeable to the patient and unfavourable to the disease. According to these circumstances, therefore, where an oily mixture is to be employed, the practitioner will be determined in his choice to have recourse either to the one or the other formula.

Acid julep. Gen.

Take of weak vitriolic acid, three drams; simple syrup, three ounces; spring water, two pounds. Mix them.

In this state the vitriolic acid is sufficiently diluted to be taken with ease in considerate doses. And it may thus be advantageously employed in various affections; concerning which we have already had occasion to make a few remarks in Chemistry, n° 617. (see Chemistry-Index), and are to be answered, either by its action on the flomach, or on the stykem in general.

Ether julep. Gen.

Take of pure vitriolic ether, two scruples; spring water, fix ounces; refined sugar, half an ounce. Mix them according to art.

Although it is in general proper that ether should be diluted only when it is to be immediately used, yet it is sometimes necessary that it should be put into the hands of the patient in the state in which it is to be taken. In such infirmities the present formula is a very proper one; for the addition of a little mucilage tends both to cover the pungency of the ether in the mouth, and to retain it in a state of mixture with the water.

Amber julep. Gen.

Take of tincture of amber, two drams; refined sugar half an ounce; spring water, six ounces. Mix them according to art.

Under this form the tincture of amber is so far diluted and sweetened, as to form an agreeable mixture, and in this manner it may often be advantageously employed for counteracting nervous affections, and answering those other purposes for which we have already mentioned that this article is had recourse to in practice.

Saline mixture, or julep. Suce.

Take of fixed vegetable alkali, three drams; river water, half a pound. To this lixivium add, lemon juice half a pound, or as much as is sufficient to saturate the alkali; syrup of black currants, one ounce.

This mixture is frequently prescribed in febrile difficulties as a means of promoting a light discharge by the surface: For where the skin is parched with great increased heat, it generally operates as a gentle diaphoretic. It often also promotes a discharge by the kidneys, and is not unfrequently employed to restrain vomiting. With these intentions it is in daily use among British practitioners, although it has no place in our pharmacopoeias, from its being entirely an extemporaneous prescription.

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Mineral solution of ars. wi.

Take of white ars. wi., reduced to a subtile powder, fixed vegetable alkali, each forty-four grains; distilled water, half a pint. Put them into a florintine flask, and let this be placed in a sand heat, so that the water may be gently till the ars. wi. be completely dissolved; then add to the solution when cold half an ounce of spirit of lavender, and as much distilled water as to make the solution amount to a pint by measure, or fifteen ounces and an half by weight.

For the introduction of this remedy we are indebted to Dr Fowler of Stafford. We have already had occasion to mention it in our article ARSENIC, n° 14; see also Chemistry, n° 1066, &c. In the former of these places we have observed, that if it be not precisely the fame, it is at least supposed to be very analogous to a remedy which has had a very extensive sale in some parts of England under the name of the tafheles auge drop; and which has been employed with very great success in the cure of obstinate intermittent. But whether the present formula, in any degree approaches to the tafheles auge drop or not, there can be no doubt from the concurring testimony of many eminent practitioners, that it is equally successful in combating intermittent. For this purpose it is given according to the age and other circumstances of the patient in doses from two to twenty drops, once, twice, or oftener in the course of the day: And its use has been found to be attended with remarkable success, although with some patients even very small doses have been found to excite severe vomiting. Besides distinctly marked intermittent, this solution has also been sometimes successful in obstinate periodical headaches, and in cutaneous affections of the leprous kind, resiling every other mode of cure. And perhaps in every case where ars. wi. can be employed with safety or advantage internally, this preparation is preferable to any other with which we are yet acquainted.

CHAP. XXIII. Syrups.

Syrups are saturated solutions of sugar, made in water, or watery or vinous infusions, or in juices. They were formerly considered as medicines of much greater importance than they are thought to be at present. Syrups and distilled waters were for some ages used as the great alternatives; infomuch that the evacuation of any peccant humour was never attempted till by a due course of these it had first been suppurated to be regularly prepared for expulsion. Hence arose the exorbitant collection of both, which we meet with in pharmacopoeias, and like errors have prevailed in each. As multitudes of distilled waters have been compounded from materials unfit to give any virtue over the helm; so numbers of syrups have been prepared from ingredients, which in this form cannot be taken in sufficient doses to exert their virtues; for two-thirds of a syrup consist of sugar, and greatest part of the remaining third is an aqueous fluid.

Syrups are at present chiefly regarded as convenient vehicles for medicines of greater efficacy; and used
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For sweetening draughts and juleps, for reducing the lighter powders into bolus, pills, or electroquaries, and other similar purposes. Some likewise may not improperly be considered as mediates themselves; as those of saffron, buckthorn-berries, and some others.

To the chapter on syrups the London college in their pharmacopoeia have prefixed the following general observations.

In the making of syrups, where we have not directed either the weight of the sugar, or the manner in which it should be dissolved, this is to be the rule:

Take of double refined sugar, twenty-nine ounces; any kind of liquor, one pint. Dissolve the sugar in the liquor in a water-bath; then set it aside for twenty-four hours; take off the scum, and pour off the syrup from the faces if there be any.

The following are the general rules which have commonly been given with respect to the preparation of syrups.

I. All the rules laid down for making decoctions are likewise to be observed in the decoctions for syrups. Vegetables, both the decoctions and infusions, ought to be dry, unless they are expressly ordered otherwise.

II. In the both London and Edinburgh pharmacopoeias, only the purest or double refined sugar is allowed.

In the syrups prepared by boiling, it has been customary to perform the clarification with whites of eggs after the sugar had been dissolved in this decoction of the vegetable. This method is apparently injurious to the preparation; since not only the impurities of the sugar are thus discharged, but a considerable part likewise of the medicinal matter, which the water had before taken up from the ingredients, is separated along with them. Nor indeed is the clarification and depuration of the sugar, by itself, very advisable; for its purification by this process is not so perfect as might be expected; after it has undergone this process, the refiners still separate from it a quantity of oily matter, which is disagreeable to the stomach. It appears, therefore, most eligible to employ fine sugar for all the syrups; even the purgative ones (which have been usually made with coarse sugar, as somewhat coinciding with their intention) not excepted; for, as purgative medicines are in general unsuitable to the stomach, it is certainly improper to employ an addition which increases their offensiveness.

III. Where the weight of the sugar is not expressed, twenty nine ounces are to be taken in every pint of liquor. The sugar is to be reduced into powder, and dissolved in the liquor by the heat of a water-bath, unless ordered otherwise.

Although in the formulae of several of the syrups, a double weight of sugar to that of the liquor is directed, yet leas will generally be sufficient. First, therefore, dissolve in the liquor an equal weight of sugar, then gradually add some more in powder, till a little remains undissolved at the bottom, which is to be afterwards incorporated by setting the syrup in a water-bath.

The quantity of sugar should be as much as the liquor is capable of keeping dissolved in the cold; if there is more, a part of it will separate, and concret into crystals or candy; if less, the syrup will be sub-

jeé to ferment, especially in warm weather, and change into a vinous or four liquor. If in crystallizing, only the superfluous sugar be separated, it would be of no inconvenience; but when part of the sugar had candied the remaining syrup is found to have an under proportion, and is as subject to fermentation as if it had wanted sugar at first.

IV. Copper vessels, unless they be well tinned, should not be employed in the making of acid syrups, or such as are composed of the juices of fruits.

The confectioners, who are the most dexterous people at these kinds of preparations, to avoid the expense of frequently new tinning their vessels, rarely make use of any other than copper ones, untinned, in the preparation even of the molten acid syrups, as of oranges and lemons. Nevertheless, by taking due care that their copper be well scoured and perfectly clean, and that the syrup remain no longer in them than is absolutely necessary, they avoid giving it any ill taste or quality from the metal. This practice, however, is by no means to be recommended to the apothecary.

V. The syrup, when made, is to be set by till next day: if any saccharine crust appears upon the surface it is to be taken off.

Syrup of vinegar. E.

Take of vinegar, two pounds and an half; refined sugar, three pounds and an half. Boil them till a syrup be formed.

This is to be considered as simple syrup merely acidulated, and is by no means unpleasant. It is often employed in mucilaginous mixtures and the like; and on account of its cheapness it is often preferred to syrup of lemons.

Syrup of marshmallow.

Take of frefh root of marshmallow, bruised one pound; double-refined sugar, four pounds; distilled water, one gallon. Boil the water with the marshmallow root to onehalf, and press out the liquor when cold. Set it by twelve hours; and, after the faces have subfided, pour off the liquor. Add the sugar, and boil it to the weight of six pounds. L.

Take of marshmallow roots, somewhat dried, nine ounces; water ten pounds purest sugar, four pounds. Boil the water with the roots, to the consumption of one half, and strain the liquor, strongly expressing it. Suffer the strained liquor to rest till the faces have subfided; and when it is free from the dregs, add the sugar; then boil so as to make a syrup. E.

The syrup of marshmallows seems to have been a foot of favourite among dispensatory writers, who have taken great pains to alter and amend it, but have been wonderfully tender in retrenching any of its articles. In the last prescription, it is loft of its superficial parts, without any injury to its virtues. It is used chiefly in nosophatic cases, for sweetening emollient decoctions, and the like: of itself it can do little service, notwithstanding the high opinion which some have entertained of it; for what can be expected from two or three spoonfuls of the syrup, when the decoction, from which two or three pounds are made, may be taken at a draught or two? It is sometimes useful in tickling coughs,
coughs, by invigorating irritating matter distilling in the fauces: in this way it sometimes affords a considerable relief.

Syrup of clove July-flowers.

Take of fresh clove July-flowers, the heads being cut off, two pounds; boiling distilled water, six pints. Macerate the flowers for twelve hours in a glass vessel; and in the drained liquor diflolve the double-refined sugar, that it may be made a syrup. L.

Take of clove July-flowers, fresh gathered and freed from the heels, one pound; purest sugar, seven pounds and a quarter; boiling water four pounds. Macerate the flowers in the water for a night; then to the strained liquor add the sugar previously beat, and diflolve it by a gentle heat, to make the whole into a syrup. E.

This syrup is of an agreeable flavour, and a fine red colour: and for these it is chiefly valued. Some have substituted for it one easily preparable at feasons when the flowers are not to be procured: an ounce of clove spice is infused for some days in twelve ounces of white wine, the liquor strained, and with the addition of twenty ounces of sugar, boiled to a proper consistence; a little cochineal renders the colour of this syrup exactly similar to that prepared from the clove July-flower; and its flavour is of the same kind, though not so pleasant. The abuse may be readily detected by adding to a little of the syrup some alkaline salt or ley; which will change the genuine syrup to a green colour; but in the counterfeit, it will make no such alteration, only varying the shade of the red.

As the beauty of the colour is a principal quality in this syrup, no force in the way of expression should be used in separating the liquor from the flowers.

Syrup of colchicum. E.

Take of colchicum root, fresh and succulent, cut into small pieces, one ounce; vinegar, fifteen ounces; purest sugar, twenty-six ounces. Macerate the root in the vinegar two days, now and then shaking the vessel; then strain it with a gentle prelure. To the strained liquor add the sugar, and boil a little, so as to form a syrup.

This syrup seems to be the best preparation of the colchicum; great care is required to take up this root in the proper season: and from errors of this kind we are to ascribe the uncertainty in the effects of this medicine as found in the herbs.

The syrup of colchicum is often successfully employed as a diuretic, and may be taken from a dram or two to the extent of an ounce or more.

Syrup of orange peel.

Take of fresh outer-rind of Seville-oranges, eight ounces; boiling distilled water, five pints. Macerate for twelve hours in a clofe vessel; and in the strained liquor diflolve double-refined sugar to make a syrup. L.

Take of yellow rind of Seville orange-peel fresh, six ounces; boiling water, three pounds. Infufe them for a night in a clofe vessel; then strain the liquor; let it stand to settle; and having poured it off clear from the sediment, diflolve in it four pounds and a

quarter of white sugar, so as to make it into a syrup with a gentle heat. E.

In making this syrup, it is particularly necessary that the sugar be previously powdered, and diflolved in the infusion with as gentle a heat as possible; to prevent the exhalation of the volatile parts of the peel. With these cautions, the syrup proves a very elegant and agreeable one, polifhing great flare of the fine flavour of the orange peel.

Syrup of Saffron. L.

Take of saffron, one ounce; boiling distilled water, one pint. Macerate the saffron, in the water, for twelve hours, in a clofe vessel; and diflolve double-refined sugar in the strained liquor, that it may be made a syrup.

Saffron is very well fitted for making a syrup, as this form a sufficient dose of it is contained in a reasonable compass. This syrup is at present frequently prescribed; it is a pleasant cordial, and gives a fine colour to juleps.

Syrup of lemon juice.

Take of lemon juice strained, after the fescs have subsided, two pints; double-refined sugar, fifty ounces. Diflolve the sugar, that it may be made a syrup. L.

Take of juice of lemons, suffered to stand till the fescs have subsided, and afterwards strained, two pounds and a half; double-refined sugar, fifty ounces. Diflolve the sugar in the juice, so as to make a syrup E.

Syrup of mulberry juice. L.

Syrup of raspberry juice. L.

Syrup of black currants. L.

These three are directed by the London college to be prepared in the fame manner as syrup of lemons, which immediately precedes them.

All these four are very pleasant cooling syrups; and with this intention they are occasionally used in draughts and juleps, for quenching thirst, abating heat &c. in bilious or inflammatory diftempers. They are sometimes likewise employed in gargarisms for inflammations of the mouth, and tonsils.

Syrup of the white poppy. L.

Take of the heads of white poppies, dried, and the seeds taken out, three pounds and an half; double-refined sugar, fix pounds; distilled water, eight gallons. Slice and bruife the heads, then boil them in the water, to three gallons, in a water-bath saturated with seasalt, and press out the liquor. Reduce this by boiling to about the measure of four pints, and strain it while hot, first through a sieve, then through a thin wooden cloth, and let it abide for twelve hours, that the fescs may subsidence. Boil the liquor, pour it off from the fescs, to three pints, and diflolve the sugar in it that it may be made a syrup.

Syrup of white poppies, or of meconium, commonly called diacodium. E.

Take of white poppy heads, dried and freed from the bead, 3 F 2
Take the fresh flowers of the wild or red poppy, four pounds; boiling distilled water, four pints and an half. Put the flowers by degrees into the boiling water in a water-bath, constantly stirring them. After this, the vessel being taken out of the bath, macerate for twelve hours; then press out the liquor, and let it stand, that the seces may subside. Lastly, make it into a syrup, with double-refined sugar.

The design of putting the flowers into boiling water in a water-bath, is, that they may be a little leached, so as to flake enough to be all immersed in the water; without this artifice they can scarcely be all got in; but they are no longer to be continued over the fire than till this effect is produced, lest the liquor become too thick, and the syrup be renderedropy.

This syrup has been recommended in disorders of the breath, cough, spitting of blood, pleurisy, and other diseases, both as an emollient and as an opiate. It is one of the lightest of the opiate medicines; and in this respect so weak, that some have doubted of its having any anodyne quality. We indeed presume, that it might be very safely superseded altogether; and accordingly it has now no place either in the Edinburgh pharmacoepoeia, or of the belt foreign ones, though still retained by the London college.

**Syrup of the red poppy. L.**

Take of the dried leaves of the damask rose, seven ounces; double-refined sugar, six pounds; boiling distilled water, four pints. Macerate the rose leaves in water for twelve hours, and strain. Evaporate the strained liquor to two pints and an half, and add the sugar, that it may be made a syrup.

**Syrup of pale rose. E.**

Take of pale roses, fresh gathered, one pound; boiling water, four pounds; white sugar, three pounds. Macerate the roses in water for a night; then to the liquor strained, and freed from the dregs, add the sugar; and boil them into a syrup.

This syrup may likewise be made from the liquor remaining after the distillation of rose water depurated from its feces.

**Syrup of dry roses. E.**

Take of red roses, dried, seven ounces; white sugar, six pounds; boiling water, five pounds. Infuse the roses in the water for a night, then boil them a little; strain out the liquor, and adding to it the sugar, boil them to the consti-tence of a syrup.

This syrup is supposed to be mildly astringent; but is principally valued on account of its red colour. The London college have omitted it, having retained others at least equal to it in that respect.

**Syrup of squills. E.**

Take of vinegar of squills, two pounds; white sugar, three pounds and a half. Make them into a syrup with a gentle heat.

This syrup was formerly prepared with some spices, intended to alleviate the offensiveness of the squills. But while they had not this effect, they often counteracted the intention in view, and are therefore omitted. It is used chiefly in doses of a spoonful or two, for promoting expectoration, which it does very powerfully.

**Simple or common syrup. E.**

Take of purest sugar, fifteen parts; water, eight parts. Let the sugar be dissolved by a gentle heat.

This preparation is a plain liquid sweet, void of flavour or colour. It is convenient for fundry purposes where these qualities are not wanted, or would be exceptional.

**Syrup of buckthorn.**

Take of the juice of ripe and fresh buckthorn berries, one gallon; ginger, bruised, one ounce; allspice, powdered, one ounce and an half; double-refined sugar, seven pounds. Set by the juice for some days, that the seces may subside, and strain. Macerate the ginger and allspice in a pint of the strained juice for four hours, and strain. Boil away the rest of the juice to three pints; then add that part of the juice in which the ginger and allspice have been macerated; and, lastly, the sugar, that it may be made a syrup.

Take of the juice of the ripe buckthorn berries, depurated, seven pounds and an half; white sugar, three pounds and a half. Boil them to the consti-tence of a syrup. E.

Both these preparations, in doses of three or four spoonfuls, operate as brisk cathartics. The principal inconveniences attending them are, their being very unpleasant, and their occasioning a thirst and dryness of the mouth and fauces, and sometimes violent gripes. These effects may be prevented by drinking freely of water.

**Syrup of red rose. E.**

The liquor remaining after the distillation of rose water (provided the still has been perfectly clean) is as proper for making this syrup as a fresh infusion; for the distillation only collects those volatile parts which are dissipated in the air while the infusion is boiling to its consti-tence. This syrup is an agreeable and mild purgative for children, in the dose of half a spoonful or a spoonful. It likewise proves gently laxative to adults; and with this intention may be of service in coltive habits. Its principal use is in affusive gyniars.
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water gruel, or other warm liquids during the operation. The ungratefulness of the buckthorn is endeavored to be remedied in the first of the above prescriptions by the addition of aromatic, which, however, are rarely sufficient for that purpose. The second also had formerly an aromatic material for the same intention, a dram of the essential oil of cloves, which being bound in a confection, is now rejected.

Syrup of balsam of Tolu. L.

Take of the balsam of Tolu, eight ounces; distilled water, three pints. Boil for two hours. Mix with the liquor, strained after it is cold, the double refined sugar that it may be made a syrup.

Balsamic syrup. E.

Take of simple syrup, just made, and warm from the fire two pounds; tincture of balsam of Tolu, one ounce. When the syrup has grown almost cold, stir into it the tincture, by litre; at a time, agitating them well together till perfectly united.

This last method of making the balsamic syrup was dropped in one of the preceding editions of the Edinburgh pharmacopoeia, on a complaint that the spirit spoiled the tincture of the syrup which it did in a great degree when the tincture was drawn with malt spirits, the nauseous oil which all the common malt spirits are accompanied with communicating that quality; and this was particularly the case when the spirituous part was evaporated from the syrup, as was directed in the former edition of the Edinburgh pharmacopoeia. Particular care therefore should be taken that the spirit employed for making the tincture be perfectly clean, and we could not be from all ill flavour.

The intention of the contrivers of the two foregoing processes seems to have been somewhat different. In the first, the more subtle and fragrant parts of the balsam are extracted from the galler rootinon matter, and alone retained in the syrup: the other syrup contains the whole substance of the balsam in larger quantity. They are both moderately impregnated with the agreeable flavour of the balsam.

In some pharmacopoeias a syrup of this kind is prepared from a tincture of balsam of Peru, with roe-water, and a proper quantity of sugar.

Syrup of violets. E.

Take of the fresh petals of the violet, two pounds; boiling distilled water, five pints. Macerate for 24 hours; afterwards strain the liquor, without prefiltering, through thin linen. Add refined sugar, that it may be made a syrup. L.

Take of fresh violets, one pound; boiling water four pounds; purest sugar, seven pounds and a half. Macerate the violets in the water for 24 hours in a glass, or at least a glazed earthen vessel, close covered; then strain without expression, and to the strained liquor add the sugar powdered, and make into a syrup. E.

This syrup is of a very agreeable flavour; and in the quantity of a spoonful or two proves to children gently laxative. It is apt to lose, in keeping, the elegant blue colour, for which it is chiefly valued; and hence some having been induced to counterfeit it with preparations of materials whose colour is more permanent. This abuse may be readily discovered, by adding to a little of the suspected syrup any acid or alkaline liquor. If the syrup be genuine, the acid will change its blue colour to a red, and the alkali will change it to a green; but if counterfeited, these changes will not happen. It is obvious, from this mutability of the colour of the violet, that the preserver would be deceived if he should expect to give any blushtinge to acidulated or alkalized jupps or mixtures by the addition of the blue syrup.

Syrup of ginger. E.

Take of ginger bruised, four ounces; boiling distilled water, three pints. Macerate for four hours, and strain, then add refined sugar, that it may be made a syrup. L.

Take of powdered ginger, three ounces; boiling water, four pounds; purest sugar, seven pounds and a half. Macerate the ginger in the water in a close vessel for 24 hours; then to the liquor, strained from the faces, add the powdered sugar, and make it into a syrup. E.

These are agreeable and moderately aromatic syrups, lightly impregnated with the flavour and virtues of the ginger.

Acid syrup. Gen.

Take of weak spirit of vitriol, two drams; syrup of lemons, six ounces. Mix them. Where we wish to obtain a syrup, not only strongly acidulated, but also powerfully astringent, this formula may be considered as well suited to answer the purpose.

Alkaline syrup. Gen.

Take of salt of tartar, three drams; simple syrup, six ounces. Mix them.

In this syrup we have in some degree the converse of the preceding; and it may be usefully employed either for the destruction of acid in the stomach, or for the formation of neutral or effervescing mixtures.

Syrup of garlic. Suec.

Take of the fresh root of garlic, sledged, one pound; boiling water, two pounds. Macerate them in a clove vessel for an hour. Add to the strained liquor, refined sugar, two pounds. Boil them to a syrup.

This syrup formerly held a place in our pharmacopoeias, and was recommended for promoting expectation in cures of chronic catarrh and other affections of the breast; but, as well as the oxymel of garlic, it is now banished from them; and there can be little doubt that the same intentions may in general be answered by less disagreeable medicines. Yet where we wish to employ garlic in a watery menstruum, this formula is perhaps one of the best under which it can be exhibited.

Syrup of almonds. Suec.

Take of sweet almonds, one pound; bitter almonds, two drams. Let the almonds be blanched and beat in a stone mortar with a wooden pestle; then by degrees add barley-water, two pounds; strain the liquor,
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lip, and form it into a syrup, with as much double-refined sugar as may be necessary.

The agreeable flavour of the almonds is in this formula communicated to a syrup, which may be advantageously employed to sweeten mixtures, or to form a pleasant drink when diffused in water; and the flavour is not a little improved by the addition of the proportion of bitter almonds here directed. But even these cannot be supposed to communicate any active quality to this syrup, as they are employed in so small a quantity; and still less is to be expected from the sweet almonds, which can communicate little more to the syrup than their mild oil.

Syrup of cinnamon. Roll.

Take of cinnamon, bruised, five ounces; spirituous cinnamon water, two pounds. Digest them in a close glass vessel for 24 hours; then add to the strained liquor double-refined sugar, three pounds. Boiled into a syrup.

This syrup is strongly impregnated with the cinnamon; and where we wish to sweeten any mixture, at the same time adding to it an agreeable aromatic, it is perhaps one of the best articles we can employ.

Emetic syrup. Brun.

Take of glass of antimony, finely powdered, two drams; Rhenish wine, twelve ounces. Let them be digested for three days in a gentle heat; then strain the liquor through paper, and mix with the strained liquor 30 ounces of double-refined sugar. Let it be formed into a syrup, and kept in a close vessel.

There can be no doubt of this syrup being strongly impregnated with the emetic quality of the antimony; and it will at least have so far the advantage of being very agreeable to the taste, that it may be readily taken by very young people. But every good effect to be obtained from it may be had with more certainty, by adding to simple syrup any quantity that may be thought necessary of the antimonial tartar previously dissolved in a small proportion of water.

Syrup of quicksilver. Suec.

Take of purified quicksilver, one dram; gum arabic, three drams; roe water, as much as sufficient for reducing the gum to mucus. Let them be rubbed in a mortar till the quicksilver totally disappears; then by degrees mix with it simple syrup, four ounces.

In this we have a preparation similar to the mercurial solution of Dr Plenck formerly mentioned; and which, while it does not possess any other advantage than mere sweetness of taste, is liable to the objections formerly urged against that preparation.

CHAP. XXIV. Medicated Honeys.

The more fixed parts of vegetables, dissolved in watery liquors may be thence transferred into honey by mixing the honey with the watery decoction or juice of the plant, and boiling them together till the aqueous part has exhausted, and the honey remains of its original consistence. Honey has not probably however, any very peculiar advantage over sugar, and is liable to many inconveniences which sugar is free from; in particular, it is much more liable to run into fermentation, and in many confutations produces gripes, and often violent effects. The Edinburgh college have therefore rejected the whole of the oxymels from their last edition of the Pharmacopæia. And the number of preparations with honey in melt of the foregoing pharmacopæas is now much diminished. Still, however, there are several much employed by practitioners of eminence; and of course retained in the London Pharmacopœia.

Honey of roses. L.

Take of dried red rose-buds, with the heels cut off, four ounces; boiling distilled water, three drins; clarified honey, five pounds. Macerate the rose leaves in the water for six hours; then mix the honey with the strained liquor, and boil the mixture to the thickness of a syrup.

This preparation is not unfrequently used as a mild cooling detergent, particularly in gargarisms for ulcerations and inflammation of the mouth and tonsils. The rose buds here used should be halfly dried; the design of doing so is, that they may the better preserve their astrigency.

Honey of squills. L.

Take of clarified honey, three pounds; tincture of squills, two pints. Boil them in a glass vessel to the thickness of a syrup.

The honey will here be impregnated with all the active parts of the squills which the tincture before contained, and may be employed as an useful expectorant or diuretic.

Oxymel of verdigrise. L.

Take of prepared verdigrise, one ounce; vinegar, seven ounces; clarified honey, fourteen ounces. Dissolve the verdigris in the vinegar, and strain it through linen; then add the honey, and boil the whole to a proper thickness.

This is an improvement of what was formerly known in our Pharmacopæias under the title of mel Egyptiacum; which, however, was, as then prepared, very uncertain with respect to strength. It is used only externally for cleansing foul ulcers, and keeping down fungous fest. It is also often serviceable in venereal ulcerations of the mouth and tonsils. But there is some danger from its application to places from the situation of which it is apt to be swallowed; for even a small quantity of verdigris passing into the stomack may be productive of distressing, if not deleterious, effects.

Oxymel of meadow saffron. L.

Take of the fresh root of meadow-saffron, cut into thin slices, one ounce; distilled vinegar, one pint; clarified honey, two pounds. Macerate the root of meadow-saffron with the vinegar, in a glass vessel, with a gentle heat, for 48 hours. Strain the liquor, pressed out strongly from the root, and add the honey. Lastly, boil the mixture, frequently stirring it with a wooden spoon, to the thickness of a syrup.
This oxymel may be considered as very analogous to the syrup of colchicum, on which we have already made some observations. Under this form it was first introduced by Dr. Stoerck. And although with certain constipations the syrup is unquestionably preferable, yet it well deserves a place in our pharmacopoeias, as being an active medicine.

Oxymel of quills. L.

Take of clarified honey, three pounds; vinegar of quills, two pints. Boil them in a glafs vessel, with a flow fire, to the thickness of a syrup.

This preparation may be considered as analogous to the syrup of colchicum of the Edinburgh pharmacopoeia. It is not inferior in efficacy to many more elaborate compositions. It is an agreeable, mild, cooling medicine. It is often used in cooling detergent gargles, and not unfrequently as an expectorant.

Simple oxymel. L.

Take of clarified honey, two pounds; distilled vinegar, one pint. Boil them in a glafs vessel, with a flow fire, to the thickness of a syrup.

This preparation may be considered as analogous to the syrupus aceti of the Edinburgh pharmacopoeia. It is not inferior in efficacy to many more elaborate compositions. It is an agreeable, mild, cooling medicine. It is often used in cooling detergent gargles, and not unfrequently as an expectorant.

Oxymel of garlic. Dan.

Take of garlic, cut in slices, an ounce and an half; caraway seeds, sweet fennel seeds, each two drams; clarified honey, ten ounces; vinegar, half a pint. Boil the vinegar for a little time, with the seeds bruised, in a glazed earthen vessel; then add the garlic, and cover the vessel close; when grown cold, pour out the liquor, and dilute it in the honey by the heat of a water bath.

This oxymel is recommended for attenuating viscid phlegm, promoting expectoration, and the fluid secretions in general. It is double a medicine of considerable efficacy, though very unpleasant, the flavour of the garlic prevailing notwithstanding the addition of the aromatic seeds.

Pectoral oxymel. Brun.

Take of elecampane roots, one ounce; orris root, half an ounce; gum ammoniac, one ounce; vinegar, half a pint; clarified honey, one pound; water, three pints. Let the roots, cut and bruised, be boiled in the water till one third is wasted; then strain off the liquor; let it stand to settle; and having poured it off clear from the feces, add to it the honey and the ammoniac, previously dissolved in the vinegar. Mix them together, by gently boiling them.

The title of this composition expresses its medical virtues. It is designed for those disorders of the breast that proceed from a load of viscid phlegm, and obstructions of the pulmonary vessels. Two or three spoultuls may be taken every night and morning, and continued for some time.

Chap. XXV. Powders.

This form receives such materials only as are capable of being sufficiently dried to become pulverizable; without the loss of their virtue. There are many substances, however, of this kind, which cannot be conveniently taken in powder: bitter, acid, febrile drugs, are too disagreeable; emollient and mucilaginous herbs and roots are too bulky; pure gums cohere, and become tenacious in the mouth; fixed alkaline salts liquefy on exposing the composition to the air; and volatile alkalies exhale. Many of the aromatics, too, suffer a greater loss of their odorous principle when kept in powder; as in that form they do not expose a much larger surface to the air.

The dose of powders, in extemporaneous prescription, is generally about half a dram; it rarely exceeds a whole dram, and is not often less than a scruple. Substances which produce powerful effects in smaller doses are not suited to this form, unless their bulk be increased by additions of less efficacy; those which require to be given in larger ones are better fitted for other forms.

The usual vehicle for taking the lighter powders is any agreeable thin liquid. The ponderous powders, particularly those prepared from metallic substances, require a more confident vehicle, as syrups; for from thin ones they soon sediment. Resinous substances, likewise are most commodiously taken in thick liquors; in thin ones they are apt to run into lumps, which are not easily again soluble.

General rules for making powders.

I. Particular care ought to be taken that nothing carious, decayed, or impure, be mixed in the composition of powders: the stalks and corrupted parts of plants are to be separated.

II. The dry aromatics ought to be sprinkled during their pulverization, with a few drops of any proper water.

III. The moister aromatics may be dried with a very gentle heat before they are committed to the mortar.

IV. Gums, and such other substances as are difficultly pulverizable, should be pounded along with the drier ones, that they may pass the sieve together.

V. No part should be separated for use until the whole quantity put into the mortar has passed the sieve, and the several siftings mixed together; for those parts of the subject which are first powdered may prove different at least in degree of efficacy, from the rest.

VI. Powders of aromatics are to be prepared only in small quantities at a time, and kept in glass vessels very closely stoppered.

If powders are long kept, and not carefully secured from the air, their virtue is in a great measure destroyed; although
although the parts in which it consists should not in other circumstances prove volatile. Thus, though the virtues of ipecacuanha are so fixed as to remain entire even in extracts made with proper menstrua, yet if the powdered root be exposed for a long time to the air, it loses its emetic quality.

**Alotic powder.** L.

Take of focotrine aloes, one pound; white canella, three ounces. Rub them separately to powder, and then mix them.

This composition has long been known in the shops under the title of *hiera pierea*. It furnishes us with an useful alicate purgative, the canella operating as a good corrigent for the aloes. But it is more frequently employed as the basis of electuaries or pills, or of a tincture which was for a long time distinguished by the appellation of *sacred tincture*.

**Alotic powder with iron.** L.

Take of focotrine aloes, powdered, an ounce and an half; myrrh, powdered, two ounces; dry extract of gentian, vitriolated iron, of each, in powder, one ounce. Mix them.

In this powder we have an alicate and chalybeate conjoint. It consists of nearly the same articles which formerly entered the composition of the *phile expersatiae oblybatae*, as they were called; and it is perhaps more frequently employed when brought to the form of pills by means of syrops than in powder; but in either way it is an useful medicine, and is particularly employed with advantage in cases of obstrued menstruation.

**Alotic powder with guaiacum.** L.

Take of focotrine aloes, one ounce and an half; gum guaiacum, one ounce; aromatic powder, half an ounce. Rub the aloes and gum guaiacum separately to powder; then mix all the ingredients together.

In the guaiacum as well as the aloes, we have a warm gummi-redous purgative; and both are corrected, as well as more minutely divided, from their combination with the aromatics. This therefore furnishes us with an useful purgative; but when taken only in small doses, its chief effect is that of promoting peripitation. It is, however, more frequently employed in the form of pills than in the state of powder; and indeed it consists of nearly the same ingredients which constituted the *phile aromatica* of the former edition of the London pharmacopia.

**Aromatic powder.** L.

Take of cinnamon, two ounces; smaller cardamom seeds, hulked, ginger, long pepper, of each one ounce. Rub them together to a powder.

**Aromatic powder, or aromatic spices.** E.

Take of nutmegs, leffer cardamom seeds, ginger, each two ounces. Beat them together into a powder, to be kept in a phial well shut.

Both these compositions are agreeable, hot, spicy medicines, and as such may be usefully taken in cold phlegmatic habits and decayed constitutions, for warming the stomach, promoting digestion, and strengthening the tone of the vilera. The dose is from ten grains to a scruple and upwards. The first is considerably the warmest. This principally arises from the quantity of long pepper which it contains. But it is perhaps to be doubted whether from this article any advantage be derived; and a powder not inferior to either might, we think, be formed, by substituting calia for the cinnamon employed by the one college, or the nutmegs by the other.

**Compound powder of aforabacca.** L.

Take of the dry leaves of the aforabacca, sweet marjoram, Syrian herb marsh, dry flowers of lavender, each one ounce. Powder them together.

**Sternutatory, or cephalic powder.** E.

Take of the leaves of acrum, three parts; marjoram, one part. Beat them together into a powder.

Though the formers of these powders be more compounded than the latter, yet they differ very little. They are both agreeable and efficacious errhines, and superior to most of those usually sold under the name of *herb sniff*. They are often employed with great advantage in cases of obstruited headach, and of opthalmias resiting other modes of cure. Taken under the form of sniff to the extent of five or fix grains at bed-time, they will operate the succeeding day as a powerful errhine, inducing frequent freeing, but still more a large discharge from the nose. It is, however, necessary, during their operation, to avoid exposure to cold.

**Powder of ceruse.** L.

Take of ceruse, five ounces; farcycol, one ounce and an half; tragacanth, half an ounce. Rub them together into powder.

This composition is the *truxis albi* of Rhazes brought back to its original simplicity with regard to the ingredients, and without the needless trouble of making it into troches. It is employed for external purposes, as in collyria, lotions, and injections, for repelling acrimonious humours, and in inflammations.

**Compound powder of crabs claws.** L.

Take of crabs claws, prepared, one pound; chalk, red coral, each prepared, three ounces. Mix them.

These powders have lost several of their ingredients without any injury to their virtues; and possibly they would still bear a farther reduction, for the crabs eyes and chalk are by themselves at least as effectual as any composition of them with coral. And perhaps every purpose to be obtained from them may be accomplished by a more simple absonent, as the chalk powder afterwards to be mentioned, or the powder of the lupili cancerorum.

**Compound powder of contrayerva.** L.

Take of contrayerva, powdered, five ounces; compound powder of crabs claws, one pound and an half. Mix them.

This powder was formerly directed to be made up into balls with water, and was then called *lupis contrayerva*; a piece of trouble now laid aside as needless, for it was necessary to reduce the balls into powder again.
again before they could be used. Nor did that form contribute, as has been imagined to their preservation; for it is scarcely to be supposed that the powder will lose more by being kept for a reasonable length of time in a close-luted glass than the balls will in the humectation with water and exsolution in the air before they are fit for being put by to keep. The medicine has much better claim to the title of an alexipharmac and sudorific than the foregoing compositions. The contravera by itself proves very serviceable in low fevers, where the claws are of no farther service than as they divide this powerful ingredient, and make it sit more easily on the stomach.

**Compound powder of chalk.**

Take of prepared chalk, half a pound; cinnamon four ounces; tormentil, gum-arabic, of each three ounces; long pepper, half an ounce. Powder them separately, and mix them.

**Chalk powder.**

Take of white chalk, prepared, four ounces, nutmeg, half a dram; cinnamon, one dram. Mix and make them into a powder; which may supply the place of the cardialic troches. The addition of the aromatics in the above formula, coincides with the general intention of the remedy, which is indicated for weakness and acidity in the stomach; and in looseness from acidity.

**Compound powder of chalk with opium.**

Take of compound powder of chalk, eight ounces: hard purified opium, powdered, one dram and an half. Mix them.

From the addition of the opium this remedy becomes still more powerful than the above in restraining diarrhoea.

**Compound powder of ipecacuauna.**

Take ipecacuauna and hard purified opium, of each, powdered, one dram; vitriolated kali, powdered, one ounce. Mix them.

**Sudorific, or Dover's powder.**

Take of vitriolated tartar, three drams; opium, root of ipecacuauna powdered, of each one scruple. Mix and grind them accurately together, so as to make an uniform powder.

The vitriolated tartar, from the crystallines of its crystals, is perhaps better fitted for tearing and dividing the tenacious opium than any other salt; this seems to be its only use in the preparation. The operator ought to be careful that the opium and ipecacuauna shall be equally diffused through the whole mass of powder, otherwise different portions of the powder must have differences in degree of strength.

The hard purified opium, directed by the London college, is, from this circumstance preferable to opium in its ordinary state, employed by the Edinburgh college.

This powder is one of the most certain sudoritics

**Compound powder of salmerry.**

Take of salmerry, hard extract of jalap, each two ounces; ginger, half an ounce. Powder them separately, and mix them.

Take of prepared chalk, half a pound; cinnamon four ounces; tormentil, gum-arabic, of each three ounces; long pepper, half an ounce. Powder them separately, and mix them. The use of the crystals in this preparation is to break down and divide the jalap into very minute particles, whereby its operation is thought to be mitigated; and on this account the two articles are directed to be pounded together, and not separately. But whether from this circumstance any advantage arises or not, there can be no doubt that this combination furnishes us with a very useful and active purgative, in every case where it is necessary to produce both a full evacuation of the intestinal canal, and a free discharge from the system in general, under the form of cathartics.

**Compound powder of myrrh.**

Take of myrrh, dried savin, dried rue, Russian catar, of each, one ounce. Rub them together into a powder.

This is a reformation of the troches of myrrh, a composition contrived by Rhazes against uterine obstructions. It may be taken in any convenient vehicle, or made into bolus, from a scruple to a dram or more, two or three times a-day.

**Op'c't: powder.**

Take of hard purified opium, powdered, one dram; burnt and prepared hartshorn, nine drams. Mix them.

The hartshorn is here intended merely to divide the opium, and to give it the form of powder, although it may perhaps have also some influence in rendering the opium more active from destroying acid in the stomach. But whether in this way it has any effect or not, there can be no doubt that it is a very convenient formula for the exhibition of opium in powder, which on some occasions is preferable to its being given either in a liquid form or in that of pills. As ten grains of this powder contain precisely one of the opium, the requisite dose may be easily adapted to the circumstances of the case. It is often successfully employed as a sweating powder; and has not, like Dover's powder, the effect of inducing sickness or vomiting.

**Compound powder of scarmony.**

Take of scarmony, hard extract of jalap, each two ounces; ginger, half an ounce. Powder them separately, and mix them.

That we know of; and as such, was recommended by Preparations and Compotions and Dr. Dover as an efficient remedy in rheumatism. Modern practice confirms its reputation, not only in rheumatism, but also in dropsy and futherland other diseases, where it is often difficult by other means to produce a copious sweat. The dose is from five to ten or twelve grains, according as the patient's stomach and strength can bear it. It is convenient to avoid much drinking immediately after taking it, otherwise it is very apt to be rejected by vomiting before any other effects are produced.
Take of scammony, crystals of tartar, each two ounces; mix, and grind them diligently into a powder. E.

It is much to be regretted, that in the pharmacopoeias published by authority in Britain, two compositions should be distinguished by the same name, differing considerably from each other in their nature and degree of activity.

The compound powder of scammony in the last edition of the London pharmacopoeia differed considerably from the present: For there, the only addition was calcined hartshorn, intended merely for the division of the scammony. This purpose is still better answered by the crystals of tartar, which at the same time conpire with the operation of the scammony as a purgative. But the addition of jalap and ginger, according to the present formula of the London pharmacopoeia, gives not only a purgative considerably different, but increases also the heating quality of the medicine, while the cream of tartar has an evident refrigerant power. Both may on occasions be useful, but we think that in most cases the Edinburgh formula will be found preferable.

In editions of our pharmacopoeias of still older date, this powder was prepared with another very active ingredient, diaphoretic antimony. It was much celebrated as distinguished by the name of its inventor, being called from its first publisher, Cornachini's powder. In a former edition of the Edinburgh pharmacopoeia it was thus divided to be prepared:

Take of diaphoretic antimony, cream of tartar, scammony, each equal parts. Make them into a powder.

This may be given to the quantity of a dram or more. In other precriptions, the tartar and antimonial calx bear nearly the same proportion to the scammony as the calcined hartthorn did in the London pharmacopoeia. It appears probable that neither of these ingredients are of any farther use, than as they divide the texture of the scammony; though Cornachini supposes very considerable advantage from some diffuscent quality in the tartar, whereby the vessels shall be opened, and the noxious humours prepared for expulsion; and from the preparation of antimony, though it have no sensible operation, he expects some share of the same success which sometimes attends the rougher preparations of that mineral.

Both the present formula may, however, be considered as possessing all the advantages of Cornachini's powder.

Powder of scammony with aloes. L.

Take of scammony, six drams; hard extract of jalap, socotrine aloes, of each an ounce and an half; ginger, half an ounce. Powder them separately, and mix them.

In this formula, the combination of scammony, jalap, and aloes, furnishes a very active purgative, which, with some intention at least, may be preferable to either of the preceding. Taken from five to ten grains, it will operate as a purgative even in cases of obstinate colicines.

Powder of scammony with calomel. L.

Take of scammony, half an ounce; calomel, double-refined sugar, of each two drams. Rub them separately to a powder, and then mix them.

In this formula, we have the scammony in a more simple state united with such a proportion of calomel as will very considerably aid its purgative power. And accordingly it may be employed with advantage, both in cases of obstinate colicines and in diarrhoeal affections, where a considerable discharge is required from the system.

Compound powder of fenna. L.

Take fenna, crystals of tartar, of each two ounces; scammony, half an ounce; ginger, two drams. Rub the scammony by itself; rub the rest together into a powder, and then mix them all.

This powder is given as a cathartic, in the dose of two scruples or a dram. The spice is added, not only to divide, but to warm the medicine, and make it fit easier on the stomach. The scammony is used as a stimulus to the fenna; the quantity of the latter necessary for a dose, when not assisted by some more powerful material, being too bulky to be conveniently taken in this form.

The composition of this medicine is now considerably simplified by the rejection both of cinnamon and cloves, as the ginger alone is found fully to answer the intention of the view.

Scyptic powder. E.

Take of alum, an ounce and an half; gum-kino, three drams. Grind them together into a fine powder.

In former editions of our pharmacopoeia, a powder of this kind was directed to be made with alum and dragon's blood, and was long in repute as an astringent, under the title of Habetius's scyptic powder. The gum-kino is judiciously substituted for the dragon's blood, as being a much more powerful and certain astringent. The chief use of this powder is in hemorrhages, especially of the uterus.

Compound powder of tragacanth. L.

Take of tragacanth powdered, gum-arabic, flarch, each an ounce and a half; double-refined sugar, three ounces. Rub them together into a powder.

This composition is somewhat simplified by the rejection of the marshmallow, and liquorice root, which formerly entered it. But this has not probably produced any diminution of its medical properties. It operates as a mild emolient; and hence becomes serviceable in hectic cafés, tickling coughs, flagrantly, some kinds of alvine fluxes, and other disorders proceeding from a thin acrimonious state of the humours, or an abraion of the mucus of the intestines; they often, and give a greater degree of constancy to the former, and defend the latter from being irritated or excoriated by them. All the ingredients coincide in these general intentions. The dose is from half a dram to two or three, which may be frequently repeated.

Anthelmintic powder. Gen.

Take of the flowers of tanf, worm-feeds, each three drams; sal marts, one dram. Mix them.

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Both the tarry and worm feel poftuha a considerable degree of anthermic power, which is not a little increased by the salt of fleel. And from this combination more effect in the expulsion of worms, particularly of the lumbrici, may be expected, than from any of the articles taken by themselves. This powder may be taken to the extent of half a dram or upwards for a dose, proportioned to the age and circumstances of the patient.

**Powder against the bite of a mad-dog.** Brun.

Take of ah-coloured ground liverwort, two ounces; black pepper, one ounce. Beat them together into a powder.

The virtue for which this medicine has been celebrated, is expressed in its title: the dose is a dram and a half, to be taken in the morning fasting, in half a pint of cows milk warm, for four mornings together.

At one period it was held, on the recommendation of Dr Mead and other eminent practitioners, in very high esteem. Now, however, it has fallen into such disrepute, as to be banished from most of the modern pharmacopoeias.

**Compound powder of arum.** Suec.

Take of arum root, freshly dried, two drams; yellow water-flag roots, burnt flagrake roots, each one dram; white camella, a dram; half of wormwood, one scruple. Beat them into a powder, which is to be kept in a close vessel.

In former editions of the London pharmacopoeia, one of the ingredients in this composition was called *acorus vulgaris* or * vulgaris*; a name which has been applied, by different writers, both to *calamus aromaticus* and to *gladiolus luteus*, or common yellow water-flag. In this uncertainty, the compounders generally took the former. But as the medicine was first contrived by a German physician (Birkemann), and as in some of the German pharmacopoeias, the *acorus vulgaris* is explained to be the water-flag, the Swedish college have rather, in conformity to the original prescription, than from any opinion of the virtues of the water-flag (which appears, when the root is dried and powdred, to be very inconsiderable), made choice of this and expressed it by the name which more clearly distinguishes it from the other. The caution of keeping the powder in a close vessel is very necessary; for if it be exposed to the air, the alkaline salt, imbibing moisture, would run into a liquid flake. Two alkaline salts have been generally directed; but, as they differ from each other only in name, one of them is here justly omitted, and supplied by a proportional increase of the other. Crabs-eyes were originally an article in this composition, but probably served little other purpose than to increase its volume.

Agreeable to the above remark, the college of Edinburgh, in a revisal of their pharmacopoea, had omitted the crabs-eyes, and continued the former practice of using calamus aromaticus for the *acorus vulgaris*. They had likewise exchanged the cinnamon for the white camella; and the alkaline salt for a neutral one, better suited to the form of a powder. Their formula was as follows:

**MACY.**

Take of arum roots, newly dried, two ounces; *calamus aromaticus*, burnt flagrake roots, each one ounce; white camella, six drams; vitriolated tartar, two drams. Mix and make them into a powder.

This article which had formerly a place also in the London pharmacopoeia, is still retained in some of the best foreign ones: But it is now altogether rejected from our pharmacopoeia.

The compound powder of arum was originally intended as a stomatchic; and in weaknesses and relaxations of the stomatch, accompanied with a surcharge of vitious humors, it is doubtless a very useful medicine. It frequently has also good effects in rheumatic cases: the dose may be from a scruple to a dram, two or three times a day, in any convenient liquor. It should be used as fresh as possible, for its virtue suffers greatly in keeping; the arum root in particular, its capital ingredient soon loses the pungency in which its efficacy principally consists.

**Digestive powder.** Suec.

Take of bitter purging salts, rhubarb, each equal parts. Mix them.

In this composition, the salt will triven the operation of the rhubarb as a cathartic, and the astringency of the latter will tend to increase the tone of the stomatch; hence, in consequence of evacuating, and at the same time strengthening the alimentary canal, it may be presumed to have considerable influence in promoting digestion.

**Dysenteric powder.** Dan.

Take of rhubarb, one ounce; calcined hawthorn, half an ounce; gum arabic, three drams; cæfarilla bark, two drams. Mix them, and reduce them to a very fine powder.

Here the rhubarb is combined with an other powerful tonic, the cæfarilla; and while the calcined hawthorn serves to neutralize acid, the gum-arabic will operate as a demulcent. This composition therefore may be very useful in dysenteric cases, after the violence of the disease has been overcome, and when there remains a debilitated and abraded state of the intestinal canal.

**Fumigation powder.** Ross.

Take of olibanum, amber, maitich, each three parts; storax, two parts: benzoin, labdanum, each one part. Mix them into a gros powder.

This powder is intended for the purpose of fumigation: and when burnt it gives out a fragrant odour; hence it may be successfully employed for combating disagreeable stinells, and counteracting putrid or other noxious vapours diffused in the atmoshere.

**Powder for infants.** Suec.

Take of magnesia alba, one ounce, rhubarb, reduced to a very fine powder, one dram. Let them be mixed.

This powder is very useful for destroying acid, and at the same time retting the diminished tone of the alimentary canal: hence it is often advantageously employed in cafes of diarrhea, which depend on these morbid.
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morbid conditions. And it is in general a circumstance of considerable advantage, that it does not tend to check loofening very suddenly. It is particularly useful with infants, and hence the origin of the name here affixed to it.

Nitrous powder. Succ. 536

Take of the powder of Peruvian bark, one ounce; powder of rhubarb, powder of sal ammoniac, each one dram and a half.

It has been imagined by many, that particular advantage resulted from uniting the Peruvian bark with sal ammoniac; and there can be no doubt, that in some cases inconvenience results from the bark, in consequence of its binding the belly. There are therefore circumstances in which the combination here proposed may perhaps be proper; but there is reason to believe that the benefit of the sal ammoniac is more imaginary than real; and it not unfrequently happens, that we are disappointed of the benefit which might otherwise be derived from the bark, in consequence of its proving even of itself a purgative. Hence, in perhaps a majority of cases, the exhibiting it with the additions here proposed will be rather prejudicial than otherwise.

Thebaic powder. Succ. 538

Take of opium, half a scruple; purified nitre, five scruples and a half; refined sugar, one ounce. Mix them together into a powder.

In this powder those inconveniences which sometimes result from opium may with certain conditions be corrected, in consequence of the refrigerant power of nitre; and hence it may prove a very useful digestive powder. The sugar is intended merely to give form to the medicine; and in its state of combination, each dram of it contains a grain of opium; so that a practitioner has it in his power easily to regulate the dose according to circumstances.

Sponge powder. Gen. 539

Take of burnt sponge, powdered, common salt, each three drams. Mix them, and divide into twelve powders.

We have formerly noticed the manner of burning sponge. (See n° 98.) It is of very considerable service in febrifulous affections, and particularly in the cure of the bronchocoele. It has of late been highly celebrated for these purposes by Mr Wilmer, under the title of the Cow ptyry remedy. There it was sometimes employed merely in its pure state, combined with a sufficient quantity of honey, to form it into a bolus; sometimes it was given united with calcined cork and pumice-stone. What advantage, however, it could have derived from these additions it is difficult to conceive; nor can we readily see how it will be improved by the addition of common salt here proposed: for this may probably lead to new combination, materially altering the qualities of those salts which the sponge itself contains; and on which its virtues, as far as it has any, must depend. At the same time, for any experience which we ourselves have had, we are inclined to think that those virtues which have been attributed to burnt sponge are more imaginary than real.

Chap. XXVI. Troches.

Troches and lozenges are composed of powders made up with glutinous substances into little cakes, and afterwards dried. This form is principally used for the more commodious exhibition of certain medicines, by fitting them to dissolve slowly in the mouth, so as to pass by degrees into the stomach; and hence these preparations have generally a considerable proportion of sugar or other materials grateful to the palate. Some powders have likewise been reduced into troches, with a view to their preparation; though possibly for no very good reasons; for the moiUening and afterwards drying them in the air, must on this account be of greater injury than any advantage accruing from this form can counterbalance.

General Rules for making Troches.

1. The three first rules laid down for making powders, are also to be observed in the powders for troches.
2. If the mass proves so glutinous as to stick to the fingers in making up, the hands may be anointed with any convenient sweet or aromatic oil; or else sprinkled with powder of starch, or of liquorice, or with flour.
3. In order to thoroughly dry the troches, put them on an inverted sieve, in a shady airy place, and frequently turn them.
4. Troches are to be kept in glass vessels, or in earthen ones well glazed.

Troches of Starch. L. 563

Take of starch, an ounce and an half; liquorice, six drams; florentine orris, half an ounce; doubt refined sugar, one pound and a half. Rub these to powder, and, by the help of tragacanth, dissolved in water, make troches. They may be made, if so chosen, without the orris.

White pastoral troches. E.

Take of purest sugar, one pound; gum arabic, four ounces; starch, one ounce; flowers of benzoin, half a dram. Having beat them all into a powder, make them into a proper mass with rose-water, so as to form troches.

These compositions are very agreeable pastorals, and may be used at pleasure. They are calculated for softening acrimonious humours, and allaying the tickling in the throat which provokes coughing.

Although not only the name but the composition also
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Also in the London and Edinburgh pharmacopoeias be somewhat different, yet their effects are very much the same.

**Troches of liquorice.**

Take of extract of liquorice, double-refined sugar, each ten ounces; tragacanth, powdered, three ounces. Make troches by adding water.

**Black pectoral troches.**

Take of extract of liquorice, gum arabic, each four ounces; white sugar, eight ounces. Diffuse them in warm water, and strain: then evaporate the mixture over a gentle fire till it be of a proper consistence for being formed into troches.

These compositions are designed for the same purposes as the white pectoral troches above described. In foreign pharmacopoeias there are some other troches of this kind, under the titles of *Trochis terebris* flavis and *rubri*; the first are coloured with saffron, the latter with bole armenic. The dissolving and straining the extract of liquorice and gum arabic, as now ordered in the last of the above prescriptions, is a considerable improvement; not only as they are by that means more uniformly mixed than they can well be by beating, but likewise as they are thereby purified from the heterogeneous matters, of which both those drugs have commonly no small admixture.

**Pectoral troches with opium.**

Take of pure opium, two drams; balsam of Peru, one dram; tincture of Tolu, three drams. Grind the opium with the balsam and tincture previously mixed, till it be thoroughly dissolv'd; then add by degrees, of common syrup, eight ounces; extract of liquorice, softening in warm water, five ounces. While beating them diligently, gradually sprinkle upon the mixture five ounces of powdered gum arabic. Extract so as to form troches, each weighing ten grains.

The directions for preparing the above troches are so full and particular, that no further explanations are necessary. Six of the troches prepared in the manner here ordered, contain about one grain of opium. These troches are medicines of approved efficacy in tickling coughs depending on an irritation of the fauces. Besides the mechanical effect of the invigilating matters and involving acrid humours, or lining and defending the tender membranes, the opium in this case, no doubt, has a considerable share, by more immediately diminishing the irritability of the parts themselves.

The composition of these troches, however, would perhaps be improved by the omission of the balsam of Peru: for although here directed only in small quantity, yet it gives a taste to the troches which is to many people very disagreeable; and it is at the same time probable that it adds very little, if any thing, to the efficacy of the medicine.

**Troches of nitre.**

Take of purified nitre, powdered, four ounces; double-refined sugar, powdered, one pound; tragacanth, powdered, six ounces. With the addition of water, make troches. L.

Take of nitre, purified, three ounces; double-refined sugar, nine ounces. Make them into troches with mucilage of gum tragacanth. E.

This is a very agreeable form for the exhibition of nitre; though, when the falt is thus taken without any liquid (if the quantity be considerable), it is apt to occasion uneasiness at the stomach, which can only be prevented by large dilution with aqueous liquors. The troches of nitre have been said to be employed with success in some cases of difficult deglutition.

**Troches of sulphur.**

Take of washed flowers of sulphur, two ounces; double-refined sugar, four ounces. Rub them together; and, with the mucilage of quince seeds, now and then added, make troches. L.

Take of flowers of sulphur, two ounces; flowers of benzoin, one scruple; white sugar, four ounces; faffitious cinnabar, half a dram. Beat them together, and add mucilage of gum tragacanth as much as is sufficient. Mix and make them into troches according to art. E.

These compoñits are to be considered only as agreeable forms for the exhibition of sulphur; na alteration or addition being here made to its virtues; unless that, by the flowers of benzoin, in the second prescription, the medicine is supposed to be rendered more efficacious as a pectoral.

The faffitious cinnabar seems chiefly intended as a colouring ingredient.

**Troches of chalk.**

Take of chalk prepared, four ounces; crabs-claws, prepared, two ounces; cinnamon, half an ounce; double-refined sugar, three ounces. These being rubbed to powder, add mucilage of gum arabic, and make troches.

**Troches of magnesia.**

Take of burnt magnesia, four ounces; double refined sugar, two ounces; ginger, powdered, one scruple. With the addition of mucilage of gum arabic, make troches.

These compositions are calculated against that uneasiness at the stomach, improperly called the *heartburn*, in which they often give immediate relief, by absorbing and neutralizing the acid juices that occasion this disorder. The absorbent powders here used are of the most powerful kind. The former has in general the effect of binding, the latter of opening, the belly; and from this circumstance the practitioner will be determined in his choice, according to the nature of the case which he may have occasion to treat.

**Red lead troches.**

Take of read lead, half an ounce; corrosive sublimate mercury, one ounce; crumb of the finest bread four ounces. Make them up with rose-water into oblong troches.

These...
These troches are employed only for external purposes as emetics: they are powerfully bitter, and require a good deal of caution in their use.

Troches of catechu. Brun.

Take of catechu, one ounce; white sugar, cane, two ounces; ambergris, musk, each ten grains; mucilage of gum tragacanth, as much as is sufficient. Make them into troches.

This medicine has long been in use as a slight restringent; and restringents thus gradually received into the stomach produce better effects than when an equal quantity is taken down at once. Their troches would be more palatable, and perhaps not less serviceable, were the musk and ambergris omitted.

CHAP. XXVI. PILLS.

To this form are peculiarly adapted those drugs which operate in a small dose, and whose nauseous and offensive taste or smell require them to be concealed from the palate.

Pills dissolve the most difficultly in the stomach, and produce the most gradual and lasting effects of all the internal forms. This is in some cases of great advantage, in others it is a quality not at all desirable; and sometimes may even be of dangerous consequence, particularly with regard to emetics, which, if they pass the stomach undissolved, and afterwards exert themselves in the intestines, operate there as violent cathartics. Hence emetics are among us scarcely ever given in pills; and hence to the refrinous and difficultly soluble substances, saponaceous ones ought to be added, in order to promote their solution.

Gummy resins, and inspissated juices are sometimes soft enough to be made into pills without addition where any moisture is requisite, spirit of wine is more proper than syrups or conserves, as it unites more readily with them, and does not sensibly increase their bulk. Light dry powders require syrup or mucilages; and the more ponderous, as the mercurial and other metallic preparations, thick honey, conserve or extracts.

Light powders require about half their weight of syrup, of honey, about three-fourths their weight, to reduce them into a due concurrence for forming pills. Half a dram of the mass will make six or seven pills of a moderate size.

General rules for making pills.

1. Gums and inspissated juices are to be first softened with the liquor prescribed, then add the powders, and continue beating them all together till they be perfectly mixed.

2. The masses for pills are best kept in bladders, which should be moistened now and then with some of the same kind of liquid that the mass was made up with, or with some proper aromatic oil.

Ethiopic pills. E.

Take of quicksilver, six drams; golden sulphur of antimony, resin of guaiacum, honey, each half an ounce. Grind the quicksilver with the honey, in a glass mortar, until the mercurial globules entirely disappear; then add the golden sulphur and gum arabic, with as much mucilage of gum arabic as is sufficient to make the mixture into a mass of the proper consistence for forming pills.

These pills are much more efficacious than those of a former edition; the ethiops mineral, there ordered, being exchanged for a more active composition. In their present form they resemble Dr Plummer's pills, described in the Edinburgh Essays, and afterwards to be mentioned. To it they are preferable in one respect, that they are less apt to run off by foot. They are an useful alterative both in cutaneous and venereal disorders. One fourth-part of the quantity above prescribed may be made into sixty pills; of which from one to four may be taken every night and morning, the patient keeping moderately warm during the whole time that this course is continued.

Pills of aloes. L.

Take of socotraine aloes, powdered, an ounce; extract of gentian, half an ounce; syrup of ginger, as much as is sufficient. Beat them together.

Albicis pills. E.

Take of socotraine aloes, in powder, thick extract of gentian, each two ounces; make them into a mass with simple syrup.

These pills were formerly directed to be made with Caffile soap; from a notion which Baerhaave and some others were very fond of, that soap promoted the solution of resinous and several other substances in the stomach. This, however, seems to be a mistake; and on the contrary, it is highly probable that the alkaline part of the soap is in most instances separated from the oily by the acid in the stomach; by which decomposition the soap may possibly retard instead of promoting the solution of the aloes. These pills have been much used as warming and stomachic laxatives: they are very well suited for the colliquings so often attendant on people of sedentary lives. Like other preparations of aloes, they are also used in jaundice, and in cases of obstructed menses. They are seldom used for producing full purging; but if this be required, a scruple or half a dram of the mass may be made into pills of a moderate size for one dose.

Pills of aloes with myrrh. L.

Take of socotraine aloes, two ounces; myrrh, saffron, of each one ounce; syrup of saffron, as much as is sufficient. Rub the aloes and myrrh separately to powder; afterwards beat them all together.

The common pills, vulgarly called Rufus's pills. E.

Take of socotraine aloes, two ounces; myrrh, saffron, one ounce; saffron, half an ounce. Beat them into a mass with a proper quantity of syrup.

These pills have long continued in practice, without any other alteration than in the syrup with which the mass is made up, and in the proportion of saffron. In our last pharmacopoeia, the syrup of wormwood was ordered, which is here judiciously exchanged by the London college for that of saffron; this preferring and
and improving the brightness of colour in the medicine, which is the characteristic of its goodness. The saffron, in the composition which is attributed to Rufus, is equal in quantity to the myrrh; and in these proportions the pill was received in our first Pharmacopoeia. As the diminution afterwards made in the saffron was grounded on very absurd reasons, viz., "left the former quantity should occasion a spasmus, cynicus," the London college have now agin increased it, and restored the pill to its original form. The virtues of this medicine may be easily understood from its ingredients. These pills, given to the quantity of half a dram or two scrupules, prove considerably more efficacious than a small quantity of the drug, half a dram or two scrupules, prove considerably more efficacious than a small quantity of the drug. The pill to its original form. The virtue of this medicine may be easily understood from its ingredients. These pills, given to the quantity of half a dram or two scrupules, prove considerably more efficacious than a small quantity of the drug, half a dram or two scrupules, prove considerably more efficacious than a small quantity of the drug.

**Colocynth pills with aloes, commonly called Coccie.**

Take focotrine aloes, scammony, of each two ounces; tal polychrest, two drams; colocynth, one ounce; oil of cloves, two drams. Reduce the aloes and scammony into a powder with the salt; then let the colocynth beat into a very fine powder, and the oil be added; lastly, make it into a proper mass with mucilage of gum arabic.

In these pills we have a very useful and active purgative; and where the simple aloetic pill is not sufficient for obviating the diminution afterwards made in the stomach, or for triturating the mercury; but it may depend upon the view of producing proper catharsis. Half a dram of the mass contains about five grains of the colocynth, ten of the aloes, and ten of the scammony.

**Copper pills.**

Take of cuprum ammoniacum, sixteen grains; crumb of bread, two ounces; spirit of sal ammoniac, as much as is sufficient to form them into a mass, which is to be divided into thirty two equal pills. These pills had formerly the name of Pilula cerulea, but they are now with greater propriety denominated from the metal which is their basis.

Each of these pills weighs about three grains, and contains somewhat more than half a grain of the cuprum ammoniacum. The above pills seem to be the best form of exhibiting this medicine. See **Cuprum ammoniacale**, and **Chemistry**, ii 1034.

**Gum pills.**

Take of galbanum, opoponax, myrrh, fagapenum, each one ounce; afafoetida, half an ounce; syrup of saffron, as much as is sufficient. Beat them together. L.

Take afafoetida, galbanum, myrrh, each one ounce; rectified oil of amber, one dram. Beat them into a mass with simple syrup. E.

The pills are designed for antibyterics and emme-

**Quicksilver pills.**

Take purified quicksilver, extract of liquorice, having the confidence of honey, of each two drams; liquorice, finely powdered one dram. Rub the quicksilver with the extract of liquorice until the globules disappear; then, adding the liquorice-powder, mix them together.

**Mercarial pills.**

Take of quicksilver, honey, each one ounce; crumb of bread, two ounces. Grind the quicksilver with the honey in a glass mortar till the globules disappear, adding occasionally a little simple syrup; then add the crumb of bread, and beat the whole with water into a mass, which is to be immediately divided into four hundred and eighty equal pills.

The quicksilver was formerly directed to be ground with resin of guaiacum and Calaite foap. The former was supposed to coincide with the virtues of the mercury, and the latter was used chiefly to divide the globules of mercury. For this last intention Dr. Saunders found that honey, the fib liberals here ordered by the Edinburgh college, is of all he tried the most effectual; but we would suppose with this gentleman, that something further is done in this process than the mere division of the mercurial globules, and that part of the quicksilver is as it were amalgamated with the honey, or brought to a state similar to that in Plenck's solution. The same effect will take place when the pills are prepared with extract of liquorice now directed by the London college.

The mercurial pill is one of the best preparations of mercury, and may in general replace most other forms of this medicine. It is necessary to form the mass immediately into pills, as the crumb soon becomes too hard for that purpose. Soap was undoubtedly a very improper medium for triturating the mercury; it is not only too hard for that purpose, but when the preparations entered the stomach, the alkaline part of the soap being engaged by the acid in that viscus, the mercury would in all probability be immediately separated. The honey and bread can only be changed by the natural powers of digestion, and can never oppress the stomach. The dose of the pills is from two to four or fix in the day, according to the effects we wish to produce.

**Jalap pills.**

Take of extract of jalap, two ounces; aromatic powder, half an ounce. Beat them into a mass with simple syrup.

This is an useful and active purgative, either for evacuating the contents of the intestinal canal, or producing a discharge from the sytem in general.
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One of the same kind, with powdered jalap in substance instead of the extract, is used in some of our hospitals as a cheap and effectual purge.

Plummer’s pill. E.

Take of sweet mercury, precipitated sulphur of antimony, each six drams; extract of gentian, white Spanish soap, each two drams. Let the mercury be triturated with the sulphur till they be thoroughly mixed, then add the extract, and form a mass with simple syrup.

These pills were recommended to the addition of the public about forty years ago by Dr Plummer, whose name they still bear. He represented them in a paper which he published in the Edinburgh Medical Essays, as a very useful alterative; and on his authority they were at one time much employed; but they are now less extensively used than formerly. And although they still retain a place in the Edinburgh pharmacopoeia, yet it is probable that every purpose to be answered by them may be more effectually obtained from the common mercurial pill, or from calomel in a more simple state.

Opium pills. L.

Take of hard purified opium, powdered, two drams; extract of liquorice, one ounce. Beat them until they are perfectly united.

Thebaic, commonly called Pacific pills. E.

Take of opium, half an ounce; extract of liquorice, two ounces; Cathartic sap, an ounce and a half; Jamaica pepper, one ounce. Soften the opium and extract separately with proof spirit, and having beat them into a pulp, mix them; then add the soap, and the pepper beat into a powder; and lastly having beat them well together, form the whole into a mass.

These two compositions, though differing in several particulars may yet be considered as fundamentally very much the same. The first is a simple opiate, in which every five grains of the mass contains one of opium; and in the opium alone can we suppose that the activity of the medicine depends.

Although some of the articles contained in the latter composition may perhaps be supposed to operate as convulsive, yet the former composition, which is the most simple, is in general preferable.

Pills similar to the second were conceived by a chemical empiric, Starkey, and communicated by him to Matthews, under whose name they were some time ago greatly celebrated. The form here given differs considerably from the original, in omitting many ingredients of no great service. Nor indeed are any of the ingredients of much consequence, except the opium; their quantity being too inconsiderable to answer any useful purpose. Ten grains of the composition contain one of opium.

Squill pills.

Take of fresh dried squills, powdered, one dram; ginger powdered, soap, of each three drams; ammoniacum, two drams; syrup of ginger, as much as is sufficient. Beat them together. L.

Take of gum ammoniac, leffier cardamom seeds, in powder, extract of liquorice, each one dram; dried root of squills, in fine powder, one scruple. Mix and form them into a mass with simple syrup. E.

There are elegant and commodious forms for the exhibition of squills, whether for promoting expectoration, or with the other intentions to which that medicine is applied. As the virtue of the compound is chiefly from the squills, the other ingredients are often varied in extemporaneous prescription; and probably no material difference takes place in the two forms here proposed excepting in the proportion of the squills, which in the former constitutes one ninth, in the latter one tenth, of the mass.

Stomachic pills. E.

Take of rhubarb, one ounce; foceotide aloes, six drams; myrrh half an ounce; vitriolated tartar, one dram; ess:itial oil of mint, half a dram; syrup of orange peel, a sufficient quantity. Make them into a mass.

This pill is intended for moderately warming and strengthening the stomach, and evacuating crude vitious humors. A scruple of the mass may be taken twice a day.

Bacher’s pills. Gen.

Take of extract of black hellebore, purified myrrh, each one ounce; power of carduus benedictus, two scruples. Mix them into a mass according to art, to be dried in the air till it be fit for the formation of pills, each weighing one grain.

These pills have been strongly recommended as a most effectual remedy in dropsical cases, and have been alleged to unite an evacuant and tonic power. Hence they have been considered as particularly suited to those cases where remarkable weaknesses and laxity occur. Under the hands of Mr Bacher the inventor, they acquired a great reputation, that, after a trial in the military hospitals at Paris, the receipt was purchased by the French king, and published by authority. But like many other nostrums since this publication, Bacher’s pill has by no means supported the reputation which it had when kept a secret. The dose is varied according to circumstances, from one to thirty pills taken in the course of the day.

Pills of elaterium. Spec.

Take of the purest gum ammoniac, two ounces; foceotide aloes, gamboge, each two drams; elaterium, half a dram. Mix them by means of bitter tincture, into a mass, and let pills be formed, each weighing two grains.

This, as well as the former, is also a pill celebrated for the cure of dropsical affections. And the elaterium from which it derives its name, is one of the most powerful evacuants in the way of catharsis. Here, however, it is united with such active articles, particularly the gamboge, as must make its effect somewhat doubtful. And we are inclined to think that a preferable formula for making the pills of elaterium, is to form it into a mass, with the extract of gentian. This is imagined to have some influence as correcting its effect, in
in exciting sickness. And when each pill is made to
contain half a grain of the elaterium, the dose may
be easily accommodated to the circumstances of the
patient, one or two pills being taken every hour till
they begin to operate.

The elaterium, whether under the form above-men-
tioned, or in the more simple state which has now
been suggested, operates as a very powerful cathartic,
often inducing the discharge of flagrant serum, when
other remedies are found ineffectual. But it can be
exhibited only in those cases where the patient still re-
tains a considerable degree of strength.

Fetid pills. Suec.

Take of afaucetida, castor, each a dram and a half;
salt of amber, half a dram; oil of harthorn, half a
scropule. Make them into a mas, with mixture of
myrrh, to be divided into pills of two grains each.
These, like the gum-pills formerly mentioned, are
chiefly used as an antimony and antipasmatic medici-
ne; and they are particularly useful in counteracting
spasmodic affections of the alimentary canal, espe-
cially those connected with flatulence. But the
afaucetida is no less useful when exhibited in a
more simple state, particularly when formed into pills
with an equal quantity of soap, by the aid of simple
syrup.

Gamboge pills. Dan.

Take of foecotrine aloe, extract of black hellebore,
sweet mercury, gamboge, each two drams; distilled
oil of juniper, half a dram; syrup of buckthorn,
as much as is sufficient for forming a mas of pills.

From the ingredients of which these pills are con-
stituted, we need hardly remark, that they must prove
a very powerful purgative. The gamboge, from which
they derive their name is unquestionably a very active
purge. But is not more so than the sweet mercury;
and perhaps from an union of these two, as much
might be expected as from the more compounded for-
mula here adopted. Yet it is not improbable that
the essential oil of juniper may in some degree operate
as a corrigent.

Pills of corrosive sublimate mercury. Suec.

Take of corrosive sublimate, purified sal ammoniac,
each one scropule; distilled water, as much as is suf-
cient to dissolve them; powder of the root of al-
thea, fifteen scropules; honey, two drams. Mix
them into a mas for the formation of pills, each
weighing three grains.

Corrosive sublimate in substance was long con-
dered as being so violent in its effects, that it could
not with safety be taken internally; but for a con-
derable time it has been used with advantage under
the form of solutions, either in water or spirits. But
to both these a considerable objection occurs from their
disagreeable brassy taint. This objection is however
entirely obviated, by reducing the solution, after it is
formed, to a solid mas, by means of crumb of bread,
or any proper powder; and by the aid of a little sal am-
moniac, the solution may be made in a very small quan-
tity of water; so that lefs of any solid intermediate

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the powders may not separate in keeping, that a dose may be easily taken upon the point of a knife, and not prove too stiff to swallow.

Electuaries receive chiefly the milder alternative medicines, and such as are not ungrateful to the palate. The more powerful drugs, as cathartics, emetics, opiates, and the like except in officinal electuaries to be dispensed by weight), are seldom trusted in this form, on account of the uncertainty of the dose; digenitive ones, acids, bitters, fetidos, cannot be conveniently taken in it; nor is the form of an electuary well fitted for the more ponderous substancess, as mercurials, these being apt to subside in keeping, unless the composition be made very stiff.

The lighter powders require thrice their weight of honey, or syrup boiled to the thickness of honey, to make them into the consistence of an electuary; of syrups of the common consistence, twice the weight of the powder is sufficient.

Where the common syrups are employed, it is necessary to add likewise a little conserve, to prevent the compound from drying too soon; electuaries of Peruvian bark, for instance, made up with syrup alone, will often in a day or two grow too dry for taking.

Some powders, especially those of the less grateful kind, are more conveniently made up with mucilage than with syrup, honey, or conserve. The three latter thick about the mouth and fauces, and thus occasion the taste of the medicine to remain for a considerable time; while mucilages pass freely, without leaving any taste in the mouth. A little soft extract of liquorice, joined to the mucilage, renders the composition sufficiently grateful, without the inconveniences of the more adhesive sweets.

The quantity of an electuary, directed at a time, in extemporaneous prescription, varies much according to its constituent parts, but it is rarely less than the size of a nutmeg, or more than two or three ounces.

**General rules for making electuaries.**

I. The rules already laid down for decoctions and powders in general, are likewise to be observed in making decoctions and powders for electuaries.

II. Gums, infused juices, and such other substances as are not pulverizable, should be dissolved in the liquor preferred: then add the powders by little and little, and keep the whole briskly stirring, so as to make an equable and uniform mixture.

III. Astringent electuaries, and such as have pulps of fruit in their composition, should be prepared only in small quantities at a time: for astringent medicines lose much of their virtue in being kept in this form, and the pulps of fruits are apt to become sour.

IV. The superfluous moisture of the pulps should be exhaled over a gentle fire, before the other ingredients are added to them.

V. Electuaries, if they grow dry in keeping, are to be reduced to a due consistence, with the addition of a little canary wine, and not with syrup or honey: by this means the dose will be the least uncertain; a circumstance deserving particular regard, in those especially which are made up with syrup, and contain a proportion of opium.

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**Electuary of caffia.**

Take of the fresh extracted pulp of caffia, half a pound; manna, two ounces; pulp of tamarinds, one ounce; rose syrup, half a pound. Beat the manna, and dissolve it over a flow fire in the rose-syrup; then add the pulps, and with a continued heat evaporate the whole to the proper thickness of an electuary.

**Electuary of caffia, commonly called diacaffia.**

Take of pulp of caffia fistularis, fix ounces; pulp of tamarinds, manna, each an ounce and a half; syrup of pale roes, fix ounces. Having beat the manna in a mortar, dissolve it with a gentle heat in the syrup; then add the pulps, and evaporate them with a regularly continued heat to the consistence of an electuary.

These compositions are very convenient officinals, to serve as a basis for purgative electuaries and other similar purposes; as the pulsing a small quantity of the fruits, for extemporaneous prescription, is very troublesome. The tamarinds give them a pleasant taste, and do not subject them, as might be expected, to turn four. After standing for four months, the composition has been found no fouver than when first made. This electuary is likewise usefully taken by itself, to the quantity of two or three drams occasionally, for gently loofening the belly in collique habits.

**Electuary of flameony.**

Take of flameony, in powder, one ounce and an half; cloves, ginger, of each fix drams; essential oil of caraway, half a dram; syrup of roes, as much as is sufficient. Mix the spices, powdered together, with the syrup; then add the flameony, and laftly the oil of caraway.

This electuary is a warm brisk purgative. It is a reform of the electuary caryocaulis of our preceding dispensatories; a composition which was greatly complained of, as being inconvenient to take on account of the largeness of its dose. A dram and a half of this, which contains fifteen grains of flameony, is equivalent to half an ounce of the other.

**Electuary of fenna.**

Take of fenna, eight ounces; figs, one pound; pulp of tamarinds, of caffia, of prunes, each half a pound; coriander seeds, four ounces; liquorice, three ounces; double-refined sugar, two pounds and an half. Powder the fenna with the coriander seeds, and sift out ten ounces of the mixed powder. Boil the remainder with the figs and liquorice, in four pints of distilled water, to one half; then press out and strain the liquor. Evaporate this strained liquor to the weight of about a pound and an half; then add the sugar, and make a syrup; add this syrup by degrees to the pulps, and laftly mix in the powder.

**Lentive electuary.**

Take of pulp of French prunes, one pound; pulp of caffia, pulp of tamarinds, each two ounces and a half; black syrup of sugar, commonly called molasses, one pound and a half; fenna leaves, in fine powder, four.
four ounces; coriander seeds, in fine powder, half an ounce. Having boiled the pulps with the syrup to the confluence of honey, add the powders, and heat the whole into an electuary.

This electuary, the name of which is with propriety changed by the London college, is now freed from some superfluous ingredients which were left in it at former revivals, viz. poly pody root, French mercury leaves, fenugreek seeds, and linseed. Molasses is preferable to either honey or sugar, as it coincides with the intention, and is not only of itself inapt to ferment, but likewise prevents such substances as are this way disposed from running into fermentation.

It is a very convenient laxative, and has long been in common use among practitioners. Taken to the quantity of a nutmeg or more, as occasion may require, it is an excellent laxative for loosening the belly in coltive habits.

Japonic electuary, commonly called Japonic confec tion. E.

Take of Japan earth, four ounces; gum-kino, three ounces; cinnamon, nutmeg, each one ounce; opium diffused in a sufficient quantity of Spanish white wine, one dram and a half; syrup of dried roes, boiled to the confluence of honey, two pounds and a quarter. Mix and form them into an electuary.

The ingredients in this electuary seem extremely well chosen, and are so proportioned to one another, that the quantity of opium is the fame as in the diascordium of the former pharmacopoeias of Edinburgh, viz. one grain in ten scruples. The gum-kino, now substituted for the tormentinal root, is an excellent improvement in the formula.

Tin electuary. Brun.

Take of pure tin, quicksilver, each one ounce. Let them be formed into an amalgam; oyster shells, prepared one ounce. Reduce the whole to a powder. Take of this powder, conserve of wormwood, each one ounce, and form an electuary with syrup of mint.

Tin, as we have already had occasion to observe above (n° 312.), has long been celebrated for the expulsion of tenia; and it is also well known, that in mercury we have one of the most powerful anthelmintics. Such a combination as the precedent, then, might be supposed well suited for the removal of that animal from the alimentary canal; and accordingly it has been alleged, that this electuary has sometimes succeeded after other remedies have failed. It may be taken twice a day, to the extent of two or three drams for a dose.

Ele Cary for the gums. Succ.

Take of powdered myrrh, three drams; cream of tartar, cochineal, each a dram and a half. Grind them together in a glass mortar; then add melted honey, four ounces; cloves, in powder, one dram.

Myrrh, particularly under the form of tincture, has long been a favourite application to the gums, when in a spongy or ulcerated state. But the spirituous menstrum there employed, although sometimes favouring the intention in view, in other infances occurs as an objection to its use. In these cases, the benefit to be derived from the myrrh may be obtained from this elec tuary, which may always be applied with facility, and sometimes with advantage.

Ele Cary of manna. Succ.

Take of manna, refined sugar pounded, fennel-water, each two ounces. Strain the mixture, using expression; then add fine powder of the root of Flo ren tine orris, one dram; fresh drawn almond oil, one ounce.

In this electuary we have a gently emollient laxative, which is very useful in those cases where obfipation either arises from indurated feces, or is supported by that cause. But its cathartic powers are by no means considerable.


Take of purified nitre, half an ounce; conserve of roses, four ounces. Mix them.

Under this formula nitre may be introduced to a considerable extent, without giving uneafiness at the stomach, while at the same time the refrigerant power is combined with the astringency of the roses. From these circumstances it may be advantageously employed in different cases, but particularly in infances of haemoptysis.

Terebinthinate electuary. Succ.

Take of spirit of turpentine, half an ounce; honey, one ounce; powder of liquorice, as much as is sufficient for the formation of an electuary.

Under this form, the oil of turpentine may be introduced with less uneafines than perhaps under almost any other. And it may thus be employed for different purposes, but particularly with a view to its diuretic power. But it has been especially celebrated for the cure of obstinate rheumatisms, and above all, for that modification of rheumatism which has the name of jiffhias, and which is found in many infances obstinately to refit other modes of cure.

Lenient linthus. Succ.

Take of gum-arabic, bruised, two drams; cherry-water, half an ounce. By trituration in a mortar, mix with them almond oil, fresh drawn, syrup of almonds, each seven ounces.

In this we have a very agreeable emollient linthus, highly useful in recent catarrhal affections, for lubricating the throat and fauces. It may be taken to pleasure to any extent that the fomach may easily bear.

CHAP. XXIX. Confec tion.

Although the London college have separated these from electuaries, yet they differ so little, that in most pharmacopoeias they are ranked under the same head. And in that of Edinburgh, there are several articles which have promiscuously the name either of confec tion or electuary. But as no inconvenience arises from the separation, and as we have followed the order of the London pharmacopoeia in other particulars, it would be improper to deviate from it in this.
Take of zedoary, in coarse powder, saffron, of each half a pound; distilled water, three pints. Make rate for twenty-four hours; then press and strain. Reduce the strained liquor, by evaporation, to a pint and a half, to which add the following, rubbed to a very fine powder; compound powder of crabs-claws, sixteen ounces; cinnamon, nutmegs, of each two ounces; cloves, one ounce; smaller cardamom-seeds, husked, half an ounce; double-refined sugar, two pounds. Make a confection.

This confection is composed of the more unexceptionable ingredients of a confection formerly held in great esteem, and which was called, from its author, конфета, Raleighana. The original confection was composed of no less than five and twenty particulars; each of which were examined apart, except one, moon-grass, the flower of which is too small to be gathered in sufficient quantity for the general use of the medicine, and the plant is poifoned of hurtful qualities, as is experienced in cattle that feed where it grows. In this examination, many of the extracts came out so very nauseous, that it was impossible to retain them, confident with any regard to the taste of the composition. But some few, of equal efficacy with any of the rest, being of a tolerable taste and flavour, were compounded in different proportions; and when, after many trials, a composition was approved, the quantity of each material, that would yield the proportion of extract which entered that composition, was calculated, and from thence the proportions were collected as now set down: after which the compound extract was made, and found to answer expectation. The London college, in the present edition of their pharmacopoeia, have still farther simplified this formula, by rejecting the rofemary, juniper, and cardamoms, which formerly entered it.

The confection, as now reformed, is a sufficiently grateful and moderately warm cardial; and frequently given with that intention, from eight or ten grains to a scruple or upwards, in boluses or draughts. The formula might perhaps be still more simplified without any loss. The crabs claw powder does not appear to be very necessary, and is inserted rather in compliance with the original formula, than from its contributing any thing to the intention of the medicine; and the following formula of the Edinburgh pharmacopoeia seems to us preferable to that of the London, even in its present improved state.

Cordial electuary, commonly called cordial confection. E.

Take of conserve of orange-peel, three ounces; preferred nutmegs, an ounce and a half; preferred ginger, six drams; cinnamon, in fine powder, half an ounce; syrup of orange peel, as much as will form the whole into an electuary.

In the above simple and elegant formula, a number of trifling ingredients are rejected, and those substituted in their place are medicines of approved efficacy. We therefore consider this preparation as an useful remedy for the purposes expressed in its title.

Confection of opium. L.

Take of hard purified opium, powdered, six drams; long pepper, ginger, caraway-seeds, of each two ounces; syrup of white poppy, boiled to the confluence of honey, three times the weight of the whole. Mix the purified opium carefully with syrup gently heated; then add the rest, rubbed to powder.

Thebeic electuary. E.

Take of aromatic powder, six ounces; Vigilian snake-root, in fine powder, three ounces; opium diffused in a sufficient quantity of Spanish white wine, three drams; clarified honey, thrice the weight of the powders. Mix them, and form an electuary.

These compositions consist of very powerful ingredients, and are doubtless capable of answering every end that can be reasonably expected from the more voluminous Theriac of Andromachus. The London college also had formerly their Theriac composed of the less exceptionable ingredients of Andromachus's. But as these medicines have for a long time been chiefly employed for external purposes, by the way of cataplasm, the London theriaca is now omitted, and its place supplied by a cataplasm composed of a few well-chosen articles, under the name of cataplasm of cummin; of which hereafter. For internal use, none of the theriacas are at present so much regarded as they have been heretofore; practitioners having introduced in their room extemporary boluses of Virginian snake-root, camphor, contrayerva, and the like; which answer all their intentions, with this advantage, that they may be given either with or without opium; an ingredient which renders the others prejudicial in cases where they might otherwise be proper.

With regard to the quantity of opium in the foregoing compositions, one grain thereof is contained in thirty-fix grains of the confection of opium, and in five scruples of the thebeic electuary. The proportion of opium will vary a little, according to the time that they have been kept: their moisture by degrees excelling, so as to leave the remainder stronger of the opium than an equal weight was at first. A change of this kind is taken notice of by many writers, but falsely attributed to an imaginary fermentative quality of the ingredients; by which they were supposed, from their multiplicity and contrariety, to be continually exalting and improving the virtues of each other.

A good deal of care is requisite in making these compositions, to prevent the waste which is apt to happen in the pounding, and which would render the proportion of opium to the other ingredients precarious. The intention of dissolving the opium in wine, for thebe and other electuaries, is, that it may be more uniformly mixed with the rest.

These compositions fully supply the place of two articles, which, though long banished from the shops, we shall here subjoin, as examples of the amazing height to which composition in medicine had at one time proceeded.

Mithridate, or the confection of Democrats.

Take of cinnamon, fourteen drams; mrrth, eleven drams; agaric, Indian nard, ginger, saffron, seeds of mithridate muftard, frankincence, chio turpentine, each ten drams; canals hay, coitus, or in its stead zedoary, Indian leat, or in its stead mace, fhechas long
long pepper, hartwort feeds, hypochilis, florax strained, opopanax, galbanum strained, opobalsam, or in its head expressed oil of nutmegs, Russian caltor, each one ounce; Poley mountain, scordium, caprapalm, or in its head cubeds, white pepper, candy-carrot feed, bdellium strained, each seven drams; Celtic nard, gentian root, dittany of Crete, red roses, Macedonian parley feed, leffer cardamom seeds husked, sweet fennel feed, gum arabic, opium strained, each five drams; calamus aromaticus, wild valerian root, aniseed, fagapenum strained, each three drams; meum athamanticum, St John's wort, acacia, or in its head terra Japonica, bellies of flinks, each two drams and a half; clarified honey, three times the weight of all the other ingredients. Warm the honey, and mix with it the opium dissolved in wine; melt the florax, galbanum, turpentine, and opobalsam (or expressed oil of nutmegs), together in another vessel, continually stirring them about, to prevent their burning; when these are melted, mix the hot honey, at first by spoonfuls, and afterwards in larger quantities at a time; when the whole is grown almost cold, add by degrees the other spices reduced into powder.

*Theriaca of Andromachus, Venice treacle.*

Take of troches of quills, half a pound; long pepper, opium strained, vipers dried, each three ounces; cinnamon, opobalsam, or in its head expressed oil of nutmegs, each two ounces; aromatic, Florence orris root, scordium, red roses, nayew seeds, extract of liquorice, each an ounce and a half; Indian nard, saffron, amomum, myrrh, coltus, or in its head zedoary, camel's hay, each one ounce; cinquefoil root, rhubarb, ginger, Indian leaf, or in its head mace, dittany of Crete, horehound leaves, calamin leaves, fethas, black pepper, Macedonian parley feed, olibanum, chio turpentine, wild valerian root, each six drams; gentian root, Celtic nard, pignel, leaves of Poley mountain, of St John's wort, and of ground pine, germander tops with the seed, carpopalm, or in its head cubeds, unashed, sweet fennel feed, leffer cardamom seeds, husked, seeds of bishop's weed, of bartwort, and of treacle mulnard, hypochilis, acacia, or in its head Japan earth, gum arabic, florax strained, fagapenum strained, terra Lemnias, or in its head bole almenus, or French bole, green vitriol calcined, each half an ounce; small (or in its head the long) birthwort root, leffer centary tops, candy carrot seed, opopanax, galbanum, strained, Russian caltor, Jews pitch, or in its head white amber prepared, calamus aromaticus, each two drams; clarified honey, thrice the weight of all the other ingredients. Let these ingredients be mixed together, after the same manner as directed in making the mithridate.

These celebrated edicaries are often mentioned by medical writers, and may serve as examples of the wild exuberance of composition which the superfluous of former ages brought into vogue. The *theriaca* is a formation of mithridate made by Andromachus physician to Nero. The mithridate itself is said to have been found in the cabinet of Mithridates king of Pontus. The first publication of this pompous arcaumen were very extravagant in their commendations of its virtues; the principal of which was made to confin it in its being a most powerful preservative against all kinds of venom; whoever took a proper quantity in the morning was insured from being poisoned during that whole day. This was confirmed by the example of its first supported inventor, who, as Celsus informs us, was by its conjunct use so fortified against the commonly reputed poisons, that none of them would have any effect upon him when he wanted their affliction. But the notions of poisons which prevailed in those ruder ages were manifestly erroneous. Before experience had furnished mankind with a competent knowledge of the powers of simples, they were under perpetual alarms from an apprehension of poisons, and believed themselves in contriving compositions which should counteract their effects, accumulating together all those substances which they imagined to be poifoned of any degree of alexipharmic power. Hence proceed the venomous antidotes which we meet with in the writings of the ancient physicians; yet it does not appear that they were acquainted with any real poison except the cistus, aconitum, and bites of venomous animals; and for these they knew of no antidote whatever. Even admitting the reality of the poisons, and the efficacy of the several antidotes separately, the compositions could no more answer the purposes expected from them, than the accumulating of all the medicinal simples into one form could make a remedy against all diseases.

Yet notwithstanding the absurdity in the original intention of these medicines, and their enormity in point of composition, as they contain several powerful materials, whose virtues, though greatly prejudiced, yet are not destroyed, by their multiplicity and contrariety; the compounds have been found, from repeated experience, to produce very considerable effects as warm opliate diaphoretics. These compositions might without doubt be hope of numerous superfluities without any diminution of their virtues; yet as the effects of them, in their present form, are so well known, so much regard has been paid to ancient authority as not to attempt a reformulation of that kind. Although these forms were originally complex, yet subsequent additions had crept into them, the accumulating of all the medicinal simples into one form could make a remedy against all diseases.

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from several parts of Galen's works, that the latter was used by the ancients only on account of the great difficulty of procuring the other; so that to retain the cassia, now that cinnamon is so common, is a blind following of these writers, without any attention to their meaning: the cassia therefore is now rejected, and half the quantity of cinnamon put in its room; which is the proportion that Galen directs to be observed in substituting one for the other. It is probable that the cassia is the same with regard to the Celtic and the Indian nard; that the black for the ancient chalcitis, now not certainly known; and, in the catalogue of its simples, describing the Roman to be a blue vitriol whereas the Italian writers are unanimous it is a green vitriol; and were it not, it would not answer to the effects of the chalcitis, which was certainly a chalybeate, and gives the medicine its black colour. What has chiefly occasioned chalcitis to be supposed a cupreous vitriol seems to be its name, or martial vitriols are derived for this chapter, there takes place more watery solution only, and they are used solely with the intention of acting topically in the way of lotion, injection, or at the utmost of gargarism.

Compounded water. L.

Take of alum, vitriolated zinc, each half an ounce; boiling distilled water, two pints. Pour the water on the salts in a glass vessel, and strain. This water was long known in our shops under the title of aqua aluminosa Bateana.

Bates directed the salts to be first powdered and melted over the fire; but this is needless trouble, since the melting only evaporates the aqueous parts, which are restored again on the addition of the water. This liquor is used for cleansing and healing ulcers and wounds; and for removing cutaneous eruptions, the part being bathed with it hot three or four times a-day. It is sometimes likewise employed as a collyrium; and as an injection in the gonorrhœa and fluor albus when not accompanied with virulence.

Styptic water. E.

Take of blue vitriol, alum, each three ounces; water, two pounds. Boil them until the salts be dissolved; then filter the liquor, and add an ounce and a half of vitriolic acid.

This water, though made with the blue in place of the white vitriol, cannot be considered as differing very much from the former. It is formed on the litigious recommended by Sydenham for stopping bleeding at the nofe, and other external hemorrhages; for this purpose cloths or doffils are to be dipped in the liquor, and applied to the part.

Water of ammoniated copper. L.

Take of lime-water, one pint; sal ammoniac, one dram. Let them stand together, in a copper vessel, till the ammoniac be saturated.

Sapphire-coloured water. E.

Take of lime-water, newly made, eight ounces; sal ammoniac, two scruples; verdigris, powdered, four grains. Mix them, and after 24 hours strain the liquor.

This is a much more elegant and convenient method than the preceding. This water is at present pretty much in use as a detergent of foul and obdurate ulcers, and for taking away specks or films in the eyes. The copper contributes more to its colour than to its medicinal efficacy; for the quantity of the metal dissolved is extremely small.

Compounded water of aceta<ed litharge. L.

Take of acetic acid water of litharge, two drams; distilled water, two pints; proof spirit, two drams. Mix the spirit with the aceta. acid water of litharge; then add the distilled water.
This liquor is of the same nature with solutions of vinegar of lead, and is analogous to the vegetable-mineral water of Mr. Goulard. It is only used externally as a坐nic against cutaneous eruptions, redness, inflammation, &c. But even here it is alleged that it is not altogether void of danger, and that there are examples of its continued employment having occasioned sundry ill consequences. But at the same time the very frequent use that is made of it with perfect impunity would lead us to conclude that in these observations there must be some mistake.

**Water of vitriolated zinc with camphor. L.**

Take of vitriolated zinc, half an ounce; camphorated spirit, half an ounce; boiling water, two pints. Mix, and filter through paper.

This is an improved method of forming the vitriolic camphorated water of the former editions of the London Pharmacopoeia. It is used externally as a lotion for some ulcers, particularly those in which it is necessary to refrain a great discharge. It is also used, and not unfrequently employed as a collyrium in some cases of ophthalmia, where a large discharge of watery fluid takes place from the eyes, with but little inflammation. But when it is to be applied to this tender organ, it ought, at first at least, to be diluted by the addition of more water.

**Vitriolic water. E.**

Take of white vitriol, sixteen grains; water, eight ounces; weak vitriolic acid, sixteen drops. Dissolve the vitriol in the water, and then adding the acid, strain through paper.

Where the eyes are watery or inflamed, this solution of white vitriol is a very useful application. The lighter inflammations will frequently yield to this medicine without any other assistance; in the more violent ones, venefection and cathartics are to be premised to its use.

**Plasters.**

Plasters are composed chiefly of oily and unctuous substances, united with powders into such a consistence that the compound may remain firm in the cold without sticking to the fingers; so that it may be soft and pliable in a low degree of heat, and that by the warmth of the human body it be so tenacious as readily to adhere both to the part on which it is applied and to the substance on which it is spread.

There is, however, a difference in the consistence of plasters, according to the purposes they are to be applied to: thus, such as are intended for the breast and stomach should be very soft and yielding, while those designed for the limbs are made firmer and more adhesive. An ounce of expressed oil, an ounce of yellow wax, and half an ounce of any proper powder, will make a plaster of the first consistence: for a hard one, an ounce more of wax, and half an ounce more of powder, may be added. Plasters may likewise be made of rhinos, gummy rhinos, &c. without wax, especially in extemoporous prescription: for officinals these compositions are less proper, as they soon grow too soft in keeping, and fall flat in a warm air.

**Plaster of Spanish flies. L.**

Take of Spanish flies, one pound; wax plaster, two pounds; prepared hog's lard, half a pound. Having melted the plaster and lard, a little before they congeal sprinkle in the flies, reduced to a very fine powder.

**Blistering plaster, or epistaphic plaster. E.**

Take of hog's lard, yellow wax, white reifin, cantharides, each equal weights. Beat the cantharides into a fine powder, and add them to the other ingredients, previously melted, and removed from the fire. Both these formulæ are very well suited to answer the intention in view, that of exciting blisters; for both are of a proper consistence, and sufficient degree of tenacity, which are here the only requisites. Cantharides of good quality, duly applied to the skin, never fail of producing blisters. When, therefore, the desired effect does not take place, it is to be ascribed to the flies either being faulty at first, or having their activity afterwards destroyed by some accidental circumstance; such as too great heat in forming, in spreading the plaster, or the like. And when due attention is paid to
to these particulars, the simple compositions now introduced answer the purpose better than those compounds plasters with mustard-feed, black pepper, vinegar, verdigris, and the like, which had formerly a place in our pharmacopoeias. It is not however improbable, that the pain of blistering-plasters might be considerably diminished by the addition of a portion of opium, without preventing the good effects otherwise to be derived from them.

Wax-plaster.

Take of yellow wax, prepared mutton-suet, each three pounds; yellow resin, one pound. Melt them together, and strain the mixture whilst it is fluid.

L.

Take of yellow wax, three parts; mutton-suet, white resin, two parts. Melt them together into a plaster; which supplies the place of mellit plaster.

This plaster had formerly the title of drawing-plaster, and was chiefly employed as a dressing after blisters, to support some discharge.

It is a very well contrived plaster for that purpose. It is calculated to supply the place of mellit plaster; whose great irritation, when employed for the dressing of blisters, has been continually complained of. This was owing to the large quantity of resin it contained, which is here on that account retrenched. It would seem that, when designed only for dressing blisters, the resin ought to be entirely omitted, unless where a continuance of the pain and irritation, excited by the vesicator, is required. Indeed plasters of any kind are not very proper for this purpose; their constitution makes them fit uneafy, and their adhesiveness renders the taking them off painful. Cerates, which are softer and less adhesive, appear much more eligible; the cerate of peppermint will serve for general use; and for some particular purposes, the cerate of yellow resin may be applied.

Cummin-plaster. L.

Take of the seeds of cummin, seeds of caraway, bay-berries, each three ounces; Burgundy-pitch, three pounds; yellow wax, three ounces. Mix, with the melted pitch and wax, the rest of the ingredients, powdered, and make a plaster.

This plaster stands recommended as a moderately warm diffusive; and is directed by some to be applied to the hypogastric region, for strengthening the viscera, and expelling flatulencies: but it is a matter of great doubt, whether it derives any virtue either from the article from which it is named, or from the caraway or bay-berries which enter its composition.

Fistula, commonly called anti-hysteria plaster. L.

Take of common plaster, asefetida, strained, each two parts; yellow wax, strained galbanum, each one part. Mix, and make them into a plaster.

This plaster is applied to the umbilical region, or over the whole abdomen, in hysterical cases; and sometimes with good effect; but probably more from its giving an additional degree of heat to the part, than from any influence derived from the fetid gums. It has indeed been alleged that from the application of this plaster to the abdomen, the taste of asefetida can be distinctly perceived in the mouth; and it is not improbable, that some absonption of its active parts may take place by the lymphatic vessels of the surface; while, at the same time, the asefetida thus applied must constantly, in some degree, act on the nerves of the nose. But, in both these ways, its influence can be inconsiderable only; and much more effect may be obtained from a very small quantity taken internally. And we are on the whole inclined to think, that the addition of the fetid gums to the common plaster is here more disagreeable than useful.

Ladanum plaster. L.

Take of ladanum, three ounces; frankincense, one ounce; cinnamon powdered, expressed oil, called oil of mace, of each half an ounce; essentail oil of peppermint, one dram. To the melted frankincense add first the ladanum, softened by heat; then the oil of mace. Mix these afterwards with the cinnamon and oil of mint, and beat them together in a warm mortar into a plaster. Let it be kept in a close vessel.

This has been considered as a very elegant stomach plaster. It is contrived so as to be easily made occasionally (for these kinds of compositions, on account of their volatile ingredients, are not fit for keeping), and to be but moderately adhesive, so as not to offend the skin, and that it may without difficulty frequently taken off and renewed; which these sorts of applications, in order to their producing any considerable effect, require to be. But after all, it probably acts more from the mere covering which it gives to the stomach, than from any of the articles abounding with essential oil which it contains.

Litharge-plaster. L.

Take of litharge, in very fine powder, five pounds; olive-oil, a gallon. Boil them with a slow fire, in about two pints of water, constantly stirring until the oil and litharge unite, and have the constitution of a plaster. But it will be proper to add more boiling water, if the water that was first added be nearly consumed before the end of the process.

Common plaster. L.

Take of litharge, one part; olive-oil, two parts; boil them, adding water, and constantly stirring the mixture till the oil and litharge be formed into a plaster.

The heat in these processes should be gentle, and the matter kept constantly stirring, otherwise it sticks up, and is apt to run over the vessel. If the composition proves dis-coloured, the addition of a little white lead and oil will improve the colour.

These plasters, which have long been known under the name of Diocleian, are the common application in excoriations of the skin, flight flesh wounds, and the like. They keep the part soft, and somewhat warm, and defend it from the air, which is all that can be expected in these cases from any plaster. Some
PHARMACY.

Part II.

Preparations and Compositions.

of our industrious medicine-makers have thought these purposes might be answered by a cheaper composition, and accordingly have added a large quantity of common whitening and hogs lard: this, however, is by no means allowable, not only as it does not stick so well, but likewise as the lard is apt to grow rancid and acrimonious. The counterfeit is distinguishable by the eye.

Litharge plaster with gum. L.

Take of litharge-plaster, three pounds; strainer galbanum, eight ounces; turpentine, ten drams; frank incense three ounces. The galbanum and turpentine being melted with a flow fire, mix with them the powdered frankincense, and afterwards the litharge-plaster melted with a very flow fire, and make a plaster.

Gum-plaster. E.

Take of common plaster, eight parts; gum-ammoniacum strainer, galbanum, yellow wax, each one part. Make them into a plaster according to art.

Both these plasters are used as digestive and suppurtives; particularly in abcesses, after a part of the matter has been maturated and discharged, for suppurating or discharging the remaining hard part; but it is very doubtful whether they derive any advantage from the gums entering their composition.

Litharge-plaster with quicksilver. L.

Take of litharge-plaster, one pound; purified quicksilver, three ounces; sulphurated oil, one dram, or what is sufficient. Make the plaster in the same manner as the ammoniacum-plaster with quicksilver.

Mercurial or blue plaster. E.

Take of olive-oil, white refin, each one part; quicksilver, three parts; common plaster, six parts. Melt the oil and refin together, and when this mixture is cold, let the quicksilver be rubbed with it till the globules disappear; then add by degrees the common plaster, melted, and let the whole be accurately mixed.

These mercurial plasters are looked on as powerful resolvents and diffuntants, acting with much greater certainty for these intestines than any composition of vegetable substanves alone; the mercury exerting itself in a considerable degree, and being sometimes introduced into the habit in such quantity as to affect the mouth. Pains in the joints and limbs from a venereal caufe, nodes, tophi, and beginning indurations of the glands, are said sometimes to yield to them.

Litharge plaster with resin. L.

Take of litharge-plaster, three pounds; yellow refin, half a pound. Mix the powdered refin, with litharge plaster, melted with a very flow fire, and make a plaster.

Sticking plaster. E.

Take of common plaster, five parts; white refin, one pound; scrapec, of each one part. Make them into a plaster, and as to make a plaster.

These plasters are used chiefly as adhesives for keeping on other dressings, &c.

Plaster of Burgundy pitch. L.

Take of Burgundy pitch, two pounds; ladanum, one pound; yellow refin, yellow wax, of each four ounces; the expressed oil, commonly called the oil of mace, one ounce. To the pitch, refin, and wax, melted together, add first the ladanum, and then the oil of mace.

This plaster was at one time much celebrated under the title of cephalic plaster, the name which it formerly held in our pharmacopoeias. It was applied in weakness or pains of the head, to the temples, forehead, &c. and sometimes likewise to the feet. Schulze relates, that an inveterate rheumatism in the temples, which at times extended to the teeth, and occasioned intolerable pain, was completely cured in two days by a plaster of this kind (with the addition of a little opium) applied to the part, after many other remedies had been tried in vain. He adds, that a large quantity of liquid matter exuded under the plaster in drops, which were so acrid as to corrode the cuticle: but it is probable, that this was much more the effect of the Burgundy pitch than of any other part of the composition; for when applied to a very tender skin, it often produces even vesication, and in moist infallences operates as rubefacient or hot plaster; and as far as it has any good effect in headach, it is probable that its influence is to be explained on this ground.

Soap-plaster. L.

Take of soap, half a pound; litharge-plaster, three pounds; mix the soap with the melted litharge plaster, and boil them to the thickness of a plaster.

Soapous plaster. E.

Take of common plaster, four parts; gum-plaster, two parts; Castile soap, scraped, one part. To the plasters, melted together, add the soap; then boil for a little, so as to form a plaster.

These plasters have been supposed to derive a resolvent power from the soap; and in the last, the addition of the gums is supposed to promote the resolvent virtue of the soap; but it is a matter of great doubt, whether they derive any material advantage from either addition.

Frankincense plaster. L.

Take of frankincense, half a pound; dragon’s blood, three ounces; litharge plaster two pounds. To the melted litharge-plaster add the refin, powdered.

This plaster had formerly in the London pharmacopoeia the title of strengthening plaster, and is a reformation of the complicated and injudicious composition described in the former pharmacopoeias, under the title of Emplastrum ad harenian. Though for the move elegant and simple, it is as effectual for that purpose as any of the medicines of this kind. If constantly worn with a proper bandage, it, in children, frequently does service: thought, perhaps, not so much from
from any strengthening quality of the ingredients, as from its being a soft, close, and adhesive covering. It has been supposed that plasters composed of hysteric medicines constringe and strengthen the part to which they are applied, but on no very just foundation; for plasters in general relax rather than affect, the unctuous ingredients necessary in their composition counteracting and destroying the effect of the others.

Defective or strengthening plaster. E.

Take of common plaster, twenty-four parts; white resin, six parts; yellow wax, oil olive, each three parts; colcothar of vitriol, eight parts. Grind the colcothar with the oil, and then add it to the other ingredients previously melted.

This plaster is laid round the lips of wounds and ulcers over the other dressings, for defending them from inflammation and a fluxion of humours; which, however, as Mr Sharp very justly observes, on account of their constipation, tend rather to bring on than to prevent. It is also used in weaknesses of the large muscles, as of the loins; and its effects seem to proceed from the artificial mechanical support given to the part, which may also be done by any plaster that adheres with equal firmness.

Deadly nightshade plaster. Brun.

Take of the juice of the recent herb of belladonna, linseed oil, each nine ounces; yellow wax, fix ounces; Venice turpentine, fix drams; powder of the herb of belladonna, two ounces. Let them be form

This plaster had formerly a place in our pharmacopoeias, but was rejected; and although still held in esteem by some, it is probably of no great value; at least it would seem to derive but little either from the fenugreek feed, with which it is now made, or from the oil and mucilages which formerly entered into its composition.

Henbane plaster. Suec.

This is directed to be prepared in the same manner as the emplastrum conio, or hemlock-plaster. From the well-known sedative power of this plant, as affaeting the nervous energy of the part to which it is applied, we might reasonably conclude that good effects might be obtained from it when used under the form of plaster and accordingly it has been with advantage employed in this manner, for allaying pain, and resolving swellings, in cases of leucitis and cancer.

Pitch plaster. Ross.

Take of white resin, fix ounces; sheep-pitch, seven ounces; yellow wax, five ounces. Melt them and form them into a plaster.

Pitch, applied externally, has been supposed to act on two principles, by its warmth and by its adhesive quality;
**Ointments and Liniments.**

Ointments and liniments differ from plasters little otherwise than in confluence. Any of the official plasters, diluted with so much oil as will reduce it to the thickness of stiff honey, forms an ointment: by farther increasing the oil, it becomes a liniment.

In making these preparations, the Edinburgh college directs its application only to a small portion at a time, the size of a crown piece or so; and after one part is fully cured, by application to another in succession, the affection may be soon completely overcome. With this intention it is most common to employ the pitch in its pure state: but the plaster here directed, while it is less adhesive, is more manageable and flexible.

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**Ointment of verdigris.**

Take of basilicon ointment, fifteen parts; verdigris, one part.

This ointment is used for cleansing sores, and keeping down fungous flesh. Where ulcers continue to run from a weakness in the vessels of the part, the tonic powers of copper promise considerable advantage.

It is also frequently used with advantage in cases of ophthalmia, depending on scrofula, where the pupils are principally affected, but when it is to be thus applied it is in general requisite that it should be somewhat weakened by the addition of a proportion of simple ointment or hog's lard. An ointment similar to the above, and celebrated for the cure of such instances of ophthalmia, has long been sold under the name of Smellon's eye-water.

**Ointment of the white calx of quicksilver.**

Take of the white calx of quicksilver, one dram; ointment of hog's lard, one ounce and a half. Mix, and make an ointment.

This is a very elegant mercurial ointment, and frequently used in the cure of obstinate and cutaneous affections. It is an improvement of the ointment of precipitated mercury of the late London pharmacopoeia; the precipitated sulphur being thrown out of the composition, and the quantity of mercury increased.

**Ointment of calx of zinc.**

Take of simple liniment, six parts; calx of zinc, one part.

This ointment is chiefly used in affections of the eyes, particularly in those cases where redness arises rather from relaxation than from active inflammation.

**Ointment of Spanish flies.**

Take of Spanish flies, powdered, two ounces; distilled water, eight ounces; ointment of yellow resin, eight ounces. Boil the water with the Spanish flies to one half, and strain. To the strained liquor add the ointment of yellow resin. Evaporate this mixture in a water-bath, saturated with sea-salt, to the thickness of an ointment.

**Episaltic ointment from infusion of cantharides.**

Take of cantharides, white resin, yellow wax, each one ounce; hog's lard, Venice turpentine, each two ounces; boiling water, four ounces. Infuse the cantharides in the water, in a close vessel, for a night; then strongly press out and strain the liquor, and boil it with the lard till the water be consumed; then add the resin, wax, and turpentine, and make the whole into an ointment.

These ointments, containing the soluble parts of the cantharides uniformly blended with the other ingredients, are more commodious, in general occasion less pain, and are no less effectual in some cases, than the compositions with the fly in substance. This, however, does
Preparations and Compositions.

Ointment of elemi. L.
Take of elemi, one pound; turpentine, ten ounces; mutton-fuet, prepared, two pounds; olive-oil, two ounces. Melt the elemi with the fuet; and having removed it from the fire, mix it immediately with the turpentine and oil, after which strain the mixture.

This ointment, perhaps best known by the name of linimentum arci; has long been in use for digesting cleansing; and incantating; and for these purposes is preferred by some to all the other compositions of this kind.

These however, are much more processes of nature than of art: and it is much to be doubted whether it has in reality any influence.

Ointment of white hellebore. L.
Take of the root of white hellebore, powdered, one ounce; ointment of hog’s lard, four ounces; essence of lemons, half a scruple. Mix them, and make an ointment.

White hellebore externally applied has long been celebrated in the cure of cutaneous afflictions; and this is perhaps one of the best formulae under which it can be applied, the hog’s lard ointment serving as an excellent basis for it, while the essence of lemons communicates to it a very agreeable smell.

Stronger ointment of quicksilver. L.
Take of purified quicksilver, two pounds; hog’s lard, prepared, twenty-three ounces; mutton-fuet, prepared, one ounce. First rub the quicksilver with the fuet and a little of the hog’s lard, until the globules disappear; then add what remains of the lard, and make an ointment.

Weaker ointment of quicksilver. L.
Take of the stronger ointment of quicksilver, one part: hog’s lard, prepared, two parts. Mix them.

Quicksilver or blue ointment. E.
Take of quicksilver, mutton fuet, each one part; hog’s lard, three parts. Rub them carefully in a mortar till the globules entirely disappear.

This ointment may also be made with double or triple the quantity of quicksilver.

These ointments are principally employed, not with a view to their topical action, but with the intention of introducing mercury in an active state into the circulatory system. And this may be effected by gentle friction on the found skin of any part, particularly on the inside of the thighs or legs. For this purpose, these simple ointments are much better suited than the more compounded ones with turpentine and the like, formerly employed. For by any acid substance topical inflammation is apt to be excited, preventing farther friction, and giving much uneasiness. To avoid this it is necessary, even with the middle and weakest ointment, somewhat to change the place at which the friction is performed. But by these ointments properly managed, mercury may in some instances be as advantageously introduced, either for eradicating syphilis.
lis, or combating other obninate diseases as under any form whatever. But to obtain these effects, it is requisite that the ointment should be prepared with very great care; for upon the degree of triture which has been employed, the activity of the mercury must entirely depend. The addition of the mutton-fuet, now adopted by both colleges, as an advantage to the ointment, as it prevents it from running into the state of oil, which the hog's lard alone in warm weather, or in a warm chamber, is sometimes apt to do, and which is followed by a separation of parts. We are even inclined to think, that the proportion of suet directed by the London college is too small for this purpose, and indeed seems to be principally intended for the more effectual triture of the mercury: But it is much more to be regretted, that, in a medicine of activity, the two colleges should not have directed the same proportion of mercury to the fatty matter. For although both have directed ointments of different strength, neither the weakest nor the strongest agree in the proportion of mercury which they contain.

Ointment of nitrate of quicksilver.

Take of purified quicksilver, one ounce; nitrous acid, two ounces; hogs lard, prepared, one pound. Dissolve the quicksilver in the nitrous acid; and, while it is yet hot, mix it with the hog's lard, previously melted, and just growing cold.

Yellow ointment. E.

Take of quicksilver, one ounce; spirit of nitre, two ounces; hogs lard, one pound. Dissolve the quicksilver in the spirit of nitre, by digestion in a sand-heat; and, while the solution is very hot, mix with it the lard, previously melted by itself, and just beginning to grow stiff. Stir them briskly together, in a marble mortar, to as to form the whole into an ointment.

These ointments differ only in name; and that employed by the London college is certainly the preferable appellation: For here the quicksilver, previous to its union with the lard, is brought to a saline state by means of the nitrous acid. And although its activity be very considerably moderated by the animal fat with which it is afterwards united, yet it still affords us a very active ointment; and as such it is frequently employed with success in cutaneous and other topical affections. In this condition, however, the mercury does not so readily enter the system as in the preceding form. Hence it may even be employed in some cases with more freedom; but in other infirmities it is apt to excoriate and inflame the parts. On this account a reduction of its strength is sometimes requisite; and it is often also necessary, from the hard consistence which it acquires, in consequence of the action of acid on the lard.

Tar ointment.

Take of tar, mutton-fuet prepared, each half a pound. Melt them together and strain.

Take of tar, five parts; yellow wax, two parts. These compositions, though the one beformed into an ointment by means of fat, the other by wax, can not be considered as differing essentially from each other. As far as they have any peculiar activity, this entirely depends on the tar. And this article, from the empyreumatic oil and saline matters which it contains, is undoubtedly, as well as turpentine, of some activity. Accordingly, it has been successfully employed against some cutaneous affections, particularly those of domestic animals. At one time, as well as the black basilicon, it was a good article employed as a dressing even for recent wounds. But although it still retains a place in our pharmacopoeias, it is at present little used with any intention.

Ointment of yellow resin. L.

Take of yellow resin, yellow wax, each one pound; olive oil, one pint. Melt the resin and wax with a slow fire; then add the oil, and strain the mixture while hot.

Basilicon ointment. E.

Take of hog's lard, eight parts; white resin, five parts; yellow wax, two parts. These are commonly employed in dressings, for digesting, cleansing, and incarnating wounds and ulcers. They differ very little, if at all, in their effects, from the Eminent unarmed, or ointment of elemi, as it is now more properly styled. But it is probable that no great effect is to be attributed to either: For there can be no doubt that the suppurative and adhesive inflammations are processes of nature, which will occur without the aid of any ointment.

Elder ointment. L.

Take of elder flowers, four pounds; mutton-fuet, prepared, three pounds; olive-oil, one pint. Boil the flowers in the suet and oil, first melted together, till they be almost crisp; then strain with expression. This ointment does not seem superior to some others, which are much neater, and less expensive. It can scarcely be supposed to receive any considerable virtue from the ingredient form which it takes its name. And accordingly it is not without propriety that it is rejected from the pharmacopoeia of the Edinburgh college.

Ointment of spermaceti. L.

Take of spermaceti, six drams; white wax, two drams; olive-oil, three ounces. Melt them together over a slow fire, stirring them coolly and briskly until they be cold. This had formerly the name of white liniment, and it is perhaps only in confidence that it can be considered as differing from the simple ointment already mentioned, or the simple cerate afterwards to be noticed.

Sulphur ointment. L.

Take of ointment of hog's lard, half a pound; flowers of sulphur, four ounces. Mix them, and make an ointment.

Ointment of sulphur, or auris oris ointment. E.

Take of hog's lard, four parts; sulphur, beat into a
vory fine powder, one part. To each pound of this ointment add effence of lemons, or oil of lavender, half a dram.

Sulphur is a certain remedy for the itch, and safer than mercury. Sir John Fringle observes, that unless a mercurial unction was to touch every part of the skin, there can be no certainty of success: whereas from a sulphureous one, a cure may be obtained by only partial unctio, the animalcula, which are supposed to occasion this disorder being like other insects, killed by the sulphureous fumes which exhale by the heat of the body. As to the internal use of mercury, which some have accounted a specific, there are several instances of men undergoing a complete salivation for the cure of the lues venerea, without being freed from the inconvenience this disorder being like other

The quantity of ointment, above directed, serves for four unctious: the patient is to be rubbed every night; but to prevent any disorder that might arise from stopping too many pores at once, a fourth part of the body is to be rubbed at one time. Though the itch may thus be cured by one pot of ointment, it will be proper to renew the application, and to touch the parts most affected for a few nights longer, till a second quantity also be exhausted: and in the worst cases, to subjoin the internal use of sulphur, not with a view to purify the blood, but to diffuse the fumes more certainly through the skin: there being reason to believe, that the animalcula may sometimes lie too deep to be thoroughly destroyed by external applications.

Tutty ointment.

654 Take of prepared tutty one dram; ointment of spermaceti, what is sufficient. Mix them so as to make a soft ointment. L. Take of simple liniment, five parts; prepared tutty, one part. E.

These unctious have long been celebrated, and are still much employed against affections of the eyes. But they cannot, we imagine, be esteemed elegant.

Both calamine and tutty act only by means of the zinc they contain, and calamine appears to contain the mol of the two, and likewise to be the least variable in its contents. But the pure flowers prepared from zinc itself are doubleless preferable to either. Hence the ointment of tutty may be considered as inferior to both the ointment of calamine and to the ointment of the cak of zinc, which have also a place in our pharmacopoeia.

Simple liniment. L.

655 Take of olive oil, four parts; white wax, one part.

This consists of the same articles which form the simple ointment of the Edinburgh pharmacopoeia, but merely in a different proportion, so as to give a thinner consistence; and where a thin consistence is requisite, this may be considered as a very elegant and useful application.

Liniment of ammonia.

656 Take of water of ammonia, half an ounce; olive-oil, one ounce and a half. Shake them together in a phial till they are mixed.

This has long been known in the flops under the title of volatile liniment, but is now more properly denominated from the principal active article, which enters its composition. It has been much employed in practice, particularly on the recommendation of Sir John Fringle in his Observations on the Diseases of the Army. He observes, that, in the inflammatory quinsey, or strangulation of the fauces, a piece of flannel, moistened with this mixture, applied to the throat, and renewed every four or five hours, is one of the most efficacious remedies. By means of this warm stimulating application, the neck, and sometimes the whole body is put into a sweat, which after bleeding either carries off or lefens the inflammation. Where the skin cannot bear the acrimony of this mixture, a larger proportion of oil may be used.

Stronger liniment of ammonia.

657 Take of water of pure ammonia, one ounce; olive oil, two ounces. Shake them together in a phial.

This article differs from the foregoing in strengt only. This arises both from its being formed of a more acrid spirit, and from its containing that spirit in a larger proportion to the oil. It is used to supply the place of the epithema et emplagrium volatile of our former pharmacopoeias, and is a very acrid stimulating composition. When largely applied, it often excites inflammation, and even vesication, on tender skin. It is often however successfully employed against obtinate rheumatic and ichthiac pains.

Camphor liniment. L.

658 Take of camphor, two ounces; water of ammonia, six ounces; simple spirit of lavender, sixteen ounces. Mix the water of ammonia with the spirit, and diffuse from a glass retort, with a flow fire, sixteen ounces. Then dissolve the camphor in the distilled liquor.

This formula, which has now for the first time a place in the London pharmacopoeia, approaches to the volatile essence of that celebrated empyric the late Dr Ward: But the above is a more elegant and active formula than either of the receipts published by Mr Page, from Dr Ward's book of receipts; and there is no reason to doubt that it will be equally effectual in removing some local pains, such as particular kinds of headach, in consequence of external application.

Soap liniment. L.

659 Take of soap, three ounces; camphor, one ounce; spirit of rosemary, one pint. Digest the soap in the spirit of rosemary until it be dissolved, and add to it the camphor.

This is the soap liniment of the former edition of the London pharmacopoeia, without any alteration: and it differs very little from the soap-balm of the Edinburgh college already mentioned. Though a less active and penetrating application than the preceding, it is perhaps no less useful: and it is often successfully employed for external purposes against rheumatic pains, sprains bruises, and similar complaints.
Part II.  

**Egyptian ointment.** Gen.

Take of honey, one pound; strong vinegar half a pound; verdigris, powdered, five ounces. Let the ingredients be boiled together till the verdigris be dissolved, so that the ointment may have a due degree of thickness and a purple colour.

This preparation had formerly a place in our pharmacopoeias under the title of *Egyptian honey*; and a similar preparation has now a place under the title of *osmyl of verdigris.* But in that formula, the proportion is much less than in the above. It may justly be considered as a very powerful application for cleaning and deterring foul ulcers, as well as for keeping down fungous flesh. But these purposes may in general be answered by articles less acid, and exciting less pain. Besides this, the above preparation is also liable to considerable uncertainty with respect to strength; for a large proportion of the verdigris will in a short time subside to the bottom; thus, what is in the top of the pot is much less active than that in the bottom.

**Anodyne ointment.** Gen.

Take of olive-oil, ten drams; yellow wax, half an ounce; crude opium, one dram. Mix them according to art, to as to form an ointment.

Opium thus externally applied, will in some degree be productive of the same effect as when used under the form of the anodyne balsam. In that state it produces its effects more immediately; but under the present form its effects are more permanent. Besides this, the present ointment furnishes us with a useful dressing for sores attended with fever and pain; to which opium when dissolved in spirit cannot be applied. Hence the present, or some analogous formula, is wellintituled to a place in our pharmacopoeias.

**Ointment for an ulcerated cancer.** Brun.

Take of the recently expressed juice of the ricinus, one pound; let it be exposed to the rays of the sun in a leaden vessel till it acquire the consistence of an oil; then to one pound of this infusipated juice add calcined lead, white precipitate mercury, each one ounce. Let them be properly mixed.

This acid application must possess a considerable degree of corrosive power. And in some cases of cancer, by the proper application of corrosives much benefit may be done: But where the disease has made any considerable progress, these will in general have the effect rather of hardening its progress than of removing it; particularly if there be a large indolent tumor below the ulcer.

**Digestive ointment.** Roff.

Take of Venice turpentine, one pound; the yolks of eight eggs. Mix them together according to art. This warm stimulating application is well fitted to promote the purgative inflammation, and may be advantageously had recourse to, where it is necessary to encourage a large discharge of pus.

**Hemorrhoidal ointment.**

Take of saturnine ointment, six drams; oil of hyoscya-...
tis and the like. It is, however, very doubtful how
far these properties depend on the fisax. If it have
really any good effect, it is probable that this is more
the consequence of the friction merely, than of any of
the articles which enter the composition of the oint-
ment. But there is reason to believe that the virtues
attributed to this ointment are more imaginary than
real.

Onion ointment. Suec.

Take of yellow wax, refin, each half a pound. To
these melted, add onions roasted under the ashes,
honey, each two pounds and a half; black soap, half
a pound. Let them be gently boiled together till
all the moisture be consumed, then strain the liquor,
expressing it from the materials, and afterwards agi-
tate it with a wooden pestle that it may unite into
one uniform mass.

This ointment is applied with the intention of pro-
moting suppuration. And it has long been feared,
that the onion, especially in its roasted state,
has a remarkable influence in this way: but there is reason to
think, that the powers attributed to it have been
greatly

Take of yellow wax, each half a pound; olive
oil, one pint. Melt the wax with the oil; and, as soon as the mixture begins to thick-
en, mix with it the calamine, and stir the ointment
until it be cold.

Cerate of Calamine. E.

Take of simple cerate, five parts; calamine prepared,
one part.

These compositions are formed on the cerate which
Turner strongly recommends in cutaneous ulcers
ations and excoriations, and which has been usually distingui-
ished by his name. They appear from experience
to be excellent epulotics, and as such are frequently
used in practice.

Cerate of acetated litharge. L.

Take of water of acetated litharge, two ounces and
a half; yellow wax, four ounces; olive oil, nine on-
ces; camphor, half a dram. Rub the camphor with
a little of the oil. Melt the wax with the remaining
oil; and as soon as the mixture begins to thicken,
pour in by degrees the water of acetated litharge,
and stir constantly until it be cold; then mix in the
camphor before rubbed with oil.

This application has been rendered famous by the
recommendations of Mr Goulard. It is unquestion-
able in many cases very useful. It cannot, however,
be considered as varying essentially from the fatum-
ointment, or ointment of acetated ceruse, formerly
mentioned. It is employed with nearly the same in-
tentions, and differs from it chiefly in consistence.

Cerate of yellow refin. L.

Take of ointment of yellow refin, half a pound; yel-
low wax, one ounce. Melt them together, and make
a cerate.

This had formerly the name of lemon ointment. It
is no otherwise different from the yellow balsamic,
or ointment of yellow refin, than being of a thinner consistence,
which renders it for some purposes more com-
modious.

Soap cerate. L.

Take of soap eight ounces; yellow wax, ten ounces;
litharge, powdered, one pound; olive oil, one pint;
vinegar, one gallon; boil the vinegar with the litharge
over a slow fire, constantly stirring until the mixture
unites and thickens; then mix in the other articles,
and make a cerate.

This, notwithstanding the name, may rather be con-
sidered as another fatumile application; its activity
depending very little on the soap; and it may be held
as varying in little else but consistence from the platter of
litharge. It can hardly be thought to differ in its

Cerate of cantharides, or Spanifh flies. L.

Take of cerate of fpermaceii, softened with heat, six
drams; Spanifh flies, finely powdered, one dram.
Mix them.

Under this form cantharides may be made to act to
any extent that is requisite. It may supply the place
either of the blistering plaster or ointment; and there
are cases in which it is preferable to either. It is par-

 however; and in supporting a drain under the form of isfue,
it is less apt to spread than the softer ointment.

Cerate of cantharides, or Spanifh flies. L.
Part II.

PHARMACY.

Cerate of opomacti. L.
Take of opomacti, half an ounce; white wax, two ounces; olive oil, four ounces. Melt them together, and stir until the cerate be cold.

This had formerly the name of sublute cerate, and it differs in nothing from the ointment of opomacti, or white liniment, as it was formerly called, excepting in confidence, both the wax and the opomacti being in a greater proportion to the oil.

Lip jodex. Roff.

Take of olive oil, eighteen ounces; white wax, one pound; opomacti, an ounce and a half; oil of rhodium, half a dram. Form a cerate, tinging it with alkanet, so as to give a red colour.

The name affixed to this cerate points out the use for which it is intended. It is chiefly employed against those chaps and excoriations of the lips, which are often the consequence of cold weather; and it is very well suited for removing affections of that kind. But excepting in the colour and smell which it derives from the alkanet and rhodium, it differs in nothing from the cerate of opomacti, and cannot be confounded as more effectively assuaging the intention in view.

Bougies. Sucx.

Take of yellow wax, melted one pound; opomacti, three drams; vinegar of litharge, two drams. Mix them, and upon removal from the fire immerse into the mixture the slips of linen, of which bougies are to be formed according to the rules of art. These may also be made with double, triple, or quadruple, the quantity of the vinegar.

It is perhaps rather surprising, that no formula for the preparation of bougies has a place in our pharmacopoeias: for, there can be no doubt, that although the preparation of them has hitherto been principally attributed to empirics, yet in the hand of the skilful practitioner they are of great service in exalting obilimate affections. Although it has been pretended by some that their influence is to be attributed to certain impregnations; yet it is on better grounds contended, that they act entirely on mechanical principles. The great object is therefore to obtain the union of a proper degree of firmness and flexibility. These qualities the above composition possesses; and it does not probably derive any material benefit from being prepared with an additional proportion of the vinegar of litharge.

Chap. XXXIV. Epithems.

By epithems or cataplasm are in general underflod those external applications which are brought to a due consistence or form for being properly applied, not by means of oily or fatty matters, but by water or watery fluids. Of these not a few are had recourse to in actual practice; but they are seldom prepared in the shops of the apothecaries; and in many of the best modern pharmacopoeias no formula of this kind is introduced. The London college, however, although they have abridged the number of epithems, still retain a few. And it is not without some advantage that there are fixed forms for the preparation of them.

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Cataplasm of cummin. L.
Take of cummin-seed, one pound; bay-berries, dry leaves of water-gernander, or forrumin, Virginia snake-root, of each three ounces; cloves, one ounce. Rub them all together; and, with the addition of three times the weight of honey, make a cataplasm.

This is adopted into the present edition of the London pharmacopoeia with a very little alteration from the left. It was formerly intended as a reformation of the theria of the London pharmacopoeia, which for some time past has been scarcely otherwise used than as a warm cataplasm. In place of the numerous articles which formerly entered that composition, only six of its ingredients are retained as contributing most to this intention: but even the article from which it now derives its name, as well as several others which still enter it, probably contribute very little to any medical propriety it may possess.

Mustard cataplasm. L.
Take of mustard seed, powdered, crumb of bread, each half a pound; vinegar, as much as is sufficient. Mix, and make a cataplasm.

Epithems of this kind are commonly known by the name of epispia. They were formerly not unfrequently prepared in a more complicated state, containing garlic, black soaps, and other similar articles; but the above simple form will answer every purpose which they are capable of accomplishing. They are employed only as application: they often inflame the part and raise blisters, but do not perfectly as cantharides. They are frequently applied to the soles of the feet in the low state of acute diseases, for raising the pulse and relieving the head. The chief advantage they have depends on the fuddeness of their action.

Alum-curd. L.
Take the whites of two eggs; flake them with a piece of alum till they be coagulated.

This preparation is taken from Riverius. It is an useful astringent epithem for sore, moist eyes, and excellently cools and represses thin discharges. Slighter inflammations of the eyes, occasioned by dust, exposure to the sun, or other similar causes, are generally removed by fomenting them with warm milk and water, and washing them with solutions of white vitriol. Where the complaint is more violent, this preparation, after the inflammation has yielded a little to bleeding, is one of the best external remedies. It is to be spread on lint, and applied at bed-time.

A Table, showing in what proportions Mercury or Opium enter different formula.

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<th>Preparations and Compositions</th>
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<tr>
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P. in se curis compositum cum opio. L. In about forty-four grains, one grain of opium is contained.

Pulvis ipecacuanthae compositus. L. In ten grains, one grain of opium.

Pulvis sodorificus. E. In eleven grains, one grain of opium.

Pulvis opiiatus. L. In ten grains, one grain of opium.

Pulvis e feumamento cum calomelano. L. In four grains, one grain of calomel.

3 K Pilula
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Aphorisms, (Horner, Strabo, &c.), a small oblong isl
and, adjoining to the continent of Egypt, over
against Alexandria. On this island stood a ca
gnominal light tower, of four sides, each side a fadum in length: and the tower so high as to be seen 100 miles off. Some affirm, each of its four corners rested on a large ear
 Crab of glass or of hard transparent stone of Ethiopia or Memphis. Others imagine the crabs were only added externally to the base by way of ornament, or as emblematical of its situation and use. The architect was Sostratus the Chian, as appears by an inscription on the tower, under Ptolemy Philadelphus, who laid out 800 talents upon it. On account of the port of Alexandria, the entrance to which was difficult and dangerous, the Pharos was called the key of the Egyptian sea, or even of Egypt itself (Lucullus: and Pharaoh, from being a proper name, it become an apppellative to denote all light houses.
enemy kept their ranks, expecting quietly the signal of battle, and on the contrary how impatient and unsteady his own men were, running up and down in great disorder for want of experience, he began to be afraid left his ranks should be broken upon the first onset; and therefore commanded the foot in the front to keep their ground, and quietly wait for the enemy. The two armies, though within reach of each other, kept a mournful silence; but at length the trumpets sounded the charge, and Caesar's army advanced in good order to begin the attack, being encouraged by the example of one Caius Crassinus, a centurion, who at the head of 120 men threw himself upon the enemy's first line with incredible fury. This he did to acquit himself of a promise he had solemnly made to Caesar, who, meeting him as he was going out of his tent in the morning, asked him, after some discourse, What his opinion was touching the event of the battle? To which he, stretching out his hand, replied aloud, Thine is the victory, Caesar; thou shalt gloriously conquer, and myself this day will be the subject of the profane either dead or alive. In pursuance of this promise he broke out of his rank as soon as the trumpet sounded; and, at the head of his company, ran in upon the enemy, and made a great slaughter of them. But while he was still pressing forward, forcing his way through the first line, one of Pompey's men ran him in at the mouth with such violence, that the point of his sword came out at the hind part of his neck. Upon his death Pompey's soldiers took courage, and with great bravery flooded the enemy's onset. While the foot were thus sharply engaged in the centre, Pompey's horse in the left wing marched up confidently; and having first widened their ranks, with a design to surround Caesar's right wing, charged his cavalry, and forced them to give ground. Hereupon Caesar ordered his horse to retreat a little, and give way to the six cohorts, which he had posted in the rear as a body of reserve. These, upon a signal given, coming up, charged the enemy's horse with that resolution and good order which is peculiar to men who have spent all their lives in camps. They remembered their instructions, not striking at the legs or thighs of the enemy, but aiming only at their faces. This unexpected and new mode of fighting had the desired effect. For the young patricians, whom Caesar contemptuously calls the pretty young dancers, not being able to bear the thoughts of having their faces deformed with fears, turned their backs, and, covering their faces with their hands, fled in the utmost confusion, leaving the foot at the mercy of the enemy. Caesar's men did not pursue the fugitives; but charging the foot of that wing, now naked and unguarded, surrounded them, and cut most of them in pieces.

Pompey was so transported with rage, in seeing the flower of his forces thus put to flight or cut in pieces, that he left his army, and retired slowly towards his camp, looking more like a man distracted and beside himself than one who by his exploits had acquired the name of the Great. When he had reached the camp, he retired to his tent without speaking a word to any; and continued there, like one distracted and out of his senses, till his whole army was deserted. Caesar no sooner saw himself master of the field than
he marched to attack the enemy's entrenchments, that, Pompey might not have time to recollect himself. When Pompey was informed that his rival was advancing to attack his entrenchments, he then felt it seemed to have recovered his senses, and cried out, What, into my camp too! He said no more; but immediately laying aside the marks of his dignity, and putting on such a garment as might befit favour his flight, he rode out at the decuman gate, and took the road to Larissa, which city had hitherto shown great attachment to him. In the mean time Caesar began the attack on the enemy's camp, which was vigorously defended by the cohorts Pompey had left to guard it; but they were at length forced to yield. Caesar was not a little surprised, when, after having forced the entrenchments, he found the enemy's tents and pavilions covered with carpets and hangings, their couches strewed with flowers, their tables ready spread, and sideboards set out with abundance of plate, bowls, and glaflies, and some of them even filled with wine. So great was the confidence of Pompey's party, that they made preparations before hand for pleasures to be enjoyed after the victory, which they thought certain. In Pompey's tent, Caesar found the box in which he kept his letters: but, with a moderation and magnanimity worthy of himself, he burnt them all, without reading one; saying, that he had rather be ignorant of crimes, than obliged to punish them.

The next day, when the dead were numbered, it appeared that Caesar had scarce lost 200 men; among whom were about 30 centurions, whom Caesar caused to be buried with great solemnity. He did particular honours to the body of Cato, whom he had begun the battle; and ordered his ashes to be deposited in a tomb, which he erected to his memory. On Pompey's side, the number of the dead amounted to 15,000 according to some, and to 25,000 according to others. Caesar took 24,000 prisoners, eight eagles, and 180 ensigns.

Pharsalia, an epic poem, composed by Lucan on the civil war between Pompey and Caesar, and particularly on the victory of the latter over the former, of which we have given an account in the preceding article. It is a poem universally acknowledged to have great beauties and great defects; but we are the least capable of estimating its merit as a whole, that either time has deprived us of the last books, or its author has left it incomplete. "The subject of the Pharsalia (says an excellent critic) carries undoubtedly all the epic grandeur and dignity: neither does it want unity of object, viz. the triumph of Caesar over the Roman liberty. In the choice of that subject, he thinks, however, that the author was not happy. The civil wars were too recent to admit in the description of them the embellishments of fiction and machinery. The fables of the gods mixed with the exploits of Caesar and Pompey, instead of raising, would have diminished, the dignity of such well known facts."

Another objection to the subject, perhaps more forcible than this, arises from the success of the war and the abilities of the generals. Lucan was a friend to liberty, and wished to raise the character of Pompey and Cato; but in spite of his utmost efforts, they are always eclipsed by the superior talents and consequent successes of Caesar. All his characters, however, are drawn with spirit, and with uncommon regard to truth; and some of the speeches which he puts into the mouths of his heroes are equal for moral sublimity to any thing that is to be found in all antiquity.

"There are in the Pharsalia (continues the critic already quoted) several very poetical and spirited descriptions. But the author's chief strength does not lie either in narration or description. His narration is often dry and harsh; his descriptions are often overcrowded, and employed too upon disagreeable objects. His principal merit consists in his sentiments, which are generally noble and striking, and expressed in that glowing and ardent manner which peculiarly distinguishes him. Lucan is the most philosophical and the most public-spirited poet of all antiquity. He was the nephew of the famous Seneca the philosopher; was himself a Stoic; and the spirit of that philosophy breathes throughout his poem. We must observe, too, that he is the only ancient epic poet whom the subject of his poem really and deeply interested. Lucan recounted no fiction. He was a Roman, and had felt all the direful effects of the Roman civil wars, and of that fever despotism which succeeded the loss of liberty. His high and bold spirit made him enter deeply into this subject, and kindle, on many occasions, into the most real warmth. Hence, he abounds in exclamations and apotropaics, which are almost always well timed, and supported with a vivacity and fire that do him no small honour."

"But it is the fate of this poet, that his beauties can never be mentioned, without their suggesting his blemishes also. As his principal excellency is a lively and glowing genius, which appears sometimes in his descriptions, and very often in his sentiments, his great defect in both is want of moderation. He carries everything to an extreme. He knows not where to stop. From an effort to aggrandise his objects, he becomes tumbled and unnatural; and it frequently happens, that where the second line of one of his descriptions is sublime, the third, in which he meant to rise still higher, is perfectly bombast. Lucan lived in an age when the fictions of the declaimers had begun to corrupt the eloquence and taste of Rome. He was not free from the infection; and too often, instead of showing the genius of the poet, betrays the spirit of the declaimer; but he is, on the whole, an author of lively and original genius."

Pharus, in botany: A genus of the hexandria order, belonging to the monoeica class of plants; and in the natural method ranking under the fourth order, Gramins. The male calyx is a bivalved uniflorous glume; the corolla, a bivalved glume; the female calyx the same with the male; the corola an uniflorous, long, and wrapping glume. There is but one feed.

Pharynx, in anatomy. See there, p. 705, 709.

Phascum, in botany: A genus of the order of must, belonging to the cryptogamia class of plants. The anther is opeculated, with a ciliated mouth; the calyptra are minute.

Phaseolus, the kidney bean; a genus of the deciduaria order, belonging to the diaphila class of plants. There is only one species; but of this there are many varieties. Those principally cultivated for the table are, 1. The common white, or Dutch kidney-bean.
Phaeolus, bean. 2. The smaller kidney-bean, commonly called the Battersea kidney-bean. And, 3. The upright fort, called the tree kidney-bean.

1. The first fort was some time ago propagated in England, and is still in Holland; it grows very tall, and requires long flakes and poles to climb on, and its beans are considerably broad; this makes them less saleable in the markets, people supposing them to be old because they are broad; and they are hence grown into diffuse, though a much more valuable kind for eating than any other.

2. The second fort, or Battersea bean, is what is more universally cultivated: it never grows very tall, nor rambles far, and the air can easily pass between the rows, because of its moderate growth; and this makes it bear plentifully, and ripen well for the table. It is the best tasted bean, except the last.

3. The third, or tree kidney-bean, is also a plentiful bearer, and never rambles, but grows up in form of a shrub; but its beans are broader than the Battersea kind, and are not so well tasted.

They are well propagated from seeds, which are to be put into the ground in the latter end of March or beginning of April for an early crop: but these should have a warm situation and a dry soil; they must also be planted in a dry season. The manner of planting them is, to draw lines with a bough over the bed, at two feet and a half distance, into which the seeds are to be dropped out about two inches asunder; and the earth is to be drawn over them with the head of a rake, to cover them about an inch deep. In a week or two after sowing, the plants will appear, and the earth should be drawn up about their stalks as they rise up; for other plants.

As the shoots again and flourishes as before; but it is not yet ascertained whether it puts forth any new roots. The seeds are not alimentary when withered, as if nature designed them only for propagating other plants. Every use which a farinaceous plant can supply, this new phaeolus has successfully answered; and the seeds in the hands of Meffrs. Herrier and Thouin will probably furnish a sufficient quantity for curiosity as well as use.

PHASES, in astronomy, from the Greek word φασμα, "to appear;" the several appearances or quantities of illumination of the moon, Venus, Mercury, and the other planets. See Astronotom.

PHASGA, or PIGAH, (Moses), a mountain on the other side Jordan, joined to Abarim and Nebo, and running south to the mouth of the Arnon: from which Moses had a view of the promised land, and where he died, having before appointed Joshua his successor. Wells takes Pifgah and Nebo to be different names of one, and the same mountain, a part or branch of the mountains Abarim, (Deut. xxxii. 49. compared with Deut. xxxiv. 1.) Or that the top of Nebo was peculiarly called Pifgah; or some other part of it, cut out in steps, as the primitive word denotes: and thus it is rendered by Aquila, by a Greek word signifying cut out (Jerome). There was also a city of this name, id.; and the adjoining country was in like manner called Pifgah, id.

PHASIANUS, in ornithology, a genus belonging to the order of gallinae. The cheeks are covered with a smooth naked skin.

Gibbons, in his Roman History, tells us, that the name Phasianus is derived from the river Phasis, the banks of which is the native habitation of the phasian. See Phasis.

1. The gallus, or common dunghill cock and hen, Dung-hill with a compressed caruncle or fleshy comb on the top cock of the head, and a couple of caruncles or wattles under the chin. The ears are naked, and the tail is compressed and eroded. Of all other birds, perhaps this species affords the greatest number of varieties; there being scarce two to be found that entirely resemble each other in plumage and form. The tail, which makes such a beautiful figure in the generality of these birds, is yet found entirely wanting in others; and only the

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the tail, but the rump also. The toes, which are usually four in all animals of the poultry kind, yet in a species of the cock are found to amount to five. The feathers, which lie so sleek and in such beautiful order in most of those we are acquainted with, are in a peculiar breed all inverted, and stand staring the wrong way. Nay, there is a species that comes from Japan, which instead of feathers seems to be covered over with hair.

It is not well ascertained when the cock was first made domestic in Europe; but it is generally agreed that we first had him in our Western world from the kingdom of Perse. Aristophanes calls the cock the Perian bird; and tells us he enjoyed that kingdom before some of its earliest monarchs. This animal was in fact known so early even in the most favage parts of Europe, that we are told the cock was one of the forbidden foods among the ancient Britons. Indeed, the domestic fowl seems to have banished the wild one. Perse itself, that first introduced it to our acquaintance, seems no longer to know it in its natural form: and if we did not find it wild in some of the woods of India, we should never have doubted, as has been done with regard to the sheep, in what form it might begin to doubt, as has been done with regard to a certain quantity from the beginning, that must necessarily cease to lay, there being no new ones generated within.

The hen seldom clutches a brood of chickens above once a season, though instances have been known in which they produced two. The number of eggs a domestic hen will lay in the year is above 200, provided she be well fed and supplied with water and liberty. It matters not much whether she be trodden by the cock or no; she will continue to lay, although the eggs of this kind can never by hatching be brought to produce a living animal. Her nest is made without any care, if left to herself; a hole scratched into the ground, among a few bushes, is the only preparation she makes for this season of patient expectation. Nature, almost exhaled by its own fecundity, seems to inform her of the proper time for hatching, which the herself testifies by a clucking note, and by discontinuing to lay. The good housewives, who often get more by their hens laying than by their chickens, often artificially protract this clucking season, and sometimes entirely remove it. As soon as a hen begins to cluck, they flint her in her provisions; which, if that fails, they plunge her into cold water; this, for the time, effectually removes her hatching; but then it often kills the poor bird, who takes cold and dies under the operation.

If left entirely to herself, the hen would seldom lay above 20 eggs in the same nest, without attempting to hatch them; but in proportion as she lays, her eggs are removed; and she continues to lay, vainly hoping to increase the number. In the wild state, the hen seldom lays above 15 eggs; but then her provision is more difficultly obtained, and she is perhaps sensible of the difficulty of maintaining too numerous a family.

When the hen begins to sit, nothing can exceed her perseverance and patience; she continues for some days immovable; and when forced away by the importunities of hunger, she quickly returns. Sometimes also her eggs become too hot for her to bear, especially if she be furnished with too warm a nest within doors, for then she is obliged to leave them to cool a little; thus the warmth of the nest only retards incubation, and often puts the brood a day or two back in the shell. While the hen sits, she carefully turns her eggs, and even removes them to different situations; till at length, in about three weeks, the young brood begin to give signs of a desire to burst their confinement. When by the repeated efforts of their bill, which serves like a pioneer on this occasion, they have broke themselves a passage through the shell, the hen still continues to sit.
generally are the first candidates for liberty; the weakest come behind, and some even die in the shell. When all are produced, they then lead them forth to provide for themselves. Her affection and her pride seem then to alter her very nature, and correct her imperfections. No longer voracious or cowardly, she abstains from all food that her young can swallow, and flies boldly at every creature that she thinks is likely to do them mischief. Whatever the invading animal be, she boldly attacks him; the horse, the hog, or the maffet. When marching at the head of her little troop, she acts the commander; and has a variety of notes to call her numerous train to their food, or to warn them of approaching danger. Upon one of these occasions, the whole brood have been seen to run for security into the thickest part of an hedge, while the hen herself ventured boldly forth, and faced a fox that came for them. As the fox would not be kept out, and thus turn her produce to the greatest advantage. A capon once invites him to succour the tenderest he did the former.

The cock, from his falaciousness, is allowed to be a short-lived animal; but how long these birds live, if left to themselves, is not yet well ascertained by any rhetorician. As they are kept only for profit, and in a few years become unfit for generation, there are few that, from mere motives of curiosity, will make the tedious experiment of maintaining a proper number till they die. Aldrovandus hints their age to be 10 years; and it is probable that this may be its extent. They are subject to some disorders; and as for poisons, besides nux vomica, which is fatal to most animals except man, they are injured, as Linneus afferts, by elderberries; of which they are not a little fond.

Of this species Mr Latham enumerates no less than Latham's 13 varieties, beginning with the wild cock, which is Synopsis, a third less in the body than the domestic cock. This variety he imagines to be the original flock from whence all our domestic varieties have sprung. They appear to be natives of the forests of India. There are but few places, however, as Mr Latham goes on to observe, where the different voyagers have not met with cocks and hens, either wild or tame; and mention has been particularly made of finding them at St Jago, Pulo Condore, Isle of Timor, Philippine and Molucca Isles, Sumatra and Java, New Guinea, Tinian, and most of the Isles of the South Seas.—Thofe of Pulo Condore are very much like our own, but considerably less, being only of the size of a crow. The cocks crow like ours, but their voices are much more small and shrill.—Damp. Voy. vol. i. p. 392.

Two wild ones were shot there by our last voyagers.—Ellis's Narr. ii. p. 340. Thofe of Sumatra and Java are remarkably large, and are called the S'tago breed. The cock is so tall as to peck off a common dinning-table. When fatigued, he flies down on the first joint of the leg; and is then taller than the common fowls. Hifph. Sumatra. p. 80. They are found in New Guinea, but not in great plenty.—Perr. Voy. p. 105.

The fowls which were met with wild at Tinian were run down without much trouble, as they could scarce fly farther than 100 yards at a flight.—Anson's Voy. p. 416. Forther observes, that they are plenty at Easter, Society, and Friendly Isles: at the two last they are of a prodigious size. They are not uncommon at the Marquefes, Hebrides, and New Caledonia; but the Low Isles are quite deftitute of them.—See Ofb. p. 193.——Ducks and poultry are numerous in the Sandwich Isles.—Cook's Journal. p. 229. In respect to Europe, little need be said, as varieties without end are everywhere seen, and their manners fully known to every one. It is observed, however, that they breed most freely in the warmer situations. In the very cold regions, though they will live and thrive, they cease to multiply. They are not found to breed in the northern parts of Siberia; and in Groenland are only kept as rarities.—Faun. Groen. On the whole, it seems quite unnecessary to enlarge further on a subject well known to every body. They are so common, that every one who wishes to become acquainted with their nature and manners, has the means of such knowledge in his power. Thofe who wish for minuter descriptions, we must refer to the authors

Phaenix.
Phasianus who have professedly written on the subject; for the varieties which we have already mentioned, we refer to Mr Latham.

Pheasants.

2. The motmot, or Guinea pheasant, is brownish, somewhat red below, with a wedge-like tail, and wants spurs. 3. The colchicus is red, with a blue head, a wedge-shaped tail, and papillous checks. It is a native of Africa and Asia. 4. The argus is yellowish, with black spots, a red face, and a blue crest on the back part of the head. It is found in China. 5. The pictus has a yellowish crest, a red breast, and a wedge-shaped tail. It is a native of China. 6. The nothomerus is white, with a black crest and belly, and a wedge-shaped tail. It is a native of China.

Mr Latham enumerates nine different species of pheasants, and of the common pheasant he reckons six varieties. The first which he describes is the sapphire pheasant. This bird LINNEUS described from the various representations of it painted on paper-hangings and China ware; and farther confirmed by a figure and description in a Chinese book which came under his inspection.

"We have lately seen (says Latham) a drawing of the tail feather of a bird of the pheasant kind, which measured above six feet in length, and which, it is probable, must have belonged to some bird not hitherto to come to our knowledge. The drawing is in the possession of Major Davies, who took it from the original feather; two of which were in the possession of a gentleman of his acquaintance, and were brought from China. They are exactly in shape of the two middle feathers of the painted pheasant; the general colour is that of a fine blue grey, margined on the sides with a rufous cream-colour, and marked on each side with numerous bars of black; between the feet and so bars in all; those on the opposite sides of the shaft seldom corresponding with each other.

"The argus, though it be a native of China, is very commonly found in the woods of Sumatra, where it is called argus. It is found extremely difficult to get the plumage of the cock after a certain time is not confined to the pheasant: the influence of the pea-hen belonging to Lady Tynte, now in the Leverian Museum, evinces the contrary, which, after having many broods, got much of the fine plumage of the cock, with the addition even of the fine train feathers. The female also of the rock manakin is said to get the plumage of the opposite sex after a number of years; and perhaps, if observed hereafter, this may be found to be the case with many other species. A gentleman of my acquaintance (continues our author), dead long since, who used to keep these birds for his amusement, oberved the same to me: and the ingenious Mr J. Hunter has a well drawn up paper in the Philosophical Transactions to the same purport; but, in addition to this, I am well informed, that it does not always require mature age to give the hen-pheasant the appearance of the male, as sometimes young birds will be adorned with his fine plumage. I will not say how this happens, and whether it may be peculiar to this species to grow barren (if that be the real reason) sooner than any other of the gallinaceous tribe; but I am assured that several of these spurious cock-like hens, have proved on eating to be young birds, from their juiciness and delicacy of flavour."

One of the varieties which our author remarks under this species, he calls the Hybridal pheasant, which is a mixed breed between the pheasant and cock; one of which is in the Leverian Museum. The two last species which our author describes, is the parakka and courrier.

The parakka is about the size of a small fowl, resembling it in the bill, legs, and body. Its length is 23 inches. The colour of the bill is dark rufous; the eyes are brown, the general colour of the plumage is a deep brown on the back, and fulvous under the belly: the top of the head is fulvous, and the feathers are somewhat long, but not so much as to form a red crest; the wings are short; the webs of some of the quills are somewhat rufous; the tail consists of 12 feathers, is even at the end, about a foot in length, and is, for the most part, carried pendant; the legs are of a dark rufous, inclining to black; the claws are like those of a fowl.

"It is peculiar (says Mr Latham) in its internal structure in respect to the windpipe; which, instead of entering directly the breast, as in most birds, passes over the side of the left clavicle, and on the outside of the fleky part of the breast, being covered only by the skin, then taking a turn upwards, passes over the right clavicle into the breast, and is distributed through the lungs in the usual way. The female has not this cirumvolution of the windpipe. The hamequaw, mentioned by Bancroft, is probably the same bird. He says that it is black, roosts in trees, and may be heard early in the morning, distinctly, but hoarsely, repeating the word hamequaw (easily mistaken for parrequaw) very loud. These are found in the unfrequented woods of the internal parts of Cayenne, Guiana, and many parts of South America. At fun-rise they set up a very loud cry, which is thought to be the loudest of all birds in the new world; at which time the eyes appear red, as does a small skin under the breast, which is not at all seen, except when the bird
bird makes such exertions, or is angry. This cry is
very like the word parraquaw; and is repeated many
times together; and often many cry at once, or an­
swer one another, but most in breeding-time, which,
is twice in the year; at each time laying from four to
six eggs; making the nest in low branches or stumps
of trees, and behaving with their chickens in the same
manner as hens. They feed on grain, seeds, and herbs;
but feed the young in the nest with worms and small
insects. They, with many other birds, inhabit the
woods by day, coming out into the open savannahs
morning and evening to feed; at which times they are
chiefly killed by the natives and near inhabitants.
They may be brought up tame; and their flesh is much
efleemed.

"The courier pheasant is but very imperfectly de­
scribed by Fernandez; and is said to be 18 inches
long. The general colour of the plumage is white,
inclined to fulvous; about the tail they are black, mixed
with some spots of white; the tail itself is long,
and of a green colour, reflecting in some lights like
the feathers of a peacock: the wings are short. This
species inhabits the hotter parts of Mexico; flies flow;
but is recorded to outrun the swiftest
horse."

Phalans were originally brought into Europe from
the banks of the Phasis, a river of Colchis, in Asia
Minor; and from whence they still retain their name.
Next to the peacock, they are the most beautiful of
birds as well for the vivid colour of their plumes as
for their happy mixtures and variety. It is far beyond
the power of the pencil to draw any thing so glos­
sly, so bright, or points so finely blending into each other.
We are told, that when Cresus, king of Lydia, was
seated on his throne, adorned with royal magnificence
and all the barbarous pomp of eastern splendor, he
asked Solon if he had ever beheld anything so fine?
The Greek philosopher, no way moved by the objects
before him, or taking a pride in his native simplicity,
replied, That after having seen the beautiful plumage
of the pheasant, he could be altonified at no other
finery.

These birds, tho' so beautiful to the eye, are not less
delicate when served up to the table. Their flesh is con­
dered as the greatest dainty; and when the old phy­
sicans spoke of the wholomemef of any viands, they
made their comparison with the flesh of the pheasant.
However, notwithstanding all these perfections to tempt
the curiosity or the plate, the pheasant has multiplied
in its wild state.

A spirit of independence seems to attend the phe­
asant even in captivity. In the woods, the hen-phe­
asant lays from 18 to 20 eggs in a season; but in a do­
meric state, the hens lays above 20. In the fame
manner, when wild, the hatches and leads up her brood
with patience, vigilance, and courage; but when kept
tame, the never fits well, so that a hen is generally her
substitute upon such occasions; and as for leading her
young to their food, she is utterly ignorant of where it
is to be found; and the young birds farve, if left folly
ad her protection. The pheasant, therefore, on every
account, seems better left at large in the woods than
reclaimed to captivity. Its fecundity when wild is
sufficient to stock the forest; its beautiful plumage
adorns it; and its flesh retains a higher flavour from its
unlimited freedom.

However, it has been the aim of late to take these
birds once more from the woods, and to keep them in
places fitted for their reception. Like all others of the
poultry kind, they have no great sagacity, and suffer
themselves easily to be taken. At night they roost up­
on the highest trees of the wood; and by day they
come down into the lower brakes and bushes, where
their food is chiefly found. They generally make a
kind of flapping noise when they are with the females;
and this often apprises the sportsman of their
approach. At other times he traces them in the snow,
and frequently takes them in springs. But of all
birds they are most easily; as they always make
a whirling noise when they rife, by which they alarm
the gunner, and being a large mark and flying very
slow, there is scarce any missing them.

When these birds are taken young into keeping,
they become as familiar as chickens: and when they
are designd for breeding, they are put together in a
yard,
P H A

Phasianus.

yard, five hens to a cock; for this bird, like all of the poultry kind, is very salacious. In her natural state the female makes her nest of dry grass and leaves; the same must be laid for her in the pheasantry, and she herself will sometimes properly dispose them. If she refuses to hatch her eggs, then a common hen must be got to supply her place, which will perform with perseverance and success. The young ones are very difficult to be reared (s); and they must be supplied with ants' eggs, which is the food the old one leads them to gather when wild in the woods. To make these go the farther, they are to be chopped up with curds or other meat; and the young ones are to be fed with great exactness, both as to the quantity and the time of their supply. This food is sometimes also to be varied; and woodlice, earwigs, and other insects, are to make a variety. The place where they are reared must be kept extremely clean; their water must be changed twice or thrice a day; they must not be exposed till the dew is off the ground in the morning, and they should always be taken in before sunset. When they become adults, they very well can shift for themselves; but they are particularly fond of oats and barley.

Phasianus.

In order to increase the breed, and make it fill more valuable, Longius teaches us a method that appears very peculiar. The pheasant is a very bold bird when first brought into the yard among other poultry, not sparing the peacock, nor even such young cocks and hens as it can matter; but after a time it will live tamely among them, and will at last be brought to couple with a common hen. The breed thus produced take much stronger after the pheasant than the hen; and in a few succicences, if they be let to breed with the cockpheasant (for the mixture is not barren), there will be produced a species more tame, stronger, and more prolific; so that he adds, that it is strange why most of our pheasantries are not stocked with birds produced in this manner.

The pheasant, when full grown, seems to feed indifferently upon every thing that offers. It is said by a French writer, that one of the king's sportmen shooting at a parcel of crows that were gathered round a dead carcass, to his great surprise, upon coming up, found that he had killed as many pheasants as crows. It is even asserted by some, that such is the carnivorous disposition of the bird, that when several of them are put together in the same yard, if one of them

finance; whereas, if he should set up the call too loud at first, and any of the birds should happen to be very near, they would be frightened away.

When a pheasant answers, the sportman is to creep nearer and nearer, still calling, though not so loud; and he will still be answered, till at length he will be led by the bird's voice within sight of it. Then he is to spread his net, and to begin to call again, keeping in some close and well sheltered place behind the net, in this place he is to call till the bird approaches; and when he has drawn it under the net, he is to appear suddenly, and the bird, rising up, will thus be caught.

There is another method of taking pheasants much quicker than that we have just described, viz. the having a live cock-pheasant to use as a stake; this bird is to be fixed under the net, and by his crowing he will soon entice others in. The sportman must lie concealed; and when another pheasant comes in, he is to draw the net over him. Many people take pheasants in springers or horse-hair stares: to succeed in this, it will be necessary to be careful in learning out their haunts, and the places by which they go out of the woods into the fields. When these are discovered, a peg must be fixed in the ground at each, and at each peg two springers may be laid open, the one to take in the legs, and the other the head. When the springers are set, the sportman must go into the woods, and get behind the birds in order to fright them with some little noise, such as shall not be enough to raise them to the wing, but only to set them a-running. They will naturally make their way out of the wood, through their accustomed paths, and be then caught in the springers.

There is another method of taking these birds in winter, provided there be no snow. This must be done with a net made in the form of a calling net, but with wider meshes; they may indeed be five inches wide. Some peas or wheat are to be taken out; and the path of the pheasants being discovered, which may easily be done by their dung, a pint or thereabout of corn is to be thrown down in the path in a place marked so that the sportman may come to it again. This must be done for some days, till at length the pheasants will expect it every day regularly; and all of them that frequent the place are brought together to feed there, and then the net is to be fixed over the place, its top being tied up to some bough of a tree, and its bottom fixed down all around, except in one place, where the walk of the pheasants lies. In this place it must be raised in the form of an arch, and the entrance must be lined with several rods of hazel; the thick ends of which are to be tied to the net, and the thin ones let into the space covered by it; and thus the pheasants will easily get in by parting the small ends of the fitches, as fish into a wheel, but they will not easily get out again. The nets are to be dyed of a colour, by laying them in a tannet; and they must, when planted for this purpose, be covered with boughs, so that the birds do not discover them, and then they will easily run into them, and be all taken at once.

(s) The pheasant is so nearly allied to our common poultry that this assertion may appear odd: it is nevertheless true; and the principal cause may be, that their proper food is not known, or not sufficiently inquired into. They feed voraciously on ants and various other insects; and it is said, that when the mulberries of corn or wheat have been eaten by them, a repast of ants has recovered them. When these fail, millipedes and earwigs together answer as an excellent medicine, along with their common food (corn,) which must be very sweet and clean. These birds are very fulled, and when cooping time is over, they are seldom found more than one in a place.
them happens to fall sick, or seems to be pining, all the rest will fall upon, kill, and devour it. Such is the language of books; those who have frequent opportunities of examining the manners of the bird itself, know what credit ought to be given to such an account.

PHASIS, a river which falls into the Euxine sea about 700 miles from Constantinople. "From the Iberian Caucasus (says Gibbon), the moist and craggy mountains of Asia, that river descends with such oblique vehemence, that in a short space it is traversed by 120 bridges. Nor does the stream become placid and navigable till it reaches the town of Sarapanea, five days journey from the Cyrus, which flows from the same hills, but in a contrary direction, to the Caffian lake. The proximity of these rivers has suggested the practice, or at least the idea, of waiting the precious merchandise of India down the Oxus, over the Cappadocian, up the Cyrus, and with the current of the Phasis into the Euxine and Mediterranean seas. As it successively collects the streams of the plain of Colchos, the Phasis moves with diminished speed, tho' accumulated weight. At the mouth it is 60 fathoms deep, and half a league broad; but a small woody island is interposed in the midst of the channel; the water, so soon as it has deposited an earthy or metallic sediment, floats on the surface of the waves, and is no longer susceptible of corruption. In a course of 100 miles, 40 of which are navigable for large vessels, the Phasis divides the celebrated region of Colchos or Mingrelia, which, on three sides, is fortified by the Iberian and Armenian mountains, and whose maritime coast extends about 300 miles, from the neighbourhood of Trebizond to Dioscurias and the confines of Cirecisia. Both the soil and climate are relaxed by excessive moisture: 28 rivers, besides the Phasis and his dependent streams, convey their waters to the sea; and the hollows of the ground appear to indicate the subterraneous channels between the Euxine and the Cappadocian." PHASMA'TA, in physiology, certain appearances arising from the various tints of the clouds by the rays of the heavenly bodies, especially the sun and moon. These are infinitely diversified by the different figures and situations of the clouds, and the appulses of the rays of light; and, together with the occasional flashings and glimmerings of different meteors, they have, no doubt, occasioned those prodigies of armies fighting in the air, &c. of which we have such frequent accounts in most of the writers. See 2 Maccab. xi. 8. Melancth. Meteor. 2. Shel. de Comet. ann. 1618.

Kircher and Schottius have erroneously attempted to explain the phenomenon from the reflection of terrestrial objects made on opaque and congealed clouds in the middle region of the air, which according to them, have the effect of a mirror. Thus, according to these authors, the armies pretended by several historians to have been seen in the skies, were no other than the reflection of the like armies placed on some part of the earth. See Hilt. Acad. Roy. Scienc. ann. 1735 p. 405. &c.

PHASSACHATES; in natural history, the name of a species of agate, which the ancients, in its various appearances, sometimes called leucahastae and perlauet-

PHEANT, in ornithology. See Phaisius.

PHEANT'S eye, or Bird's eye. See Adonis.

PHEBUS, a deacon of the port of Corinth, called Cenchrea. St Paul had a particular esteem for this holy woman; and Theodore thinks the apostle lodged at her house for some time, while he continued in or near Corinth. It is thought he brought to Rome the epistle he wrote to the Romans, wherein he is commended and recommended in so advantageous a manner. He says (Rom. xvi. 1, 2), "I commend unto you Phebus our filter, which is a servant of the church which is at Cenchrea; that ye receive her in the Lord, as becometh saints, and that ye afflict her in whatsoever business the hath need of you for she hath been a succourer of many, and of myself also." Some moderns have advanced a notion that Phebus was wife to St Paul; but none of the ancients have said any thing like it. It is thought, in quality of deaconess, she was employed by the church in some mitrations suitable to her sex and condition: as to visit and instruct the Chaldaic women, to attend them in their sick, and distribute alms to them.

PHEGOR, or PEOR, a deity worshipped at a very early period by the Midianites and Moabites, and probably by all the other tribes which then inhabited Syria. Much has been said concerning the functions of this god, and the rank which he held among the Pagan divinities (see Baal-Peor); and many conjectures have been formed concerning the origin of his name. Most of these seem to have no better foundation than the fenile dreams of the Jewish rabbis. Phegor, or Peor, is undoubtedly the same with the Hebrew word pechor, which signifies aperture, and probably refers to the prophetic influence always attributed to the solar deity, by which he opened or discovered things to come. Accordingly we find Phegor or Peor generally joined to Baal, which was the Syrian and Chaldean name of the sun after he became an object of worship; hence Baal-Pechor might have been the sun worshipped by some particular rites, or under some particular character. What these were, a resolution of Pechor into its component parts may perhaps inform us. As this word, wherever it occurs in Scripture, has some relation to diffusing or opening the mouth wide, it is probably compounded of Pha the mouth or face, and ebhar naked. In those countries we know that the women wore veils; but it would appear, that in celebrating the rites of this deity they were unveiled. It seems even not improbable, that on these occasions the fexes danced promiscuously without their clothes; a practice which would naturally give birth to the licentious amours mentioned in the 23rd chapter of the book of Numbers. If this be admitted, it will follow that Phegor was the sun presiding over the myrtles of Venus.

PHELANDRIUM, water-hemlock; a genus of the digynia order, belonging to the pentandria class of plants. There are two species, one of which, viz. the aquaticum, is a native of Britain. This grows in ditches and ponds, but is not very common. The stalk is remarkably thick and dichotomous; and grows in the water. It is a poison to horses, bringing upon them, as Linnaeus informs us, a kind of palsy; which, however, he supposes to be owing not so much to the noxious qualities of the plant itself, as to thefle of an
Phengites infect which feeds upon it, breeding within the falks, and which he calls curculio paraplepticus. The Swedes give swine's dung for the cure. The seeds are sometimes given in intermittent fevers, and the leaves are by some added to divertive cataplasmis. In the winter, the roots and stem, diftefted by the influence of the weather, afford a very curious fkeleton or network. Horses, sheep, and goats, eat the plant; swine are not fond of it; cows refuse it.

PHENICE, a port of the Phenicians, and which he calls terr, the roots and by times given in intermittent fevers, and the leaves are fond of it; cows refuse it. Borses, sheep, and goats, eat the plant; swine are not beautiful fpecies of pale, yellowifh, white, or honey colour; the is very weak and brittle in the mafs; dilated, and all approaching to a flat circumference, from which alone this temple was tranfmitted through the centuries.

PHENICE, a port of the Phenicians, to the weft of the ifland. St Paul having anchored at Phenice, when he was carried to Rome (Acts xxvii. 12.), advised the ship's crew to fpend the winter there, becaufe the feafon was too far advanced.

PHENICIA. See Phoenicia.

PHINEUS, in heraldry, the barbed heads of darts, arrows, or other weapons.

PHEOS, in botany, a name which Theophratus, Dioscorides, and others, give to a plant ufed by fullers in dyeing their cloths, and of which there were two kinds, a smaller called simply pheos, and a larger called biggopheos. This plant is sometimes called pheos, and is thus confounded with a kind of march cudweed, or gnaphalium, called alfo by that name; but it may alwaies be difcovered which of the two plants an author means, by obferving the fente in which the word is ufed, and the use to which the plant was put. The pheos, properly so called, that is, the cudweed, was ufed to stuff beds and other fuch things, and to pack up with earthen vefels to prevent their breaking; but the phoos, improperly called pheos, only about cloths: this was, however, alfo called fabe and gnaphos.

PHÆRECRATES, a Greek comic poet, was conemporary with Plato and Ariftophanes. After the example of the ancient comedians, who never introduced upon the theatre imaginary but living characters, he added his contemporaries. But he did not abufe the liberty which at that time prevailed upon the stage; and laid it down as a rule to himself never to destroy the reputation of any perfon. Twenty-one comedies are attributed to him, of which there now only remain some fragments collected by Hertelius and Grotius. From these fragments, however, it is easy to difcern, that Pherecrates wrote the puref Greek, and poiffeed that ingenious and delicate raillery which is called ttic urbanity. He was author of a kind of verse called-from his own name, Phere-ratick. The three laft feet were in hexameter verse, and the firft of those three feet was always a fpondee. This verse of Horace (for example, Qamvis ponica pinus) is a Pherecratick verse.

We find in Plutarch a fragment of this poet upon the mu sic of the Greeks, which has been critically examined by M. Burette of the academy of inscriptions. See the 15th volume of the collection published by that learned society.

PHERECYDES, a native of Scyros, flourished about the year 560 before the Christian era, and was disciple of Pittacus, one of the seven wife men of Greece (see Pyrracus). He is said to have been the firft of all the philosophers who has written on natural fubjects and the effence of the gods. He was alfo the firft, it is faid, who held the ridiculous opinion, "that animals are mere machines." He was Pythagoras's mafter, who loved him as his own father. This grateful scholar having heard that Pherecydes lay dangerously ill in the ifland of Delos, immediately repaired thither, in order to give every neceffary afistencia to the old man, and to take care that no means should be left untried for the recovery of his health. His great age, however, and the violence of his difeafe, having rendered every precription ineffectual, his next care was to fee him decently buried; and when he had paid the laft duty to his remains, and ereated a monument to his memory, he fet out again for Italy. Other caufes have been aligned for the death of Pherecydes: fome fay he was eaten up by lice, and others that he fell headlong from the top of Mount Corycius in his way to Delphos. He lived to the age of 85 years, and was one of the firft profe writers among the Greeks. See Pittacus. Some fay he was not of this ifland, but of another. Enefeld's History of Phylosophy.
PHERETIMA, the wife of Battus king of Cyrene, and the mother of Aemilius. After her son's death, she recovered the kingdom by means of Ammaeus, king of Egypt, and to avenge the murder of Aemilius, she caused all his affinities to be crucified round the walls of Cyrene, and the cut of the breasts of the wives, and hung them up near the bodies of their husbands. It is said that she was devoured alive by worms; a punishment which according to some of the ancients, was inflicted by Providence for her unparalleled cruelties.

PHILO, a king of Egypt, who succeeded Sesostris. He was blind; and he recovered his sight by washing his eyes, according to the directions of the oracle, in the urine of a woman who had never had any unlawful connections. He tried his wife first, but she appeared to have been faithful to his bed, and she was burnt with all those whose urine could not restore sight to the king. He married the woman whose urine proved beneficial.

PHILAE, a well-known vessel made of glass used for various purposes. Luden Pulas, is a phial of glass coated on both sides with tin-foil for a considerable way up the sides, of great use in electrical experiments. See Electricity, pufin.

PHIDIAS, the most famous sculptor of antiquity, was an Athenian and a cotemporary of the celebrated Pericles; who flourished in the 8th Olympiad. This wonderful artifl was not only conummate in the use of his tools, but accomplished in the branches and branches of knowledge which belong to his profession, as history, poetry, fable, geometry, optics, &c. He first taught the Greeks to imitate nature with such success as to make the works of his pupil, Polyclitus, famous, and the ancients, without exception, declare that the imitation of nature, which is the end of art, was never so well accomplished by any Greek artist as by him. His Nemesis was a statue of Athena Parthenos, and it is said that the greatest artists of Greece, Phidias, Polyclitus, and Scopas, all laboured to make this statue perfect. Phidias, in this magnificence, was the first artist who attempted to produce the effect of life in a statue, and he succeeded so far as to make his statue appear to breathe, and to move with the wind. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the art of cutting the statue out of the marble in one piece, and then placing it in a position which it was intended to assume. He was the first who made use of the system of Dr. Ure, of cutting the statue out of the marble, and then placing it in a position which it was intended to assume. He also invented the...
middle with pebble stones for carts and carriages which usually contain three-fifths of the whole breadth, and on each side with bricks for foot passengers. Between the brick and stone pavements are gutters paved with brick to carry off the water, and the foot-ways are defended from the approach of carriages, by rows of polls placed without the gutters, at the distance of ten or twelve feet from each other.

Besides the forementioned main streets, there are many others not originally laid down in the plot; the most of which are Water-street and Dock-street. Between these, and many others not originally laid down in the plot; the Water-street is paved, from the pier, erected into piers, and is forty feet wide in a right line to the bank, in its whole length, between it and Front-street. Southward of Pine-street there is an office of about eighty feet eastward, and, the street from thence to Cedar-street is 45 feet wide, and called Penn-street.

Besides the division into streets, in order to regulate elections, the city and liberties are likewise parcelled into wards; the city, from Cedar to Vine-street, contains twelve wards; the liberties, on the north of the city, two; the district of Southwark two; Paphyunk and Moyamensing, each one.

The magistracy consists of two branches: fifteen aldermen are chosen by the freeholders to continue in office for seven years; who choose a recorder from the citizens at large for seven years, and a mayor from their own number for one year. Thirty common councillors are chosen by the citizens at large, entitled to vote for representatives in assembly, to continue in office for three years; there were intended to form a balanced government upon the principle, that the choice by freeholders, and for a longer term would produce a more sedentary body of aldermen, and that the citizens at large would choose characters fitter to represent and form the popular branch of city government.

Eight aldermen and fifteen common councillors form a quorum or board to transact business, at which the mayor or recorder presides; they sit and deliberate together, but no act is legal, unless, a majority of the aldermen, a majority of the common councillors present, and the mayor or recorder concur.

A city court is held by the mayor, recorder and aldermen four times a year, and holds cognizance of all crimes and misdemeanors committed within the city.

A court of aldermen having cognizance of debts above forty shillings, and not exceeding twenty pounds is held every week beginning on Monday morning, and sitting by adjournments until the business of the week is finished.

Each alderman has separate cognizance of debts, under forty shillings.

The number of inhabitants including the city and suburbs (including the district of Southwark and the compactly built part of the Northern Liberties, which to every purpose, but as their governments) are considered as parts of the city, is found by the late census to be 42,400, there was then about 7000 houses, factories and workshops. The number has now increased to about 9000, and there are at present a great number of houses. Hence if the number of inhabitants has increased as the houses, which is highly probable, the number of citizens may be estimated at about 35,000.

The buildings appropriated to public worship in the city and suburbs are in number 28, and are as follows: Of the Baptist church one, German Calvinist one, Protestant Episcopal church one, Friends meeting-houses five, of the German Lutherans two, Swedish Lutherans one, of the Hebrews one, of the Moravians one, of the Presbyterians of different denominations six, of the Roman Catholics three, and of the universalists one.

There are also lately erected two buildings by the Africans; the one denominated the African Protestant Episcopal church; in which the ministers of the episcopal churches occasionally officiate. The other is called the African Methodist Episcopal church.

The city is provided with a number of public and private charitable institutions; the principal of which here, the Pennsylvania hospital, the house of employment, commonly called the bettering-house; the Friends alms-house; Christ church hospital; the dispensary; the humane society; the Philadelphia library; seminaries of learning, &c.

The Pennsylvania hospital, the design of which was first suggested by the late Dr Thomas Bond, is supported partly by public grants and partly by private subscriptions; its present property amounts to a little above 30,000£. Six physicians chosen by the managers attend the hospital. Lately the assembly granted 10,000£. out of certain loan-office funds to enable the managers to make additions to the buildings agreeable to the original plan, and to comprise a lying in and foundling hospital, as soon as a specific fund can be raised.

This institution has been extensively useful, and the conduct of the managers has done honour to their benevolence and integrity. The medical students pay for the privilege of attending the hospital practice, and this money the physicians have generously given for the purpose of founding a medical library, and to purchase Dr Chovel's preparations; by the addition of which to Dr Tothergill's valuable present, the institution without any expense to its funds, is possessed of the most useful and ornamental collection that was ever seen in America. The pay of those pupils exceeds 100£. per annum, which is amply sufficient to furnish the library with new books and to preserve the anatomical collections, &c.

The house of employment is under the direction of a board of managers and of the overseers, or guardians of the poor. This is a spacious, convenient building, where the poor of the city and liberties receive a comfortable maintenance; and those who are able to work are employed in some useful manufactures. The managers of this house were incorporated in the year 1766, and were authorized to impose taxes to defray the necessary contingent expenses.

The quaker's alms-houses, designed for the reception of the aged poor of that religious community, is placed under the superintendence of committees appointed from time to time by the monthly meetings of Philadelphia. Besides their contributions in common with the rest of their fellow-citizens to the support.
port of the infirm and indigent of the general mass, this charitable society is concerned to make particular provision for their own poor: some of whom are admitted within these walls and receive all the alms their several cafes require.

The Philadelphia dispensary was established by and is wholly dependent on the contributions of a generous public for its continuance. It is under the direction of twelve managers, elected annually from among the subscribers. These managers provide the best medicines that can be procured, and appoint an apothecary who gives constant attendance to prepare and distribute them to all the poor who apply. They likewise appoint five attending and four consulting physicians, whose business it is to visit the sick who are unable to go abroad, and to prescribe when called upon whatever medicine is delivered. It is necessary that patients who apply should produce a recommendation from one of the subscribers; and every subscriber who contributes one guinea annually has the privilege of recommending two patients at a time.

Among all the exertions of active benevolence for which this metropolis is distinguished, perhaps there is no one calculated to become so extensive a blessing as this institution. Many are the instances of the poor who do not choose to apply for admittance into the Pennsylvania hospital, and who at the same time are too indigent to pay a physician for medicine and attendance. To prevent patients of this description from languishing under their complaints, was the benevolent intention of the Philadelphia dispensary: and so great, indeed, hath been the success of the institution, that for one year, from December 1789 to December 1790, 1902 patients were under the care of the board, of whom 1528 were cured, and 111 relieved.

Christ Church hospital is an endowment for aged women of the protestant episcopal church, made by Dr John Kearley, formerly an eminent physician in this city; who bequeathed for this purpose, an estate chiefly landed, which he vested in the rector, churchwardens, and vestrymen of the united episcopal churches of Christ Church and St Peter's.

Since the endowment of this institution, it has received a considerable accession of property, by the gift of Mr Joseph Dobbins, a native of this city, now residing in Carolina; subject to an annuity during Mr Dobbins's life.

Dr Kearley's will requires that the women belonging to this institution shall be supplied with meat, drink, and lodging; with necessary allowance in physic and surgery;—there are now nineteen on the foundation.

The Humane Society. This charter qualifies the society, as a body corporate, to meet on the first Wednesday in March, and then to choose twelve managers for the ensuing year, to superintend and direct in all cases that relate to the design of the institution. In order to spread their alms, as wide as their capital would admit of, they have purchased eighteen sets of instruments, the best adapted to take bodies out of the water, and eighteen boxes of medicines, &c. which, with printed directions how to use them, they have deposited under prudent persons, at all those places in and near the city where they were most likely to be useful.

Besides these principal establishments, there are many others, more restricted in their design and usefulness; such as the society for visiting the public prison, and alleviating the miseries of its unhappy tenants; a class of citizens, who, in times past, have been considered as the outcasts of society, incapable of reformation, and unworthy of pity.—The society to promote the abolition of slavery, and to befriend the free Africans, who stand in need of support in affording their rights. The society for establishing Sunday schools, calculated to spread the knowledge of religion and useful learning among poor children.

Societies, some of which are incorporated, for the relief of the widows and children of the clergy, supported by the members of the particular community to which they belong; and various other associations. In short, so multiplied are the institutions of generosity and benevolence, public and private, that there is hardly a pressure under which the poor and stranger can suffer, but what will meet with some alleviation as soon as it is sufficiently known.

The Philadelphia Library. This valuable collection of books was begun in the year 1731, with the trifling sum of $100, raised by subscription among a few private gentlemen, the friends of science. In the year 1742, the stock had accumulated so much, and its utility was so generally recognized, that the company received a charter of incorporation. Since this latter period the collection has greatly increased, by an annual contribution of ten thousand volumes from each member, and the occasional donations of generous individuals, at home and abroad. At present it contains more than twelve thousand volumes, besides a valuable philosophical apparatus. The rooms are open every day in the week, except Sunday, for the benefit of strangers as well as citizens. Such free access to so large a repository of knowledge, in every branch of science, cannot fail of being extensively useful. And perhaps it is to institutions of this kind which are established in all the considerable towns of America, that her citizens are in a great degree, indebted for their general information and improvement.

Under this head it is not amiss to take notice that the Loganian library, the most rare and valuable collection of books in the ancient languages which is to be found on the continent, has lately been removed to a room built for the purpose, adjoining to the city library. This mass of antiquity was bequeathed by the late James Logan, Esq. to the public; and cannot fail to add much to the gratification of those who have a taste to explore the tombs of ancient erudition.

Seminary of learning. Of these the first in rank is the Pennsylvania university. This seminary was instituted by a special act of the legislature in the year 1779; and by another act in the year 1791, it was united with the old college, academy, and charitable schools of Philadelphia, and placed under the direction of one board, consisting of twenty four trustees, of whom the governor of the state for the time being, is always presiding ex officio.

The funds of this institution are about two thousand three hundred pounds per annum. The number of students in all the schools is about five hundred; of whom five-and-twenty are admitted annually to the honour of degrees. The library and philosophical apparatus which belong to the seminary are judiciously selected, and very respectable.
The faculty consist of a provost, who is professor of natural philosophy; a vice-provost, who is professor of moral philosophy; and professors of the Greek and Latin languages; of Mathematics; of English and belles lettres; of the German language; of anatomy, surgery, and midwifery; of the practice of physic; of the institutes, and clinical medicine; of chemistry; of anatomy, &c. of materia medica; of botany, and of law.

The college of physicians. This society was formed in the year 1787, and obtained a charter in the year 1789. It was instituted with the laudable design of consulting in new and difficult cases, and introducing greater uniformity in practice. They hold their stated meetings on the first Tuesday in every month.

The museum, which Mr. Peale has now brought to light, when the arrival of great numbers of people greatly increased the rates of both.

The banks of North America, the United States, and Pennsylvania, all of which are in Philadelphia, have greatly contributed to facilitate and extend its commerce.

Philadelphia, an ancient town of Turkey in Asia, in Natalia. It is seated at the foot of Mount Tmolus, by the river Cogamus, from whence there is an exceeding fine view over an extensive plain. This place was founded by Attalus Philadelphia, brother of Eumenes.

It was very liable to earthquakes, which perhaps, arose from its vicinity to the region called Catakeu-

The number of churches he reckoned at 24, chief-priests, his substitue, whom we went to visit, received us at his palace, a tithe given to a very indifferent house or rather a cottage of clay. We found him ignorant of the Greek tongue, and were forced to discourse with him by an interpreter in the Tur-

There is not a place in America, or, perhaps, in Europe, which can boast of a better market of fresh provis-

The peculiar situation of Philadelphia, poffeising, by means of the Delaware, all the advantages of an excellent seaport, and from its inland situation in the midfl of an extensive and well settled country, admirably adapted to the internal trade both of Pennsylvania and the neighbouring states, has contributed greatly to the increase of its population and the ex-

The settlement of this place was founded by Attalus Philadelphia, brother of Eumenes.

The foundations of this place. In the year 1591, this place alone refused to admit Barbary pirates; but it was at length forced to capitulate for want of provisions. It has been matter of surprise that this town was not totally abandoned; and yet it has survived many cities less liable to inconveniences, and is still an extensive place, tho' in its appearance it is poor and mean. Some remnants of its walls are still standing, but with large gaps. The materials of the wall are small stones strongly cemented. It is thick, lofty, and has round towers. Near this place, between the mountains, there is a spring of a purgative quality; it is much esteemed, and many people resort to it in the hot months. It tastes like ink, is clear, but tinged the earth with the colour of ochre. The famous wall which credulity has ascribed to be made of human bones, stands beyond this and beyond the town. See the article next.

When Dr. Chandler was there he tells us, 'The Travels in the article next.
The laity in general knew as little of Greek as the popes; and yet the liturgies and offices of the church are read as elsewhere, and have undergone no alteration on that account.

"The Philadelphians are a civil people. One of the Greeks sent us a small earthen vessel full of choice wine. Some families beneath the trees by a rill of water, invited us to sit down and partake of their refreshments. They entreated us when we met; and the agent or governor, on hearing that we were Franks, bade us welcome by a messenger."

"Philadelphia professing waters excellent in drinking, and being situated on one of the most capital roads to Smyrna, is much frequented, especially by Armenian merchants. The Greeks still call this place by its ancient name, but the Turks call it Alikabijar. The number of inhabitants are about 7000 or 8000; of whom 2000 are supposed to be Christians. It is about 40 miles E. S. E. of Smyrna. E. Long. 28. 15. N. Lat.

15. N. Lat. 38. 28.

Philadelphia, a name which some authors have given to what is otherwise called Christian bones, found in the walls of that city. It is a vulgar error that these walls are built of bones; and the tradition has given to that fortune to be various bodies, chiefly vegetable, of the country is, that when the Turks took the place, they crushed and mixed the stones, chiefly vegetable, incurred over and preferred in a spur of the nature of that which forms incrustations in Knarborough springs, and other places with us. These bodies are often cemented together in considerable numbers by this matter, and their true shape lost in the congeries till a diligent and judicious eye traces them regularly.

Philadelphia-Society, in ecclesiasticall history, an obscure and inconsiderable society of mystics. They were formed about the end of the last century by an English female fanatic, whose name was Jane Leadley. This woman seduced by her visions, predictions, and doctrines, several disciples, among whom were perfoms of learning. She believed that all differences among Christians would cease, and the kingdom of the Redeemer become a scene of charity and felicity, if Christians, disregarding the forms of doctrine or discipline of their several communions, would all join in committing their souls to the care of the internal guide, to be instructed, governed, and formed, by his divine impulse and suggeftions. But she went farther than this: the even pretended a divine commihion to proclaim the approach of this glorious communion of saints; and was convinced that the society established by her was the true kingdom of Christ. One of her leading disciples was, that of the final restoration of all intelligent beings to perfection and happiness.

Philadelphus, in antiquity, was a title or surname born by several ancient kings; formed from the Greek, φίλος, "friend," lover," and αδελφός, "brother," q. d. one who loves his brother or brethren.

See Ptolemy and Egypt.

Philadelphia, the Pipe-tree, or Mock-orange, a genus of the monogynia order, belonging to the ic़andria class of plants.

Species 1. The coronarius, white syringa, or mock-

Brittany has been long cultivated in the gardens of country as a flowering shrub; it is not well known in what country it is to be found native. It rises seven or eight feet high; sending up a great number of slender stalks from the root. These have a grey bark, branch out from their sides, and are garnished with oval spear-shaped leaves. These stalks have deep indentations on their edges; their upper surface being of a deep green, but the under surface pale, with the taste of a fresh cucumber. The flowers are white, and come out from the sides and at the ends of the branches in loose bunches, each standing on a distinct foot stalk: they have four oval petals, which spread open, with a great number of stamens within, surrounding the style.

This shrub by its flowers makes a fine figure in May Dist. of

and June; for they are produced in clusters both at the end and from the sides of the branches. They are of a fine white colour, and exceedingly fragrant. The petals of which each is composed are large, and spread out thickly those of the orange; and then forming branches, which stand each on its own separate short foot stalk, and being produced in plenty all over the shrub, both at once feal the eye and the finell: The eye, by the pleasing appearance it will then have; the flower, as the air at some distance will be replete with the odoriferous particles constantly emitted from those fragrant flowers. These flowers, however, are very improper for chimney's, water glasses, &c. in rooms; for in those places their scent will be too strong; and for ladies in particular, often too powerful.

The double-flowering syringa, is a low variety of this species, seldom rising to more than a yard high. The description of the latter belongs to this fort, except that the leaves and branches are proportionably smaller and more numerous, and the bark of the shoots of a lighter brown. It is called the Double flowering syringa, because it sometimes produces a flower or two with three or four rows of petals; whereas, in general, the flowers, which are very few, and seldom produced, are single. They are much smaller than those of the other; and you will not see a flower of any kind on this shrub often perhaps than once in five years. It is hardly worth propagating on this account; so that a few plants only ought to be admitted into a collection, to be ready for observation.

The dwarf syringa is full of lower growth than the other, seldom arising to more than two feet in height. The description of the first fort will agree with this; only that the branches and leaves are full proportionally smaller and more numerous, and the bark is full of a lighter brown. It never produces flowers.

2. The nainus, with oval leaves somewhat indented, and double flowers, seldom rises above three feet high. The flowers come out singly from the sides of the branches, and have a double or treble row of petals of the same size and form as well as the same scent with the former; but this fort flowers very rarely, so is but little esteemed.

3. The inodorous, with entire leaves, is a native of Carolina, and as yet but little known in Europe. It rises with a shrubby stalk of about 16
feet in height, sending out slender branches from the sides opposite, garnished with smooth leaves sharped like those of the pear-tree, and standing on pretty long footstalks. The flowers are produced at the ends of the branches; and are large, white, spreading open, with a great number of short laminae with yellow fummits. This is called the Carolina Syringa, the tallest grower by far of any sort of the syringas, and makes the grandest show when in blow; though the flowers are delitute of smell.

The propagation of all the forts is very easy: They are increased by layers, cuttings, or suckers. 1. The most certain method is by layers; for the young twigs being laid in the earth in the winter, will be good-rooted plants by the autumn following. 2. Thesf plants may be increased by cuttings, which being planted in October, in a shady moist border, many of them will grow; though it will be proper to let those of the Carolina fort remain until spring, and then to plant them in pots, and help them by a little heat in the bed. By this assistance, hardly on cutting will fail. 3. They may be also increased by suckers: for all the forts throw out suckers, though the Carolina syringas the least of any. These will all strike root, and be fit for the nursery ground: nay, the double-flowering and the dwarf sorts are always increased this way; for these plants having stood five or six years, may be taken up and divided into several scores. All the plants, however, whether raised from layers, cuttings, or suckers should be planted in the nursery-ground to get strength, before they are set out for growth. They should be planted a foot asunder, and the distance in the rows should be two feet. After this they will require no other care than hoeing the weeds, until they have stood about two years, which will be long enough for them to stand there.

Philæni, were two brothers, citizens of Carthage, who fadificd their lives for the good of their country. At the time when the Carthaginians ruled over the greater part of Africa, the Cyrenians were also a great and wealthy people. The country in the middle between them was all fandy, and of an uniform appearance. There was neither river nor mountain to distinguish their limits; a circumstance which engaged them in a terrible and tedious war with one another. After their armies and fleets had been often routed and put to flight on both sides, and they had weakened one another pretty much; and fearing left by and by, some third people should fall upon the conquered and conquerors together, equally weakened, upon a cessation of arms they made an agreement, “that upon a day appointed deputies should set out from their respective homes, and the place where they met one another should be accounted the common boundary of both nations.” Accordingly the two brothers called Philæni, lent from Carthage, made all dispatch to perform their journey. The Cyrenians proceeded more slowly. These last, perceiving themselves a little behind, and turning apprehensive of punishment at home for mismanaging the affair, charged the Carthaginians with setting out before the time; made a mighty battle upon it; and, in short, would rather choose any thing than to go away undone. But whereas the Carthaginians desired any other terms, provided only they were fair, the Greeks made this proposal to the Carthaginians, “either to be buried alive in the place which they claimed as the boundary to their nation; or that they would advance forward to what place they inclined upon the same condition.” The Philæni accepting the offer, made a sacrifice of themselves and their lives to their country, and so were buried alive. The Carthaginians dedicated altars in that place to the memory of the two brothers. These altars, called Are Philænorum, served as a boundary to the empire of the Carthaginians, which extended from this monument to Hercules’s Pillars, which is about 2000 miles, or, according to the accurate observations of the moderns, only 1420 geographical miles. It is Sallust who gives this account in his history of the Jugurthine war.

Philanthropy is compounded of two Greek words which signify the love of mankind. It is therefore of nearly the fame import with benevolence (A); and differs from friendship, as this latter affection subsists only between a few individuals, whilst philanthropy comprehends the whole species.

Whether man has an instinctive propensity to love his species, which makes him incapable of happiness but in the midst of society, and impels him to do all the good that he can to others, feeling their felicity an addition to his own, is a question that has been warmly debated among philosophers ever since metaphysics was studied as a science. With the opinions of the ancients we shall not, in this detached article, trouble our readers; but it would be unpardonable to pass without notice the different theories which on this interesting subject have divided the moderns.

Hobbes, who believed, or pretended to believe, that right results from power, and that in society there is no other standard of justice than the law of the land, or the will of the supreme magistrate, built his opinions upon a theory of human nature in which philanthropy has no place. According to him, mankind, in the original state of nature, were wholly selfish. Each endeavoured to seize, by fraud or force, whatever he thought would contribute to his comfort; and as all had nearly the same wants, the inevitable consequence of this selfishness was universal war. We are taught indeed by the same philosopher, that, in a series of ages, mankind discovered the miseries of this state of nature; and therefore, upon the same basis of universal selfishness, formed societies over which they placed supreme governors for the purpose of protecting the weak against the violence of the strong. He does not, however, explain how men, whose angry and selfish passions were thus excited to the utmost against each other, could enter upon this friendly treaty; or, supposing it formed, how the ignorant multitude were induced to pay obedience to the more enlightened few. Clogged with this and other insurmountable difficulties, his philosophy of human nature soon fell into merited contempt; but about the origin of philanthropy those who united in opposition to him still thought very differently from one another.

(A) We say nearly of the same import; because benevolence extends to every being that has life and senses, and is of course susceptible of pain and pleasure; whereas philanthropy cannot comprehend more than the human race.
The elegant Shaftsbury, who had imbied much of the spirit of Plato, endeavoured, like his master, to deduce all the duties of man, and almost all his actions, from a number of internal feelings or instincts which he supposed to be interwoven with his constitution by the immediate hand of God. This system appeared so honourable to human nature, and at the same time was so easily comprehended, that the noble lord had soon many followers, and may indeed be considered as the founder of a school which has produced philosophers whose works do honour to the age and country in which they flourished. Amongst these we must reckon Bishop Butler, Hutcbon, Lord Kames, Dr Bratlie, and perhaps Dr Reid.

According to the system of these writers, the whole duty of man results from an intuitive principle, to which they have given the name of the moral sense; and with this sense they conceive philanthropy to be inseparably united, or rather perhaps to make an essential part of it. (See Moral Philosophy.) If this theory be carried to its utmost extent, as it has been by some of its patrons, it seems to follow, that peace and harmony should reign among savages; and that a man who had from his infancy grown up in solitude, and harmony of each other. Savages, too, are indeed to be abundantly furnished with their pleasures or enjoyments. This conclusion, however, is contrary to acknowledged facts. Savages are generally divided into small tribes or hordes; and though the attachment of individuals to their own tribe appears indeed to be abundantly strong, the tribes themselves are frequently at war, and entertain a constant jealousy of each other. Savages, too, are almost universally afraid of strangers; and the few solitary individuals, who have been caught in parts where they had run wild from their infancy, instead of being delighted with the appearance of fellow-men, have either fled from them with their utmost speed, or been fixed to the spot in terror and astonishment. These are no indications of that instinctive philanthropy for which some writers so strenuously plead. They have indeed induced others to deny, that in human nature there is any instinctive principles at all; and to endeavour to account for our several propensities by the influence of education producing early and deep-rooted habits.

At the head of this school stood Locke and Harte.

The former, employing himself almost wholly on the intellectual powers of man, and combating the absurd, though then generally received, belief, that there are in the human mind innate principles of speculative truth, has touched but incidentally on our principles of action. It seems, however, to be evident, that he did not consider any one of these principles as innate; and his opinion was adopted by Harte, who studied the sensitive part of human nature with greater industry and success than perhaps any writer who had preceded him in that department of science. This philosopher refutes all kinds of instinct to man, even the 

He considers such acquisitions as even necessary and unavoidable, and founds them on the great law of association, which we have elsewhere endeavoured to explain (See Metaphysics, Part I. chap. v.). Harte was a Chritian, and appears to have been a man of great piety. Conceiving with Locke that men are born without any ideas, or any principles either of knowledge or of action, but that they are subject to the law of association as much as to the impressions of sense, he seems to have thought, that the important purpose for which they are sent into this world is, that they may acquire habits of piety and virtue, which, operating like instincts, will fit them for the purer society of a future state. That this theory is unfriendly to morals, no man who understands it will presume to affirm. It appears, indeed, to be more consistent with the necessity of a revelation from God than that of Shaftsbury, which has so many followers: but notwithstanding this, we cannot help thinking that the excellent author has carried his antipathy to instincts much too far (see Instinct), and that the truth lies in the middle between him and his opponents.

Without some instincts to influence before the dawn of reason, it is not easy to be conceived how children could be induced to that exercise which is absolutely necessary to life and health; nor does it appear with sufficient evidence that the human race are deferred by every instinct as soon as their rational powers are evolved. It seems to be a matter of fact which cannot be controverted, that women have an instinctive attachment to their new-born infants; but that thefle, when they become capable of distinguishing objects, are infintively attached to their parents, their brothers, and sisters, is a position which, though it may be true, seems incapable of proof. That they soon appear to be formed, is a fact which we believe no man will deny; but the attachment may be accounted for by the associating principle operating upon that desire of happiness which is necessarily formed as soon as happiness is experienced. (See Passion). An infant becomes earlier attached to its nurse than to any other person; because, feeling wants which the supplies, the idea of enjoyment becomes soon associated in its mind with the perception of the woman. If this woman be its mother, a hasty observer immediately attributes this attachment to instinct existing before the infant to love its parent; but that instinct has here no place; it is evident from the well-known facts, that a child is as fond of a tender nurse, though no relation, as of the most affectionate mother; and as regards of a mother who seldom sees it, or sees it with indifference, as of any other person. Nay, we have seen children of the sweetest dispositions as fond of the maid with whom they slept, as of a very affectionate parent by whom they had been tenderly nursed: and none man will say that this could be instinct; it was evidently a new association of the idea of the maid with the greatest happiness which they enjoyed after the period of their suckling was at an end.

It is much in the same way that children acquire an attachment to their brothers and sisters. Brothers and sisters being constantly together, contribute to each
inculcate which they have in each other's company, and the
mates mutual love in their minds, which generated mutual love in their minds,
offspring. Benevolence, thus generated, soon extends as children advance towards the state of manhood.
man soon discovers, that, as he is a member of a
great measure on the prosperity of the whole. Hence in the eminence of our countrymen. But the
plea of benevolence stops not here. He who's mind is
himself, but as being, in reality his fellow-citizens and
lar countries as provinces of one great country
in their original state, cannot be considered as other
by the great law of
This is
tainly not to the heat of passion.
than hardly ever rises to the warmth of
by them,
regretted
of Philetus;
read in the falfe Abdias, in the life of
St J
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infrene
of what is found in Abdias. St J.
P. St Paul made him bishop of Coloss, but the Menex
infrene, that he went to Gaza in
and a little
of his martyrdom with Appia his wife, in the time of Nero. They
relate several particulars of his martyrdom, and say,
that his body remained at Colosse, where it performed several miracles.
PHILETAS, a Greek poet and grammarian, of
the island of Cos, flourished under Philip and Alexander the Great, and was preceptor of Prolemy Philadelphia. He was the author of some elegies, epigrams, and other works, which have not come down to us. He is celebrated in the poems of Ovid and Propertius, as one of the best poets of his age. Elian reports a very improbable story of him, namely, that his body was so slender and feeble, that he was obliged to have some lead in his pockets, to prevent him from being carried away by the wind.
PHILETUS. St Paul writing to Timothy (2 Tim. ii. 16, 17, 18.) in the 65th year of Christ, and a little while before his own martyrdom, speaks thus: "But thun profane and vain babblings, for they will increase unto more ungodliness. And their word will eat as doth a canker; of whom is Hymeneus and Philetus; who concerning the truth have erred, saying, that the resurrection is past already, and overthrow the faith of some." We have nothing very certain concerning Philetus; for we make but small account of what is read in the false Abdias, in the life of St James major, even supposing this author had not put the name of Philetus instead of Phlegelus. This is the substance of what is found in Abdias. St James the son of Zebedee, passing through the synagogues of Judea

earth, and commanded them to be mutually aiding Philin, to each other.

PHILEMON, a Greek comic poet, was son to
Damon, and contempory with Menander. Any advantage he had over this poet, was owing less to his
own merit than to the intrigues of his friends. Plau-
tus has imitated his comedy du Marchand. He is re-
ported to have died laughing on seeing his afs eat
igs. He was then about 97 years of age. His son,
Philemon the younger, was also the author of 54 com-
edies, of which there are still extant some consider-
able fragments collected by Grotius. These clearly
prove that he was not a poet of the first rank. He
flourished about the year 274 before our Saviour.

PHILEMON, was a rich citizen of Colosse in Phrygia.
He was converted to the Christian faith, with Appia his wife, by Epaphras the disciple of St Paul; for St Paul himself did not preach at Colosse, Colos. ii. 1. Perhaps we should have known nothing of St Phile-
mon, had it not been on the account of his slave O-
nefimus, who having robbed him, and run away from
him, came to Rome where he found St Paul, and was
very serviceable to him. St Paul converted him, bap-
tized him, and sent him back to his matter Philemon;
to whom he wrote a letter full extant, and which pa-
s for a masterpiece of that kind of eloquence, natural,
 lively, strong, and pathetic, that was peculiar to St
Paul. Philemon (i. 2.) had made a church of his
house, and all his domestics, as well as himself, were
of the household of faith. His charity, liberality, and
compation, were a sure refuge to all that were in
direftes. The Apostolical Constitutions say, that St
Paul made him bishop of Colosse; but the Menex
infrene, that he went to Gaza in Palestine, of which he was the apostle and first bishop. From thence he
returned to Colosse where he suffered martyrdom with Appia his wife, in the time of Nero. They
relate several particulars of his martyrdom, and say,
that his body remained at Colosse, where it performed
several miracles.
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and Samaria, preached everywhere the faith of Jesus Christ. Hermogenes and Philetus strenuously opposed him, affirming, that Jesus Christ was not the Messiah. Hermogenes was a notable magician, and Philetus was his disciple, who being converted, was desirous to bring his master to St James; but Hermogenes bound him up so by his magic art, that he could not come at the apostle. Philetus found means to make St James acquainted with what had happened to him; upon which St James unbound him, and Philetus came to him. Hermogenes perceiving how ineffective his art was against the saint, became himself a convert as well as Philetus.

PHILIBEG, a little plaid, called also kilts, and is a sort of short petticoat reaching nearly to the knees, worn by the Scotch Highlanders. It is a modern substitute for the lower part of the plaid, being found to be less cumbersome, especially in time of action, when the Highlanders used to tuck their breacdan into their girdle. Almost all of them have a great pouche of better and other kinds, with tassels dangling before them, in which they keep their tobacco and money.

PHILIP, the elder brother of Antiochus Epiphanes (1 Macc. vi. 14. & 55, 2 Macc. ix. 29.), was a Phrygian by birth and very much in Antiochus's favour. This prince made him governor of Jerusalem (2 Macc. viii. 8. v. 22.) where he committed many outrages upon the Jews, to force them to forsake their religion. Seeing that Apollonius and Seraon were defeated by Judas Maccabeus, he sent for new succours to Ptolemy governor of Cilicia-Syria, who sent him Gorgias and Nicamor with a powerful army. Some time after, Antiochus going beyond the Euphrates, to extort money from the people, Philip went along with him; and Antiochus finding himself near his end (1 Macc. vi. 14.) made him regent of the kingdom, put his diadem into his hands, his royal cloak, and his ring, that he might render them to his son the young Antiochus Eupator. But Lyfias having taken possession of the government in the name of young Eupator, who was but a child, Philip not being able to cope with him, durst not return into Syria; but he went into Egypt, carrying the body of Epiphanes along with him, there to implore assistance from Ptolemy Philometor against Lyfias the usurper of the government of Syria. The year following, while Lyfias was busy in the war carrying on against the Jews, Philip got into Syria, and took possession of Antioch. But Lyfias returning into the country, with great diligence, retook Antioch, and put Philip to death, who was taken in the city.

Philip the apostle was a native of Bethsaida in Galilee. Jesus Christ having seen him, said to him, "Follow me;" John i. 43. 44. &c. Philip followed him; and soon after finding Nathanael, Philip said to him, "We have found the Messiah, of whom Moses and the prophets have spoken, Jesus of Nazareth, the son of Joseph." Nathanael asked him, Can any thing good come out of Nazareth? To which Philip replied, "Come and see." Then he brought Nathanael to Jesus, and they went with him to the marriage of Cana in Galilee. St Philip was called at the very beginning of our Saviour's mission; and when Jesus Christ was about to feed the 5000 that followed him (Luke vi. 13. Mat. x. 2. John vi. 5-7.) he asked St Philip, only to prove him, whence bread might be bought for such a multitude of people? Philip answered, that 200 penny-worth of bread would not be sufficient for every one to take a little. Some Gentiles having a curiosity to see Jesus Christ, a little before his passion, they addressed themselves to St Philip (John xii. 21, 22.) who mentioned it to St Andrew, and these two, to Christ. At the last supper, Philip desired our Saviour to show them the Father, being all that they desired (John xiv. 8-10.) but Jesus told them, that seeing the son they saw the Father also. This is all we find concerning Philip in the gospel.

The upper Asia fell to this apostle's lot, where he took great pains in planting the gospel, and by his preaching and miracles made many converts. In the latter part of his life, he came to Hierapolis, in Phrygia, a city very much addicted to idolatry, and particularly to the worship of a serpent of a prodigious bigness. St Philip by his prayers procured the death, or at least the disappearing, of this monster, and convinced its worshippers of the absurdity of paying divine honours to such odious creatures. But the magistrates enraged at Philip's success, imprisoned him, and ordered him to be severely flogged, and then put to death, which some say was by crucifixion; others, by hanging him up against a pillar. St Philip is generally reckoned among the married apostles; and it is said he had three daughters, two whereof preferred their virginity, and died at Hierapolis; the third, having led a very spiritual life, died at Ephesus. He left behind him no writings. The gospel under his name was forged by the Gnostics, to countenance their bad principles and worse practices. The Christian church observes the festival of this saint, together with that of St James, on the first day of May. Euseb. lib. iii. c. 30.

Philip, the second of the seven deacons, was chosen by the apostles after our Saviour's resurrection. (Acts vi. 5.) This deacon, they say, was of Caesarea in Palestine. It is certain that his daughters lived in this city (Acts xxi. 8. 9.) After the death of St Stephen, all the the Christians excepting the apostles, having left Jerusalem, and being dispersed in several places, St Philip went to preach at Samaria (id. viii. 1, 2, &c. where he performed several miracles, and converted many perfons. He baptized them; but being only a deacon, he could not confer on them the Holy Ghost. Wherefore having made known to the apostles at Jerusalem, that Samaria had received the word of God, Peter and John came thither and the Samaritans that were converted received the Holy Ghost. St Philip was probably at Samaria when the angel of the Lord ordered him to go to the south part of the country, in the road that leads from Jerusalem to old Gaza. Philip obeyed, and there met with an Ethiopian eunuch belonging to Queen Candace, who had the care of her revenues and had been at Jerusalem to worship God there (Id. viii. 24, 27, &c.) He was then returning from his own country, and was reading the prophet Isaiah as he went along in his chariot. Philip, hearing the eunuch reading the prophet Isaiah, said to him, Do you understand what you read? The eunuch replied, How should I understand, except somebody explain it to me? He desired Philip therefore to come and sit down by him in the chariot. The passage the eunuch was reading is this, "He was led as a sheep to the slaughter;" and
Philip, and like "a lamb dumb before his shearer, so he opened not his mouth." The eunuch then says to Philip, Pray, whom does the prophet speak of in this place? Is it of himself, or of some other? Then Philip began to instruct him concerning Jesus Christ. And having gone on together, they came to a fountain; when the eunuch said to Philip, Here is water, what hinders me from being baptized? Philip told him that he might be so, if he believed with all his heart. He replied, I believe that Jesus Christ is the son of God. He then ordered the chariot to stop, and they both alighted and went down into the water, while Philip baptized the eunuch. Being come out of the water, the Spirit of the Lord took away Philip, and the eunuch saw no more of him. But Philip was found again at Azotus, and he preached the gospel in all the cities he passed through, till he arrived at Caesarea in Palestine. After this the scripture does not inform us of any particulars relating to Philip. The modern Greeks say that he went to Tralles in Asia, where he founded a church, of which he was the apostle and bishop; and where he reified in peace after performing many miracles. The Latins on the contrary, say that he died at Caesarea, and that three of his daughters were there buried with him. It is thought that the eunuch converted by St Philip was the first apostle of the Ethiopians; and that the Abydines boast of having received the Christian faith from him.

Philip II. was the 4th son of Amyntas, king of Macedonia. He was sent to Thebes as an hostage by his father, where he learnt the art of war under Epa Ministérios, and studied with the greatest care the manners and the pursuits of the Greeks. He discovered, from his earliest years, that quickness of genius and quickness of courage which afterwards procured him to great name and such powerful enemies. He was recalled to Macedonia; and at the death of his brother Perdiccas he ascended the throne as guardian and protector of the youthful years of his nephew. His ambition, however, soon discovered itself, and he made himself independent about the year 350 before Christ. The valor of a prudent general, and the policy of an experienced statesman, seemed requisite to ensure his power. The neighbouring nations, ridiculing the youth and inexperience of the new king of Macedonia, appeared in arms; but Philip soon convinced them of their error. Unable to meet them as yet in the field of battle, he suspended their fury by presents, and soon turned his arms against Amphipolis, a colony tributary to the Athenians. Amphipolis was conquered, and added to the kingdom of Macedonia, and Philip meditated no less than the destruction of a republic which had rendered itself so formidable to the rest of Greece, and had even claimed submission from the princes of Macedonia. His designs, however, were as yet immature; and before he could make Athens an object of conquest, the Thracians and the Illyrians demanded his attention. He made himself master of a Thracian colony, to which he gave the name of Philip, and from which he received the greatest advantages on account of the golden mines in the neighbourhood. These made it a very important capture he settled in it a number of workmen, and was the first who caused gold to be coined in his own name. He employed his wealth in procuring spies and partisans in all the great cities of Greece, and in making conquests without the aid of arms. It was at the siege of Methone in Thrace that Philip had the misfortune to receive a wound in his right eye from the stroke of an arrow. In the midst of his political prosperity, Philip did not neglect the honour of his family. He married Olympias the daughter of Neopolemus, king of the Molopists; and when, some time after, he became father of Alexander, the monarch, conscious of the ineftable advantages which arise from the lesions, the example, and conversation of a learned and virtuous preceptor, wrote a letter with his own hand to the philosopher Aristotle, and begged him to retire from his usual pursuits, and to dedicate his whole time to the instruction of the young prince. Every thing seemed now to conspire to his aggrandizement; and historians have observed that Philip received in one day the intelligence of three things which could gratify the most unbounded ambition, and flatter the hopes of the most aspiring monarch: the birth of a son, an honourable crown at the Olympic games, and a victory over the barbarians of Illyricum. But all these increased rather than satiated his ambition; he declared his inimical sentiments against the power of Athens, and the independence of all Greece, by laying siege to Olynthus, a place which on account of its situation and consequence, would prove most injurious to the interests of the Athenians, and most advantageous to the intrigues and military operations of every Macedonian prince. The Athenians, routed by the eloquence of Demothenes, sent 17 vessels and 2000 men to the assistance of Olynthus; but the money of Philip prevailed over all their efforts. The greatest part of the citizens suffered themselves to be bribed by the Macedonian gold, and Olynthus surrendered to the enemy, and was instantly reduced to ruins. Philip soon after defeated the Athenians, and made a great number of them prisoners, whom he diminished without ransom. Of this victory, the fruit of that excellent discipline which he had established in his army, the Macedonian Phalanx had the principal honour. This was a body of infantry heavily armed, consisting commonly of 6,000 men, who each of them a shield six feet high and a pike 21 feet long. (See Phalanx.) The successe of his arms, and especially his generosity after victory, made his alliance and peace, a desirable object to the people of Athens; and as both parties were inclined to this measure, it was concluded without delay. His successes were as great in every part of Greece; he was declared head of the Amphictyonic council, and was intrusted with the care of the sacred temple of Apollo at Delphi. If he was recalled to Macedonia, it was only to add fresh laurels to his crown, by victories over his enemies in Illyricum and Thessaly. By assuming the mask of a moderator and peace-maker, he gained confidence; and in attempting to protect the opoanians against the incroaching power of Sparta, he rendered his cause popular; and by discounting the infuls that were offered to his person as he passed through Corinth, he displayed to the world his moderation and philosophic virtues. In his attempts to make himself master of Euboea, Philip was unsuccessful; and Phocion, who defended his gold as well as his meanes, obliged him to evacuate an island whose inhabitants were inaccessible to the charms of money as they were unarmed at
at the horrors of war, and the bold efforts of a vigilant enemy. From Euboea returned his arms against the Scythians; but the advantages he obtained over this indigent nation were inconsiderable, and he again made Greece an object of plunder and rapine. He advanced far in Bocotia, and a general engagement was fought at Charonea. The fight was long and bloody, but Philip obtained the victory. His behaviour after the battle reflects great disgrace upon him as a man and as a monarch. In the hour of felicity, and during the entertainment which he had given to celebrate the trophies he had won, Philip fell from his camp, and with the inhumanity of a brute, he insulted the bodies of the slain, and excited over the calamities of the prisoners of war. His inhumanity, however, was checked, when Demades, one of the Athenian captives, reminded him of his meanness, by exclaiming, "Why do you, O king, set the part of a Thersites, when you can represent with so much dignity the elevated character of an Agamemnon?" The reproach was felt; Demades received his liberty; and Philip learned how to gain popularity even among his fallen enemies, by relieving their wants and easing their difficulties. At the battle of Charonea the independence of Greece was extinguished; and Philip, unable to find new enemies in Europe, formed new enterprises, and meditated new conquests. He was nominated general of the Greeks against the Persians, and was called upon as well from inclination as duty to avenge those injuries which Greece had suffered from the invasions of Darius and of Xerxes. But he was stopped in the midst of his warlike preparations, being rabbed by Paulanius as he entered the theatre at the celebration of the nuptial of his daughter Cleopatra. This mistake of sentiment was the more distressing upon the causes which produced it; and many who consider the recent repudiation of Olympias and the resentment of Alexander, are apt to investigate the causes of his death in the bosom of his family. The ridiculous honours which Olympias paid to her husband's murderer strengthened the suspicion; yet Alexander declared that he invaded the kingdom of Persia to revenge his father's death upon the Persian satraps and princes, by whose immediate intrigues the assassination had been committed. The character of Philip is that of a fagacious, artful, prudent, and intriguing monarch: he was brave in the field of battle, eloquent and disflurming at home, and he possessed the wonderful art of changing his conduct according to the disposition and caprice of mankind, without ever altering his purpose, or losing sight of his ambitious aims. He possessed much perverence, and in the execution of his plans he was always vigorous. He had that eloquence which is inspired by strong passion. The hand of an assassin prevented him from achieving the boldst and the most extensive of his undertakings; and he might have acquired as many laurels, and conquered as many nations, as his son Alexander did in the succeeding reign; and the kingdom of Persia might have been added to the Macedonian empire, perhaps with greater moderation, with more glory, and with more lasting advantages. The private character of Philip lies open to censure, and raises indignation. The admirer of his virtues is disfigured to find him among the most abandoned profligates, and disgracing himself by the most unnatural crimes and licentious indulgencies which can make even the most debauched and the most profligate to blush. He was murdered in the 47th year of his age, and the 24th of his reign, about 336 years before the Christian era. His reign is become uncommonly interesting, and his administration a matter of instruction. He is the first monarch whose life and actions are described with peculiar accuracy and historical faithfulness. Philip was the father of Alexander the Great and of Cleopatra, by Olympias; he had also by Audace an Illyrian, Cynis, who married Amyntas the son of Perdiccas, Philip's elder brother; by Nicalus a Thessalian, Nikes, who married Cynarius; by Philene a Larissian dancer, Arinna, who reigned some time after Alexander's death; by Cleopatra, the niece of Attalus, Caranus and Euphra, who were both murdered by Olympias; and Prolene the first king of Egypt, by Arsinoe, who in the first month of her pregnancy was married to Lagus. Of the many memorable actions and sayings reported by Plutarch of this prince, the following are the most remarkable. Being present at the sale of some captives in an indecent posture, one of them informed him of it; "Set this man at liberty (says Philip), I did not know that he was my friend. "Being solicited to favour a lord of his court, who was like to lose his character by a jest but severe sentence, Philip refused to hearken to the solicitation, and added, "I had rather that he be disgraced than myself." A poor woman was importuning him to do her justice; and as he sent her away from day to day, under the pretence that he had no time to attend to her petition, the said to him with some warmth, "Cease then to be a king." Philip felt all the force of this reproof, and indignantly gave her satisfaction. Another woman came to ask justice of him as he was going out from a great entertainment, and was condemned. "I appeal (exclaimed she)!" "And to whom do you appeal (said the king to her)?" "To Philip failing." This answer opened the eyes of the monarch, who retracted his sentence. If he possessed any virtue, it was principally that of suffering injuries with patience. Democharus, to whom the Greeks gave the surname of Parrheist, on account of his excclent petulance of tongue, was one of the deputies whom the Athenians sent to this monarch. Philip, at the conclusion of the audience, begged the ambassadors to tell him, "if he could be of any service to the Athenians," to which Democharus gave an inoffensive return, which he forgave. Having learned that some Athenian ambassadors charged him, in full assembly, with atrocious calumnies: "I am under great obligations (said he to those gentlemen, for I shall henceforth be so circumstanced in my words and actions, that I shall convict them of falsehood." One saying of Philip, which does him less honour than those we have before mentioned, was, "Let us amuse children with playthings, and men with oaths." This abominable maxim, which was the foul and spring of his politics, gave rise to the observation, "That he was in full length, what Louis XI. afterwards was in miniature." It is well known that Philip had a penchant about him, who called out at times, "Philip remember that thou art mortal!" but whether we should place this to the account of his pride or his humility, it is difficult to say. Philip V. was king of Macedon, and son of Demetrius. His infancy, at the death of his father, was
Philip, a native of Acrania, physician to Alexander the Great. When that monarch had been suddenly taken ill, after bathing in the Cydnus, Philip undertook to remove the complaint, when the rest of the physicians believed that all medical assistance would be ineffectual. But as he was preparing his medicine, Alexander received a letter from Parmenio, in which he was advised to beware of his physician Philip, as he had confined against his life. The monarch was alarmed; and when Philip presented him the medicine, he gave him Parmenio's letter to peruse, and began to drink the potion. The solemnity and composure of Philip's countenance, as he read the letter, removed every suspicion from Alexander's breast, and he pursued the directions of his physician, and in a few days recovered.

There were besides, a vast number of persons of this name in antiquity, and many of them were very eminent.

Philip, king of France, succeeded his father Henry
Philip. Henry I. in 1060, when but eight years of age, under the regency and guardianship of Baudouin V., count of Flanders, who discharged his trust with zeal and fidelity. He defeated the Gaftons who were inclined to revolt, and died, leaving his pupil 15 years of age. This young prince made war in Flanders against Robert, Baudouin's younger son, who had invaded Flanders, which belonged to the children of his elder brother. Philip marched against him with a numerous army, which was cut to pieces near Mount Cuffel. Peace was the consequence of the victory, and the conqueror quietly enjoyed his usurpation. Philip, after the fatigues of the war, by way of relaxation gave himself up entirely to pleasure and dissipation.

Tired of his wife Bertha, and fond of Bertrade, spouse of Foulques count of Anjou, he carried her off from her husband. Having in 1093, legally annulled his own marriage, under the pretext of barrenness, and Bertrade's marriage with the count of Anjou having been set aside under the same pretext, Philip and she were afterwards solemnly married by the bishop of Beauvais. This union was declared void by Pope Urban II. a Frenchman by birth, who pronounced the sentence in the king's own dominions, to which he had come for an asylum. Philip, fearing that the anathemas of the Roman pontiff might be the means of exciting his subjects to rebellion, sent deputies to the pope, who obtained a delay, during which time he was permitted to use the crown. To know what is meant by this permission, it is necessary to recollect, that at that period kings appeared on the throne not by right of inheritance, but by the will of the people.

The pontiff, Laurens, who came after him exasperated to the court by his inordinate ambition, had been a pupil of Suger, archbishop of Paris, and it was to avenge this insult that he obtained the consent of the clergy of France to send an embassy to Philip, a nation to whom the assertion of pope in the throne of France was so odious. The legates were received with such measures of contempt as to provoke the utmost resentment against them. Philip was equal in spirit to the leaders of the Crusades, and his conquests were attended with the same fortune. The provinces of France were at that time divided into numerous states, and each had its own laws and customs, which were in some respects different from those of the rest of the kingdom. The conqueror felt himself at home in these ancient territories, and was as much at home in the fields of battle as in the presence of the king. He was a soldier in the field, and a statesman in council; he was the conqueror of Flanders, and the conqueror of his enemies. He was the protector of the arts, and the benefactor of the people.

Philip II., surnamed Augustus, the conqueror and given of God, son of Louis VII. (called the younger), King of France, and of Alix, his third wife, daughter of Thibault, count of Champagne, was born the 22d of August 1165. He came to the crown, after his father's death in 1180, at the age of 15 years. His youth was spent like that of the generality of other princes, by avoiding the rock of pleasure on which so many are apt to split, his courage thereby became the more lively and intrepid. The king of England seemed willing to take advantage of his minority, and to seize upon a part of his dominions. But Philip marched against him, and compelled him, sword and hand, to confirm the ancient treaties between the two kingdoms. As soon as the war was ended, he made his people enjoy the blessings of peace. He gave a check to the oppressions of the great lords, banished the comedians, punished the blamable habits of the clergy, and made the clergy answerable for the behaviour of their clergy. The tranquillity of France was somewhat disturbed by a difference between the king of Flanders, which was however happily terminated in 1184.

Some time after he declared war against Henry II. of England, and took from him the towns of Ile- douard, Tours, Mans and other places. The epidemical madness of the crusades was gradually spreading all Europe; and Philip, as well as other princes, caught the infection. He embarked in the year 1190, with Richard I. king of England, for the relief of the Christians in Palestine who were oppressed by Saladin. These two monarchs fat down before Acre, which is the ancient seat of the Israelites, and were engaged in a civil war on the banks of the Euphrates. When the two European monarchs had joined their forces to the aid of the Asiatic Christians, they counted above 300,000 fighting men. Acre surrendered the 13th of July 1191; but the unhappy disaffection which took place between Philip and Richard, rivals of glory and of interest, did more mischief than could be compensated by the successful exertions of those 300,000 men. Philip, tired of these divisions and displeased with the behaviour of Richard his valet, returned to his own country, which perhaps he should never have left, or at least have seen again with more glory. Besides, he was attacked (by the historians) with a languishing disorder, the effects of which were attributed to poison; but which might have been occasioned merely by the burning heat of a climate so different from that of France. He left his hair, his beard, and his nails; nay, his very flesh came off. The physicians urged him to return home; and he was determined to follow their advice. The year after, he obliged Baudouin VIII. count of Flanders to leave him the duchy of Artois. He next turned his arms against Richard king of England, from whom he took Evreux and Vernon; though he had promised upon the holy gospels never to take any advantage of his rival during his absence; so that the consequences of this war were very unfortunate. The French monarch repulsed from Rouen with 15,000 men, a truce for six months; during which time he married Engelburge, princess of Denmark, whose beauty could only be equalled by her virtue. The divorcing of this lady, whom he had long coveted, in order to marry Agnes daughter of the duke of Merania, embroiled him with the court of Rome.
Sans-terre succeeded to the crown of England in 1199, to the prejudice of his nephew Arthur, to whom of right it belonged. The nephew, supported by Philip, took arms against the uncle, but was defeated in Poitou, where he was taken prisoner, and afterwards murdered. The murderer being summoned before the court of the peers of France, not having appeared, was declared guilty of his nephew's death, and condemned to lose his life in 1203. His lands, situated in France, were forfeited to the crown. Philip soon set about gathering the fruit of his vaillant's crime. He feized upon Normandy, then carried his arms into Maine, Anjou, Touraine, Poitou, and brought those provinces, as they anciently were, under the immediate authority of his crown. The English had no other part left them in France but the province of Guienne. To crown his good fortune, John his enemy was embroiled with the court of Rome; which had lately excommunicated him. This ecclesiastical thunder was very favourable for Philip. Innocent II. put into his hands, and transferred to him, a perpetual right to the kingdom of England. The king of France, when formerly excommunicated by the pope, had declared his censures void and abusive; he thought very differently, however, when he found himself the executor of a bull investing him with the English crown. To give the greater force to the sentence pronounced by his holiness, he employed a whole year in building 1700 ships, and in preparing the finest army that was ever seen in France. Europe was in expectation of a decisive battle between the two kings, when the pope laughed at both, and artfully took to himself what he had bestowed upon Philip. A legate of the holy see persued John Sans-terre to give his crown to the court of Rome, which received it with enthusiasm. Then Philip was expressly forbid by the pope to make any attempt upon England, now become a fee of the Roman church, or against John who was under her protection. Meanwhile, the great preparations which Philip had made alarmed all Europe; Germany, England, and the Low-Countries were united against him in the manner as we have seen them united against Louis XIV. Ferrand, count of Flanders, joined the emperor Othon IV. He was Philip's vaillant; which was the strongest reason for declaring against him. The French king was no wise disconcerted; his fortune and his courage disfipated all his enemies. His vaillant was particularly conspicuous at the battle of Bouvines, which was fought on the 27th of July 1214, and lasted from noon till night. Before the engagement, he knew well that some of his nobles followed him with reluctance. He assembled them together; and placing himself in the midst of them, he took a large golden cup, which he filled with wine, and into which he put several slices of bread. He eat one of them himself, and offering the cup to the rest, he said, "My companions, let those who would live and die with me follow my example." The cup was emptied in a moment, and those who were the least attached to him fought with all the bravery that could be expected from his warmest friends. It is also reported that after showing the army the crown that was worn by seveareigns upon these occasions, he said, "If any one thought himself more worthy than he was to wear it, he had only to explain himself; that he should be content it were the prize of that man, who should display the greatest valour in battle." The enemy had an army of 150,000 fighting men; that of Philip was not half so numerous; but it was composed of the flower of his nobility. The king run great hazard of his life; for he was thrown down under the horses feet, and wounded in the neck. It is said 50,000 Germans were killed; but the number is probably much exaggerated. The counts of Flanders and Boulogne were led to Paris with irons upon their feet and hands; a barbarous custom which prevailed at that time. The French king made no conquest on the side of Germany after this ever memorable action; but it gained him an additional power over his vaillants. Philip, conqueror of Germany, and poiffeilor of almost all the English dominions in France, was invited to the crown of England by the barbers of King John, who were grown weary of his tyranny. The king of France, upon this occasion, concluded himself like an able politician. He persuaded the English to ask his son Louis for their king; but as he wished at the same time to manage the pope, and not lose the crown of England, he chose to affit the prince his son, without appearing to act himself. Louis made a defcent upon England, was crowned at London, and excommunicated at Rome in 1216; but that excommunication made no change upon John's situation, who died of grief. His death extinguished the resentment of the English, who having declared themselves for his son Henry III. forced Louis to leave England. Philip-Augustus died a little time after, at Mantes, the 14th of July 1223, aged 39, after a reign of 43 years. Of all the kings of the 3d race, he made the greatest accession to the crown-lands, and transmitted the greatest power to his successors. He reunited to his dominions Normandy, Anjou, Maine, Touraine, Poitou, &c. After having subdued John Sans-terre, he humbled the great lords, and by the overthrow of foreign and domestick enemies, took away the counterpoise which balanced his authority in the kingdom. He was more than a conqueror; he was a great king and an excellent politician; fond of splendor on public occasions, but frugal in private life; exact in the administration of justice; skilful in employing alternately flattery and threatenings, rewards and punishments; he was zealous in the defence of religion, and always disposed to defend the church; but he knew well how to procure from her succours for supplying the exigencies of the state. The lords of Coucy, Rhetel, Roffy, and several others, feized upon the property of the clergy. A great many of the prelates applied for protection to the king, who promised them his good offices with the depradores. But, notwithstanding his recommendations, the pillages continued. The bishops redoubled their complaints, and intreated Philip to march against their enemies. "With all my heart (said he); but in order to fight them, it is necessary to have troops, and troops cannot be raised without money." The clergy understood his meaning; they furnished subsidies, and the pillages ceased. The enterprizes of Philip Augustus were almost always successful; because he formed his projects with deliberation, and executed them without delay. He began by tending
rendering the French happy, and in the end rendered them formidable; though he was more inclined to anger than to gentleness, to punish than to pardon, he was regretted by his subjects as a powerful genius, and as the father of his country. It was in his reign that the marshal of France was seen, for the first time, at the head of the army. It was then also, that families began to have fixed and hereditary revenues, which were obliged to have hospitals for the cure of the clergy with less ingenuity and judgment. This did not, however, prevent the king from showing them favours, though the controversy itself laid the foundation of all the disputes which were afterwards agitated about the authority of the two powers; disputes which contributed not a little to confine the ecclesiastical jurisdiction within narrower limits. While Philip was employing himself in some external regulations, he was unhappily interrupted by Edward III. declaring war against France. This prince immediately recovered those parts of Guienne of which Philip was in possession. The Flemish having been invited from France in spite of oaths and treaties, joined the standard of Edward; and required that he would assume the title of king of France, in consequence of his pretensions to the crown; because then, agreeably to the letter of their treaty, they only followed the king of France. From this period is dated the union of the flower-de-luce and leopards in the arms of England. Edward, in order to justify the change of his arms, caused the following manifesto to be published in the verse of the times.

Res sum regnorum, hina ratione, duorum:
Anglorum in regno sum regi excerpto paterno:
Matris jure quia Francorum munus jovem:
Hinc ejf armorum variatio fatae morum.

In the way of a parody to these lines, Philip made the following reply:

Prado regnorum qui diecis effe duorum,
Francorum regno provoaberis, atque paterno.
Succedunt marce huic regno, non mulieres:
Hinc ejf armorum variatio fata tuerum.

In the mean time Philip put himself in a posture of defence. His arms were at first attended with some success; but those advantages were far from compensating the losses of the battle of Edcufe, in which the French fleet, consisting of 120 large ships, and manned by 45,000 seamen, was beaten by that of England in the year 1340. This defeat is to be attributed, in part, to the little attention which had been paid to the navy of France, notwithstanding her favourable situation, by being walled by two seas. She was obliged to make use of foreign ships, which obeyed but slowly, and even with some reluctance. This war, which had been alternately discontinued and renewed began again with more heat than ever in 1345. The two armies having come to an engagement the 26th of August 1346, near Crecy, a village in the county of Pontlieu, the English there gained a signal victory. Edward had only 20,000 men, while Philip had nearly twice that number; but the army of the former was insurged to war, and that of the latter was ill disciplined and overcome with fatigue; the French lost from 25,000 to 30,000 men; of which numbers were the John king of Bohemia (who though blind, fought gallantly), and about 1500 gentlemen, the flower of the French nobility. The losses of Calais, and several other
other places, was the sad fruit of this defeat. Some time before Edward had challenged Philip of Valois to a single combat, which he refused, not on the score of cowardice, but from the idea that it was improper for a sovereign prince to accept a challenge from a king who was his vassal. At length, in 1547, a truce for six months was concluded between France and England, and afterwards prolonged at different times. Philip died a short time after, the 23rd of August 1550, aged 57 years, and far from bearing on his monument the title of Fortune. He had, however, reunited Dauphiny to France. Humbert, the last prince of that country, having left all his children, and worn with the wars which he had held out against Savoy, turned a Dominican, and gave his province to Philip, in 1549, on condition that the eldest son of the kings of France should bear the title of Dauphin. Philip likewise added to his dominion Roussillon and a part of Cerdagne, by lending some money to the king of Majorca, who gave him those provinces as a security; provinces which Charles VIII., after the Duke of Savoy, had surrendered, without any reimbursement. It is surprising that in so unfortunate a reign he should have been able to purchase those provinces after having paid a great deal for Dauphiny; but the duty on salt, the rise on the other taxes, and especially the frauds committed in the coinage of money, are supposed to have enabled him to make those acquisitions. The fictitious and ideal value of the coin was not only raised, but a great deal of bad money was issued from the mint. The officers of the mint were sworn upon the Gospels to keep the secret: but how could Philip flatter himself that to grog a fraud would not be discovered?  

Philip II. son of Charles V. and of Isabella of Portugal, who was born at Valladolid on the 21st of May 1527, became king of Naples and Sicily by his father's abdication in 1554. He ascended the throne of Spain on the 17th of January 1556 by the same means. Charles had made a truce with the French, but his son broke it; and having formed an alliance with England, poured into Picardy an army of 40,000 men. The French were cut to pieces at the battle of St. Quintin, which was fought on the 20th of August 1557. That town was taken by assault, and the day on which the breach was mounted Philip appeared armed cap-a-pie in order to animate the soldiers. It was the first and last time that he was observed to wear this military dress. It is well known, indeed, that his terror was so great during the action that he made two vows; one, that he should never again be present in a battle; and the other, to build a magnificent monastery dedicated to St. Lawrence, to whom he attributed the success of his arms, which he executed at Fic平安, a village about seven leagues from Madrid. After the engagement, his general the Duke of Savoy, wanted to kiss his hand; but Philip prevented him saying, "It is rather my duty to kiss your's, who have the merit of so glorious a victory," and immediately presented him with the colours taken during the action. The taking of Catelet, Ham, and Noyon, were the only advantages which were derived from a battle which might have proved the ruin of France. When Charles V. was informed of this victory, it is said he asked the perfon who brought him the intelligence, "if his son was at Paris?" and being answered in the negative, he went away without uttering a single word. The Duke of Guise having had time to assemble an army, repaired the disgrace of his country by the taking of Calais and Thionville. While he was animating the French, Philip gained a pretty considerable battle against Marshal de Thermes near Gravelines. His army was, on this occasion, commanded by count Egmont, whom he afterwards caused to be beheaded. The conqueror made no better use of the victory of Gravelines than he had done of that of St. Quintin; but he reaped considerable advantage from the glorious peace of Chateau-Cambresis, the master-piece of his politics. By that treaty, concluded the 13th of April 1559, he gained possession of the strong places of Thionville, Mariembourg, Montmedy, Heidin, and the county of Charollos. This war, so terrible, and attended with so much cruelty, was terminated like many others, by a marriage. Philip took for his third wife Elizabeth, daughter of Henry II. who had been promised to Don Carlos. After these glorious achievements, Philip returned in triumph to Spain, without having drawn a sword. His first care, upon his arrival at Valladolid, was to demand of the grand inquisitor, the spectacle of an auto-da-fe. This was immediately granted him; 40 wretches, some of whom were priests or monks, were strangled and burnt, and one of them was burnt alive. Don Carlos de Seza, one of those unfortunate victims, ventured to draw near to the king, and said to him, "How, Sir, can you suffer so many wretches to be committed to the flames? Can you be witness of such barbarity without weeping?" To this Philip coolly replied, "If my own son were sullusted of hereby, I would myself give him up to the severity of the inquisition. Such is the horror which I feel when I think of you and your companions, that if an executioner were wanting, I would supply his place myself." On other occasions he conducted himself agreeably to the spirit which had dictated this answer. In a valley of Piedmont, bordering on the country of the Milanese, there were some heretics; and the governor of Milan had orders to put them all to death by the gibbon. The new opinions having found their way into some of the districts of Calabria, he gave orders that the innovators should be put to the sword, with the reservation of 60 of them, of whom 30 were afterwards strangled, and the rest committed to the flames. This spirit of cruelty, and shameful abuse of his power, had the effect to weaken that power itself. The Flemish, no longer able to bear to hard a yoke, revolted. The revolution began with the fine and large provinces of the continent; but the maritime provinces only obtained their liberty. In 1579 they formed themselves into a republic, under the title of the United Provinces. Philip sent the Duke of Alva to reduce them: but the cruelty of that general only served to exasperate the spirit of the rebels. Never did either party fight with more courage, or with more fury. The Spaniards, at the siege of Haerlem, having thrown into the town the head of a Dutch officer who had been killed in a skirmish, the inhabitants threw to them the heads of eleven Spaniards, with this inscription: "Ten heads for the payment of the tenth penny, and the eleventh for interest." Haerlem having surrendered at discretion, the conquerors caused all the magistrates, all the pastors, and above 1500 citizens, to be hanged.
The Duke of Alva, being at length recalled, the grand commander of the Requesnes was sent in his place, and after his death Don John of Austria; but neither of those generals could restore tranquillity in the Low Countries. To this end of Charles V. succeded a grandson no less illustrious, namely, Alexander Farnese duke of Parma, the greatest man of his time; but he could neither prevent the independence of the United provinces, nor the progress of that republic which arose under his own eye. It was then that Philip, always at his ease in Spain, instead of coming to reduce the rebels in Flanders, prostrated the Prince of Orange, and set 250,000 crowns upon his head. William, superior to Philip, disdained to make use of that kind of vengeance, and trusted to his sword for its preservation.

In the mean time the king of Spain succeeded to the crown of Portugal, to which he had a right by his mother Isabella. This kingdom was subjected to him by the Duke of Alva, in the space of three weeks, in the year 1580. Antony, prior of Crato, being proclaimed king by the populace of Lisbon, had the resolution to come to an engagement; but he was vanquished, pursued, and obliged to fly for his life.

A cowardly affaid, Balthazar Gerard, by a pistol-shot killed the Prince of Orange, and thereby delivered Philip from his most implacable enemy. Philip was charged with this crime, it is believed without reason; though, when the news was communicated to him, he was imprudent enough to exclaim, "If this blow had been given two years ago, the Catholic religion and I would have gained a great deal by it."

This murder had not the effect to restore to Philip the Seven United Provinces. That republic, already powerful by seas, affiled England against him. Philip having resolved to defend Elizabeth, fitted out, in 1588, a fleet called the Invisible. It consisted of 150 large ships, on which were counted 2650 pieces of cannon, 8000 seamen, 20,000 soldiers, and all the flower of the Spanish nobility. This fleet, commanded by the Duke of Medina Sidonia, failed from Lisbon when the season was too far advanced; and being overtaken by a violent storm, a great part of it was dispersed. Twelve ships, driven upon the coast of England, were captured by the English fleet, which consisted of 100 ships; 50 were wrecked on the coasts of France, Scotland, Ireland, Holland, and Denmark, such was the success of the Invincible. See ARAMADA.

This enterprise, which cost Spain 40 millions of ducats, 20,000 men, and 100 ships, was productive only of disgrace. Philip supported this misfortune with an heroic resolution. When one of his courtiers told him with an air of consolation, what had happened, he coolly replied, "I lent to fight the English, and not the winds. God's will be done." The day after Philip ordered the bishops to return thanks to God for having preserved some remains of his fleet; and he wrote thus to the pope: "Holy father, as long as I remain master of the fountain-head, I shall not much regard the loss of a rivulet. I will thank the Supreme Disposer of empires, who has given me the power of easily repairing a disaster which my enemies must attribute solely to the elements which have fought for them."

At the same time that Philip attacked England, he was encouraging in France the Holy League: the object of which was to overturn the throne and divide the state. The leaguers conferred upon him the title of Protector of their association; which he eagerly accepted, from a persuasion that their exertions would soon conduct him or one of his family, to the throne of France. He thought himself so sure of his prey, that when speaking of the principal cities in France, he used to say, "My fine city of Paris, my fine city of Orleans," in the same manner as he would have spoken of Madrid and Seville. What was the result of all these intrigues? Henry IV. embraced the Catholic religion, and by his abjuration of Protestantism made his rival lose France in a quarter of an hour.

Philip, at length, worn out by the debaucheries of his youth, and by the toils of government, drew near his last hour. A flood fever, the most painful grief, and a complication of other disorders, could not disengage him from business, nor draw from him the least complaint. "What!" said he to the physicians who hesitated about letting blood of him; "What! are you afraid of drawing a few drops of blood from the veins of a king who has made whole rivers of it flow from heretics?" At last, exhausted by a complication of distempers, which he bore with an heroic patience, and being eaten up of lice, he expired the 13th of September 1598, aged 72 years, after a reign of 43 years and eight months. During the last 50 days of his illness he showed a great sense of religion, and had his eyes almost always fixed towards heaven.

No character was ever drawn by different historians Watson's in more opposite colours than that of Philip; and yet, Philip H. considering the length and activity of his reign, there is none which it should seem would be more easy to ascertain. From the facts recorded in history, we cannot doubt that he possessed, in an eminent degree, penetration, vigilance, and a capacity for government. His eyes were continually open upon every part of his extensive dominions. He entered into every branch of administration; watched over the conduct of his ministers with unwearied attention; and in his choice both of them and of his generals discovered a considerable share of sagacity. He had at all times a composed and settled countenance, and never appeared to be either elated or depressed. His temper was the most imperturbable, and his looks and demeanor were never changed. God's will was done. In the reign of Philip, there is nothing which was expected; but of this triumph there occurs not a single instance in the reign of Philip; who without hesitation violated his most sacred obligations.
gations as often as religion afforded him a pretence, and under that pretence exercised for many years the most unremitting cruelty without relaxation or remorse. His ambition, which was exorbitant; his resentment, which was immeasurable; his arbitrary temper, which would submit to no control—conquered with his bigotted zeal for the Catholic religion, and carried the fanguinary spirit, which that religion was calculated to inspire, to a greater height in Philip than it ever attained in any other prince of that or of any former or succeeding age.

Though of a small size, he had an agreeable presence. His countenance was grave, his air tranquil, and one could not discover from his looks either joy or chagrin, the half of that sum. His revenues, after the support of his household, were very trifling, considering the fortune or chagrin he had caused more blood to flow, than any prince of that or of any former or succeeding age.

Philip was very jealous of outward respect; he was unwilling that any should speak to him but upon their knees. The duke of Alva having one day entered this prince's cabinet without being introduced, he received the following harsh salutation, accompanied with a stormy countenance: "An impudence like this of yours would have caused me to be more than commonly devout; as religion afforded him a pretence, and under that pretence exercised for many years the most unremitting cruelty without relaxation or remorse. His ambition, which was exorbitant; his resentment, which was immeasurable; his arbitrary temper, which would submit to no control—conquered with his bigotted zeal for the Catholic religion, and carried the fanguinary spirit, which that religion was calculated to inspire, to a greater height in Philip than it ever attained in any other prince of that or of any former or succeeding age.

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that he had been killed. This threw that whole part of the army into such a consternation, that when Brutus attacked them in front, they were most completely routed: three whole legions being cut in pieces, and a prodigious slaughter made among the fugitives. But by the imprudence of the general in pursuing too far, the wing of the republican army commanded by Cassius was left naked and separated from the rest of the army; on which they were attacked at once in front and in flank, and thus they were defeated and their camp taken, while Brutus imagined that he had gained a complete victory. Cassius himself retired to an eminence at a small distance from Philippus; whence he sent one of his greatest intimates to procure intelligence concerning the fate of Brutus. That general was on his way, and already in view, when the messenger set out. He soon met his friends; but they fled before them. He then proceeded to inquire the news. Cassius, who held what passed, imagined that he was taken prisoner by the enemy, retired to his tent, and in despair cut off one of his freedmen's heads from his body when Brutus entered. However, the freedman was never afterwards seen.

The second engagement was pretty similar to the first. Brutus again opposed Othoianus, and met with the same success; but in the mean time Antony, to whom he ought undoubtedly to have opposed himself, having to do only with the lieutenants of Cassius gained a complete victory over them. What was worst, the fugitives, instead of leaving the field of battle altogether, fled for protection to Brutus's army; where, crowding in among the ranks, they carried despair and confusion wherever they went, so that a total defeat ensued, and the republican army was almost entirely cut in pieces. After the battle, Brutus put an end to his own life, as is related more fully in the articles respecting Philippus.

The city of Philippopolis is likewise remarkable on an account of an epistle written by St. Paul to the church in that place. It was a Roman colony (Luke, Piiny, Coin, Inscription). It is also remarkable for being the birthplace of Adrautus, the Peripatetic philosopher, and disciple of Aristotle. The town is still in being, and is an archbishop's seat; but greatly decayed and badly peopled. However, there is an old amphitheatre, and several other monuments of its ancient grandeur.

E. Long. 44° 55'. N. Lat. 41° 0'.

PHILIPPICS,  קטנים הֹקִים, in literature, is a name which is given to the orations of Demosthenes against Philip king of Macedon. The Philippics are reckoned the master-pieces of that great orator. Longinus quotes many instances of the sublime from them, and points out a thousand latent beauties. Indeed that pathetic in which Demosthenes excelled, the frequent interjections and apostrophes wherewith he attacked the indolence of the Athenians, where could they be better employed? Whatever delicacy there be in the oration against Leptines, the Philippics have the advantage over it, were it only on account of the subject, which gives Demosthenes fair a field to display his chief talent, we mean, with Longinus, that of moving and astonishing.

Dionyfius Halicarnassenus ranks the oration on the Halonese among the Philippics, and places it the eighth in order: but though his authority be great, yet that force and majesty wherein Cicero characterizes the Philippics of Demosthenes, seem to exclude the oration on the Halonese out of the number; and authorize the almost universal opinion of the learned, who reject it as spurious. Libanius, Photius, and others, but above all the language of the style, and the lowness of the expressions, which reign throughout the whole, father it on Hegesippus. PHILIPPI is likewise applied to the fourteen orations of Cicero against Mark Antony. Cicero himself gave them this title in his epistles to Brutus: and pohtority have found it so just, that it has been continued to our times. Juvenal, Sat. 5. calls the second the divina Philippica, and witnesses it to be of great fame, confponse divina Philippica sana. That orator's invective against the magistrates and friends of Antony, which he delivered against the triumvirate, he procured Cicero's murder, cut off his head, and stuck it up in the very place whence the orator had delivered the Philippics.

PHILIPPINE ISLANDS, are certain islands of Asia, which lie between 141 and 126 degrees of east longitude, and between 6 and 20 degrees of north latitude; about 300 miles south east of China. They are said to be about 1200 in number, of which there are 400 very considerable. They form a principal division of that immense Indian Archipelago, which consists of so many thousand islands, some of which are the largest, and many of them the richest, in the world. The Philippines form the northernmost cluster of these islands, and were discovered in the year 1522 by the famous navigator Ferdinand Magellan, a Portuguese gentleman, who had served his native country both in the wars of Africa and in the East Indies; particularly under the Archduke, the famous Portuguese general, who reduced Goa and Malacca to the obedience of that crown. Magellan having had a considerable share in those actions, and finding himself neglected by the government of Portugal, and even denied, as it is said, the small advance of a dollar in his pay, left the court of Portugal in disgust, and offered his services to Charles V. then emperor of Germany and king of Spain, whom he convinced of the probability of discovering a way to the Spice Islands, in the East Indies, by the west; whereupon the command of five small ships being given him, he set sail from Seville, on the 10th of August 1519, and standing over to the coast of South America, proceeded southward to 52°, where he fortunately lit upon a strait, hence called the Strait of Magellan, which carried him into the Pacific Ocean or South Sea, and then steering northward, repelled the equator: after which he stretched away to the west, across that vast ocean, till he arrived at Guam, one of the Ladrones, on the 10th of March 1521, and soon after failed to the westward, and discovered the Philippines, which he did on St. Lazarus's day; and, in honour of that saint, he called them the Archipelago of St. Lazarus. He took possession of them in the name of the king of Spain, but happened to be killed in a skirmish he had with the natives of one of them. His people, however,
however, arrived afterwards at the Moluccas, or Clove Islands, where they left a colony, and returned to Spain by the way of the Cape of Good Hope; being the first persons that ever sailed round the globe. But there was no attempt made by the Spaniards to found or plant the Philippine Islands until the year 1564, in the reign of Philip II., son of Charles V. when Don Louis de Velasco, viceroy of Mexico, sent Michael Lopez Delagañtes there with a fleet, and a force sufficient to make a conquest of these islands, which he named the Philippines, in honour of Philip II. then upon the throne of Spain; and they have remained under the dominion of that crown till taken by Sir William Draper. The Philippines are scarce inferior to any other islands of Asia in all the natural productions of that happy climate; and they are by far the best situated for an extensive and advantageous commerce. By their position, they form the centre of intercourse with China, Japan, and the Spice Islands; and whilst they are under the dominion of Spain, they connect the Asiatic and American commerce, and become a general magazine for the rich manufactures of the one and for the treasuries of the other. Besides, they are well situated for a supply of European goods, both from the side of Acapulco and by the way of the Cape of Good Hope. In fact, they formerly enjoyed a traffic in some degree proportioned to the peculiar felicity of their situation; but the Spanish dominion is too vast and unconnected to be improved to the best advantage. The spirit of commerce is not powerful in that people. The trade of the Philippines is thought to have declined; its great branch is now reduced to two ships, which annually pass between these islands and Acapulco in America, and to a single port of Manila in the island of Luzon.

Indeed the Spaniards appear by no means to be actuated by the spirit of industry; for, so far from improving the fine situation of these islands to the utmost, it happens, on the contrary, that the trade centred to the mother-country; for, (to confine ourselves to Manila, with which they have most to do), instead of taking Spanish manufactures, they trade with the Chinese for spices, silks, stockings, Indian stuffs, callicoes, chintz, and many other articles; and with the Japaneese for cabinets, and all sorts of lacquered ware; for all which they pay in gold or silver. All these commodities, together with what the islands produce in great quantities of wrought plate by the Chinese artificers, are collected at Manila, and transported annually in two ships to Acapulco in Mexico. Each of these ships is esteemed worth £600,000 Sterling; and in the war which began in 1739, and which was not distinguished by such a series of wonderful successes as that which ended in 1763, the taking of one of the galleons which carry on the trade between Manila and America, was considered as one of the most brilliant advantages which the English gained. This trade is not laid open to all the inhabitants of Manila, but is confined by very particular regulations, somewhat analogous to those by which the trade of the regtiter ships from Cadiz to the West Indies is restrained. The ships employed are all king's ships, commissioned and paid by him; and the tonnage is divided into a certain number of bales, all of the same size. These are divided among the convents at Manila, but principally the Jesuits (1), as a donation to support their missions, for the propagation of the Roman Catholic faith. Most of the religious are concerned in this trade, and fell to the merchants at a great price what room in the ship they are not to occupy. This trade is by a royal edict limited to a certain value, but it always exceeds it, each ship being generally worth 3,000,000 dollars. The returns made from America are in silver, cochineal, sweetmeats, together with some European millenary ware for the women, and some strong Spanish wine. It is obvious, that the greatest part of the treasure remitted does not remain at Manila, but is dispersed over India for goods. Many strong remonstrances against this Indian trade to Mexico have been made to the court of Spain, wherein they urge, that the silk manufactories of Valcntia and other parts of Spain, the linens from Cadiz, and their other manufactories, are hurt in their sale in Mexico and Peru, by the Chineses being able to afford them goods of the same sort cheaper than they are able; that these trade laid open, the whole treasure of the New World would centre in Spain, or with European Merchants; but now it enriches only the Jesuits and a few private persons. Wise as these arguments are, the Jesuits and priests, verant in intrigue, and the most selfish set of men on earth, had interest enough at court to stop the effect.

At Cavite in this bay are a fort, a town, and a fine dock-yard, where those large galleons are built and repaired, and where they load and unload, together with all the other large ships that trade to this bay.

The principal of the Philippine islands are Luzon or Manila, Tandogo or Samol, Malbato, Mindora, Luman, Paragon, Panay, Leyte, Bohol, Sibuy, Sogbo, Negros, St. John, Xolo, and Mindanoa. In most of these, the Spanish power prevails, and all are under the governor of Luzon; but there are some in which the nation has little authority, or even influence, such as Mindanoa.

The inhabitants of these islands consist of Chineses, Ethiopians, Malays, Spaniards, Portuguese, Pintados or Painted People, and Moslees, a mixture of all these. Their persons and habits resemble those of the several nations whence they derive their original; only, it is observable, that the features of the blacks of these islands are as agreeable as those of the white people. There is not a foil in the world that produces greater plenty of all things for life; as appears by the multitude of inhabitants to be found in the woods and mountains, who subsist almost entirely by the fruits of the earth, and the venison they take. Nor can any country appear more beautiful; for there is a perpetual verdure, and buds, blossoms, and fruit, are found upon the trees all the year round, as well on the mountains as in the cultivated gardens. Valuable

(1) We do not know who has the Jesuits share since they were expelled the Spanish dominions.
PHI [ 477 ]

PHILIPPINES, a religious society of young women at Rome, so called from their taking St Philip de Neri for their protector. The society consists of 100 poor girls, who are brought up till they are of age to be married, or become nuns, under the direction of some religious women, who teach them to read, write, and work, and instruct them in the duties of Christianity. They wear a white veil, and a black cross on their breasts. See Macedonia.

* PHILIPPISTS, a sect or party among the Lutherans; the followers of Philip Melancthon. He had strenuously opposed the Ubiquists, who arose in his time; and the dispute growing still hotter after his death, the university of Wittemberg, who espoused Melancthon's opinion, were called by the Fiacrians, who attacked it, Philipps.

PHILIPS (Fabian), was author of several books relating to ancient customs and privileges in England. He was born at Prebury in Gloucestershire, September 28th, 1601. When very young, he spent some time in one of the Inns of Chancery; and went from thence to the Middle-Temple, where he became learned in the law. In the civil wars he was a bold adherent of the king's prerogative; and was so passionate a lover of Charles I. that two days before that illustrious monarch was beheaded, he wrote a protestation against the intended murder, and caused it to be printed, and affixed to posts in all public places. He likewise published in 1649, 4to, a pamphlet intituled, "Fertitas Inconsciis; or King Charles I. no Man of Blood, but a Martyr for his People:" which was reprinted in 1660, 8vo. In 1653, when the courts of justice at Westminster, especially the Chancery, were voted down by Oliver's parliament, he published, "Confiderations against the pillaging and taking them away:" for which he received the thanks of William Lenthal, Esq; speaker of the late parliament, and of the keepers of the liberties of England. He was for some time a printer in London, Middlesex, Cambridgeshire, and Huntingdonshire; and spent much money in searching records, and writing in favour of the royal prerogative. The only advantage he received for this attachment to the royal cause was, the place of one of the commissioners for taking up the lands ofworth £200 per annum, which only lasted two years. After the Restoration of Charles II. when the bill for taking away the tenures was depending in parliament, he wrote and published a book to show the necessity of preferring them, intituled, "Tenenda non Tollenda; or, the necessity of preferring tenures in capite, and by Knight's-service, which, according to their first institution, were, and are yet, a great part of the faslus populi, &c. 1660." 4to. In 1663 he published, "The antiquity, Legality, Reafon, Duty, and Neces­ sity of Pre-emption and Pounte for the King," 4to; and afterwards many other pieces upon subjects of a familiar kind. He affitzy Dr Bates in his "Elenchus Motuum; especially in searching the records and offices for that work. He died November 17th, 1690, in his 89th year; and was buried near his wife in the church of Twyford in Middlesex. He was a man well acquainted with records and antiquities; but his manner of writing is neither close nor well digested. He published a political pamphlet in 1689, intituled,
intitled, "Urfa Major et Minor; showing that there is no such Fear, as is fabiously pretended, of Popery and arbitrary Power."

Philips (Ambrose), an English poet, was descended from a very ancient and considerable family of that name in Leicestershire. He received his education at St John's college, Cambridge; during his stay at which university, he wrote his pastorals, which acquired him at the time so high a reputation. His next performance was, The Life of Archbishop Williams, written, according to Mr Cibber, to make known his political principles, which in the course of it he had a free opportunity of doing, as the archbishop, who is the hero of his work, was a strong opponent to the high church measures.

When he quitted the university, and came to London, he became a constant attendant at, and one of the wits of, Button's coffee-house, where he obtained the friendship and intimacy of many of the celebrated geniuses of that age, more particularly of Sir Richard Steele, who, in the first volume of his Tatler, has inserted a little poem of Mr Philips's, which he calls a Winter Piece, dated from Copenhagen, and addressed to the earl of Dorset, on which he bestows the highest encomiums; and indeed, so much justice is there in the his commendations, that even Mr Pope himself, who had a fixed aversion for the author, while he affected to defpise his other works, used always to except this from the number.

The first dislike Mr Pope conceived against Mr Philips, proceeded from that jealousy of fame which was so conspicuous in the character of that great poet; for Sir Richard Steele had taken so strong a liking to the pastorals of the latter, as to have formed a design for a critical comparison of them with those of Pope, in the conclusion of which the preference was to have been given to Philips. This design, however, coming to Mr Pope's knowledge, that gentleman, who could not bear a rival near the throne, determined to ward off this flame by a stratagem of the most artful kind; which was no other than taking the fame talk on himself; and, in a paper in the Guardian, by pointing out the absurdity of such a judgment. However, notwithstanding the ridicule that was drawn on him in consequence of his flandering as it were in competition with so powerful an antagonist, it is allowed, that there are, in some parts of Philips's pastorals, certain strokes of nature, and a degree of simplicity that are much better suited to the purposes of pastoral, than the more correctly turned periods of Mr Pope's versification. Mr Philips and Mr Pope being of different political principles, was another cause of enmity between them; which arose at length to so great a height, that the former, finding his antagonist too hard for him at the weapon of wit, had even determined on making use of a rougher kind of argument; for which purpose he even went so far as to hang up a rod at Button's for the chastisement of his adversary whenever he should come thither; which, however, Mr Pope declining to do, avoided the argumentum baculium in which he would, no doubt, have found himself on the weakest side of the question. Our author also wrote several dramatic pieces: The Briton, Distracted Mother, and Humphrey duke of Gloucester; all of which met with success; and one of them is at this time a standard of entertainment at the theatres, being generally repeated several times in every season. Mr Philips's circumstances were in general, through his life, not only easy but rather affluent, in consequence of his being connected, by his political principles, with persons of great rank and consequence. He was concerned with Dr Hugh Boulter, afterwards archbishop of Armagh, the right honourable Richard Wels, Esq; lord chancellor of Ireland, the reverend Mr Gilbert Burnet, and the reverend Mr Henry Stevens, in writing a series of papers called the Free Thinker, which were all published together by Mr Philips, in three volumes in 12mo.

In the latter part of Queen Anne's reign, he was secretary to the Hanover club, who were a set of noblemen and gentlemen who had formed an association in honour of that succession, and for the support of its interests; and who used particularly to distinguish in their toasts such of the fair sex as were most zealously attached to the illustrious House of Brunswick. Mr Philips's station in this club, together with the zeal shown in his writings, recommended him to the notice and favour of the new government. He was, soon after the accession of king George I. put into the commissary of the peace, and appointed one of the commissariow of the lottery. And, on his friend Dr Boulter's being made primate of Ireland, he accompanied that prelate across St George's channel, where he had considerable preferments bestowed on him, and was elected a member of the House of Commons there, as representative for the county of Armagh. At length, having purchased an annuity for life of 400l. per annum, he came over to England some time in the year 1748; but having a very bad state of health, and being moreover of an advanced age, he died soon after, at his lodgings near Vauxhall, in Surry.

"Of his personal character (says Dr Johnson) all I have heard is, that he was eminent for bravery, and skill in the sword, and that in conversation he was solemn and pompous." He is somewhere called Quaker Philips, but, however, appears to have been a man of integrity; for the late Paul Whitehead relates, that when Mr Addison was secretary of state, Philips applied to him for some preferment, but was coolly answered, "that it was thought that he was already provided for, by being made a justice for Welfminster." To this observation our author, with some indignation, replied, "Though poetry was a trade he could not live by, yet he scorned to owe subfistence to another which he ought not to live by."

The following anecdote is told of our author by Dr Johnson: "At a coffee-house, he (Philips) was discoursing upon pictures, and phying the painters, who, in their historical pieces, always draw the same fort of sky, "They should travel (said he), and then they would see that there is a different sky in every country, in England, France, Italy, and so forth." "Your remark is just (said a grave gentleman who sat by), I have been a traveller, and can testify what you observe is true; but the greatest variety of skies that I found was in Poland." "In Poland, Sir? (says Philips)."
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“Philips (Catharine), a very ingenious lady, the daughter of Mr John Fowler merchant, was born at London in January 1641, and educated at a school at Hackney. She married James Philips of the priory of Cardigan, Esq.; and went with the vicountesses of Dun-gannon and Pembroke to Ireland, where she translated Corneille’s tragedy of Pompey into English, which was several times acted there with great applause.

She translated also the four first acts of Horace, another tragedy of Corneille, the fifth being done by Sir John Denham. This excellent and amiable lady, for such it seems she was, died of the small-pox in London, the 22d of June 1664, much and justly regretted; “having not left (says Langhame) any of her sex her equal in poetry.—She not only equaled (adds he) all that is reported of the poetesses of antiquity, the Lesbian Sappho and the Roman Sulpitia, but justly found her admirers among the greatest poets of our age.” Cowley wrote an ode upon her death. Dr Jeremy Taylor had addressed to her his “Measures and offices of Friendship;” the second edition of which was printed in 1657, 12mo. She assumed the name of Orinda. In 1667, were printed, in folio, “Poems from the most dearly admired Mrs Catharine Philips, the matchless Orinda. To which is added, monsieur Corneille’s Pompey and Horace, tragedies. With several other translations from the French;” and her picture before them, engraved by Faithorne. There was likewise another edition in 1678, folio; in the preface of which we are told, that “she wrote her familiar letters with great facility, in a very fair hand, and perfect orthography; and if they were collected with those excellent discourses she wrote on several subjects, they would make a volume much larger than that of her poems.” In 1705, a small volume of her letters to Sir Charles Cotterel were printed under the title of “Letters from Orinda to Poliarisch. The editor of these letters tells us, that “they were the effect of an happy intimacy between herself and the late famous Poliarisch, and are an admirable pattern for the pleasing correspondence of a virtuous friendship. They will sufficiently instruct us, how an intercourse of writing between persons of different sexes ought to be managed with delight and innocence; and teach the world not to load such a commerce with ceniture and derogation, when it is removed at such a distance from even the appearance of guilt.”

Philips (John), an eminent English poet, was born in 1676. He was educated at Winchester and Oxford, where he became acquainted with Milton, whom he studied with great application, and traced in all his successful translations from the ancients. The first poem which distinguished our author, was his Splendid Shilling, which is in the Tuler-fyled the first burlesque poem in the English language. His next was intitled Blenheim, which he wrote at the request of the earl of Oxford, and Mr Henry St John, afterwards Lord Bolingbroke, on the victory obtained there by the duke of Marlborough in 1704. It was published in 1705; and the year after he finished another poem upon cyder, the first book of which had been written at Oxford. It is on the model of Virgil’s Georgics, and is a very excellent piece. We have no more of Mr Philips but a Latin ode to Henry St John, Esq which is esteemed a master-piece. He was contriving greater things; but illness coming on, he was obliged to drop every thing but the care of his health. This care, however, did not give him; for, after lingering a long time, he died at Hereford, Feb. 15, 1708, of a consumption and asthma, before he had reached his 33d year. He was interred in the cathedral of that city with an inscription over his grave; and had a monument erected to his memory in Westminster-abbey by Sir Simon Harcourt, afterwards lord-chancellor, with an epitaph upon it written by Dr Atterbury, though commonly ascribed to Dr Freind. He was one of those few poets, whose muse and manners were equally excellent and amiable; and both were so in a very eminent degree.

Dr Johnfon observes, that “Philips has been always praised, without contradiction as a man modest, blameless, and pious; who bore a narrow fortune without discontent, and tedious and painful maladies without impatience; beloved by those that knew him, but not ambitious to be known. He was probably not formed for a wide circle. His conversation is commended for its innocent gaiety, which seems to have flowed only among his intimates; for I have been told, that he was in company silent and barren, and employed only upon the pleasures of his pipe. His addiction to tobacco is mentioned by one of his biographers, who remarks, that in all his writings except Blenheim, he has found an opportunity of celebrating the fragrant fume. In common life, he was probably one of those who please by not offending, and whose conversation was loved, because his writings were admired. He died honoured and lamented, before any part of his reputation had withered, and before his patron St John had disgraced him. His works are few. The Splendid Shilling has the uncommon merit of an original design, unless it may be thought precluded by the ancient Cen TOR. To degrade the found ing words and flatly construction of Milton, by an application to the lowest and most trivial things, gratifies the mind with a momentary triumph over that grandeur which hitherto held its captives in admiration; the words and things are presented with a new appearance, and novelty is always grateful where it gives no pain. But the merit of such performances begins and ends with the first author. He that should again adopt Milton’s phrase to the gross incidents of common life, and even adapt it with more art, which would not be difficult, must yet expect but a small part of the praise which Philips has obtained; he can only hope to be considered as the repeater of a jest.

There is a Latin ode written to his patron St John, in return for a present of wine and tobacco, which cannot be passed without notice. It is gay and elegant, and exhibits several artful accommodations of classic expressions to new purposes. It seems better turned than the odes of Hannes. To the poem on cyder, written in imitation of the Georgies, may be given this peculiar praise, that it is grounded in truth; that the precepts which it contains are exact and just; and that it is therefore at once a book of entertainment and of science. This I was told by Miller, the great

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great gardener and botanist, whose expression was, that ‘there were many books written on the same subject in prose, which do not contain so much truth as that poem.’ In the disposition of his matter, so as to interfere precept, relating to the culture of trees, with sentiments more generally pleasing, and in easy and graceful transitions from one subject to another, he has very diligently imitated his master; but he unhappily pleased himself with blank verse, and supposed that the numbers of Milton which impress the mind however, our learned authors with veneration, combined as they are with subjects of inconceivable grandeur, could be sustained by images which at most can rise only to elegance. Contending angels may shake the regions of heaven in blank verse; but the flow of equal measures and the embellishment of rhyme, must recommend to our attention the art of engraving, and decide the merit of the redilection and ear-rain. What study could confer, Phillips had obtained; but natural deficiency cannot be supplied. He seems not born to greatness and elvation. He perhaps, through the influence of Milton, imitated his master, yet he was not contented to copy him entirely, but to alter him in order to render him more pleasing. His last poem was applied to the work of Lucretius, that ‘it is written with much art, though with few blazes of genius.’

It deserves to be remarked, that there were two poets of both the names of our author, and who flourished in his time. One of them was Milton’s nephew, and wrote several things, particularly some memoirs of his uncle, and part of Virgil’s Aeneid. The other was the author of two political farces, which were both printed in 1716.

The Earl of Marlborough married, with the Honourable Mrs. Jockey the Highlander. 2. The Pretender’s Flight, or A Mock Coronation, with the Humours of the Mediterranean.

PHILIPSBURG, is an imperial town of Germany, in the circle of the Upper Rhine. It is very strong, and looked upon as one of the bulwarks of the empire. It is seated in a morass, and fortified with seven bastions and several advanced works. The town belongs to the bishop of Spire, but all the works and the fortifications to the empire. It has been several times taken and retaken, particularly by the French in 1734, when the duke of Berwick was killed at the siege; but it was rendered back the year following, in consequence of the treaty of Vienna. It is seated on the river Rhine, over which there is a bridge seven miles south of Spire, two south-east of Worms, and forty north-east of Strasbourg.

PHILISTIA (anc. geog.), the country of the Philistines. (Bible) which lay along the Mediterranean, from Joppa to the boundary of Egypt, and extending to inland places not far from the coast. Pale- stine, the people; Philistia, the country (Josephus). Afterwards applied to the whole of the Holy Land and its inhabitants. Philistias, the people (Sepharvites, Vulgate); the Caphtorim and Philistia, originally from Egypt, and descendants of Cham (Moses). Expelled and destroyed the Hivites the ancient inhabitants, and occupied their country; that is, the region which retained the name of Philistia, in which that of Caphtorim was swallowed up.

PHILISTINES, were the ancient inhabitants of Palestine, well known in sacred history. These people are sometimes called in Scripture Cherithites and Caph- torims the earlier part of their history is, like that of Philistines, most other nations, very obscure and uncertain. The authors of the universal history tell us, that they were descended from the Caphtorim partly, and partly from the Caphtorim, both from the loins of Mizraim the son of Ham, the son of Noah. Moses tells us (Deut. xii. 43), that they dwelt among the Avim or Avides even to Azzah or Gazah, where they settled; but when this happened cannot be determined. On the whole, however, our learned authors are generally of opinion, that Philistia and Caphtorim, from whom the Philistines are descended, came originally from Egypt; and called the country which they had conquered by their own name. (See Palestine). Many interpreters; however, think, that Caphtor was but another name for Cappadocia, which they imagine to have been the original country of the Philistines. But Father Calmet, in a particular dissertations prefixed to the first book of Samuel, endeavours to shew that they were originally of the isle of Crete. The reasons which led him to think that Caphtor is the isle of Crete are as follow: The Philistines were strangers in Palestine as appears in various parts of Scripture; such as Gen. x. 14. Deut. ii. 23. Jer. xlviii. 4. and Amos ix. 7. whence the Septuagint always translate this name Strangers. Their proper name was Cherethim for Ezekiel (xxv. 16.), speaking against the Philistines, has these words, “I will stretch out my hand upon the Philistines, and I will cut off the Cherethim, and destroy the remnant of the sea-coast.” Zephaniah (ii. 5.), inveighing against the same people, says, “Wo unto the inhabitants of the sea-coasts, the nation of the Cherethites.” And Samuel (I. xxx. 14.) says, that the Amalekites made an irruption into the country of the Cherethites, that is to say, of the Philistines, as the sequel of the discourse proves. And afterwards the kings of Judah had foreign guards called the Cherethites and Pelathites, who were of the number of the Philistines (2 Sam. xvi. 18). The Septuagint, under the name Cherethites, understood the Cretans; and by Cherith they understood Crete. Besides the Scripture says, that the Philistines came from the isle of Caphtor. Now we see no island in the Mediterranean wherein the marks whereby the Scripture describes Caphtor and Cherethim agree better than in the isle of Crete. The name Cretum or Cherithim is the name with that of Cretensia. The Cretans are one of the most ancient and celebrated people which inhabited the islands of the Mediterranean. They pretended to have been produced originally out of their own soil. This island was well peopled in the time of the Trojan war. Homer calls it the island with a hundred cities. The city of Gaza in Palestine went by the name of Minos (Steph. Byzant. in Gasa), because Minos king of Crete was the founder of that country, called this ancient city by his own name.

Herodotus acknowledges that the Cretans were originally all barbarians, and did not come from Greece. Homer says, that a different language was spoken in the isle of Crete; that there were Greeks there, true or ancient Cretans Pelagians, &c. The ancient Cretans are the same as the Cherethites, the Pelagians as the Philistines or Pelathites of the Scripture: their language was the same with that of the Canaanites or Phoenicians, that is, Hebrew: they were defended, as well
Our God; its own. Marna, Mamas, or Marnafh. from them called all the country to he driven out, they being Egyptians. freedom; they became like other idolatrous nations; Univerfa1 History must be considered as It Chlrrence. "Their character (say the authors of the Universal History, who say, that Captus, the name of an old city of Egypt, is a corruption of the ancient Caphtor. It is not, however, of great importance to determine whether they came from Crete, from Cappadocia, or from Egypt: they had certainly been a considerable time in the Land of Canaan, when Abra- ham arrived there in the year of the world 2083. They were then a very powerful people, were governed by kings, and in possession of several considerable cities. The race of kings then in power were honoured with the title of Abimelech. This race, however, was but of short duration; for their monarchy became an aristocracy of five lords, who were, as far as we can discover, partly independent of each other, though they acted in concert for the common cause. This form of government was again succeeded by another race of kings, distinguished by the title of Abiah, though they also bore that of Abimelech. The kings were always under great limitations. The Philistines appear to have been a very warlike people, industrious, and lovers of freedom; they did not circumscribe, and in the early periods of their history held adultery in the greatest ab- herrence. "Their character (say the authors of the Universal History) must be considered as different periods; for we may say they were not always the same people. In the days of Abraham and Isaac, they were without all doubt a righteous and hospitable nation: but afterwards a revolution in government, religion, and morals, may have ensued. From thenceforward they became like other idolatrous nations; the fame enormities crept in and prevailed among them. They are constantly mentioned in Scripture as strangers; and though, possessed of a most considerable part of the Land of Promise, yet God would never suffer them to be driven out, they being Egyptians by de- scent, and not original natives, whose land only was promised to Abraham and his seed. Their arrogance and ambition were great; and so irreconcilable was their enmity (a) to the Israelites, that one would be almost tempted to think they were created on purpose to be a thorn in their sides; for though the hand of God was evidently against them several times, and particularly when they detained the ark, yet they hardened their hearts, and closed their eyes against conviction. They seem to have entertained a very fond veneration for their deities, in which they perished, tho’ they were eye-witnesses of the flame and ignominy which befel them in the presence of the captive ark; nay, they were so biased in their favour, as to imagine that their gods might prevail against Him who had in so glaring a manner put them to shame and disgrace. They were much addicted to trade; which, considering their situation, they may have exercised from the beginning; but, by the accession of the fugitive Edomites in David’s time, they rose to so great a reputation as merchants, that the Greeks, it seems, pre- ferred them to all other nations in that respect, and from them called all the country bordering on theirs Paleflne. Their language was not so different from that spoken by the Hebrews as to cause any difficulty for them to converse together, as will be perceived by their intercourse with Abraham and Isaac; so that, in all this region, the several nations spoke one and the same tongue, perhaps with some variation of dialect. They had doubtless the arts and sciences in common with the most learned and ingenious among their contemporaries, and perhaps some of them in greater perfection. They had giants among them, but whether they were originally of the breed of the Anakims, who retired hither when they were expelled from Hebron, or were sprung from accidental births, is not easily de- determined. We must not forget, that the invention of the bow and arrow is ascribed to this people. "Their religion was different at different times; under their first race of kings, they used the same rites with the Hebrews. Abimelech, in the bin he had like to have committed with Sarah, through Abraham’s timidity, was favoured with a divine admonition from God; and, by his speech and behaviour at that time, it seems as if he had been used to converse with the Deity. In after-times, they erred into endless super- titions, and different kinds of idolatry; each of the principal or five cities seemed to have had an idol of its own. Marna, Marnas, or Marnath, was worshipped at Gaza, and is said to have migrated into Crete, and to have become the Cretan Jupiter. Dagon was worshipped at Azotus he seems to have been the greatest, the most ancient, and most favourite god they had; to which may be added, that he perhaps subsi- ded the longest of any that did not starve out of the country. To him they ascribed the invention of bread- corn, or of agriculture, as his name imports. We cannot enter into the common notion of his being repre- sented as a monster, half man half fish; nor confe- quently into another almost as common, that he is the same with the Syrian goddess Derceto, who, we are told, was represented under some such mixed form. Our opinion is, that this idol was in shape wholly like a man; for we read of his head, his hands, and his feet. He flowed in a temple at Azotus, and had priests of his own who paid him a very constant attendance. (a) "From a passage in Chronicles, it is guessed to have been of very ancient date; where it is said, that ‘the men of Gath slew the Children of Ephraim, who would have taken their cattle from them.’ This incident is nowhere else to be found; and there are various notions concerning the fence in which we must take this passage. As to the time of the transmigration, most people allow it to have been while the children of Israel were sojourners in Egypt. It plainly appears, by the next verse, that Ephraim himself was living at that period. The Targum supposes his children mistook the time they were to serve in Egypt, and began too early an attempt upon their Promised Land."
Next to Dagon was Baalzebub the God of Ekron. In the text of the New Testament he is called Beelzebub, and the prince of devils. His name is rendered lord of flies; which by some is held to be a mock appellation bestowed on him by the Jews; but others think him so styled by his worshippers, as Hercules Apo­mylos, and others, were, from his driving those insects away; and urge, that Ahaziah, in his ficknefs, would scarce have applied to him, if his name had carried in it any reproach. But it must be remembered, it is the sacred historian that makes use of that contemptuous term in derision; whereas the idolatrous monarch, who was one of his votaries, might call him by his common name, supposed to have been Beal-zeboth, 'the lord of armies,' or Baal-ramim, 'lord of heaven,' or some other bordering on Baal-zebub. How, or under what form he was represented, is uncertain: fame place him on a throne, and attire him like a king; others paint him as a fly.

But we put for omnifcience and veracity; that he had a divine authority, without the claim for futurity. Derecto we take certainly to have been the goddeff of Aifealon; but we are supported by profane authority, without the least countenance from Scripture. Gath is seemingly the only city of all the five unprovided with a deity; wherefore, as the Scripture declares, that Ahtaroth, or Allarte, was wor­shipped by th‘s people, we are ready to place her at Gath, and the rather, as this of all their cities may have had most communication with Sidon. To speak in general concerning their religious rites and ceremonies, which is all we can do, they seem to have erected very large and spacious temples, or very wide halls, for the celebration of their solemn feafons and festival days (for such they fully had); their religious offices were attended with much pomp, and a great concourse from all parts; and they presented their gods with the chief part of their spoil, and carried them about with them when they went to war. We do not find in Scripture that they sacrificed their chil­dren; and yet the Curetes (b) are said to be their de­fendants."

With respect to the history of this extraordinary people, we find from the above extract, that they were not compre­hended in the number of nations devoted to exter­mination, and whose territory the Lord had abandoned to the Hebrews; nor were they of the cursed feed of Canaan. However, Joshua did not forbear to give their lands to the Hebrews, and to set them up by command from the Lord, because they possessed a country which was promised to the people of God (Joh. xv. 45—47, and xiii. 2, 3.) But these conquests of Joshuah must have been ill maintained, since under the Judges, under Saul, and at the beginning of the reign of David, the Philis­tines oppressed the Israelites. True it is, Shamgar, Sam­son, Samuel, and Saul, made head against them, but did not reduce their power; and they continued independent down to the reign of David, who sub­jected them to his government.

They continued in subjeCl:ion to the kings of Judah down to the reign of Jehoram, son of Jehoshaphat; that is, for about 446 years. However Jehoram made war against them, and probably reduced them to his obedience again; because it is observed in Scripture, that they revolted again from Uzziah; and that this prince kept them to their duty during the time of his reign (2 Chr. xx. 16. and xxvi. 6, 7.) During the unfortunate reign of Ahaz, the Philis­tines made great havoc in the territories of Judah; but his son and suc­cessor Hezekiah subdued them (2 Chr. xxviii. 18, and 2 Kings xviii. 8.) Lastly, they regained their full liberty under the latter kings of Judah; and we may see by the menaces denounced against them by the prophets Ifaiah, Amos, Zephaniah Jerusalem, and Ezekiel, that they brought a thousand hardships and calamities upon the children of Israel: for which cruelties God threatened to punish them. Esarhaddon besieged Affodor or Azoth, and took it (Ifa. xx. 1.) And according to Herodotus, Pammennus king of Egypt took the same city, after a siege of 29 years. There is great probability, that Nebuchadnezzar, who subdued the Ammonites, Moabites, Egyptians, and other nations, bordering upon the Jews, reduced all the Philis­tines. After this, they fell under the dominion of the Per­sians; then under that of Alexander the Great, who destroyed the city of Gaza, the only city in Phoenicia that durst oppose him. After the perfor­mance of Antiochus Epiphanes, the Ammonians sub­jected under their obedience several cities of the Phi­lites; and Tryphon gave to Jonathan Maccabbeus the government of the whole coast of the Mediter­ranean, from Tyre as far as Egypt, which included all the country of the Philis­tines.

PHILLYREA, MOCK PRIVET; a genus of the monogynia order, belonging to the diadia clas of plants. Each flower contains two males and one female. Some say there are seven species, all of them thrubby plants, and natives of France or Italy. Others reckon only three species, which are as follow:

1. *Phillyrea media*; the oval leaved phillyrea or mock pi3. privet, or the medial leaved phillyrea, a tall evergreen planting shrub, native of the south of Europe. 2. *Phillyrea la- and Gar­fisula*; the broad-leaved phillyrea or mock privet a tall deciduous evergreen shrub, native of the south of Europe. 3. *Phillyrea angustifolia*; the narrow-leaved phillyrea or mock privet, a deciduous shrub, native of Spain and Italy.

1. The first has three varieties, &c. The first is the common smooth-leaved phillyrea. This plant grows to be 12 or 14 feet high, and the branches are very nu­merous. The older branches are covered with a dark brown bark, but the bark on the young shoots is of a fine green colour. They are oval, sparsely, and grow opposite, by pairs, on strong short footstalks.

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Phillyrea. The flowers are produced in clusters from the wings of the young branches. They are small, and of a kind of greenish-white colour; they appear in March, and are succeeded by berries, which are first green, then red, and black in the autumn when ripe. The second variety is the privet-leaved phillyrea, which grows to be 10 or 12 feet high, and the branches of which are covered with a brown bark. The leaves a little resemble the privet; they are of a fine green colour, and grow by pairs on the branches. They are of a lanceolate figure, and their edges are entire or nearly so; for some figs of ferratures sometimes appear. The flowers grow like others in clusters in March. They are white, and are succeeded by small black berries. The third variety, or the olive-leaved phillyrea, is the most beautiful of all the sorts. It will grow to be about 10 or 12 feet high; and the branches, which are not numerous, spread abroad in a free easy manner, which may not improperly be said to give the tree a make no. They are long and slender, and are covered with a light brown bark; and on these the leaves stand opposite by pairs at proper intervals on short footstalks. They resemble those of the olive-tree, and are of a delightful green as to force sentinel. Their surface is exceeding smooth, their edges are entire, and the membrane of a thickish consistence. The flowers are small and white, and like the other sorts make no show. They are succeeded by single roundish berries.

2. The broad-leaved phillyrea will grow to be about 12 feet high. The branches seem to be produced stronger and more upright than those of the former species. The bark is of a grey colour, spotted with white, which has a pretty effect; and the leaves grow opposite by pairs. They are of a heart-shaped oval figure of a thick consistence, and a strong dark-green colour. Their edges are sharply ferrated, and they stand on short strong footstalks. The flowers grow from the wings of the leaves in clusters in March. They are of a kind of greenish-white colour, more to show, and are succeeded by small round black berries. There are also three varieties of this species, viz. the flex-leaved phillyrea, the prickly phillyrea, and the olive phillyrea with slightly ferrated edges.

3. The narrow-leaved phillyrea is of lower growth, seldom rising higher than 8 or 10 feet. The branches are few and slender, and they also are beautifully spotted with grey spots. The leaves, like the others, stand opposite by pairs. They are long and narrow, spear-shaped, and undivided, of a deep green colour, and of a thick consistence. Their edges are entire, and they also stand on short footstalks. The flowers, like the others, make no show. They are whitish, and grow in clusters from the wings of the branches, in March; and are succeeded by small round black berries. The varieties of this species are, the rosemary phillyrea, lavender phillyrea, striped phillyrea, &c.

This vegetable is to be propagated by seeds or layers. 1. By seeds. The ripen in the autumn, and should be sown soon after. They would be made fine, and if it is not naturally sandy, if some drift and sand be added, it will be so much the better. The seeds for the most part remain until the second spring before they come up; and if they are not sown soon after they are ripe, some will come up even the third spring after. They must be sown about an inch deep; and during the following summer should be kept clean from weeds. After they are come up, the same care must be observed, and all watering in warm weather; and if the beds are hooped, and the plants shaded in the hottest season, they will be so much the better for it. However, at the approach of winter they must be hooped, and the beds covered with mats in the hardiest sorts, otherwise there will be danger of lodging the whole crop; for these trees, though they are very hardy when grown tolerably large, are rather tender than feedlings. It will be proper to let them remain in the seed-beds with this management for two summers; and then waiting for the first autumnal rains, whether in September or October (and having prepared a spot of ground), they should at that juncture be planted out, and this will occasion them immediately to strike root. The distance they should be planted from each other need not be more than a foot, if they are not designed to remain in the nursery; if there is a probability of their not being wanted for some years, they should be allowed near double that distance; and every winter the ground in the rows should be well dug, to break their roots, and cause them to put out fresh fibres otherwise they will be in danger of being lost when brought into the shrubby quarters.

2. By layers they will easily grow. The autumn is the best time for this operation, and the young shoots are fit for the purpose. The best way of layering them is by making a slit at the joint; though they will often grow well by a twill being only made. When the gardener chooses the method of twisting a young branch for the layers, he must be careful to twist it about a joint so as only to break the bark; for if it is too much twisted, it will die from that time, and his expectations wholly vanish. But if it be gently twisted with art and care, it will at the twilled parts be preparing to strike root, and by the autumn following, as well as those layers that had been slit, will have good roots; the thorned end which was weaver for planting where they are wanted to remain, whilst the thicker and worst-rooted layers may be planted in the nursery-ground like the feedlings, and treated accordingly.

PHILO, an ancient Greek writer, was of a noble family among the Jews, and flourished at Alexandria during the reign of Caligula. He was the chief of an embassy sent to Rome about the year 42, to plead the cause of the Jews against Apion, who was sent by the Alexandrians to charge them with neglecting the honours due to Caesar. Caligula, however, would not allow him to speak, and behaved to him in such a manner that Philo was in considerable danger of losing his life. Others again tell us that he was heard; but that his demands were refused. He afterwards went to Rome in the reign of Claudius; and then, Eusebius and Jerome inform us, he became acquainted with St Peter, with whom he was on terms of friendship. Photius adds, that he became a Christian, and afterwards, from some motive of resentment, renounced it. Great part of this account is uncertain, for few believe that St Peter was at Rome so early as the reign of Claudius, if he ever was there at all.

Philo was educated at Alexandria, and made very great progress in eloquence and philosophy. After the fashion of the time, he cultivated, like many of his nation and faith, the philosophy of Plato, whose principle
Philo.
Philocrates.

Philo.
Philocrates.

PHILOCLES.

sciples he so thoroughly imbibed, and whose manner he so well imitated, that it became a common saying, "Aur Plato philonianum, aut Philo platonizat." Josephus says, he was a man "eminent on all accounts:" and Eusebius describes him, "copious in speech, rich in sentiments, and sublime in the knowledge of holy writ." He was, however, so much immersed in philosophy, particularly the Platonic, that he neglected the Hebrew language, and the rites and customs of his own people. Scaliger says, that Philo "knew no more of Hebrew and Syriac than a Gaul or a Scythian." Grotius is of opinion, that "he is not fully to be depended on, in what relates to the manners of the Hebrews:" and Cudworth goes further; for "though a Jew by nation (says he), he was yet very ignorant of Jewish customs." Fabricius thinks differently; for though he allows some inadvertencies and errors of Philo with regard to their matters, yet he does not see a sufficient foundation on which to charge so illustrious a doctor of the law with ignorance. He allows, however, that Philo's passion for philosophy had made him more than half a pagan; for it led him to interpret the whole law and the prophets upon Platonic ideas; and to admit nothing as truly interpreted which was not agreeable to the principles of the academy. Besides, this led him farther; he turned every thing into allegory, and deduced the darkest meanings from the plainest words. This most pernicious practice Origin, it is known, imitated, and exposed himself by it to the scoffs of Celsus and of Porphyry. Philo's writings abound with high and mythical, new and subtle, far-fetched and abstractive notions; and indeed the doctrines of Plato and Moos are so promiscuously blended, that it is not an easy matter to assign to each his principles. There are certainly, however, in his works many excellent things. Though he is continually Platonicizing and allegorizing the Scriptures, he abounds with fine sentiments and lessons of morality; and his morals are rather the morals of a Christian than of a Jew. He is, moreover, the author of a work entitled "The works which give us every reason to believe that he was a man of great prudence, confidence, and virtue.

His works were first published in Greek by Turnebus at Paris 1552. A Latin translation made by German was afterwards added, and printed several times with it. The Paris edition of 1640 in folio was the best for a whole century; which made Cotelerius say, that "Philo was an author that deserved to have a better text and a better version." In 1742, a handsome edition of his work was published at London by Dr. Mangey in two volumes folio; which is certainly preferable if it were only for the paper and print, but it is not so good a one as Philo deserves.

Many of our readers may be desirous of further details respecting this celebrated man; we refer such therefore to Josephus's Antiquities, Eusebius's Ecclesiastical History, St. Jerome's work De Scripturis Eclesiastici, Fabricius Bibli. Graec. Cava Hist. Liter. and vol. II. of Monumenta of the Greek Church.

PHILOCLES, an admiral of the Athenian fleet during the Peloponnesian war. He recommended to his countrymen to cut off the right hand of such of the enemies as were taken, that they might be rendered unfit for service. His plan was adopted by all the ten admirals except one; but their expectations were frustrated, and instead of being conquerors they were totally defeated at Ægospotamos by Lyndander, and Philocles was put to death with the rest of his colleagues.

PHILOCETES, in fabulous history, the son of Pean, was the faithful companion of Hercules; who at his death obliged him to swear not to discover the place where his ashes were interred, and presented him with his arrows dipped in the Hydra's blood. The Greeks at the siege of Troy being informed by an oracle that they could never take that city without those fatal arrows, went to Philocetes, and inquired upon his discovering where he had left his friend; when Philocetes, to evade the guilt of perjury, let them know where Hercules was intombed, by ramifying upon the place: but he was punished for the violation of his oath, by dropping an arrow upon that spot, which, after giving him a great ague, was at length cured by Macdon. He was afterwards taken by Ulysses to the siege of Troy, where he killed Paris with one of his arrows.

PHILOLAUS, of Crotona, was a celebrated philosopher of antiquity, of the school of Pythagoras, to whom that philosopher's Golden Verses have been ascribed. He made the heavens his principal object of contemplation; and has been idly (A) supposed to have been the author of that true system of the world which Copernicus afterwards revived. This made Bullialus place the name of Philolaus at the head of two works, written to illustrate and confirm that Ytylem.

"He was (says Dr. Enfield) a disciple of Archytas, and flourished in the time of Plato. It was from him that Plato purchased the written records of the Pythagorean system, contrary to an express oath taken by the society of Pythagoreans, pledges themselves to keep secret the mysteries of their faith. It is probable, that among those books was the one of Timaeus, upon which Plato formed the dialogue which bore his name. Plutarch relates, that Philolaus was one of the perfons who escaped from the house which was burned by Cylon, during the life of Pythagoras; but this account cannot be correct. Philolaus was contemporary with Plato, and therefore certainly not with Pythagoras. Interfering in affairs of state, he fell a sacrifice to political jealousy.

"Philolaus treated the doctrine of nature with great subletly, but at the same time with great obscurity; referring every thing that exists to mathematical principles. He taught, that reason, improved by mathematical learning, is alone capable of judging concerning the nature of things; that the whole world consists of infinite and finite; that number suffices by itself, and is the chain which by its power sustains the eternal frame of things; that the Monad is not the sole principle of all things, but that any number is necessary to furnish materials from which all subsequent numbers may be produced; that the world is one whole, which has a fiery centre, about which the ten celestial spheres revolve, heaven, the sun, the planets, the

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A) We say idly, because there is undoubted evidence that Pythagoras learned that system in Egypt. See PHILeSOPHY.
The study of philology deals with the properties and affections of words. It is the science of the nature of the present subject as fully and as intelligibly as possible, that, following Timaeus, whose writings he preferred, he so far departed from the Pythagorean system as to conceive two independent principles in nature, God and Matter, and that it was from the same source that Plato derived his doctrine upon this subject.

**PHILOLOGY.**

Philostratus

**PHI**

The earth, and the moon; that the sun has a vitreous surface, whence the fire diffused through the world is reflected, rendering the mirror from which it is reflected visible; that all things are preferred in harmony by the law of necessity; and that the world is liable to destruction both by fire and by water. From this summary of the doctrine of Philolaus it appears probable, that, following Timaeus, whose writings he preferred, he so far departed from the Pythagorean system as to conceive two independent principles in nature, God and Matter, and that it was from the same source that Plato derived his doctrine upon this subject.

**PHILOLOGY.**

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vented by the Egyptian Mercury; others ascribed the honour of the invention to the Syrians." Some contend, that letters were an antediluvian invention, preferred among the Chaldeans or Assyrians, who were the immediate descendants of Noah, and inhabited those very regions in the neighbourhood of which the ark rested, and where that patriarch afterwards fixed his residence. This circumstance, they think, affords a strong presumption that the use of letters was known before the deluge, and transmitted to the Assyrians and Chaldeans by Noah their progenitor, or at least by their immediate ancestors of his family. Others, with much probability, conclude that letters were of Divine origin, and were first communicated at Sinai.

The descendants of Seth, according to the oriental tradition, were chiefly addicted to agriculture and tending of cattle. They devoted a great part of their time to the exercises of piety and devotion. From this circumstance they came to be distinguished by the title of the (a) fonts of God. According to this description, the Sethites were a simple (a), unimproved race of people till they mingled with the race of Cain; after which period they at once adopted the improvements and the vices of that wicked family.

It is not, however, probable, that all the descendants of Seth, without exception, mingled with the Cainites. That family of which Noah was descended had not incorporated with the race of Cain: it was, according to the sacred historian, lineally descended from Seth, and had preferred the worship of the true God, when, it is probable, the greatest part of mankind had apostatised and become idolaters (c). Along with the true religion, the progenitors of Noah had preferred that simplicity of manners and equability of character which had distinguished their remote ancestors. Agriculture and rearing cattle had been their favourite occupations. Accordingly we find, that the patriarch Noah, immediately "after the deluge," became a husbandman, and "planted a vineyard." The chosen patriarchs, who doubtless imitated their pious ancestors, were shepherds, and employed in rearing and tending cattle. Indeed there are strong premonitions that the Chaldeans, Assyrians, Syrians, Canaanites, and Arabians, in the earliest ages followed the same profession.

From this deduction, we imagine it is at least probable, that the ancestors of Noah perished in the observance of the same simplicity of manners which had been handed down from Adam to Seth, and from him to Enoch, Methuselah, Lamech, and from this last to Noah. According both to scripture and tradition, the descendants of Seth adhered to the primitive and truly patriarchal institutions.

If these premises are allowed the merit of probability, the orientals, however, affirm that Seth, whom they call Edris, was the inventor of astronomy. We believe it will be superfluous to suggest, that our intention in the course of this deduction, is, if possible, to trace the origin and antiquity of the Hebrew tongue: and to try to discover whether that language, or any of its sister dialects, may claim the honour of being the original language of mankind.

Whatever may have been the dialect of Noah and his family, that same dialect, according to the Mosaic account, must have obtained, without any alteration, till the era of the building of the tower of Babel. Upon this occasion a dreadful convulsion took place; the language of mankind was confounded, and men were scattered abroad upon the face of all the earth.

How far this catastrophe (x) extended, is not the Confusion business of the present inquiry to determine. One thing is certain beyond all controversy, namely, that the tower of Babel, and the languages of all the nations which settled near the centre of population were but slightly affected by its influence. A very judicious writer has observed, that Strabo, 7000 years after, the inhabitants of those countries exhibited a very strong resemblance of cognition, "in their language, manner of living, and the lineaments of their bodies. At the same time he observes, that the resemblance in all those particulars was most remarkable among the inhabitants of Mesopotamia." This observation, with respect to language, will, we doubt not, be vouched for by every one of our readers who has acquired even a superficial knowledge of the languages current in those quarters, at a very early period.

It appears, then, that the languages of the Armenians, Syrians, Assyrians, Arabians, and probably of the Chanaanites, did not suffer materially by the confusion of tongues. This observation may, we imagine, be extended to many of the dialects (y) spoken by the people who settled in those countries not far distant.

(a) From this passage (Gen. ch. vi. ver. 2) misunderstanding, originated the absurd idea of the connection between angels and mortal women. See Joseph. Antiq. Jud. i. cap. 4. See Eusth. Chron. lib. 1. All the fathers of the church, almost without exception, adopted this foolish notion. See also Philo. Jud. p. 198. ed. Turn. Paris 1552.

(b) The orientals, however, affirm that Seth, whom they call Edris, was the inventor of astronomy.

(c) We think it highly probable that idolatry was established before the flood; because it prevailed almost immediately after that catastrophe. See Polytheism.

(d) For the first language communicated to Adam, see the article on Language: also Smith's Connect. Vol. I. I. ii. p. 111. et seq.

(e) Josephus and the fathers of the church tell us, that the number of languages produced by the confusion of tongues was 72; but this is a mere rabbinical legend.

(f) The languages of the Medes, Persians, Phoenicians, and Egyptians, very much resembled each other in their original complexion; and all had a strong affinity to the Hebrew, Chaldean, Syriac. &c. See Walton's Proleg.
PHILOLOGY.

History of flant from the region where the sacred historian has fixed the original seat of mankind after the deluge. The inference then is, that if Noah and his family spoke the original language of Adam, as they most probably did, the judgment which affected the confusion of tongues did not produce any considerable alteration in the language of the descendants of Noah as settled near the region where that patriarch had fixed his residence after he quitted the ark.

But supposing the changes of language produced by the catastrophe at the building of the tower to be considerable as has ever been imagined, it does not, after all, appear certain that all mankind without exception were engaged in this impious enterprise. If this assertion should be well founded, the consequence will be, that there was a chosen race who did not engage in that enterprise. If there was such a family, society, or body of men, it will follow, that this family, society, &c. retained the language of its great ancestor without change or variation. Such a family did actually exist, is highly probable, for the following reasons:

1. We think there is reason to believe, that Ham, upon the heavy curse denounced upon him by his father, retired from his brethren, and fixed his residence elsewhere. Accordingly, we find his descendants scattered far and wide, at a very great distance from the Gordyean mountains, where the ark is generally supposed to have rested immediately after the flood. Some of them we find in Chaldea, others in Arabia Felix, others in Ethiopia (c), others in Canaan, and others in Egypt; and, finally, multitudes scattered over all the coasts of Africa. Between these countries were planted many colonies of Semites, in Elam, Affyrria, Syria, Arabia, &c. We find, at the same time, the descendants of Shem and Japheth settled in a great degree, contiguous to each other. This diffusion of the Hamites, irregular as it is, can scarce, we think, have been accidental; it must have been owing to some uncommon cause, and none seems more probable than that alligned above. If, then, the descendants of Ham separated early, and took different routes, as from their posterior situations it appears they did, they could not all be present at the building of the tower.

2. It is not probable that the descendants of Shem were engaged in this undertaking, since we find that they were not scattered abroad upon the face of all the earth. The children of Shem were Elam, Assur, Arphaxad, Lud, and Aram. Elam settled near the mouth of the river Tigris, in the country which, by Gentile writers, was called Asia. Above him, on the same river, lay the demesne of Assur on the western side. In like manner, upon the same river, above him was situated Aram, who possessed the country of Armenia; and opposite to him was Arphaxad, or Araxes or Arachas, and his country was designated Armenia. Lud, as some think, settled in Lydia, among the sons of Japhet; but this opinion seems to be without foundation (h). Here, then, there is no diffusion, but such as must have originated from the nature of the thing. The four, or rather the five, brothers, all settled contiguous, without being scattered abroad upon the face of the whole earth. Besides, there was no confusion of language among these tribes: they continued to use one and the same lip through many succeeding generations.

From these circumstances, it appears that the posterity of Shem were not involved in the guilt of the builders of the tower, and of consequence did not undergo their punishment. If, then, the language of the family of the Semites was not confounded upon the erection of the tower, the presumption is, that they retained the language of Noah, which, in all probability, was that of Adam. Some dialectical differences would in process of time creep in, but the radical fabric of the language would remain unaltered.

3. The posterity of Shem appear in general to have cultivated the pastoral life. They imitated the style of living adopted by the antediluvian posterity of Seth. No sooner had Noah descended from the ark, than he became *ib ha Adamah, a man of the earth; that is, a husbandman, and planted a vineyard. We find that some ages after, Laban the Syrian had flocks and herds; and that the chief wealth of the patriarch Abraham and his children consisted in their flocks and herds. Even his Gentile descendants, the Ishmaelites and Midianites, seem to have followed the same occupation. But people of this profession are seldom given to changes: their wants are few, and of consequence they are under few or no temptations to deviate from the beaten track. This circumstance renders it probable, that the language of Noah, the same with that of Adam, was preferred with little variation among the descendants of Arphaxad down to Abraham.

We have observed above, that Ham upon the curse denounced against him by his father, very probably left the society of his other brothers, and emigrated elsewhere, as Cain had done in the antediluvian world. There is a tradition still current in the East, and which was adopted by many of the Chaldaic fathers (i), that Noah, in the 930th year of his life, by divine appointment,

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*Proleg. I. Gale's Court of the Gent. vol. 1. 1. ch. 11. page 70. et seq.; Boch. Phaleg and Canaan pass. To these we may add the Greek language, as will appear more fully below.

(o) Josephus informs us, that all the nations of Asia called the Ethiopians Caffim; 1. 1. cap. 7.

(i) The ancient name of Lydia was Mesmaia. See Strabo Caffim 1. 13. page 586. chap. 7. Rhod. 377. The Lydians were celebrated for inventing games; on which account they were nicknamed by the Eolian Greeks *Lydi, Lydi or Ludis, from the Hebrew words *luw, ludere, illudere, divaderere. We find (Ezek. xxvii. ver. 10.) the men of Elam and Lud joined in the defence of Tyre; which seems to intimate, that the Elamites and Ludites were neighbours. If this was actually the case, then Lud settled in the same quarter with his brothers.

(i) Epiph. vol. i. page. 5. ïnd. pag. 709. where our learned readers will observe some palpable errors about Rhinocerous, &c. ïndeb. Chron. pag. 10. Syncellus, pag. 89. Cedrenus, Chron. Pofch. &c.
ment, did, in the most formal manner, divide the whole terraqueous globe among his three sons, obliging them to take an oath that they would stand by the decision. Upon this happened a migration at the birth of Peleg, that is, about three centuries after the flood. It is affirmed, that Nimrod the arch-rebel disregarded this partition, and encroached upon the territory of Ashur, which occasioned the first war after the flood.

The Greeks had acquired some idea of this partition, which they supposed to have been between Jupiter, Neptune, and Pluto. Plato seems to have heard of it (s): "For (says he) the gods of old obtained the dominion of the whole earth, according to their different allotments. This was effected without any contention, for they took possession of their several provinces in a fair and amicable way, by lot." Jofephus, in his account of the dispersion of mankind, plainly intimates a divine disposition; and Philo Judaeus (t) was of the same opinion before him.

In consequence of this arrangement, the sons of Shem possessed themselves of the countries mentioned in the preceding pages: the pofterity of Japhet had spread themselves towards the north and west; but the Hamites, who had separated from their brethren in consequence of the curse, not choosing to retire to their quarters, which were indeed very distant from the place where the ark refted, seized upon the land of Canaan (w). Perhaps, too, it might be suggested by some malicious spirits, that the aged patriarch was dealing partially, when he alligned Ham and his pofterity a quarter of the world to inhabit not only remote from the centre of population, but likewise fequestered from the rest of mankind (s). Be that as it may, the children of Ham removed eastward, and at length descending from the Carducean or Gordion mountains, directed their course towards the plains of Shinar, which had been possessed by the Alburim ever since the era of the first migration at the birth of Peleg. The sacred historian informs us, that the whole earth was of one language and of one speech; that in journeying from the east, they lighted upon the plain of Shinar, and dwelt there. In this passage we find no particular people specified; but as we find Nimrod, one of the descendants of Ham, settled in that country, we are sure that they were the offspring of that patriarch. It would not, we think, be easy to assign a reason how one branch of the family of Ham came to plant itself in the midst of the sons of Shem by any other means but by violence.

It is indeed generally supposed, that Nimrod, at the head of a body of the children of Ham, made war upon Ashur, and drove him out of the country of Shinar; and there laid the foundation of that kingdom, the beginning of which was Babel: that this chief supported by all the Cushites, and a great number of apotates from the family of Shem and Japhet who had joined him, refused to submit to the divine ordinance by the mouth of Noah, with respect to the partition of the earth; and that he and his adherents were the people who erected the celebrated tower, in consequence of a revolution which they had formed to keep together, without repairing to the quarters assigned them by the determination of heaven. This was the crime which brought down the judgment of the Almighty upon them, by which they were scattered abroad upon the face of all the earth. The main body of the children of Shem and Japhet were not engaged in this impious undertaking; their language, therefore, was not confounded, nor were they themselves scattered abroad. Their habitations were contiguous; those of the Shemites towards the centre of Asia; the dwellings of Japhet were extended towards the north and north-west; and the languages of both those families continued for many ages without the least variation, except what time, climate, laws, religion, new inventions, arts, sciences, and commerce, &c. will produce in every tongue in a succession of years.

The general opinion then was, that none but the progeny of Ham and their associates were present at the building of the tower, and that they only suffered by the judgment (o) consequent upon that attempt. There are even among the Pagans some allusions to the division of the world among the three sons of Noah. Many of the learned have imagined that this patriarch was Saturn; and that his three sons were Jupiter, Neptune, and Pluto, as has been observed above.

Bero-

(k) Critias, vol. 3, pag. 109. Serr. Apollodoros mentions a time when the gods respectively føelected particular cities and regions, which they were to take under their peculiar protection.

(l) L. 10. p. 236. Turn. Paris 1552. We have a plain allusion to this distribution (Deut. ch. xxxii. ver. 7) "When the most High divided to the nations their inheritance, when he separated the sons of Adam, he set the bounds of the people, according to the number of the children of Israel; for the Lord's portion is his people; Jacob is the lot of his inheritance." From this passage it appears, that the whole was arranged by the appointment of God, and that the land of Canaan was expressly referred for the children of Israel. St Paul, Acts ch. xvii. ver. 26, speaks of this divine arrangement, "God made of one blood all nations of men, for to dwell on all the face of the earth; and determined the bounds of their habitation."

(m) the ark, according to the most probable accounts, rested upon mount Ararat in Armenia.

(n) We think it is by no means improbable that Noah, well knowing the wickedness of the family of Ham, and especially their inclination to the idolatry of the antediluvians, might actually intend to separate them from the rest of mankind.

(o) Some learned men have imagined that this confusion of language, which the Hebrew calls Liph, was only a temporary failure of pronunciation, which was afterwards removed. This they are led to conclude, from the agreement of the languages of these people in after times.
We have pursued this argument to considerable length, because some have inferred, from the difference in languages existing at this time, that mankind cannot have sprung from two individuals; because, from the connection still existing among languages, some have been bold enough to question the fact, though plainly recorded in sacred history; and lastly, because we imagine that some of our readers, who do not pretend to peruse the writings of the learned, may be gratified by seeing the various opinions respecting the confusion of tongues, and the dispersion of mankind, collected into one mass, equally brief, we hope, and intelligible: and this view of these opinions, with the foundations on which they respectively rest, we think may suffice to prove, that the language of Noah was for some ages preferred unmixed among the descendants of both Shem and Japhet.

To gratify still farther such of our curious readers as may not have access to more ample information, we shall in this place exhibit a brief detail of the circumstances which attended this fatal attempt. The people engaged in it have been held up as a profligate race. The Almighty himself characterizes them as "the children of men," which is the very appellation by which the antediluvian sinners were characterized; the sons of God saw the daughters of men, &c. Their design in raising this edifice was "to make them a name, and to prevent their being scattered abroad upon the face of the whole earth." Whatever resolution the rest of mankind might have taken, they had determined to maintain themselves on that spot. The tower was intended as a centre of union, and perhaps as a forte of defence. Such a stupendous fabric, they imagined, would immortalize their memory, and transmit the name of their confederacy with eclat (p) to future ages. This design plainly intimates, that there was only a party concerned in the undertaking, since, had all mankind been engaged in it, the purpose would have been foolish and futile. Again, they intended, by making themselves a name, to prevent their being scattered abroad upon the face of the earth. This was an act of rebellion in direct contradiction to the divine appointment, which constituted their crime, and brought down the judgment of Heaven upon their guilty heads. The consequence of the confusion of languages was, that the projectors left off to build (q), and were actually scattered abroad, contrary to their intention.

Abydenus, in his Assyrian annals, records, that the Pagan translators carried up to heaven; but that the pagans ruined it by tempests and whirlwinds, and overthrew it upon the heads of those who were employed in the work, and that the ruins of it were called Babel.

3 Q. Babel.

(p) Many foolish and absurd notions have been entertained concerning this structure. Some have imagined that they meant to take shelter there in case of a second deluge; others, that it was intended for idolatrous purposes; others, that it was to be employed as an observatory. Its dimensions have likewise been most extravagantly magnified. Indeed Strabo, l. 16, mentions a tower of immense size remaining at Babylon in his time, the dimensions of which were a stadia every way. This, however, seems to have been the remains of the temple of Bel or Belus.

(q) For a description of the tower, see the article Babel.
Before there was but one language subsisting among men: but now there are many, a manifold speech; and he adds, that a war soon after broke out between (s) Titan and Cronus. (r) The Sybiline oracles give much the same account of this early and important transmigration.

"Justin * informs us, that the Phoenicians who built Tyre were driven from Assyria by an earthquake. These Phoenicians were the descendants of Mizraim, the youngest son of Ham; and we, think, confederates in building the tower, and were driven away by the catastrophe that ensued. Many other allusions to the dismission of this branch of the family occur in Pagan authors, which the limits to be observed in an inquiry of this nature oblige us to omit. Upon the whole, it is probable that the country of Shinar lay defolate for some time after this revolution; for the dread of the judgment inflicted upon the original inhabitants would deter men from settling in that inauspicious region. At last, however, a new colony arrived, and Babylon, became the capital of a flourishing kingdom.

Our readers, we believe, will expect that we should say something of Nimrod the mighty hunter, who is generally thought to have been deeply concerned in the transmigrations of this period. According to most authors, both ancient and modern, this patriarch was the leader of the confederates who erected the tower, and the chief instigator to that enterprise. But if the tower was built at the birth of Phægus, according to the Hebrew computation, that chief was either a child, or rather not born at that period (v). The Seventy have pronounced him a giant, as well as a huntsman. They have translated the Hebrew word גֵּבֵר, which generally signifies strong, mighty, by the word τερεκτις; an idea which we imagine those translators borrowed from the Greeks. The antediluvian giants are called נַפְשָׁיִם and רֵפְהִים, but never גֵּבֵר. The Rabbinical writers, who justly hated the Babylonians, readily adopted this idea (x); and the fathers of the church, and the Byzantine historians, have universally followed them. He has been called נִמְרוֹד, נָבְרֹד, נָחוֹר, נָבָרֹד, and נָבָרֹד. Not a few have made him the fifth Bacchus, and compounded his name of Bar, a son, and Cyth, that is, the son of Cythere. Some have imagined that he was the Orion of the Pagans, whose shade is so nobly described by Homer. But the etymology of this last name implies something (y) honourable, and very unfortuitous to the idea of the tyrant Nimrod. It must be observed, however, that we find nothing in Scripture to warrant the supposition of this man's being a tyrant; so far from it, that (z) some have deemed him a benefactor to mankind. See Nimrod.

The beginning of this prince's kingdom was Babel. Enoeus gives us first * a catalogue of six kings of the * Chaldeans, and then another of five kings of Ara-ribboned, who reigned in Chaldea after them. This might naturally enough happen, since it appears that the inhabitants of those parts of Arabia which are adjacent to Chaldea were actually Cuthites, of the same family with the Babylonians.

The Cuthites, however, were at last subdued, perhaps partly expelled Chaldea by the Chafidim, who, probably claimed that territory as the patrimony of their progenitors. That the Chafidim were neither Cuthites, nor indeed Hamites, is obvious from the name. The Hebrews, and indeed all the Oriental authors (z), denominated both the people who inhabited the eastern coast of Arabia Cufbim, and also the Ethiopians who sprang from the last mentioned people. Had the later inhabitants of Chaldea been the descendants of Cufbim, the Jewish writers would have called them Cufbim. We find they called the Phoenicians Cusanim, the Syrians Aramim, the Egyptians Misraim, the Greeks Τύρων, &c. The Chafidim, therefore, or modern inhabitants of Chaldea, were positively descended of one Chefed or Chafed; but who this family-chief was, it is not easy to determine. The only person of that name whom we have met with in early times is the fourth son of Nahor; the brother of Abraham; and some have been of opinion that the Chaldeans were the progeny of this name. This appears to us highly probable, because both Abram and Nahor were natives of Ur of the Chafidim. The former, we know, in consequence of the divine command, removed to Ur; where his family multiplied, and, in process of time, became masters of the whole country, which they called the land of the Chafidim, from Chefed or Chafed, the name of their ancestor. This account is the more probable, as we find the other branches of Nahor's family settled in the same neighborhood (a).

How the Greeks came to denominate the Cufbim, is a question rather difficult to be resolved; but we know that they always affixed to their proper name a gentilic, derived from their own language. They knew a rugged, erratic nation (u) on the banks of the river Thermodon, in the territory of Pontus, bordering on Armenia the Lefs.  

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* Philip. lib. 18. cap. 3.
* Bochar. Phalæg. lib. 1. cap. 10.
† Gen. xi. 22. versa 22.
§ Gen. xix. 10. versa 10.

(a) See Strabo. Perieg. ver. 768. Strabo, l. 12. page 543. Caphaurb. As the Chalybes were famous for manufacturing
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History of Left. These, in ancient times, were called Alphes, or Chalphy, because they were much employed in forging and polishing iron. Their neighbours, at length, gave them the name of Chald or Calid, which imports, in the Armenian dialect, fierce, hardy, robust. This title the Greeks adopted, and out of it formed the word Χαλδαῖοι, "Chaldeans."

The Mosaic history informs us (c), that Ashur went out of that land (Shinar) and built Nineveh and several other considerable cities. One of the successors of Ashur was the celebrated Ninus, who first broke the peace of the world *, made war upon his neighbours, and obliged them by force of arms to become his subjects, and pay tribute. Some authors make him the immediate succesor of Ashur, and the builder of Nineveh. This we think is not probable; Eusebius, as we have observed above, gives a list of six Arabian princes who reigned in Babylon. These we take to have been the immediate successors of Nimrod, called Arameans; because these people were Cuflhites. Ninus might be reputed the first king of the Assyrians, because he figured beyond his predecessors; and he might pass for the builder of Nineveh, because he greatly enlarged and beautified that city. We therefore imagine, that Ninus was the fifth or sixth in succession after Ashur.

† Lib. 2. Ninus, according to Diodorus Siculus †, made an alliance with Arius king of the Arabinians, and conquered the Babylonians. This event, in our opinion, put an end to the empire of the Hamites or Cuhim in Shinar or Babylonia. The author observes, that the Babylon which figured afterwards did not then exist.

‡ Ch. xxiii. This fact is confirmed by the prophet Isaiah §: "Behold the land of the Chasdim; this people was not till Ashur founded it for them, that dwell in the wilderness. They set up the towers thereof, &c." After Babylonia was subdued by the Assyrians under Ninus, the capital was either destroyed by that conqueror or deserted by the inhabitants. At length it was re-edified by some one or other of the Assyrian monarchs, who collected the roving Chalde m, and obliged them to settle in the new city. These were subject to the Assyrian empire till the reign of Sardanapalus, when both the Medes and Babylonians rebelled against that effeminate prince.

The Chaldeans were celebrated by all antiquity for their proficiency in astronomy, astrology, magic, and curious sciences. Ur or Orchoe (p) was a kind of university for those branches of learning. Such was their reputation in those studies, that over a great part of Asia and Europe a Chaldean and an astrologer were synonymous terms. These sciences, according to the tradition of the Orientals, had been invented by Seth, whom they call Edris; and had been cultivated by his descendants downward to Noah, by whom they were transmitted to Shem, who conveyed them to Arphaxad and his posterity.

To us it appears probable, that the religious sentiments transmitted from Noah through the line of Shem, were kept alive in the family of Arphaxad, and so handed down to the families of Serug, Nahor, Terah, Abram, Nahor II. and Haran, &c. They Jewish Rabbins, and all the Persian and Mahomedan writers, make Abraham contemporary with Nimrod; who, they say, perfecuted him most cruelly for adhering to the true religion. That these two patriarchs were contemporary, is very improbable, since Nimrod was the third generation after Noah, and Abram the tenth. Abram has been inveigled by the rabbinical writers with every department of learning. According to them, he transported from Charchae into Canaan and Egypt, astronomy, astrology, mathematics, geography, magic, alphabetical writing, &c. &c.

After the Babylonish captivity, when the Jews were Legendary dispersed over all the east, and began to make profeleytes tales conte of the gate among the Pagans, wonderful things were reported of Abram with respect to his acquirements in human erudition, as well as his superiority in virtue and piety. These legendary tales were believed by the profeleytes, and by them retailed to their connexions and acquaintances. But certainly the holy man either was not deeply versed in human sciences, or did not deem them of importance enough to be communicated to his posterity; since the Jews are, on all hands, acknowledged to have made little progress in these improvements. To think of raising the fame of Abram, by clasifying him with the philosophers, betrays an extreme defect in judgment. He is entitled to praise of a higher kind; for he excelled in piety, was the father of the faithful, the root of the Mel-
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History of Ishah, and the friend of God. Before these, all other titles vanish away. Such of our readers, however, as have leisure enough, and at the same time learning enough to enable them to consult the rabbinical legends, will be furnished with a full and ample detail of his imaginary exploits and adventures. Others, who are either not willing or not qualified to peruse the writings of the rabbins, may consult Dr. Hyde* de Relig. vet. of

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It is agreed, however, that the Persians, Chaldeans, and Arabians, pretended that their religion was that of Abraham; that honourable mention is made of him in the Koran; and that the name of Abraham or Ibrahim was celebrated over all the east. See Abraham.

Is the progress of this disquisition, we have seen that the language of Noah was, in all probability, the same or nearly the same with that of Adam. Additions and improvements might be introduced, but still the radical flamina of the language remained unaltered. It has likewise, we hope, appeared, that the confusion of languages at the building of the tower of Babel was only partial, and affected none but the rebellious crew of the race of Ham and the apostate part of the families of Shem and Japhet. We have concluded, that the main body of the race of Shem, at least, were neither differed nor their language confounded; and that consequently the descendants of that patriarch continued to speak their paternal dialect or the uncorrupted language of Noah. To these arguments we may stake the liberty to add another, which is, that in all probability the worship of the true God was preferred in the line of Arphaxad downwards to the family of Abraham: and it now appears that the Hebrew and Chaldean were originally spoken by the same family; and of course were the same between themselves, and were actually the first language upon earth, according to the Mosaic history.

Numberless additions, alterations, improvements, we acknowledge, were introduced in the course of 2000 years; but still the original flamina of the language were unaltered. Our readers will please to observe, that the Orientals are not a people given to change; and that this character, in the earliest ages, was still more prevalent than the present. This attention, we presume, needs no proof.

In confirmation of these presumptive arguments, we may add the popular one which is commonly urged upon this occasion, viz. that the names of antediluvian persons and places mentioned by the sacred historian, are generally of Hebrew original, and significant in that language. Some of them, we acknowledge, are not so; but in this case it ought to be remembered, that a very small part of that language now exists, and that probably the radicals from which these words are descended are among the number of those which have long been lost.

Sect. I. The Hebrew Language.

Having thus proved the priority of the Hebrew character to every other language that has been spoken by men, the Jews shall now proceed to consider its nature and genius; from which it will appear still more evidently to be an original language, neither improved nor debased by foreign idoms. The words of which it is composed are short, and admit of very little flexion. The names of places are defective of their nature, situation, accidental circumstances, &c. Its compounds are few, and inartificially joined together. In it we find few of those artificial affixes which distinguish the other cognate dialects; such as the Chaldean, Syrian Arabian, Phoenician, &c. We find in it no traces of improvement from the age of Moses to the era of the Babylonish captivity. The age of David and Solomon was the golden period of the Hebrew tongue; and yet, in our opinion, it would puzzle a critic of the nicest acumen to discover much improvement even during that happy era. In fact, the Jews were by no means an inventive people. We hear nothing of their progress in literary pursuits; nor do they seem to have

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(e) Compare Gen. chap. XII. ver. 2. with Acts chap. VII. ver. 4.
Section I.

Philology.

The language of the Hebrews was the principal object of their studies. They were commanded to contemplate day and night; and in them they were to place their chief delight. The consequence of this command was, that little or no regard could be paid to taste, or any other subject of philosophical investigation. Every unimproved language abounds in figurative expressions borrowed from sensible objects. This is in a peculiar manner the characteristic of the language in question; of which it would be superfluous to produce instances, as the fact must be obvious even to the attentive reader of the English Bible.

In the course of this argument, we think it ought to be observed, and we deem it an observation of the greatest importance, that if we compare the other languages which have claimed the prize of originality from the Hebrew with that dialect, we shall quickly be convinced that the latter has a just title to the preference. The writers who have treated this subject, generally bring into comparison the Hebrew, Chaldean, Syrian, and Arabian. Some one or other of these has commonly been thought the original language of mankind. The arguments for the Syrian and Arabian are altogether futile. The numerous improvements superinduced upon these languages, evidently prove that they could not have been the original language. In all cognate dialects, etymologists hold it as a maxim, that the leaft improved is likely to be the most ancient.

We have observed above, that the language of Abraham and that of the Chaldeans were originally the same; and we are persuaded, that if an acute critic should take the pains to examine frieely these two languages, and to take from each what may reasonably be supposed to have been improvements or additions since the age of Abraham, he will find intrinsic evidence sufficient to convince him of the truth of this position. There appear still in the Chaldean tongue great numbers of (r) words the same with the Hebrew, perhaps as many as mankind had occasion for in the most early ages; and much greater numbers would probably be found if both languages had come down to us entire. The construction of the two languages is indeed somewhat different; but this difference arises chiefly from the superior improvement of the Chaldean. While the Hebrew language was in a manner stationary, the Chaldean underwent progressive improvements; was mellowed by antitheses, rendered honorous by the disposition of vocal sounds, acquired a copiousness by compounds, and a majesty by affixes and prefixes, &c. In process of time, however, the difference became so great, that the Israelites did not understand the Chaldean language at the era of the Babylonish captivity. This much the prophet (i) intimates, when he promises the pious Jews protection from a fierce people; a people of a deeper speech than they could perceive; of a hammering tongue, ch. xxxiii. that they could not understand.

The priority of the Chaldean tongue is indeed contended for by very learned writers. Camden (f) calls it the mother of all languages; and most of the fathers (r) were of the same opinion. Amiur (g) has made a col. lection of arguments, not inconsiderable, in favour of Gram. Syr. and Myricus, after him, did the fame. Erpe (h) Pref. ad niusl, in his Oration for the Hebrew tongue, thought Gram. the argument for it and the Chaldean fo equal, that he did not choose to take upon him to determine the question.

Many circumstances, however, concur to make us assign the propriety to the Hebrew, or rather to make us believe that it has suffered fewer of those changes to which every living tongue is more or less liable. If we strip this language of every thing obviously adventitious, we shall find it extremely simple and primitive. 1. Every thing maseretical, supposing the vowels and points (c) essential, was certainly unknown in its original character. 2. All the prefixed and affixed letters were added time after time, to give more compass and precision to the language. 3. The various voices, moods, tenses, numbers, and persons of verbs, were posterior improvements; for in that tongue, nothing at first appeared but the indeclinable radix. 4. In the same manner, the few adjectives that occur in the language, and the numbers and regimen of nouns, were not from the beginning. 5. Most of the Hebrew nouns are derived from verbs; indeed many of them are written with the very same letters. This rule, is very general; for few verbs are derived from nouns, and none from prepositions. 6. All the verbs of that language, at least all that originally belonged to it, uniformly consist of three letters, and seem to have been at first pronounced as syllables. If we analogize the Hebrew language in this manner, we shall reduce it to a very great simplicity; we shall confine it to a few names of things, persons, and actions; we shall make many of its words monosyllables, and give it the true characters of an original language. If at the same time we reflect on the small number of (n) radical words in that dialect, we shall be more and more convinced of its originality.

It will not be expected that we should enter into a minute discussion of the grammatical peculiarities of this ancient language. For these we must refer our readers to the numerous and elaborate grammars of that tongue, which are every where easily to be found. We shall only make a few itidures, which naturally present themselves, before we dismiss the subject.

The generality of writers who have maintained the

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(r) Most of the Chaldean names mentioned in Scripture are pure Hebrew words compounded; such as Nebuchadnessar, Nebuwarden, Rabshak, Rabmag, Belshazzar, Rabfaris, Nabaz, Malabha, Phrat or Pharad, Barof, Garchemish, Ur, Cutha, Heb. Cufb, &c. All these words, and a multitude of others which we could mention, approach so near the Hebrew dialect, that their original is discernible at first sight. Mott of these are compounds, which the limits prescribed will not allow us to decompound and explain.

(c) The futility of these points will be proved in the following part of this section.

(n) The radical words in the Hebrew language, as it now stands, are about 5000.
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All languages in the east originally the same.

superior antiquity of the Hebrew language, have at the same time contended that all other languages of Asia, and most of those of Europe, have been derived from that tongue as their source and matrix. We, for our part, are of opinion, that perhaps all the languages in the eastern part of the globe are derived from it, and were originally one and the same; and that the differences which afterwards diversified them sprang from climate, caprice, inventions, religion, commerce, conquests, and other accidental causes, which will occur to our intelligent readers. We have endeavoured to prove, in the preceding pages, that all mankind were not concerned in the building of the fatal tower, nor affected by the punishment consequent upon that attempt; and we now add, that even that punishment was only temporary; since we find, that those very Hamites or Cushim, who are allowed to have been affected by it, did certainly afterwards recover the former organization of their lip, and differed not more from the original standard than the descendants of Japhet and Shem.

The Jewish rabbis have pretended to ascertain the number of languages generated by the vengeance of Heaven at the building of Babel. They tell us that mankind was divided into 70 nations and 70 languages, and that each of these nations had its tutelar or guardian angel. This fabulous legend is founded on the number of the progeny of Jacob at the time when patriarch and his family went down into Egypt. Others attribute its origin to the number of the sons and grandsons of Noah, who are enumerated Gen. chap. x.

The fathers* of the church make the languages at the confusion to amount to 72; which number they complete by adding Caanan and Eliliah, according to the Septuagint, who are not mentioned in the Hebrew text. This opinion, they think, is supported by the words of Moses, when he faith, that "when the Mohn scattered the sons of Adam, he set the bounds of the people according to the number of the tribes of Israel." That is, they say, he divided them into 72 nations, which was the number of the children of Israel when they came into Egypt. The Targum of Ben-Uzziel plainly favors this interpretation; but the Jerusalem Targum intimates that the number of nations was only 12, according to the number of the tribes of Israel. This passage, however, seems to refer to the tribes of the Chanaanites; and imports, that the Almighty assigned to the different septs of that family such a tract of land as he knew would make a sufficient inheritance for the children of Israel.


(1) The Egyptians might not eat bread with the Hebrews, for that is an abomination to the Egyptians. The Philistines (Samuel I. paff.) always call the Israelites Hebrew by way of reproach.
have written the history of that people at the era of
the Spanish invasion of their country. As this plan
was too much circumscribed to be generally useful,
heretical figures were in process of time invented
as subsidiaries to this contrived orthography. In
this scheme, we imagine, the process was somewhat
more extensive. A lien might be sketched, to import
fierce tears or valour; an ox, to denote strength; a fly,
to signify swiftness; a hare, to intimate timorousness,
&c.

The next step in this process would naturally ex-
tend to the inventing and appropriating of a few ar-
bitrary characters, for representing abstract ideas, and
other relations, which could not be well ascertained
by the methods abovementioned. These arbitrary signs
might readily acquire a currency by compact, as mo-
ney and medals do over a great part of the world.—
Upon this plan we imagine the ancient Chinefes form-
ed their language.

But neither the picture nor the hieroglyphic, nor
the method of denoting ideas by arbitrary characters
appropriated by compact, could ever have arrived at
such perfection as to answer all the purposes of ideal
communication. The grand defideratum then would be
to fabricate characters to represent simple sounds,
and to reduce these characters to so small a number
as to be easily learned and preferred in the memory.
In this attempt the Chinefe have notoriously failed;
their letters, or rather their characters, are so numer-
ous, that few, if any, of their most learned and in-
duflrious authors, have been able to learn and retain
the whole catalogue. Indeed these people are not
able to conceive how any combinations of 20 or 30
characters should be competent to answer all the pur-
poses of written language.

Many different nations have claimed the honour
of this invention. The Greeks ascribed it to the Pho-
cnicians; and consequently used the word συνειρηφ, to
read; and consequently the poet ἠλικεσπικεους, to
be the Phcenicians, in the same sense with συνειρηφ,

† Lucan.

Others have attributed the invention to the Egyp-
tians. That people ascribed every useful and ingenious
invention to their Thoth, or Mercury Trifmegi-
† Bibl. 1, 2, 10.

† Nat. Hist. lib. 7, c. 56.

giustus. Plato seems to have believed this tradition (x),
and pretends to record a dispute between the king of
Egypt that then reigned and this philosopher, with re-
spect to the influence that the art of alphabetic writing
might possibly have upon the improvements of man-
kind in science and liberal arts. Diodorus Sicili-
ian (y) gives a similar history of the fame invention,
but carries it back to the reign of Osiris.

Pliny informs us (z), that Cellius attributed letters to
the fame Egyptian Mercury, and others to the Sy-
rians; but that for "his part, he thought that the Af-

(x) See Phaedrus, page 124o. See also page 374. Phil.

(y) It is true, the Egyptians attribute the invention to their Thoth, and the Phenicians to their Hercules, or
Melicerta or Baal; but these were only imaginary personages.
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trated his abridgment from written memoirs, or histories of the transactions of his ancestors regularly transmitted from the most early periods. These annals he probably abridged, as Ezra did afterwards the history of the Kings of Israel. If this was the case, as it most probably was, the art of writing in alphabetical letters must have been known and practised many ages before Moses. It has indeed been contended, that the Jewish decalogue, inscribed upon two tables of stone, was the very first specimen of alphabetical writing. The arguments adduced in proof of this fact are lame and inconclusive (m). Had that been the

(m) The most ingenious and plausible of those arguments which have fallen under our observation, is given by Mr. Johnfon vicar of Cranbrook, a writer of great learning and piety, who flourished in the beginning of the present century, and whose works deserve to be more generally known than we have reason to think they are at present. After endeavouring to prove that alphabetical writing was not practised before the era of Moses, and expatiating upon the difficulty of the invention, this excellent scholar attempts to show, that the original Hebrew alphabet was actually communicated to the Jewish legislator at the same time with the two tables of the law. "I know not (says he) any just cause why the law should be written by God, or by an angel at his command, except it were for want of a man that could well perform this part. This could give no addition of authority to the law, especially after it had been published in that authoritative and miraculous manner at Mount Sinai. The true writing of the original was indeed perfectly adjusted, and precisely ascertained to all future ages, by God’s giving a copy of it under his own hand; but this, I conceive, had been done altogether as effectually by God’s dictating every word to Moses, had he been capable of performing the office of an amanuensis." The learned writer goes on to suppose, that it was for the purpose of teaching Moses the alphabet, that God detained him forty days in the mount; and thence he concludes, that the Decalogue was the first writing in alphabetical characters, and that those characters were a divine, and not a human invention.

It is always rash, if not something worse, to conceive reasons not assigned by God himself, for any particular transaction of his with those men whom he from time to time inspired with heavenly wisdom. That it was not for the purpose of teaching Moses the alphabet that God detained him forty days in the mount, when he gave him the two tables of the law, seems evident from his detaining him just as many days when he gave him the second tables after the first were broken. If the legislator of the Jews had not been sufficiently instructed in the art of reading during his first stay in the mount, he would have been detained longer; and it is not conceivable, that though in a fit of pious ardor, he would have been wholly unmingled by the idolatry of his countrymen, as to forget completely an art which, by the supposition, the Supreme Being had spent forty days in teaching him! "But if Moses could, at his first ascent into the mount, perform the office of an amanuensis, why are the original tables said to have been written by the finger of God, and not by him who wrote the second?" We pretend not to say why they were written by God rather than man; but what is true is, that by whomsoever they were written, the characters employed were afterwards adopted by man. The Hebrew alphabet, without the Masoretic points, is confessedly defective; and every man who is in any degree acquainted with the language, and is not under the influence of inveterate prejudice, will readily admit that those points are no improvement. But we cannot, very well suppose an art invented by infinite wisdom, to fall short of the utmost perfection of which it is capable: an alphabet communicated to man by God, would undoubtedly have been free both from defects and from redundancies; we may suppose it would have had a distinct character for every simple found, and been at least as perfect as the Greek or the Roman.

But we need not fill our pages with reasonings of this kind against the hypothesis maintained by Mr. Johnfon. We know that "Moses wrote all the words of the Lord." i.e. the substance of all that had been delivered in Exod. xx, xxi, xxii, xxiii, before he was called up into the mount to receive the table of stone; nay, that he had long before been commanded by God himself, to "write in a book" an account of the victory obtained over Amalek (Exod. xvii. 14). All this, indeed, the learned writer was aware of; and to reconcile it with his hypothesis, he frames another, more improbable than even that which it is meant to support. "It is not unreasonable (fays he) to believe that God had written these tables of stone, and put them in mount Horeb, from the time that by his angel he had there first appeared to Moses; and that, therefore all the time after, while he kept Jethro’s sheep thereabouts, he had free acces to those tables, and pur sued them at discretion." But if belief should rest upon evidence, we beg leave to reply, that to believe all this would be in the highest degree unreasonable: for there is not a single hint in Scripture of the tables having been written at fo early a period, or upon such an occasion, as God’s first appearance to Moses in the burning bush. We know how reluctant Moses was to go upon the embassy to which he was then appointed; and it is strange, we think passing strange, that when he records so faithfully his own backwardness, and the means made use of by God to reconcile him to the arduous undertaking, he should make no mention of these important tables, if at that period he had known any thing of their existence. Besides all this, it is not wonderful, if Moses had been practising the art of writing, as our author supposes, from the time of the burning bush to the giving of the law, he should then have stood in need of forty days teaching from God, to enable him to read with ease the first tables, and of other forty, to enable him to write the second? This gave such a mean view of the natural capacity of the Hebrew legislator as renders the hypothesis which implies it wholly incredible. See a Collection of Discourses, &c. in two volumes, by the Reverend John Johnson, A. M. vicar of Cranbrook in Kent.
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the cause, some notice must have been taken of so palpable a circumstance. Moises wrote out his history, his laws, and his memoirs; and it appears plainly from the text, that all the learned among his countrymen could read them. Writing was then no novel invention in the age of the Jewish legislator, but current and generally known at that era.

The patriarch Job lived at an earlier period (a). In that book we find many allusions to the art of writing, and some passages which plainly prove its existence. This shows that alphabetical characters were not confined to the chosen seed, since Job was in all probability a descendant of Huz, the eldest son of Nahor, the brother of Abraham. From this circumstance, we think we may fairly conclude, that this art was known and practised in the family of Terah the father of Abraham.

There was certainly a tradition among the Jews in the age of Josephus, that writing was an antediluvian invention (b). That historian pretends, that the descendants of Seth erected two pillars, the one of stone and the other of brick, and inscribed upon them their astronomical observations and other improvements.—This legend shows that there did exist such an opinion of the antiquity of the art of writing.

27 The original alphabet preserved in the family of Noah.

There must have been a tradition to the same purpose among the Chaldeans, since the writers who have copied from Berosus, the celebrated Chaldean historian (c), speak of alphabetical writing as an art well known among the antediluvians. According to them, Oannes the Chaldean legislator gave his disciples “an insight into letters and science. This person also taught concerning the generation of mankind, of their different pursuits, of civil polity, &c. Immediately before the deluge (say they) the god Cronus appeared to Sisuthrus or Xisuthrus, and commanded him to commit to writing the beginning, improvement, and conclusion of all things down to the present term, and to bury these accounts securely in the temple of the Sun at Sephora.” All these traditions may be deemed fabulous in the main; but still they evince that such an opinion was current, and that though the use of letters was not indeed eternal (d), it was, however, prior to all the records of history; and of course, we think, an antediluvian discovery.

This original alphabet, whatever it was, and however constructed, was, we think, preferred in the family of Noah, and from it conveyed down to succeeding generations. If we can then discover the original Hebrew alphabet, we shall be able to investigate the primary species of letters expressive of those articulate sounds by which man is in a great measure distinguished from the brute creation. Whatever might be the nature of that alphabet, we may be convinced that the ancient Jews deemed it sacred, and therefore preferred it pure and unmixed till the Babylonian captivity. If, then, any monuments are still extant inscribed with letters prior to that event, we may rest assured that these are the remains of the original alphabet.

There have, from time to time, been dug up at Jerusalem, and other parts of Judea, coins and medals, and medals, inscribed with letters of a form very different from those square letters in which the Hebrew Scriptures are now written.

When the Samaritan Pentateuch was discovered (q), it evidently appeared that the inscriptions on those medals and coins were drawn in genuine Samaritan characters. The learned Abbé Barthelemi, in his *differtation on the two medals of Antigonus Mem. da king of Judea, one of the later Amonoenn princes, proves that all the inscriptions on the coins and medals of Jonathan and Simon Maccabeus, and also on his, were invariably in the Samaritan character, down to the 40th year of the chalurian era.”

It was easy to prove, from the Mihna and Jerusalem talmud, that the Scriptures publicly read in the synagogues to the end of the second century were written in the Samaritan character, we mean in the same character with the Pentateuch in question. As the ancient Hebrew, however, ceased to be the vulgar language of the Jews after their return from the Babylonian captivity, the copies of the Bible, especially in private hands, were accompanied with a Chaldaic paraphrase; and at length the original Hebrew character fell into disuse, and the Chaldaic was universally adopted.

It now appears that the letters inscribed on the ancient coins and medals of the Jews were written in the Samaritan form, and that the Scriptures were written in the very same characters: we shall therefore leave it to our readers to judge whether (considering the implacable hatred which subsisted between these two nations) it be likely that the one copied from the other; or at least that the Jews preferred to the beautiful letters used by their ancestors, the rude and inelegant characters of their most detested rivals. If, then, the inscriptions on the coins and medals were actually in the characters of the Samaritan Pentateuch (and it is absurd to suppose that the Jews borrowed them from the Samaritans), the consequence plainly is, that the letters of the inscriptions were those of the original Hebrew alphabet, coeval with that language, which we dare to maintain was the first upon earth.

It may, perhaps, be thought rather superfluous to...
mention, that the Samaritan colonists, whom the kings of Assyria planted in the cities of Samaria (x), were natives of countries where Chaldaic letters were current, and who were probably ignorant of the Hebrew language and characters. When those colonists embraced the Jewish religion, they procured a copy of the Hebrew Pentateuch written in its native character, which, from superstitition, they preferred inviolate as they received it; and from it were copied successively the others which were current in Syria and Palestine when Archibishop Uther procured his.

From the reasons above exhibited, we hope it will appear, that if the Hebrew alphabet, as it appears in the Samaritan Pentateuch, was not the primitive one, it was at least that in which the Holy Scriptures were first committed to writing.

Scaliger has inferred, from a passage in Enèb †ius *, and another in St Jerom †, that Ezra, when he reformed the Jewish church, transferred the Scriptures from the ancient characters of the Hebrews into the square letters of the Chaldeans. This, he thinks, was done for the use of those Jews who, being born during the captivity, knew no other alphabet than that of the people among whom they were educated. — This account of the matter, though probable in itself, and supported by passages from both Talmuds, has been attacked by Buxtorf with great learning and no less acrimony. Scaliger, however, has been followed by a crowd of learned men (s), whose opinion is now pretty generally espoused by the sacred critics.

Having said so much concerning the Hebrew alphabet in the preceding pages, we find ourselves laid under a kind of necessity of hazarding a few conjectures on the vowels and Masoretic points; the first essential, and the last an appendage, of that ancient language. The number of the one, and the nature, antiquity, and necessity of the other, in order to read the language with propriety and with discrimination, have been the subject of much and often illiberal controversy among philological writers. To enter into a minute detail of the arguments on either side, would require a complete volume: we shall, therefore, briefly exhibit the state of the controversy, and then adduce a few observations, which, in our opinion, ought to determine the question.

The controversy then is, whether the Hebrews used any vowels; or whether the points, which are now called by that name, were substitutted instead of them; or if they were, whether they be as old as Mo-

(x) 2 Kings, chap. xvii. ver. 24. And the king of Assyria brought men from Babylon, and from Cuthah, and from Hamath, and from Sepharvaim, and placed them in the cities of Samaria. Babylon, Cuthah, and Hamath, were neighbouring cities, and undoubtedly both spoke and wrote in the Chaldaic style. The natives of Hamath spoke the Syriac, which at that time differed very little from the Chaldaic.

(3) CaSaubon, Grotius, Vossius, Bochart, Morin, Brenerwood, Walton, Prideaux, Huet, and Lewis Capel, always a sworn enemy to Buxtorf. All, then, have maintained the same ground with Scaliger: how truly, appears above.

(r) The term masʻarah or masʻoret signifies "tradition;" and imports the unwritten canon by which the reading and writing of the sacred books was fixed.

(u) These points are 14 in number, whose figures, names, and effects, may be seen in most Hebrew grammars.

(x) These books are the Bahir, Zahar, and the Kizri. As for the Kizri, the Jews make it about 1900 years old; and the other about a century later. But the fidelity of the Jews in such matters cannot be relied upon.
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Some learned men (v) have ascribed the invention of the vowel points in quinque to the rabbis of the school of Tiberias: which, according to them, flourished about the middle of the second century. This opinion is by no means probable, because it appears plain from history, that before that period all the Jewish scribes in that province were destroyed, and their heads forced into exile. Some of those retired into Babylonia, and settled at Sora, Naherda, and Pompeietha, where they established famous universities.

After this era there remained no more any rabbinical schools in Judaea, headed by professors capable of undertaking this difficult operation, nor indeed of sufficient authority to recommend it to general practice, had they been ever so thoroughly qualified for executing it.

Capellus and Father Morin, who contend for the late introduction of the vowel-points, acknowledge that there can certainly be no language without vocal sounds, which are indeed the soul and essence of speech; but they affirm that the Hebrew alphabet actually contains vocal characters, as well as the Greek and Latin and the alphabets of modern Europe. These are alph, be, vou, yud. These they call the mater lectionis, or, if you please, the parents of reading.

To these some, we think, very properly, add air e in, ajin. These, they conclude, perform exactly the same office in Hebrew that their descendants do in Greek. It is indeed agreed upon all hands, that the Greek alphabet is derived from the Phoenician, which is known to be the same with the Samaritan or Hebrew. This position we shall prove more fully when we come to trace the origin of the Greek tongue. Hitherto the analogy is not only plausible, but the resemblance precise. The Hebrews and Samaritans employed these vowels exactly in the same manner with the Greeks; and fo all was easy and natural.

But the affurers of the Masoretic system maintain, that the letters mentioned above are not vowels but consonants or aspiratives, or any thing you please but vocal letters. These they endeavour to prove from their use among the Arabs, Persians, and other oriental nations: But to us it appears abundantly strange to suppose that the Greeks pronounced bein, gama, delta, &c. exactly as the Hebrews and the Phoenicians did, and yet at the same time did not adopt their mode of pronunciation with respect to the five letters under consideration. To this argument we think every objection must undoubtedly yield. The Greeks borrowed their letters from the Phoenicians; these letters were the Hebrew or Samaritan. The Greeks wrote and (z) pronounced all the other letters of their alphabet, except the five in question, in the same manner with their originals of the calf: if they did so, it obviously follows that the Greek and oriental office of these letters was the same.

Another objection to reading the Hebrew without the aid of the Masoretic vowel points, arises from the consideration, that without these there will be a great number of radical Hebrew words, both nouns and verbs, without any vowel intervening amongst the consonants, which is certainly absurd. Notwithstanding this supposed absurdity, it is a well known fact, that all the copies of the Hebrew scriptures, used in the Jewish synagogues throughout the world, are written or printed without points. These copies are deemed sacred, and kept in a coffer with the greatest care, in allusion to the ark of the testimony in the tabernacle and temple. The reasons, however, reads the portions of the law and hagiographa without any difficulty. The same is done by the remains of the Samaritans at this day. Every oriental scholar knows that the people of these countries look upon consonants as the flamma of words. Accordingly, in writing letters, in dispatches upon business, and all affairs of small moment, the vowels are generally omitted. It is obvious, that in every original language the sound of the vowels is variable and of little importance. Such was the case with the Hebrew tongue: Nor do we think that the nations of the country would find it a matter of much difficulty to learn to read without the help of the vowels. They knew the words beforehand, and so might readily enough learn by practice what vowels were to be inserted.

When the Hebrew became a dead language, as it certainly was in a great measure to the vulgar after the return from the Babylonish captivity; such subsidies might, we think, have been useful, and of course might possibly have been adopted for the use of the vulgar: but the scribe, the lawyer, and the learned rabbi, probably disliked such barbarous elements. We shall in this place hazard a conjecture, which, to us at least, is altogether new. We imagine that the Phoenicians, who were an inventive, ingenious people, had, prior to the age of Cadmus, who first brought their letters into Greece, adopted the more commodious method of inferring the vowels in their proper places: whereas the Jews, zealously attached to the customs and sounds of their forefathers, continued to write and read without them. In this manner the Gephurei, who were the followers of Cadmus, communicated them to the Ionians their neighbours. We are convinced that the materials of the religion, Chaldæan, and Oriental languages. Reading without the vowel points we have seldom failed in our search; but when we followed the method of reading by the Masoretic points, we seldom succeeded; and this, we believe, every man of tolerable erudition who will make a trial will find by experience to be true. This argument appears to us superior to every objection. Upon this basis, the most learned Bocchart has erected his etymological fabric, which will be admired by the learned and ingenious as long as philology shall be cultivated by men.

(v) See Buxtorf the father, in Tiber. cap. 5, 6, 7. Buxtorf the son de Antiq. Punct. P. II. 11.

(z) This is fo true, that according to Heilychius and Suidas, maran, to act the Phænician, signifies "to read."
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It has been urged by the zealots for the Masoretic system, that the Arabians and Persians employ the vowel points. That they do so at present is readily granted but whether they did so from the beginning seems to be the question. That Arabia was overspread with Jewish exiles at a very early period, is abundantly certain. It was natural for them to retire to a land where they would not hear of war nor the sound of the trumpet. Accordingly we find that, prior to the age of the Arabian impostors, Arabia swarmed with Jewish settlements. From these Jews, it is high- ly probable that their neighbours learned the use of the points in question; which in the course of their conquests the Saracens communicated to the Persians. It has been alleged with great show of reason, that without the vowel points, it is often impossible to develop the genuine signification of many words which occur frequently in the language; many words of different and sometimes opposite significations are written with exactly the same consonants. Without the points, then, how are we to know the true meaning of a word? In answer to this objection, we beg leave to observe, that during the first period of a language, it is impossible that there should not occur a number of similar sounds of different significations. This is perfectly attributable to the poverty of the language. When a few terms have been once fabricated, men will rather annex new significations to old terms, than be at the expense of time or thought to invent new ones. This must have been the case with the Hebrew in particular; and indeed no language on earth is without instances of this inconvenience, which, however, in a living tongue, is easily overcome by a difference of accent, tone, gesture, pronunciation; all which, we think, might obviate the difficulty.

From the preceding arguments, we think ourselves authorized to infer that the Masora is a novel system, utterly unknown to the most ancient Jews, and never admitted into those copies of the Scriptures which were deemed most sacred and most authentic by that people.

According to Origen.

Brepth bara Elcém eth afhamaim oneth aares.
Ouaares aithea Thoàoo ouboou ouôóókh al phne The- òm ounoué elcém maraœph eth al phne aamain.
Ouïomer elcém iei or ouïci or.
Ouiar elcém eth aor khi tôb ouïabâel elcém bén aor ouben aôóókh.

Upon the whole, we presume to give it as our opinion, that in the most early periods, the vowels akph, kr, jad or yd, vàw or vàw and perhaps ain or aju, were regularly written wherever they were founded. This to us appears plain from the practice of the ancient Greeks. It is agreed on all hands that the Samaritan and Phoenician alphabets were the same; and that the former was that of the Jews originally. The Phoenicians certainly wrote the vowels exactly, as so did the Greeks who copied their alphabet; If the Phoenicians wrote their vowels, so then did the Jews of the age of Cadmus; but Cadmus was contemporary with some of the earliest judges of Israel; the consequence is evident, namely, that the Jews wrote their vowels as late as the arrival of that Coloney-chief in Greece. We ought naturally to judge of the Hebrew by the Chaldaic, Syriac, and Arabian, its sister dialects. All these languages in ancient times had their vowels regularly infixed; and why not the Hebrew in the same manner with the rest?

As these first vowels, which were coeval with the other letters, often varied in their sound and application, the points, in all appearance, were first invented and employed to ascertain their different sounds in different connections. Other marks might be invented to point out the various tones of voice, like the or accents, with which the vowels were to be enunciated, as was done among the latter Greeks. In
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Process of time, in order to promote celerity of writing, the vowels were omitted, and the points substituted in their place.

Before we conclude our observations on the Hebrew language, we ought, perhaps, to make an apology for omitting to interlard our details with quotations from the two Talmuds, the Midrash, the Gemara, the Cabbalas, and a multitude of rabbinical writers which are commonly cited upon such an occasion. We believe we could have quoted almost numberless passages from the two Buxtorfs, Father Morin, Capellus, and other Hebrew critics, with no great trouble to ourselves, and little emolument to the far greater part of our readers. But our opinion is, that such a pedantic display of philological erudition would probably have excited the indignation of our unlearned, readers. Our wish is to gratify readers of both descriptions, by contributing to the edification of one class without disquieting the other.

We cannot, we imagine, handsomely take leave of the sacred language without giving a brief detail of those excellencies which, in our opinion, give it a just claim to the superiority over those other tongues which have sometimes contended with it for the prize of antiquity: and of these the following in our apprehension deserve particular notice.

If this language may claim any advantage over its antagonists, with respect to its being rather a mother than a daughter to any of them, it is undoubtedly from the simplicity, its purity, its energy, its fecundity of expressions, and significations. In all these, notwithstanding its paucity of words, it excels the vast variety of other languages which are its cognate dialects. To these, we may add the significancy of the names, both of men and brutes; the nature and properties of the latter of which are more clearly and more fully exhibited by their names in this than in any other tongue hitherto known. Besides, its well authenticated antiquity and the venerable tone of its writings surpass any thing left upon record in any other dialect now extant in the world. These extraordinary qualities excite our admiration at present under every disadvantage: and from this circumstance we may infer its incomparable beauty in the age of the Jewish legislator, and what effects it would naturally produce, could we know it now as it was spoken and written in the days of David and Solomon.

As far, however, as we understand it in its present mutilated condition, and are able to judge of its character from those few books that have come down to our time, we plainly perceive that its genius is simple, primitive, natural, and exactly conformable to the character of those uncultivated patriarchs who used it themselves, and transmitted it to their descendants in its native purity and simplicity. Its words are comparatively few, yet concise and expressive; derived from a very small number of radicals, without the artificial composition of modern languages. No tongue, ancient or modern, can rival it in the happy and rich fecundity of its verbs, resulting from the variety and significance of its conjugations; which are so admirably arranged and diversified, that by changing a letter or two of the primitive, they express the various modes of acting, suffering, motion, rest, &c. in such a precise and significant matter, that frequently in one word they convey an idea which, in any other language, would require a tedious paraphrase. These propositions might easily be illustrated by numerous examples; but to the Hebrew scholar these would be superfluous, and to the illiterate class neither interesting nor entertaining.

To these we may add the monosyllabic tone of the language, which, by a few prefixes and affixes without affecting the radix, varies the significancy almost at pleasure, while the method of affixing the person to the verb exhibits the gender of the object introduced. In the nouns of this language there is no flexion except what is necessary to point out the difference of gender and number. Its cafes are distinguished by articles, which are only single letters at the beginning of the word: the pronouns are only single letters prefixed; and the prepositions are of the same character prefixed to words. Its words follow one another in an easy and natural arrangement, without intricacy or transposition, without suspending the attention or involving the sense by intricate and artificial periods. All these striking and peculiar excellencies combined, plainly demonstrate the beauty, the facility, and antiquity of the language under consideration.

We would not, however, be thought to intimate that this tongue continued altogether without changes and imperfections. We admit that many radical words of it were lost in a course of ages, and that foreign ones were substituted in their place. The long sojourning of the Israelites in Egypt, and their close connection with that people, even quasi sacra, must have introduced a multitude of Egyptian vocabularies and phrases into the vulgar dialect at least, which must have gradually incorporated with the written language, and in process of time have become parts of its essence. In Egypt, the Israelites imbibed those principles of idolatry which nothing less than the final extirpation of their polity could eradicate. If that people were so obdurately attached to the Egyptian idolatry, it is not very probable that they would be averse from the Egyptian language. Besides, the Scripture informs us, that there came up out of Egypt a mixed multitude; a circumstance which must have influenced the Hebrew tongue with the dialect of Egypt. As none of the genuine Hebrew radicals exceed three letters, whatever words exceed that number in their radical state may be justly deemed of foreign extraction.

Some Hebrew critics have thought that verbs constitute the radicals of the whole language; but this opinion appears to us ill founded: for though many Hebrew nouns are undoubtedly derived from verbs, we find at the same time numbers of the latter deduced from the former.

Before we conclude our detail of the Hebrew tongue, a few of our readers may possibly imagine we are about to give some account of the Hutchinsonian system; a system so highly in vogue not many years ago. But as this allegorical scheme of interpretation is now in a manner exploded, we shall beg leave to remit our curious Hebrew to Mr Holloway's Originals, a small book in 2 vols 8vo, but replete with multifarious erudition, especially in the Hutchinsonian style and character. — 

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We now proceed to give some account of the Arabian language, which is evidently one of the finer dialects of the Hebrew. Both, we imagine, were originally the same; the former highly improved and enlarged; the latter in appearance, retaining its original simplicity and rude aspect, spoken by a people of a genius by no means inventive. In this inquiry, too, as in the former, we shall spare ourselves the trouble of descending to the grammatical minutiae of the tongue; a method which we are persuaded, would neither sift our learned nor edify our unlearned readers. To those who are inclined to acquire the first elements of that various, copious, and highly improved tongue, we beg to refer to the Declaration of Hariri, translated by the elder Schulens; Mr Richardson's Peric; and Arab. Gram. &c.

We have pronounced the Hebrew and Arabian finer dialects; a relation which, as far as we know, has been seldom controverted; but we think there is authentic historical evidence that they were positively one and the same, at a period when the one as well as the other appeared in its infant undorned simplicity. The following detail will, we hope, fully authenticate the truth of our position.

The original language of the Hebrews is not well authenticated. It is generally supposed to be a confederacy of several distinct tribes, who, under different aspects, peopled the whole land of Haraviah, where there was great store of water.

The Arabic tongue, originally pure Hebrew, was in process of time greatly transformed and altered from its simple unpolished state. The Arabs were divided into many different tribes; a circumstance simplicity, which naturally produced many different dialects. These, however, were not of foreign growth. No foreign enemy ever conquered these independent hordes. The Persians, Greeks, and Romans, sometimes attempted to invade their territories; but the ruggedness of the ground, the scarcity of pasture, the penury of water, and their natural bravery, always protected them. They were indeed once invaded by the Abyssinians or Ethiopians with some show of success; but these invaders were in a short time expelled the country. Their language, of consequence, was never adulterated with foreign words or exotic phrases and idioms. Whatever augmentations or improvements it received were derived from the genius and industry of the natives, and not from adventurous or imported acquisitions. From this circumstance we may justly infer, that the Arabian tongue was a long time stationary, and of course differed in no considerable degree from its Hebrew archetype. The learned Schulens, in his commentary on Job, hath shown, to the conviction of every candid inquirer, that it is impossible to understand that sublime composition without having recourse to the Arabic idioms. That patriarch was a Chuzite. His country might be reckoned a part of Arabia. His three friends were actually Arabian.
Arabians, being the descendants of Ishmael and Esau.

His country bordered upon that of the predatory Chaldeans, who were an Arabian banditti. When we consider all these circumstances in connection, we are strongly inclined to believe that the book of Job was actually written in Arabic, as the language floated at that period; which, according to the most probable opinion, could not have been later than the age of Moses. The learned are generally agreed that this whole book, the three first chapters excepted, is a poetical composition, replete with themost magnificent imagery, the boldest, the juiciest, and most gorgeous tropes and allusions, and a grandeur of sentiment wholly divine. Whoever has read the poetical compositions of the modern Arabians, on divine subjects, with any degree of taste, will, we flatter ourselves, discover a striking similarity both of diction and sentiment. Be this as it may, we think there is no reason to conclude that the Arabic dialect deviated much from the Hebrew standard prior to the Christian era.

Of those different dialects which prevailed among the various tribes among which the peninsula of Arabia was divided, the principal were the Hemyaret and the Koreith. Though some of these were tributary to the Tobass, or Hemyarat sovereign of Arabia Felix, yet they took no great pains to cultivate the language of that province, and of course these people did not thoroughly understand it. As for the independent tribes, they had no temptation to cultivate any other language than their own.

The Koreith tribe was the noblest and the most learned of all the western Arabs; and the kaabs, or square temple of Mecca, was before the era of Mohammed solely under the protection. This temple drew annually a great concourse of pilgrims from every Arabian tribe, and indeed from every other country where the Sabian religion prevailed. The language of the Koreith was studied with emulation by the neighbouring tribes. Numbers of the pilgrims were people of the first rank, and possessed all the science peculiar to their country or their age. Great fairs were held during their residence at Mecca, and a variety of gay amusements filled up the intervals of their religious duties. In these entertainments literary compositions bore the highest and most distinguished rank; every man of genius considering not his own reputation alone, but even that of his nation or his tribe, as interested in his success. Poetry and rhetoric were chiefly esteemed and admired; the first being looked upon as highly ornamental, and the other as a necessary accomplishment in the education of every leading man. An assembly at a place called Ocaab, had been in consequence established about the end of the sixth century, where all were admitted to a rivalship of genius. The merits of their respective productions were impartially determined by the assembly at large; and the most approved of their poems, written on silk, in characters of gold, were with much solemnity suspended in the temple as the highest mark of honour which could be conferred on literary merit. These poems were called the Moallabat, “suspended,” or Modabebat, “golden.” Seven of these are still preserved in many European libraries.

From this uncommon attention to promote emulation, and refine their language, the dialect of the Koreith became the purest, the richest, and the most polite, of all the Arabian idioms. It was studied with a kind of predilection; and about the beginning of the seventh century it was the general language of Arabia, the other dialects being either incorporated with it, or sliding gradually into disuse. By this singular idiomatic union the Arabic has acquired a prodigious fecundity; whilst the luxuriance of synonyms, and the equivocal or opposite senses of the same words, hath furnished their writers with a wonderful power of indulging, in the fullest range, their favourite passion for antithesis and quaint allusion. One instance of this we have in the word witi.; which signifies a prince, a friend, and also a lance. This same word, with the change of one letter only, becomes wals; which, without equivocation, imports a sovereign. Examples of this kind occur in almost every page of every Arabic dictionary.

But all these advantages of this incomparable lan They were called the Chaldeans, who were an Arabian banditti.
body knows with what unremitting ardour the learned Arabs, under the first khiliffs, perused and translated the philosophical works of the Grecian sages. The very same spirit might animate their predecessors, though they wanted learning, and perhaps public encouragement, to arouse their exertions. From this quarter, we think the Arabs may have learned to admire, and then to imitate, the Grecian worthies.

The Ptolemies of Egypt were the protegèd patrons of commerce as well as of learning. Under these princes all nations were invited to trade with that happy country. The Arabs, now no longer fettered by Egyptian jealousy, carried their precious commodities to Alexandria; where the Grecian literature, though no longer in its meridian splendor, flourished never with a clear unfaded lustré. The court of the first Ptolemies was the retreat of all the most celebrated geniuses of Greece and of the age; in a word, Alexandria was the native land of learning and ingenuity. Here the ingenious Arab must have heard the praises of learning incessantly proclaimed; must have been often present at the public exhibitions of the poets and orators; and even though he did not understand them exactly, might be charmed with the melody of the diction, and struck with surprise at their effects on the audience. The reader will please to reflect, that the Arabian traders were the first men of the nation, both with respect to birth, learning, and fortune. Thése wise men, to use the language of Scripture, inspired with the natural curiosity of their race, might hear of the celebrated Olympic games, the public recitations before that assembly, and the glorious prize belotted upon the conquerors. Such information might animate them to institute something parallel at Mecca, with a view to improve their language, and at the same time to derive honour and emolument to themselves. The Koreishim might promise themselves the like advantages from the establishment of the fair and assembly at Ocdad, as the natives of Elys drew from the institution of the Olympic games. For these reasons, we conjecture the literary compositions at the place just mentioned were instituted at so late a period, though the nation had existed more than 2000 years before the establishment of this anniverary. Upon the whole, we are inclined to believe, that the Arabs, notwithstanding all the fine things recorded of them by their own poetical historians, and believed perhaps too easily by those of other countries, were in the days of ignorance like the earliest Romans, latrones et feminabarbi. For our part, we think it by no means probable that a people of that character should after so long a course of years, have stumbled upon so laudable and so beneficial an institution, without taking the hint from some foreign one of a similar complexion. This we acknowledge is only a conjecture, and as such it is submitted to the judgment of the reader.

There were, as has been observed above, two principal dialects of the original Arabic: the Hāmyaritik spoken by the genuine Arabs, and the Koreishite or pure Arabic, which at last became the general language of the people. The former of these inclined towards the Syriac or Chaldean; the latter being, according to them, the language of Ilhamel, was deeply tainted with the Hebrew idiom. The oriental writers tell us that Terah, the grandfather of Hāmyar, was the first who translated the Syriac or to the Arabic. Hence, say they, the Hāmyaritik dialect must have approached nearer to the purity of the Syriac, and of consequence must have been more remote from the true genius of the Arabic than that of any of the other tribes. The fact seems to stand thus: The Hāmyarites were neighbours to the Chaldeans and Syrians, and consequently were connected with those people by commerce, war, alliances, &c. This circumstance introduced into their language many phrases and idioms from both these nations. That Terah was concerned in adulterating the dialect of the Hāmyarites, is a mere oriental legend, fabricated by the Arabs after they began to peruse the Hebrew Scriptures. The Korān being situated in the centre of Arabia, were left exposed to intercourse with foreigners, and therefore preserved their language more pure and untainted.

The learned well know, that the Korān was written in the dialect of the Koreish; a circumstance which communicated an additional splendor to that branch of the Arabian tongue. It has been proved, that the language of the original inhabitants of Arabia was the genuine Hebrew; but upon this supposition a question will arise, namely, whether the Arabs actually preserved their original tongue pure and uncorrupted during a space of 2000 years, which elapsed between the deluge and the birth of Mohammed? or, whether during that period, according to the ordinary course of human affairs, it underwent many changes and deviations from the original standard?

The admirers of that language strenuously maintain the former position; others, who are more moderate in their attachment, are disposed to admit the latter. Chardin observes of the oriental languages in general, that they do not vary and fluctuate with time like the European tongues. "Ce qu'il y a de plus admirable, dit il, et de plus remarquable, dans ces langues, c'est qu'elles ne changent point, et n'ont point changé depuis des milles années." The same author, "il y a milles années, le monde de plus pur, plus courte, et plus eloquente dicition." It is not to our purpose to transcribe the remaining part of the author's reflection upon this subject: From the above it plainly appears that he concludes, that the Arabian tongue has suffered no change since the publication of the Korān; and at the same time infinuates, that it had continued invariable in its original purity through all ages, from the days of Korbūn to the appearance of that book. Whether both or either of these sentiments is properly authenticated will appear in the sequel.

The learned Dr Robertson, professor of oriental languages in the university of Edinburgh, informs us, that the Arabs, in order to preserve the purity of their tongue, strictly prohibited their merchants, who were obliged to go abroad for the sake of commerce, to use the language of commerce with strange women. We know not where this injunction is recorded, but certainly it was a most terrible interdict to an amorous son of the desert. If such a prohibition actually existed, we fulped it originated from some other source than the fear of corruption their language. Be that as it may, the Doctor,
The Style of the Koran now obsolete, that as well as the great Schultens, is clearly of opinion, that the language in question, though divided into a great number of streams and canals, still flowed pure and limpid in its course.

Our readers who are acquainted with the history of the orientals are already apprized of the steady attachment of those people to ancient customs and institutions. We readily allow, that in the article of Language this same predilection is abundantly obvious; but every oriental scholar must confess, that the style of the Koran is at this day in a manner obsolete, and become almost a dead language. This fact, we believe will not be questioned. If the Arabian has deviated so very considerably from the standard of the Koran in little more than 1000 years, and that too after an archetype is ascertained; by a parity of reason we may infer, that much greater deviations must have affected the language in the space of 5000 years.

It is universally allowed by such as maintain the unfulfilled purity of the Arabian tongue, that it was originally the same with the Hebrew, or with the ancient Syrian and Chaldaic. Let any one now compare the words, idioms, and phrænology of the Koran with the remains of those three languages, and we may venture to affirm that the difference will be palpable. This circumstance, one would think, indicates in the strongest terms a remarkable alteration.

The Arabs themselves are agreed, that notwithstanding the amazing fecundity of their language, vast numbers of its radical terms have been irrecoverably lost. But this loss could not be supplied without either fabricating new words or borrowing them from foreign languages. To the latter method we have seen their aversion; and must therefore conclude that they adopted the former.

The Chaldeans, Syrians, and Phenicians, had made innovations on their language at a very early period, even before conquests were undertaken: We see no reason to suppose that the Arabs did not innovate as well as their nearest neighbours: the Hamyarites did actually innovate.

There are, we think, very strong reasons to believe, that Job was an Arabian, and flourished prior to Moses, perhaps as early as Jacob. The style, the genius, the figurative tone of the composition; the amazing sublimity of the sentiments, the allusions, the pathos, the solemnness, the variety, and irregularity; the poetical enthusiasm which pervades the whole poem, strongly breathe the Arabian spirit: indeed the very diction is peculiar to that single book, and differs widely from that of the Psalms and every poetical part of the Sacred Canon. If we compare this book with Mohammed's Koran, we shall scarce find any resemblance of words or phrænology; but a wonderful similarity of figures, enthusiasm, and elevation of sentiments.

We are then led to conclude, that the Arabic did actually lose and gain a multitude of vocables between the era of its first establishment among the descendants of Joktan and Ihmael and the birth of the impositor.

The art of writing was introduced among the Arabs at a very late period: Without the assistance of this art one would think it altogether impossible to preserve any language in its primeval purity and simplicity. Our curious readers may here expect some account of the Arabic characters: the following detail is the most probable one we have been able to collect on that subject.

It is generally agreed, that the art of writing was known among the Hamyarites or Homrites at a very early period. These people were sovereigns of Arabia during a course of many ages. Their character was somewhat perplexed and confused. It was called "Mo'adin," from the mutual connection of the letters. The alphabet of these people resembled that of the Hebrews both in the number and order of the letters, titles, and is called al'guh breis; from the first ten letters of the Hebrew alphabet, artificially thrown together.

And resembling the Hebrew in its phrænology.
'or PHILOLOGY.'

§ Robert Clav. Pent. P. 35, 36. 53

Improved about 300 years after Mohammed.

Abauil the fon of Mocla &gt; 300 years after the death of Mohammed, found out a more elegant and more expedient character. This invention of Abauil was afterwards carried to perfection by Ebn Bowla, who died in the year of the Hegira 413, when Kader was caliph of Bagdad. This character, with little variation, obtains at this day. As we think this article of some importance, we shall, for the sake of our unlearned readers, transcribe an excellent account of this whole matter from the very learned Schulten.

"The Cuphic characters," says he, "which had been brought from the region of the Chaldeans to the province of Hejaz, and to Mecca its capital, in the age of Mohammed, was employed by the Koreithites, and in it the koran was written. But as this character was rude and clumsy, in consequence of its size, and ill calculated for expedition, Abauil Ebn Mocla devised a more elegant and expedient one. This perfon was vizir to Haradius the 41st caliph, who began to reign in the year of the Hegira 322. Accordingly, in the 10th century, under this emperor of the Saracens, the form of the Arabian alphabet underwent a change; and the former clumsy embarrased character was made to give way to the polished, easy, and expedient type. Regarding this expedition alone, the author of the invention left very few vowel characters; and as the Hebrew manner of writing admits five long ones and five short in different shapes, he taught how to express all the vowels, both long and short, suitably to the genius of the language, by three, or rather by two, small points, without any danger of a mistake: an abbreviation truly deferuing applause and admiration; for by placing a very small line above or below, he expressed ḥa and ḍ, by placing the same character above or below, he meant to imitate ʾ only. To the other short

ones, ʾ and ʾ, he assignd a small ᴱ above and ᵠ below. In order to represent the long ones, he called in the matres lectionis, the quiescent letters ᵫ, ṣ, ᵱ, ᴱ, so that ḥa with ᵱ intimatd ʾ and ʾ long, i.e. kametz and cholem; jod placed after ḫarm became tawr and chirek long. Ḥa annexed to ḫama made šbūrk.

In this paffage, this great orientalist acknowledges that the vizir above-mentioned, who carried the Arabian alphabet to the pinnacle of perfection, invented and annexed the vowel points for the sake of ease and expedition in writing; from which we may infer, that prior to the tenth century the Arabians had no vowel points, and consequently either read without vowels, or contented themselves with the matres lectionis above-mentioned.

The design of the author of the invention in fabricating these points, was confessedly ease and expedition in writing: a circumstance which furnishes a violent prejumition that the Hebrew vowel-points were devised and annexed at some late period for the very fame purpofes.

Some, indeed, have gone fo far as to affirm that the Arabians were the original fabricators of the vowel-points. The Arabians† (says the learned Dr Gre-† Diff. on the Origin of the Cuphic letters) were the original authors of the vowel-points. They invented three, called ṣafha, Ḫama, and ᵷefa, and if these were not in use till several years after Mohammed, it is certain that the first copies of the koran were without them. The rabbis stole them from the Arabs." This, however, is carrying the matter too far, since it is certain that the Jews were acquainted with the points in question long before the period above mentioned.

Though it is not one of our intention to enter into a minute detail of the peculiarities of this noble language, we cannot omit observing one thing, which indeed belongs to grammar, but is not generally taken notice of by the Arabic grammarians. The roots of verbs in this dialect are universally triliteral, so that the composition of the 28 Arabian letters would give near 22,000 elements of the language. This circumstance demonstrates the surprising extent of it: for although great numbers of its roots are irrecoverably lost, and some perhaps were never in use; yet if we supposd 10,000 of them, with the Arabic out reckoning quadrilateralis to exist, and each of them language, to admit only five variations, one with another, in forming derivative nouns, the whole language would then consist of 50,000 words, each of which may receive a multitude of changes by the rules of grammar.

Again, the Arabic seems to abhor the composition of words, and invariably expresses very complex ideas by circumlocution; so that if a compound word be found in any dialect of that language, we may at once pronounce it of foreign extraction. This is indeed a distinguishing feature in the structure of this tongue, as well as of some of its ffer dialects. This circumstance has, in our opinion, contributed not a little to the amazing fecundity of that language: for as every ingredient in the composition of a complex idea requires a

† See this whole detail in Dr Pocock's Specim. Hist. Arab. p. 253, et seq.
(c) Irak, "Babylonia," from Eras, one of the cities buill by Nimrod. The Arabians have generally restored the ancient names of places. Thus with them Tyre is L İz, Sidon Syrd, Egypt Mesoi, &c.
the book of Ecclesiastes seem to be composed in this species of verification. The profody of the Arabs was never digested into rules till some time after the death of Mohammed; and this is said to have been done by Al Khalti al Farabidi, who lived in the reign of the caliph Kuran of Rafehid.

After so many encomiums on the copiousness of the Arabic tongue, one class of our readers may possibly expect that we should subjoin a brief detail of its genius and character; and this we shall do with all possible brevity.

All the primary or radical words of the language are composed of different combinations of consonants by triads; so that the various combinations and conjunctions of radicals make more than 1,000, even without including those which may arise from the meeting of guttural letters. From this quality of the language has flowed that facility of the dialect which has preferred it pure and entire for so many thousand years, and secured it from those changes and that fluctuation to which most other tongues are subject.

Perhaps notwithstanding its copiousness and variety, no other language can vie with the one in question in point of peripetica and precision. It is possessed of a brevity and rotundity which, amidst the great variety, enables it to express with clearness and energy what could not be expressed in any other tongue without tedious circumlocutions. To this purpose we shall beg leave to transcribe a passage from Bishop Pocock's oration on the Arabic language. As we imagine few of our readers who will have the curiosity to peruse this article can be unacquainted with the Latin tongue, we shall give it as it stands in the original without a translation:

“Neque in nulla certa laudis parte, mira illa qua, non solum verborum in significando, peripeticate, sed in prolacione, elegantia et dulcedine caverunt, feditas; quoque, non solum accurata, inter literas ex significata proportione, fenso vel intentioni, vel remissioni, prout res perfuaverit, interiortur, effecerunt. Hoc in genere eft, quod nuplum in verbo aliquo, genuine apud Arabes originali, concurrent, non incidente vocalibus aliis mutandis motione consonantia, cum vel tres, vel plures, alius in linguas frequentus colludiantur. Immo neque, fi adint, quae aperitatis remedio tunc, vocalibus, quas libet tempus tenent committunt consonantias; sed infra natura postulat, ut concurreat debet illa, quae se invicem, line aperitatis inductione confequi, et inter se connecti non posse; illi vel illus, vel literarum mutatione, eas abjiciendo, inferendo, emolendo, aliique quibus poenis modis remedii quorum unum adeo ab omnibus, vel vel ab omnibus, vel diuus eft, absentequum. Quid si nobis fere videntur, et aperitatis line aperitatis ob ariabbus prolata, illud auribus auditi, et usi, non linguas imputantur, nec moliis illi est sonare nobis, quam eorum nobis censendum. Quem et gutturalium, quem nobis maxima aperitatis causa videntur, abfentiem, ut magnum in lingua Graeca defectum, argutum Arabes.

The learned Dr Hunt, late professor of the Hebrew and Arabic languages at Oxford, is of the same opinion with the very learned prelate, part of whose oration

**Oratory and poetry of the Arabs.**

The orations of the Arabs were of two kinds, metrical and prologetic. The former they compared to pearls set in gold, and the latter to lozenges. They were ambitious of excelling in both; and whoever did so was highly distinguished. His success in either of those departments was thought to confer honour, not only on his family, but even on his tribe. In their poems they were preferred the genealogies of their families, the privileges of their tribes, the memory of their heroes, the exploits of their ancestors, the propriety of their language, the magnificence of banquets, the generosity of their wealthy chiefs and great men.

After all, we cannot avoid being of the unpopular opinion, that this mighty parade of eloquence and poetry did not reach backwards above two centuries before the birth of Mohammed, as it certainly vanished at the era of the propagation of his religious institutions. The two succeeding centuries were the reigns of superflition and bloodshed. The voice of the muses is seldom heard amid the din of arms.

The ancient Arabs, at whatever time poetry began to be in request among them, did not at first write poems of considerable length. They only composed themselves in metre occasionally, in acute rather than harmonious strains. The Proverbs of Solomon, and
PHILOLOGY.

Sect. III.

Arabic Language.

In our document, we have transcribed above, with respect to the delicacy and elegance of the Arabian language:—

"Nusquam, milhi credite, (inquit ille) auribus magis parcit quam in Arabis; nulla lingua a nobis in Alguiri, alioque quam Arabica. Quamquam enim nonnullæ ejus literæ minus forte vulgat, immo durius etiam fonnuntis, tamen Arabes eas temperant cum lenibus, duras cum grave, graves cum acutis melius, voce inde non minus auribus iucundae quam pronunciatus factiles conferent, totique sermoni miram fonorum tam dulcedinem quam varietatem addiderint. Quod quidem orationis modulant ædium in Corano adae magnificentum est, ut primum Islaiminis oppugnatores cum liberalia ideæ arte scriptum dixerint. Non auribus tantum gratus est Arabions, sed et animæ concepius exprimendis aptus, fonos suis contentius temper accommodans, et felici verborum junctura omnium naturam depingens."

To these we might add quotations from Erpenius' on the same subject, from Golius, Schultens, Hottinger, Bochart, and Sir William Jones; besides a whole cloud of oriental witnesses, whose extravagant encomiums would rather astonish than edify the far greater part of our readers. These panegyrics may perhaps be in some measure hyperbolical; but in general we believe them pretty well founded. At the same time we are convinced that the Arabic, however melodious in the ear of a native, founds harsh and unharmonious in that of a European.

When we consider the refinement and the variety of the Arabic tongue, we are led to conclude, that to acquire a tolerable degree of skill in its idioms, is a more difficult task than is generally imagined; at least some who have acquired the knowledge of the Greek and Latin, and likewise of the more fashionable modern languages, with facility enough, have found it so. Be that as it may, there are two classes of men who, in our opinion cannot handomely dispense with the knowledge of that almost universal tongue: the gentleman who is to be employed in the political transactions of the most respectable mercantile company upon earth, in the eastern parts of the world; and the divine, who applies himself to investigate the true purport of the sacred oracles; without this, the former will often find himself embarrassed in both his civil and mercantile negotiations; and the latter will often grope in the dark, when a moderate acquaintance with that tongue would make all further round about him.

Bochart, Hottinger, Schultens, Pocock, Hunt, and Robertus, &c. have taken wonderful pains, and lavished a profusion of learning, in proving the affinity and dialectical cognition between the Hebrew and Arabic. Much of this labour, we think, might have been spared. We presume to affirm, that no person tolerably versed in both languages can read a single paragraph of the Arabic version of the New Testament, or indeed of the Koran itself, without being convinced of the truth of this position: it is but stripping the latter of its adventitious fruipery, and the kindred features will immediately appear.

The learned professors of the university of Leyden were the first who entered upon the career of Arabian learning. To them the European students are principally indebted for what knowledge of that language they have hitherto been able to attain. Though several Italians have contributed their endeavours, yet the fruit of their labours had been rendered almost useless by more commodious and more accurate works printed in Holland.

The palm of glory, in this branch of literature, is due to Golius, whose works are equally profound and elegant; so perceptive in method, that they may always be consulted without fatigue, and read without languor. Erpenius' grammar, and his memorable dictionary, will enable the student to explain the history of Taimur by Ibn Arabish. If he has once mastered that sublime work, he will understand the learned Arabic better than most of the Khattabs of Constantinople or of Mecca.

The Arabic language, however, notwithstanding all its boasted perfections, has undoubtedly shared the fate of other living languages; it has gradually undergone such considerable alterations, that the Arabic spoken and written in the age of Mohammed may be now regarded as a dead language: it is indeed so widely different from the modern language of Arabia, that it is taught and studied in the college of Mecca just as the Latin is at Rome.

The dialect of the Highlands of Yemen is said to have the nearest analogy to the language of the Koran, because the Highlanders have little intercourse with strangers. The old Arabic is through all the East, like the Latin in Europe, a learned tongue, taught in colleges, and only to be acquired by the perusal of the best authors.

"Ut falsa in falso præsus mutantur in annos, &c."

Sect. III. Of the Chaldean, Phoenician, or Ethiopic Abyssinian, and Egyptian Languages.

As there is a very swift connection and dialectical analogy among these languages, we have arranged them all under one section; especially since what is observed relating to one of them may, without the least straining, be extended to them all. We shall begin with the Chaldaic.

The Chaldeans, or Chafidim, as they are always called in Scripture, were the descendants of Chedon the son of Nahor, the brother of Abraham. The descendants of this patriarch drove the Cushim or Arabians out of Babylonia, and possessed themselves of that country at a very early period. As the Chafidim or Chaldean were the posterity of Nahor, the descendant of Heber, they undoubtedly spoke the original Hebrew tongue as well as the other branches of that family. But being an ingenious inventive people, they seem to have polished their language with much care and delicacy of taste.

The only genuine remains of the ancient Chaldaic language are to be found in the Hebrew Scriptures; and these are contained in 268 verses, of which we have two hundred in Daniel, reaching from verses 4th chapter 2d to chapter 8th exclusive; in Ezra 67, in chapter 4th, 17 verses; chapter 5th, the same number; chapter 6th, 18 verses; and in chapter 7th, 15: in Jeremiah, chapter 10th, there is extant only one verse. From these fragments, compared with the Hebrew
Chaldean Language

Chaldean differs little from the Hebrew.

The Chaldean declensions and conjugations differ so little from the Hebrew modifications, that it would be almost superfluous to dwell upon them in this section. The most effectual way to acquire an idea of the ancient, Chaldaic, is to decompose the names confessedly of that dialect, which occur in many places of Scripture. By this method of proceeding, its beautiful structure and expressive energy will be readily comprehended even by the most illiterate classes of our readers. At the same time, we must observe, that the Chaldaic and ancient Syriac bore so near a resemblance to each other, that they have generally been classed under one head.

The first Chaldaic word that occurs in the Old Testament is bara "created." This word has all along been alligned to the language under consideration; for what reason, we confess we are not able to discover. The greatest part of the Hebrew tongue is now lost. The words lar, "a son," and bara "created," (rather fail! avot), may probably be of that number. Another Scripture word which is often quoted, and always ascribed either to the Syriac or Chaldaic, is igar or jegur ja-hadubia, which signifies "a monument of witnesses." Every body knows, that when Jacob and Laban made their compact, the latter denominated the heap of stones reared upon that occasion in this manner; while the former called it Gala'd, as we now write and pronounce it. This pronunciation, however, does not appear to us altogether genuine. The word is probably compounded of saf galumus, "a heap," and yv chad, attentatis, feculum, eternity, an age! so that yv ga-chad, or galaad as it came to be written afterwards signified an "everlasting heap." Laban then had respect to the end for which the monument was erected; but Jacob alluded to its duration. It appears, however, upon this and every other occasion, when Chaldaic words are mentioned, that s, a, was a favourite letter both with the Syrians and Chaldeans. We may likewise observe, that the same people always changed the Hebrew s b'n into m thau, in order to avoid the serpentine sound of that consonant.

The Chaldaic names of gods, men, places, &c. which occur in Scripture, appear to be no other than Hebrew polished and improved. Bel, Belus in Latin, is evidently yav Baal, or we think rather yav Bebel. The Phoenicians, and f. murmurs the Hebrews, used it to signify the high one. The Chaldeans used their word Bel for the same purpose; and because this word originally importcd the High One, they dignified their first monarch with that name. They denominated their capital city Be-bel which imports the temple of Bel, and afterwards Babylon, which intimates the abode or dwelling of our lord the sun. Nibo was a name of the moon among the Babylonians, derived from the Hebrew nabo, nabi, "to prophecy." Aser was the planet Mars, from s naser or bars, narse, "to gird," alluding to the girding on of arms. Abod was an Assyrian name of the sun, a word deduced from the Hebrew t c tab, us, "one." Ninoz was the name of an Arabian idol, which often occurs in the composition of Babylonian names. In Arabic it signifies an eagle: we think, however, that the word is the Hebrew ta nasaer, cufadunis, fervatur, "to keep, to preferre." To these names of deities many more might be added, which the nature of our design will not allow us to mention.

Almost all the Chaldean proper names which occur either in sacred or prophane history are evidently of Hebrew original, or cognate with that language. We shall subjoin a few examples: Nabonassis is evidently compounded of Nado and nazur, both Hebrew words. Nabonassar is made up of Nabo and Puls, the name with Bel and azer or Aser, above explained. Belges is made up of Bel and yva Elyas, "fire," Nebuchadnessazar, Belhazzer, Bethlahm, Neriglissar, Nebuzaradan, Rahmag, Rabari, Nergal-Sharzer, Rabibakeh, Ezaraddon, Merodach, Elia Merodach, and numberless others, are so manifestly reducible to Hebrew vocabularies, when decomposed, that the oriental scholar will readily distinguish them.

Names of places in the Chaldaic are likewise fo nearly Hebrew, that nothing but the dialectical tone separates them. Thus Ur of the Chaldees is actually the city being faced to the sun; Sippara is plainly the Hebrew word Zipporah; Carshemish, a city on the Euphrates, is evidently compounded of Kir or Kar "a city," and Chemosh, a name of the sun. In short, every Chaldean or old Syrian word now extant, without any difficulty, beway their Hebrew original. As for their dialectical differences, these we remit to the Chaldaic and Syriac grammars and lexicons.

We now proceed to the consideration of the Phoenician language, which is known to have been that of language derived from the Hebrew, and consequently a cognate of the ancient Canaanites. That this was one of the original dialects, and consequently a cognate of the Hebrew, is universally acknowledged. Instead therefore of endeavouring to prove this position, we may refer our readers to the works of the learned Mr Bochart, where that author has in a manner demonstrated this point, by deriving almost all the names of the Phoenican colonies from the Hebrew, upon the supposition that the dialect of these people was closely connected with that tongue.

St Augustine de Civitatis Dei, has observed, that even in his time many of the vulgar in the neighbourhood of Carthage and Hippo spoke a dialect of the old Punic which nearly resembled the Hebrew. Procopius, de bello Goth. informs us, that there existed even in his days in Africa a pillar with this inscription in Hebrew, "We fare from the face of Joshua the robber, the son of Nun." The names of all the ancient cities built by the Carthaginians on the coast of Africa are easily reducible to the Hebrew original. The Carthaginian names of persons mentioned in the Greek and Latin history, such as Himilco, Hamilcar, Alcudub, Hannibal, Hanno, Dido, Anna or Hannah, Sophonisba, Gifgo, Matheral, Adherbal, &c. all breathe a Hebrew extraction.

The
The Greeks borrowed a great part of their religious
worship from the people of whose language we are
treating; of consequence, the names of most of their
gods are Phænician. Almost every one of these is
actually Hebrew, as might easily be shown. The
names of persons and places mentioned in the frag-
ments of Sanchoniathon, preferred by Eusebius, are
all of Hebrew complexion. The names mentioned in
the Hebrew scriptures of places which belonged to the
Canaanites prior to the invasion of the Israelites under
Joshua, are as much Hebrew as those
which were afterwards substituted in their stead. The Punic scene in Plautus has been analysed by Bochart and several
other learned men, by whom the language has been
clearly proved to be deduced from the Hebrew, with
some dialectical variations.

The island of Melita (Malta now) was inhabited by
a colony of Phænicians many ages before the Moors
took possession of it. Among the vulgar of that island
many Punic vocables are current to this day, all which
may be readily traced up to the Hebrew fountain. To
these we may add many inscriptions on stones, coins,
medals, &c. which are certainly Phænician, and are cer-
tainly of Hebrew extraction. We have thrown togeth-
er these few hints without pursuing them to any
great length, as we deemed it unnecessary to dwell long
on a point so hackneyed and so generally
acknowledged.

Before we proceed to treat of the ancient language
of the Ethiopians, we find ourselves obliged to hazard
a few frieties of the origin of that ancient nation. If we can once settle that single point, the discovery
will open an avenue to their primitive dialect, the
article about which we are chiefly concerned in the
present discussion.

In our Section concerning the Hebrew language, we
were led often to mention the patriarch Cush the eldest
son of Ham. The poiverity of this family-chief under his son Nimrod, possessed themselves of Shinar, af-
terwards denominated Chaldea. These were probably
the Arabsians whose kings (according to Eusebius,
Africanus, and other ancient chronologers) reigned in
Babylon during several succedaneous generations. Those were the Cufhim or Cushites, whom the learned Mr Bryant has concluded over a great part of the world,
and to whose industry and ingenuity he has ascribed
almost all the inventions, arts, sciences, laws, policy,
religious, &c. which distinguished mankind in the ear-
liest ages.

In process of time, the poiverity of Chafid or Che-
ved called Chaldrm or Chalidim in the east, and Chal-
dees in the west, drove out the Cufhim, and seized
upon their country. The Cufhim retired westward, and
spread themselves over that part of Arabia situa-
ted towards the south east. They probably extended themselves over all the eastern part of that peninsula,
from the sea to the wilderness between Arabia and Syria. Those were the Ethiopians mentioned in Scrip-
ture by a very pardonable inadvertency of our tra-
lators. These, then, we think, were the primitive Chaldean
Cufhim.

Josephus informs us *, that all the Asiatics called
the Ethiopians of Africa by the name of Cufhim. This
name, denomination was not given them without good rea-
son; it importetd at least, that they deemed themselves the
descendants of Cufh; it being the common practice of
the orientals in the early ages to denominate nations and tribes from the name of their great patriarch or
founder. The name Cufhim must then have been given
to the Ethiopians, from a perversion that they were
the progeny of the son of Ham who bore that name.
By what route foever the Cufhim penetrated into that
region of Africa which was called by their name, it
may be taken for granted that they were the descend-
ants of Cufh above mentioned.

It has been observed above, that the poiverity of Cufh
possessed the country of Shinar or Chaldea at a
very early period, but were expelled by the Chafidim
or Chaldeans. Upon this catastrophe, or perhaps
somewhat later, a colony from the fugitive Cufhim
transported themselves from the south and south east
coast of Arabia over the sea, which lies between that
country and Ethiopia. However imperfect the art
of navigation might be in that age, the distance was so
small that they might easily enough make a voyage
crofs that narrow sea in open boats, or perhaps in can-
oes. However that may have been, it cannot be
doubted that the tribes on both sides of that branch
of the sea were kindred nations.

If, then, both the northern and southern Cufhim
sprang from the same flock, there can be no doubt
that both spoke the same language. The language of
the Babylonian Cufhim was Chaldaic, and of conse-
quence that of the Ethiopian Cufhim was the same.
We may therefore rest assured, that whatever changes
the Ethiopian dialect may have undergone in the
course of 3000 years, it was originally either Chaldaic,
or at least a branch of that language. Scaliger in-
forms us, that the Ethiopians call themselves Chal-
dees; and that, says he, not without reason, because
of those many sacred and profane books which are
extant among them, the most elegant and most beau-
tiful are written in a style near that of the Chaldean or
African. Mianarius Victor, who was the first that
reduced the Ethiopic tongue to the rules of grammar,
tells us in his Pretamium, "that the Ethiopians call
their tongue Chaldaic; that it springs from the Ba-
ylonian; and is very like the Hebrew, Syrian, and
Arabic: At the same time (he concludes), that this
language may be easily learned by those who are
masters of the Hebrew." The learned Bochart, and
Bishop Walton in his Proleg, are clearly of the same
opinion.

The vulgar letters of the Ethiopians, according to § Lib. 3.
Diodorus Siculus, were the same with the sacred
characters of the Egyptians (p). From this account, step.
if the Sicilian may be trusted, the sacred letters of
these people, concerning which so many wise conjec-

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(p) We find the same observation confirmed by Heliodorus (Ethi. lib. x. p. 476.) "The royal letters of
the Ethiopians (says he) were the sacred characters of the Egyptians." Cassiodorus likewise affures us,
"That the letters inscribed upon the Egyptian obelisks were Chaldeans." See Sect. Shenfrut.
Ancient intercourse between the Ethiopians and Egyptians.

They have been formed, were actually Chaldaic. To carry on this investigation a little farther, we may observe, that Sir William Jones seems to have proved, by very plausible arguments, that the Shanfrit characters were deduced from the Chaldaic. This circumstance affords a presumption that the Ethiopian Cufhites were likewise concerned with the Egyptians; who, as is remarked in the Section concerning the Shanfrits, probably introduced the religion of the Brahmans into Hindoos. This is advanced as a conjecture only; and yet when we consider the affinity between the Egyptian and Gentoo religions, we are strongly inclined to hope that this furnishes one day be verified by undeniable facts.

The original Ethiopians were a people highly civilized; their laws, their institutions, and especially their religion, were celebrated far and wide. Homer talks in raptures of the piety of the Ethiopians, and sends his gods every now and then to revel 12 days with that devout people. The Sicilian adds a number of very specious arguments to prove that those two nations had sprung from the same stock. He mentions a similarity of features, of manners, of customs, of laws, of letters, of the fabrication of statues, of religion, as evidences of the relation between those two neighbouring nations. There was, every now and then, a commerce, as to sacred rites, between the two countries. The Egyptians sent annually a deputation of their priests, furnished with the portable statues of their gods, to visit the fanes of the devout Ethiopians. Upon this occasion, a solemn religious banquet was prepared, which lasted 12 days, and of which the priests of both nations were partakers. It was, we imagine, a kind of sacramental institution, by which both parties publicly avouched their agreement in the ceremonies of their religion respectively. These observations plainly show, that the most ancient Ethiopians were a people highly civilized; indeed so much, that the Egyptians were at one time contented to be called Ethiopians. The tone of their language was certainly the same with that of the Chaldeans or Arabian Cufhites, from whom they were defended. We know not whether there are any books in the ancient Ethiopian tongue; so that it is not easy to produce infallible proofs of its coincidence with the Chaldaic. Dio- genes Laertius * informs us, that Thraffylus, in his catalogue of the books composed by Democritus, mentions one, *πυγή εκ Μαρτήνα ετελευτανων, concerning the sacred letters in the island of Meros (s); and another concerning the sacred letters in Bablyon. Had these books survived the ravages of time, they would in this age of research and curiosity have determined not only the point under our consideration, but the affinity of sacred rites among the Chaldeans, Ethiopians, and Egyptians.

We have now shown that the Ethiopians were a colony of Cufhites; that the Cufhites were originally sovereigns of Shinar or Chaldea, and consequentely spoke either Chaldaic or a dialect of that tongue; that their colonists must have used the same language; that the ancient Ethiopians were a people highly polished, and celebrated in the most early ages on account of their virtue and piety. It has likewise appeared, that the common letters of that people were the sacred characters of the Egyptians. The letters, we imagine, where the Cufhite; for which see the Sect. on the Arabis. When they were discarded, and the modern substitutes in their room, cannot be determined; nor is it we apprehend, a matter of much importance. We shall therefore drop that part of the subject, and refer our curious and inquisitive readers to the very learned Job Ludolf's (r) excellent grammar and Dictionary of the Abyssinian or Geez tongue, where they will find every thing worth knowing on the subject. We shall endeavour to gratify our readers with a very brief account of the modern Ethiopian or Abyssinian tongue; for which both they and we will be obliged to James Bruce, Esq.; that learned, indefatigable, and adventurous traveller; who, by his observations on that country, which he made in person, often at the hazard of his life, has discovered, as it were, a new world both to Europe and Asia.

The most ancient language of Ethiopia, which we shall now call Abyssinia (its modern name), according to that gentleman, was the G.ez, which was spoken by the ancient Cufhite shepherds. This, we should think, approaches nearest to the old Chaldaic. Upon a revolution in that country, the court refided many years in the province of Amhara, where the people spoke a different language, or at least a very different dialect of the same language. During this interval, the Geez, or language of the shepherds, was dropped, and retained only in writing, and as a dead language: the sacred Scriptures being in that tongue only saved it from going into dilute. This tongue is exceedingly harsh and unharmonious. It is full of these two letters D and T, in which an accent is put that nearly resembles stammering. Considering the small extent of sea that divides this country from Arabia, we need not wonder that it has great affinity with the Arabic. It is not difficult to be acquired by those who understand any other of the oriental languages; and as the roots of many Hebrew words are only to be found here, it seems to be absolutely necessary to all those who wish to obtain a critical skill in that language.

The Ethiopic alphabet consists of 26 letters, each of which, by a virgula or point annexed, varies its sound in such a manner as that those 26 form as it were 62 distinct letters. At first they had but 25 of their original letters, the Latin P being wanting; so that they were obliged to substiute another letter in its place. Paulus, for example, they call Paulus, Aus- tus, or Casaus: Petros, they pronounced Ketros. At last they substituted T, and added this to the end of their alphabet; giving it the force of P, though it was really a repetition of a character rather than the invention of a new one. Besides these, there are 20 others of the nature of diphthongs; but some of them

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*(s)* Where the capital of Ethiopia was situated.
*(r)* A very learned German, who published a grammar and dictionary of the Geez in folio.
are probably not of the same antiquity with the letters of the alphabet, but have been invented in later times by the scribes for convenience.

The Amharic, during the long banishment of the royal family in Shoa, became the language of the court, and seven new characters were of necessity added to answer the pronunciation of this new language; but no book was ever yet written in any other language than Geez. There is an old law in the country handed down by tradition, that whoever shall attempt to translate the Holy Scripture into Amharic or any other language, his throat shall be cut after the manner in which they kill sheep, his family fold to slavery, and their houses razed to the ground.

Before we leave this subject, we may observe that all the ancients, both poets and historians, talk of a double race of Ethiopians; one in India, and another in Africa. What may have given rise to this opinion it is not easy to discover. Perhaps the swarthy complexion of both people may have pleased the ancients, and that vocal language seems to have been the original Ethiopia. When we consider the low situation of the Delta, the violent current of the Nile, and the climate as compared with other countries, as the ancients called them, we are rather inclined to believe that the original Egyptians and Ninevites were of the same stock, and that the Amharic letters were the original. Many are of opinion that the ancient name of Egypt was not Egypt, but Egypt, as it is called by the ancients. The Egyptians were a colony of Ethiopians; and this is too evident to admit of contradiction. The excavations, originally dug out of the solid rocks of porphyry and marble, in which the natives refided before the plains were drained, have been observed by a most judicious traveller (c) very few years ago. At the same time, the most accurate and judicious travellers (h) who have visited that region in modern times, are generally of opinion that the land has gained nothing on the sea since the period when Herodotus wrote his description of that country; from which circumstance we may be led to conclude, that the idea of the inundation of the Delta is not founded in fact.

But even admitting that the Egyptian Delta has acquired nothing from the sea since the age of Herodotus, it certainly does not follow that the region in question was never overflowed by that element; since there are in many parts of the globe, large tracts of land certainly once covered with sea, which have continued to this day in the very same situation in which they were 2000 years ago. We leave the decision of this point to the judgment of our readers.

We have already hinted our opinion of the nature of the Egyptian language; but because Egypt is generally thought to have been the native land of hieroglyphics, and because many are of opinion that hieroglyphical characters were prior to the alphabetical, we shall hazard a few conjectures with respect to that species of writing.

The end of speech, in general is to enable men to communicate their thoughts and conceptions one to another; but before this is to perform the same office when people are at so great a distance that vocal sounds cannot mutually reach them. Hieroglyphics are said to have been invented to supply this defect. The most ancient languages were every where full of tropes and figures borrowed from several objects. As in that state of society men have not learned to abstract and generalize, all their ideas are borrowed from such objects as most forcibly strike their senses. This circumstance would naturally suggest the idea of conveying their sentiments to each other, when absent, by delineations of corporeal objects. Thus, if a sage asked a loan of his friend's

(c) See Mr Bruce’s Travels, Vol. 1.
(h) Mr Bruce, Dr Shaw, Bishop Pocock, Savary, Volney, &c.
Neceffity would foon impel our favage correspondents to fabricate a method more extensively ufeful, which would likewise be suggested by the conftant ufe of the metaphorical mode of speech. Some favage leaders, more fagacious than the vulgar herd, would obferve that certain fensible objects were fitted according to the rules of analogy, to reprefent certain human paflions, and even fome abftract ideas; and this would be readily enough adopted by the herd as a new improvement. In this cafe a horn might be the emblem of power, a fword of bravery, a lion of fury, a fox of cunning, a ferpent of malice, &c. By and by artificial figns might be contrived to exprefs fuch ideas as could not readily be denoted by bodily objects. This might be called fymbolical writing. Such was the foundation of the Chinese charaeters; and hence that prodigious number of letters of which the written language of that people is compofed. Farther they could not proceed, notwithstanding their boasted inventive powers; and farther, we believe no nation ever did proceed, who had once upon a time no other characters but hieroglyphical. The Mexicans, had arrived at the very loweft stage of hieroglyphical writing, but had not taken one step towards alphabetical. The Hurons employ hieroglyphical fymbols, but never entertain a fingle idea of alphabetical. Hieroglyphical charaeters are the images of objects conveyed to the mind by the organs of vision; alphabetical are arbitrary artificial marks of found, accommodated by compafs to convey to the mind the ideas of objects by the organs of hearing. In a word, we think that there is not the leaft analogy between these two fpecies to conduct from the one to the other: we are therefore of opinion, that hieroglyphical characters were never the vulgar channels of ideal conveyance among civilized people.

We know that in this point we differ from many learned, judicious, and ingenious writers; fome of whom have taken much pains to investigate the intermediate stages through which the fabricators of characters muff have pafted in their progres from hieroglyphical to alphabetical writing. These writers have adopted a plan analogous to Bihip Wilkins's project of an artificial language. In this theory, we own, we are led to fuppoft that they fuppofted all mankind were once upon a time favage, and were left to hammer out words, as well as characters, by neceffity, ingenuity, experience, practice, &c. For our part, we have endeavoured to prove, in our fection on the Hebrew language, that alphabetical writing was an antediluvian invention: and we now lay it down as our opinion, that among all thofe nations which fettled near the centre of civilization, hieroglyphies were comparatively a modern fabrication.

The orientals are, at this day, extravagantly devoted to allegory and ficion. Plain unadorned truth with them has no charms. Hence that extravagant medley of fables and romance with which all antiquity is relle, and by which all ancient history is difguifed and corrupted. Every doctrine of religion, every precept of morality, was tendered to mankind in parables and proverbs. Hence, fays the Scripture, to underfland a proverb, the words of the wife, and their dark fayings. The eftabh fages involved their maxims in this efigmatical drefs for feveral reafons: to fix the attention of their disciples; to affit their memory to gratify their allegorical taste; to fhew their wit and exercife their judgment; and fometimes perhaps to display their own acutenefs, ingenuity, and invention.

It was among the ancients an universal opinion, that the most facred arcana of religion, morality, and the sublime sciences, were not to be communicated to uninitated favage. For this reafon every thing facred was involved in allegorical darknefs.

Here, then, we ought to look for the origin of hieroglyphical or picture-writing among the civilized nations of the eft. They did not employ that fpecies of writing because they were ignorant of alphabetical characters, but becaufe they thought fit to conceal the moft important heads of their doctrines under hieroglyphical figures. The Egyptian priests were moft celebrated for their fkill in devifing thofe emblematical repreffentations; but other nations likewise employed them. We learn from the fragments of Herodotus the Chaldean historian, preferred by Syncellus and Alexander Polyhiftor, that the walls of the temple of Belus at Babylon were covered all over with thofe emblematical paintings. These characters were called hiropy, becaufe they were chiefly employed to reprefent facred objects; and γεγραφόν, becaufe they were originally carved or engraved. Their name points to their own ufe. Instead of purfing these obfervations, which the nature of our defign will not permit, we muft refer our readers to Herodotus, i. ii. Diodorus Sic. l. i. Strabo, l. xvii. Plut. Isis and Osiris; and among the Christian fathers, to Clem. Alex. Eufeb. Prep. Evang.; but chiefly to Horapollo's Hieroglyphica.

From this deduction we would conclude, that this fpecies of writing was an adventitious mode in Egypt, peculiar to the priests, and employed chiefly to exhibit things facred; and that among all civilized people it did not superede the ufe of alphabetical characters, nor did the ufe of the latter originate from the former. When alphabetical letters were invented, if indeed And pofterior in time to alphabetic characters, they were antecedent in time to the other in ufe and extent. The Egyptian priests alone knew the true import of thofe facred symbols; and communicated that knowledge firit to their own children from generation to generation, then to the initiated, and laft of all to the grandees of the nation, all of whom were indeed initiated. The hieroglyphics of Egypt were not then the fymbols of any facred occult language; but figns invented by the priests and prophets or wise men, in order to represent their deities, the attributes and perfections of their deities, and the mysterious arcana of their religion, and many other circumftances relating to objects of importance, which were deemed either too facred or too important to be imparted to the vulgar.

The Egyptians ascribed the invention of letters to a perfon whom they called Thoth *, Thoth* or Eufbus. Prope. Ev. 7 BYCTIS: the Greeks Ἰησοῦς; and the Romans Mercurius. Plato † calls him a god, or a godlike man; † Phaedrus Diodorus ‡ makes him privy counfellor to Osiris; San- † Lib. 1, 2, choniath.
Two kinds of letters

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c110niathon ap. Euseb. § connects him with the Phoenician Cronus or Saturn. To this Mercury the Egyptians ascribe the invention of all the arts and sciences.

He was probably some very eminent inventive genius, who flourished during the first ages of the Egyptian monarchy, and who perhaps taught the rude savages the art of writing.

According to Diodorus Siculus, the Egyptians had two kinds of letters: the one sacred the other common; the former the priests taught their own children, the latter all learned promiscuously. In the sacred characters the rites and ceremonies of their religion were couched; the other was accommodated to the ordinary business of life. Clem. Alexand. mentions three different styles of writing employed by the Egyptians. "The pupils, who were instructed by the Egyptians, first learned the order and arrangement of the Egyptian letters, which is called aphabetography, that is, the manner of writing letters; next, the sacred character, which the sacred scribes employed; lastly, the hieroglyphic character, one part of which is expressed by the first elements, and is called Cyriologis, that is, capital, and the other symbols. Of the symbolic kind, one part explains properly by imitation; and the other is written tropically, that is, in tropes, and figures; and a third by certain enigmatical expressions. Accordingly, when we intend to write the word sun, we describe a circle; and when the moon, the figure of that luminary, after the appearance of that planet appearing horned, conformable to the change."

By the description above translated, it plainly appears, that the sacred character of the Egyptians was entirely different from the hieroglyphic; and by this consideration we are in a good measure justified, in supposing, as we have done all along, that the sacred letters of the Egyptians were actually the Chaldæan.

The inscriptions on the obelisks mentioned by Caius- dorus, so often quoted, were certainly engraved in the sacred character; and the character in which they were drawn was that above mentioned. If the sacred letters were Chaldæan, the sacred language was probably the same.

The Egyptians pretended, that the Babylonians derived the knowledge of the arts and sciences from them; while, on the other hand, the Babylonians maintained, that the former had been tutored by them. The fact is, they both spoke the same language; used the same religious rites; had applied with equal facility to astrology, astronomy, geometry, arithmetic, and the other sciences; of even a rivalry had arisen between the two nations, which laid the foundation of those opposite pretensions.

The most faithful specimen of the vulgar language of the Egyptians, is, we believe, still preserved in the Coptic, which, however, is so replete with Grecian terms that it must be difficult to trace it out.

Under the Ptolemies, the Greek was the language of the court, and consequently must have diffused itself over all the country. Hence, we believe, two-thirds of the Coptic are Greek words, diversified by their terminations, declensions, and conjugations only.

To be convinced of the truth of this, our learned and curious readers need only consult Christian Sholtz’s Egyptian and Coptic grammar and dictionary, corrected and published by Godfried Woide, Oxford, 1788.

The Egyptians and Phœnicians were in a manner cousins, and consequently must have spoken the same language; that is, one of the following dialects of the Hebræan, Chaldæan, Arabian, Cufhite, &c.- This is not a mere conjecture; it may be realized by almost numberless examples. It is true, that when Joseph’s brethren went down to Egypt, and that ruler desired to converse with them, they could not understand the Egyptian idiom which he spoke; nor would he, had he been actually an Egyptian, have understood them without an interpreter. The only conclusion from this circumstance is, that by this time the Egyptian had deviated considerably from the original language of mankind. The Irish and Welch, every body knows, are only different dialects of the Celtic tongue; and yet experience proves, that a native of Ireland and another of Wales cannot well comprehend each other’s language, nor converse intelligibly without an interpreter. The Erse, spoken in the Highlands of Scotland, and the Irish are known to be both branches of the old Celtic; yet a Scotch Highlander and an Irishman can hardly understand each other’s speech. By a parity of reason, a Hebrew and an Egyptian might, in the age of Joseph, speak only different dialects of the same original tongue, and yet find it difficult to understand one another. The fact seems to be, the Hebrew dialect had been in a manner stationary; from the migration of Abraham to that period; whereas the Egyptian, being spoken by a powerful, civilized, and highly cultivated people, must have received many improvements, perhaps additions, in the course of near two centuries.

The descendants of Canaan and of Mizraim were slightly connected in their religious ceremonies; they worshipped the same objects namely, the Host of heaven; they mourned Osiris and Adonis in concert; they carried on a joint commerce, and, we think, spake the same language; we may therefore, conclude, that their vulgar letters were nearly the same, both in form, disposition, and number. Their original number was probably 16. viz. five vowels, five mutes, simple and middle, four liquids, and the solitary s.-

With these, it is likely, was joined a mark of aspiration, or an a, such as we have in the Roman alphabet, and found on some Greek monuments. Cadmus was originally an Egyptian; that leader brought a new set of letters into Greece. These are generally deemed to be Phœnician. They were near the same with the ancient Pelasgic, as will be shown in the section of the Greek language. The latter, we think, were from Egypt, and consequently the former must have been from the same quarter. Danaus, Perseus, Lelex, &c. were of Egyptian extractions; they too adopted the Cudman characters, without substituting any of their own.

The Jovim, or Ionians, emigrated from Gaza, a colony of Egyptians; and their letters are known to have differed very little from those of Cadmus and the Pelasgi.
Chaldean Language, &c.

We are abundantly sensible that there are found upon Egyptian monuments characters altogether different from those we have been describing. At what time, by what people, and to what language, these letters belonged, we will not pretend to determine. The Ethiopians, the Chaldeans, the Persians, the Greeks, the Romans, the Saracens have, at different times, been sovereigns of that unhappy country. Perhaps other nations, whose memory is now buried in oblivion, may have erected monuments, and covered them with inscriptions composed of words taken from different languages, perhaps, upon some occasions, whimsically devised, with a view to perplex the curious antiquaries of future ages. Some of these are composed of hieroglyphics intermingled with alphabetical characters, artificially deranged, in order to render them unintelligible. These we do not pretend to develop because the most inquisitive and sagacious antiquaries are not yet agreed as to their purport and signification.

We shall now go on to show, that most part of the names of persons and places, &c. which have been conveyed down to us, may, in general, be reduced to a Hebrew, Phoenician, Syrian, or Chaldean original. As the firit of these languages is most generally known, we shall employ it as our archetype or standard beginning with those terms which occur in Scripture.

The word Pharaoh, the title of the melch or king of Egypt, is, we think, compounded of two terms, which plainly discover a Hebrew original. According to an oriental tradition, the firit who assumed this title was the sovereign of the royal shepherds; a race of people from Arabia and Phoenicia. They conquered Egypt at an early period, and kept possession of it for several centuries. They gloried in the title Pharaoh, which plainly discovers a Hebrew original. Ancient Egyptian names of Hebrew original.

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The conclusion, therefore, is, that the vulgar Egyptian letters were the same with the Phoenician.

Thebrew word ben or chon signifies "power, wealth, sufficiency;" a very proper epithet for the sun, who was thought to beflow these blessings. The name of Joseph's wife was Aneath or Apiath, compounded of Ifab "a woman," and Neith or Neit, an Egyptian name of "Minerva, a votary of Minerva."

Almost all the names of cities belonging to Egypt which are mentioned in Scripture are evidently Hebrew. To be satisfied as to this position, our curious readers may consult Jamieson's "Scriptures," an excellent and significant cast in that language.
the land of Mizraim; the Egyptians themselves, in later times, seem to have called it *Aegyptus*, "Egypt," which some think is compounded of *Ai*, Hebrew, "an isle, a country a province," and Copt or Copt, "a famous city in that country."

From this specimen, we hope it will appear that the Egyptian language in the more early ages was one of those dialects into which that of the descendents of the poledavilian patriarchs was divided, and perhaps subdivided, a few centuries after the deluge. Among all these, we believe, such an affinity will be found, as plainly demonstrates that they originally sprang from one common rock. Here we might easily follow the Egyptian language into Greece; and there we are persuaded we might trace a vast number of Egyptian terms into that tongue, which, however, the nature of this inquiry will not permit. If our learned readers should incline to know more of the affinity of the Egyptian tongue with the others so often mentioned, they may consult Bochart's *Chanaan*, Walton's *Proleg.* Gebelin's *Monde Prim.* Jametot's *Spicilegia,* &c.

**Sect. IV. Of the Persian Language.**

The Persian language is divided into the ancient and modern; the former of which is at this day very imperfectly known, the latter is at present one of the most expressive, and at the same time one of the most highly polished, in the world. We shall, in treating of this language, in compliance with the plan we have all along followed, begin with the ancient.

When Mohammed was born, and *Amu Shiri Sava* whom he calls the *just king* sat on the throne of Persia, two languages were generally prevalent in that empire (x). The one was called *Dari,* and was the dialect of the court, being only a refined and elegant branch of the *Parfi,* so called from the province of *Shiraz* is now the capital; and that of the learned, in which most books were composed, and which had the name of *Pahlavi,* either from the heroes who spoke it in former times, or from *pahla,* a tract of land which included some considerable cities of *Iran*; the ruder dialects of both were spoken by the rustics of several provinces; and many of these distinct idioms were vernacular, as happens in every kingdom of considerable extent. Befides the Parfi, and Pahlavi, a very ancient and obscure tongue was known to the priests and philosophers, called the language of the *zend,* because a book on religious and moral duties which they held sacred, and which bore that name, had been written in it; while the *Pazend* or comment on that work was composed in *pahlavi,* as a more popular dialect. The letters of this book were called *zend,* and the language *zendga.*

The Zend and the old Pahlavi are now almost extinct in *Iran,* and very few even of the Grebes can read it; while the Parfi remaining almost pure in *Shabnameh,* has, by the intermixture of Arabic words, and many imperceptible changes, now become a new language exquisitely polished by a series of fine writers both in prose and verse, analogous to the different idioms gradually formed in Europe after the subversion of the Roman empire.

The very learned and laborious Sir William Jones is confident that the *Parfi* abounds with words from guage and the Shanfrit, with no other change than such as may be observed in the numerous dialects of India; that very many Persian imperatives are the roots of Shanfrit verbs; and that even the moods and tenses of the Parfi verb substantive, which is the model of all the rest, are deducible from the Shanfrit by an easy and clear analogy. From this he infers that the *Parfi,* like the various idiom dialects, is derived from the language of the Bramins. This conclusion, we imagine, is not altogether just, since by the same train of reasoning we may infer that the Shanfrit is derived from the Parfi.

The same learned gentleman adds, that the multitude of compounds in the Persian language proves that it is not of Arabic but Indian original. This is undoubtedly true; but though the *Parfi* is not of Arabic original, it does not necessarily follow that it is of Shanfrit. We might with the same propriety, and with an equal flow of reason, conclude, that the Greek language is descended of the Shanfrit, because it too abounds with compounds. We may then rest assured, that neither the one nor the other argument adduced by the ingenious prelident proves that the *Parfi* tongue is a descendant of the Shanfrit.

The gentleman so often mentioned, assures us, that the Zend bears a strong resemblance to the Shanfrit; which, however, it might do without being actually derived from it, since we believe every oriental scholar will find that all the languages from the Mediterranean to the utmost coast of Hindostan exhibit very strong signatures of a common original. The Parfi, however, not being the original dialect of Iran or Perfi, we shall pursue it no farther at present, but return to give some account of the Pahlavi, which was probably the primitive language of the country. We have observed above, that the Pazend or comment on the Zend was so compounded in the Pahlavi for the use of the vulgar. This, according to Sir William, was a dialect of the Chaldaic; and of this admission he exhibits the following proof.

By the nature of the Chaldean tongue, most words ended in the first long vowel, like *jensia* "heaven;" and that very word, unaltered in a single letter, we find in the Pazend, together with *laita* "night," *moj" "water," *nird" "fire," *madir" "rain," 9 and a multitude of others, all Arabic or Hebrew, with a Chaldean termination; so *zaman,* by a beautiful metaphor from *pruning trees,* means in Hebrew, to *compoze* verse; and thence, by an easy transition, to sing them; now in Pahlavi we see the verb *zamardicont* "to sing," with its forms *zamarsami* "I sing," and *namzard* "he sang," the verbal terminations of the Persian being added to the Chaldaic root. All these words are integral parts of the language; not adventitious like the Arabic nouns and verbs engraven on modern Persian.

(x) The moderns call the empire of Perfi *Iran,* a name unknown to the ancients.
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From this reasoning it plainly appears, 1st, that Pahlavi was the ancient language of Persia; and, 2d, that the ancient Pahlavi was a cognate dialect of the Chaldean, Hebrew, Arabic, Phœnician, &c. M. Anquetil has annexed to his translation of the Zendavesta two vocabularies in Zend and Pahlavi, which he found in an approved collection of Rawzahat or Traditional Pieces in modern Pahlavi. His vocabulary of the Pahlavi strongly confirms this opinion concerning the Chaldaic origin of that language. But with respect to the Zend, it abounded with vast numbers of pure Sanskrit words, to such a degree, that fix or seven words in ten belonged to that language.

From this deduction it would appear, that the old languages of Persia were Chaldaic and Shanscrit; and that when they had ceased to be vernacular the Pahlavi and Zend were deduced from them respectively, and the Parthi either from the Zend, or immediately from the dialect of the Brahmans; but all had perhaps a mixture of Tartarian; for the best lexicographers assure that, numberless words in ancient Persian are taken from the Cimmerians. With respect to the lait of these, we cannot help being of opinion, that colonies of people from the neighbourhood of Peræa did transport themselves into Scæna Tartary, and perhaps into Europe. These colonies brought along with them those vowels which still occur in their dialect. Emigrants from those quarters must have found their way into Scandinavia, since numberless Persian words are still current in those regions. Perhaps Odin and his followers emigrated from the neighbourhood of Media and Peræa, and brought with them the dialect of the nations from whose country they had taken their departure.

With respect to the Zend, it might well be a dialect of the Shanscrit, and was probably a sacred language; and if so, concealed from the vulgar, and reserved for the offices of religion. If Zoroartreus, or Zaraduth as the orientals call him, travelled into Egypt, and was initiated in the mysteries of the Egyptian religion, as some pretend he was, he might be introduced into the sacred dialect of that people by the priests under whom he studied. When that philosopher returned into Peræa, and became the apologist of a new religion, he might compose the volume of his laws and religious institutions in the sacred language of his Egyptian tutors. This language then became that of the Magi, who concealed it carefully from the knowledge of the uninitiated, as the priests did in Egypt and the Brahmans in Hindoostan.

In our Section on the Shanscrit language, we shall give a detail of a number of particulars, which to us seem to furnish a prepossension that the language, in question was imported from Egypt into Hindoostan. We confess there are not sufficient data to improve these prepossessions into absolute certainty; but we hope the time is at hand when the worthy members of the Asiatic Society will discover abundant materials to ascertain the truth of this position. We are the rather inclined to adopt this hypothesis, when we consider the character of Zoroartreus in connection with that of the Egyptian Cohens and of the Indian Brahmans.

If this opinion should one day appear to be well-founded we do believe the coincidence between the language of the Zend and the Shanscrit will be clearly accounted for, without making the Hindoos masters of Iran or Peræa, and thus driving them back to the shores of the Ganges. That the nations of Turan or Scythia did actually overrun that country, and make themselves masters of a considerable part of it at different times is vouched by the records and traditions of the Persians themselves. Upon those occasions a number of Tartarian words might be introduced into the country, and acquire a currency among the inhabitants. As the Annals of Ancient Peræa have been long since destroyed and consigned to eternal oblivion, it is impossible to ascertain either the extent or duration of these invasions. Indeed the nature of our design does not call for that investigation.

In order to corroborate the cognition between the Chaldean and Pahlavi languages, we shall subjoin a few arguments derived from the Mosaic history, and the other writings of the Old Testament. These will be admitted as irreducible proofs of the position above advanced by such as admit the authenticity of those records.

Elam is always allowed to have been the progenitor of the Persians. This patriarch was the eldest son of Shem the son of Noah; and according to the Mosaic account, his posterity settled in the neighbourhood of the descendants of Japheth, Arabian, Li'd, and Aram, the others sons of Shem. The country where they settled was designated Elymatis* as late as the beginning of the Christian era. This name was retained in Babil, till the Sarcens conquered and took possession of that country. If this was the case, as it certainly was, the Elamites or Persians spoke a dialect of the primary language, which, in the first Section, we have proved to have been the Hebrew.

When the four eastern monarchs invaded the five cities of the plain in Canaan†, Chedorlaomer king of Elam was at the head of the confederacy. Amraphel king of Shinar, that is Babylon or Chaldea, was one of the allies; Arioch king of Elazor was another; and Tidal, king of some scattered nations in the same neighbourhood, was the fourth. That Chedorlaomer was principal in this expedition, is obvious from the historian's detail of the second, where that prince is placed first, and the rest are named the kings that were with him. This passage likewise demonstrates, that Elam, Shinar, and Elazor, lay contiguous, and were engaged in the same cause. Wherever the country in question is mentioned in Scripture prior to the era of Daniel and Ezra, it is always under the name of Elam. To go about to prove this would be superfluous.

According to Xenophon they knew no other thing of horsemanship before the age of Cyrus; but ib. in that historian informs, that after that monarch had introduced the practice of fighting on horseback, they became so fond of it, that no man of rank would deign to fight on foot. Here it ought to be considered, that the historian above mentioned was now writing a moral, military, and political romance; and therefore introduces this anecdote, in order to exalt the character of his hero: so that we are not to suppose that the people under consideration were unacquainted with the art of horsemanship till that period.

The very name Pears or Pharos is certainly of Hebrew origin. It is derived from Phars, or Pharsalia, and was the name of the city and the province; and we are not to suppose that the Persians knew no description of horse.
brev origin, and alludes to the skill that people pro-
ounced in horsemanship. The original seems to be Phar-
as, a horse, and in the Arabic Phara, intimates a horse, and Phara a horseman. Consequently,
the people were denominated Peri, and the country Parz, because they were trained from their infancy to
ride the great horse, which indeed they deemed their
greatest honour. This name was perhaps first impos-
ited upon them by the neighbouring nations, and in
process of time became their gentile appellation. Ginal
Pars, the fun

Hence we believe comes Hama-
the 'heathts or chapels' where the fire sacred to
the fire was kept burning; which, we believe, the
Greeks called Thetis or 'fire-temples.' Herodotus
mentions a custom among the Peri, according to
which, when they came to engage an enemy, they call
a rope with a kind of gin at the end of it on their
enemy, and by those means endeavoured to entangle
and thus to overpower them. The people of Per-
ia who employed this sort of gin or gin were called Saparta,
from Parz, Pharz, or ferig, a word which in Hebrew,
Arabic, and Chaldaic, signifies to 'hamper or en-
tangle;' hence perhaps the Greek word Σαρατια, a
'basket or net.' Sar or Sar in Hebrew, Phœnician,
Syria, &c. signifies 'a lord, a prince,' and hence
we have the initial syllable of the far-famed sar-tubh,
Zoroâser. In a word, most of the Perian names that
occur in the Grecian histories, notwithstanding the
scandalous manner in which they have been defiled
and metamorphosed by the Greeks, may still be figured
with a little skill and industry be traced back to a Hebrew,
Chaldaic, Syria, or Phœnician origin. In the books of
Daniel, Ezra, Nehemiah, and Esther, we find a
number of Perian names which are all of a Hebrew or
Chaldaic composition; to investigate these at much
greater length would be foreign to the design of the
prefent article. If our curious reader should incline
to be more fully justified in this point, he may con-
sult Bochard's Chanaan, D'Herbelot's Bib. Orient.
Walton's Proleg. &c.

It now appears, we hope to the entire satisfaction of
our readers, that the Pahlavi is a remnant of the
old Perian, and that the latter is a cognate branch of
the Hebrew, Chaldaic, Syria, &c. We have likewise
added some preterit proofs that the Zend was copied from the facred language of the Egyptian:
we shall now endeavour to explain by what changes
and revolutions the language first mentioned arrived
at its present fummit of beauty and perfection.

We have observed above, that the Sythians, whom
the old Perians called Sarxwax Saxis, and whom the modern
call Turan, often invaded and over-ran Peria at a
very early period. The confedence was, an influ-
ce of Scythian or Tartarian terms, with which that
language was early impregnated. This in all proba-
bility occasioned the first deviation from the original
standard. The conquests of Alexander, and the do-
mation of his succesfors, must, one would imagine, in-
troduce an inundation of Greek words. That event,
however, seems to have affected the language in no
considerable degree, at least very few Grecian terms oc-
cur in the modern Perian.

The empire of the Arsacid or Parthian, we appre-
hened, produced a very important alteration upon
the ancient Perian. They were a Semitic tribe; and as they conquered the Perians, retained
the dominion of those parts for several centuries, and
actually incorporated with the natives, their language
must necessarily have given a deep tincture to the or-
ginal dialect of the Perians. Sir William Jones has
observed that the letters of the inscriptions at Fakhr
or Perspolis bear some resemblance to the old Runic
letters of the Scandinavians. Tho frofructions we take to have been Parthian; and we hope, as the Par-
ians were a Tartarian clan, this conjecture may be
admitted till another more plausible is discovered. The
Perians, it is true, did once more recover the empire;
and under them began the reign of the Deri and Parsi
tongues; the former confiding of the old Perian and
Parthian highly polished; the latter of the same
languages in their uncultivated vernacular dress. In this
situation the Perian language remained till the in-
vasion of the Saracens. The Perians, we know it was their
language that the modern Perian, we infer, had been faithfually
and settled in that fine country; demolished every
monument of antiquity, records, temples, palaces;
every remnant of ancient superstition; massacred or ex-
pelled the ministers of the Magian idolatry; and in-
truced a language, though not entirely new, yet
widely differing from the old exemplar.

But before we proceed to give some brief account of
the modern Perian, we must take the liberty to hazard
one conjecture, which perhaps our readers in modern
Perian may not find themselves disposed to admit. In
modern Perian we find the ancient Perian names won-
derfully altered and defected from that form under
which they appear in the Scripture, in Ctesias, Megalhe-
es, and the other Greek authors. From this it has been
inferred that not only the Greeks, but even the facred
historians of the Jews, have changed and metamorphosed
them most unmercifully, in order to accommodate them
to the standard of their own language. As to the
Greeks, we know it was their custom in the very ear-
ian; we cannot believe so much of the Hebrews. We make
no doubt of their writing and pronouncing the names of
the Perian monarchs and governors of that nation
nearly in the same manner with the native Perians. It
is manifest, beyond all possibility of contradiction, that
they neither altered the Tyrian and Phœnician names of
persons and places when they had occasion to men-
tion them, nor those of the Egyptians when they oc-
curred in their writings. The Babylonian and Chal-
daic names which are mentioned in the Old Testa-
ment vary nothing from the Chaldean original. No
reason can be assigned why they should have transfor-
med the Perian names more than the others. On the
contrary, in Ezra, Nehemiah, and Esther, we find the
Perian names faithfully preserved throughout.

The fact, we imagine, is this: Our modern ad-
mirers of the Perian have borrowed their names of
the ancient kings and heroes of that country from ro-
tantick and fabulous legends of more modern date and
composition. The archaie of Peria were destroyed by the Sar-
casens: nothing of importance was written in that
country till two centuries after the era of Mo-
hammed. What succeeded was all fiction and romance.
The authors of these entertaining compositions either forged names of heroes to answer their purpose, or laid hold on such as were celebrated in the ballads of the ancient kings and heroes of Persia; and probably many of them had undergone considerable changes during the continuance of the Parthian empire. Upon this foundation has the learned Mr. Richardson erected a very irregular, fabric, new, and to use his own expression, we think built upon pillars of ice. He has taken much pains to invalidate the credit of the Grecian histories of the Parthian empire, by drawing up in battle array against their records legions of romantic writers, ancient kings and heroes of their own. 

The period numbers the foundation of the Parthian empire. Upon this event, many of the poets were not born till near a thousand years after the events had taken place; and to complete the probability, who lived two hundred years after all the chronicles of the Medes and Persians had been finally destroyed by the fury of the Saracens.

After the decisive victory obtained over the Persians at Kodesh, their ancient government was overturned, their religion proscribed, their laws trampled under foot, and their civil transgressions disturbed by the forcible introduction of the lunar for the solar calendar; while, at the same time, their language became almost overwhelmed by an inundation of Arabic words; which, from that period, religion, authority, and fashion, incorporated with their idioms.

From the seventh till the tenth century the Persian tongue, now impregnated with Arabic words, appears to have laboured under much discouragement and neglect. Bagdad, built by Almanfor, became soon after the year 762 the chief residence of the Khalifs, and the general resort of the learned and the ambitious from every quarter of the empire. At length, the accession of the Buyah princes to the Persian throne marked the beginning of the great epoch of the revival of Persian learning. About the year 977 the throne of Persia was filled by the great Azuddudawia; who first assumed the title of Sultan, afterwards generally adopted by eastern princes. He was born in Esphahan, and had a strong attachment to his native kingdom. His court, whether at Bagdad or in the capital of Persia, was the haunt of taste and the favored residence of genius. The native dialect of the prince was particularly distinguished, and became soon the general language of composition in almost every branch of polite learning. From the end of the tenth till the fifteenth century may be considered as the most flourishing period of Persian literature. The epic poet Ferdabi, in his romantic history of the Persian kings and heroes, displays an imagination and smoothness of numbers hardly inferior to Homer. The whole fantastic range of Persian enchantment he has interwoven in his poems, which abound with the noblest efforts of genius. This bard has stamped a dignity on the monitors and fictions of the east, equal to that which the prince of epic poetry has given to the mythology of ancient Greece. His language may at the same time be considered as the most refined dialect of the ancient Persian, the Arabic being introduced with a very sparing hand; whilst Sadi, Jami, Hafez, and other succeeding writers, in prose as well as verse, have blended in their works the Arabic without reserve; gaining perhaps in the nervous luxuriance of the one language what may seem to have been lost in the softer delicacy of the other. Hence Ebn Fekreddin Anju, in the preface to the Dictionary called Farhang 'jenanuvi', says, that the Deri and the Arabic idioms were the languages of heaven; God communicking to the angels his milder mandates in the delicate accents of the first, whilst his stern commands were delivered in the rapid accents of the last.

For near 300 years the literary fire of the Persians seems indeed to have been almost extinguished; since, during that time, hardly any thing of that people which deserves attention has appeared in Europe: enough, however, has already been produced, to inspire us with a very high opinion of the genius of the east. In taste, the orientals are undoubtedly inferior to the best writers of modern Europe; but in invention and sublimity they are excelled, perhaps equalled, by none. The Persians affect a rhetorical luxuriance, which to a European wears the air of unnecessary redundancy. If to these leading distinctions we add a peculiar tone of imagery, of metaphor, of illusion, derived from the difference of government, of manners, of temperament, and of such natural objects as characterize Asia from Europe; we shall fee at one view, the great points of variation between the writers of the east and west. Amongst the oriental historians, philosophers, rhetoricians, and poets, many will be found who would do honour to any age or people; whilst their romances, their tales, and their fables, stand upon a ground which Europeans have not yet found powers to reach. We might here quote the Arabian Nights Entertainments, Persian Tales, Pilpay's Fables, &c.

We shall now annex a few strictures on the genius of that noble language; though it is our opinion that the province of the philologist is to investigate the origin, progress, and final improvement of a language, without descending to its grammatical minutiae or peculiar idiomatic distinctions. We have already observed, that the tongue under consideration is partly Arabic and partly Persian, though the latter generally has the ascendant. The former is nervous, impetuous, and mafculine; the latter is flowing, soft, and luxuriant. Wherever the Arabic letters do not readily incorporate with the Persian, they are either changed into others or thrown away. Their letters are the Arabic with little variation; these being found more commodious and expeditious than the old letters of the Dari and Parsi. Their alphabet consists of 32 letters, which like the Arabic, are read from right to left; their form and order will be learned from any grammar of that language. The letters are divided into vowels and consonants as usual. The Arabic characters, like those of the Europeans, are written in a variety of different hands; but the Persians write their poetical works in the Talikh, which answers to the most elegant of our Italic hands.

There is a great resemblance between the Persian and English languages in the facility and simplicity of their form and construction; the former, as well as the latter, has no difference of terminations to mark the gender either in substantives or adjectives; all inanimate things are neuter; and animals of different sexes have either different names, or are distinguished by the words m or male, and f female. Sometimes indeed,
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Sect. IV.

Perfian Language.

The Perfian substatives have but one variation of case which is formed by adding a syllable to the nominative in both numbers: and answers often to the dative, but generally to the accusative, case in other languages. The other cases are expressed for the most part by particles placed before the nominative. The Perfians have two numbers, singular and plural: the latter is formed by adding a syllable to the former.

The Perfian adjectives admit of no variation but in the degrees of comparison. The comparative is formed by adding ter, and the superlative by adding terin to the positive.

The Perfians have active and neuter verbs like other nations; but many of their verbs have both an active and neuter tense, which can be determined only by the construction. Those verbs have properly but one conjugation, and but three changes of tense: the imperative, the aorist, and the preterite; all the other tenses being formed by the help of particles or auxiliary verbs. The passive voice is formed by adding the tenses of the substative verb to the participle of the active.

In the ancient language of Persia there were very few or no irregularities: the imperative, which is often irregular in the modern Perfian was anciently formed from the infinitive, by rejecting the termination eden; for originally all infinitives ended in den, till the Arabs introduced their harh consonants before that syllable, which obliged the Perfians, who always affected a sweetness of pronunciation, to change the old termination of some verbs into ten, and by degrees the original infinitive grew quite obsolete: yet they still retain the ancient imperative, and the aorists which are formed from it. This little irregularity is the only anomalous part of the Perfian language; which nevertheless far surpasses in simplicity all other languages ancient or modern.

With respect to the more minute and intricate parts of this language, as well as its derivations, compositions, et cetera, we must remit our readers to Minimskie's Institutiones Lingae Turcicae cum rudimentis paralleli linguarum Arab. et Perf. Sir William Jones's Perfian Grammar; Mr. Richardson's Arabian and Perfian Dictionary; D. Herbelot's Bibl. Orient. Dr. Hyde de Relig. vet. Perf. et cetera. Our readers, who would penetrate into the innermost recesses of the Perfian history, colonies, antiquities, connections, dialects, may consult the last mentioned author, especially chap. xxxv. De Perse et Perfarum nominibus, et de Moderna atque vetere lingua Perfica et jureque dialectis. In the preceding inquiry we have followed other authors, whose accounts appeared to us more natural, and much less embarrassing.

To conclude this section, which might easily have been extended into a large volume, we shall only take the liberty to put our readers in mind of the vast utility of the Arabian and Perfian languages. Numberless events are preferved in the writings of the orientals which were never heard of in Europe, and must have for ever lain concealed from the knowledge of its inhabitants, had not these two tongues been studied and understood by the natives of this quarter of the globe. Many of those events have been transmitted to posterity in poems and legendary tales like the Romic fragments of the north, the romances of Spain, or the Heroic ballads of Great Britain. Such materials as these, we imagine, may have suggested to Firdauzi, the celebrated heroic poet of Persia, many of the adventures of his Shabahmed: which, like Homer when strip of the machinery of supernatural beings, is supposed to contain much true history, and a most undoubted picture of the superlition and manners of the times. The knowledge of these two languages has laid open to Europe all the treasures of oriental learning, and has enriched the mind of Britons with Indian science as much as the produce of these regions has increased their wealth and enervated their constitution.

Before we conclude this section, we shall subjoin a fewextracts on the nature of Perfian poetry, in order to render our inquiry the more complete. The modern Perfians borrowed their poetical measures from the Arabs: they are exceedingly various and complicated: they consist of 9 different kinds; but the most common of them are the Iambic or Trochaic measure, and a metre that chiefly consists of those compound feet which the ancients called 8 νηπε, which are composed of iambic and spondees alternately. In lyric poetry their verses generally consist of 12 or 16 syllables; but sometimes, but seldom, consist of 14. Some of their lyric verses contain 13 syllables: but the most common Perfian verse is made up of 11; and in this measure are written all their great poems, whether upon heroic or moral subjects, as the works of Firdauzi and Jami, the Bostar of Sadi, and the Mebnavi of Geladedin. This forte of verse answers to our common heroic rhyme, which was brought to so high a degree of perfection by Pope. The study of the Perfian poetry is so much the more necessary, as there are few books or even letters written in that language, which are not interperpered with fragments of poetry. As to their profody, nothing can be more easy and simple. When the fluent can read prose easily, he will with a little attention read poetry with equal facility.

Sect. V. Shanferit and Bengalefe Languages.

The Shanferit, though one of the moft ancient languages in the world, was little known even in Asia till about the middle of the present century. Since that period, by the indefatigable industry of the very learned and ingenious Sir William Jones and the other worthy members of that society of which he has the honour to be president, that noble and ancient language has at length been brought to light; and from it vast treasures of oriental knowledge will be communicated both to Europe and Asia; knowledge which, without the exertions of that establishment, must have lain concealed from the researches of mankind to the end of the world. In this section we propose to give to our readers such an account of that language as the limits of the present article, and the help we have been able to procure, shall permit.

The Shanferit language has for many centuries lain concealed in the hands of the bramins of Hindoosta: It is by them deemed sacred, and is of consequence confined solely to the offices of religion. Its name

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Shanfrit imports the perfect language, or, according to the eastern style, the language of perfection; and we believe no language ever spoken by man is more justly intituled to that high epithet.

The grand source of Indian literature, and the parent of almost every dialect from the Persian gulp to the China seas, is the Shanfrit; a language of the most venerable and most remote antiquity, which, tho' at present flut up in the libraries of the bramins, and appropriated solely to the records of their religion, appears to have been current over most of the oriental world. Accordingly traces of its original extent may be discovered in almost every district of Asia. Those who are acquainted with that language have often found the familiarities of Shanfrit words to those of Persian and Arabic, and even of Latin and Greek; and that not in technical and metaphorical terms, which refined arts and improved manners might have occasionally introduced, but in the main ground-work of language, in monosyllables, the names of numbers, and appellations of such things as would be first discriminated on the immediate dawn of civilization.

The ancients coins of many different and distant kingdoms of Asia are fraught with Shanfrit characters, and mostly contain allusions to the old Shanfrit mythology. Besides, in the names of persons and places, of titles and dignities, which are open to general notice, even to the farthest limits of Asia, may be found manifest traces of the Shanfrit. The scanty remains of copic antiquities afford little scope for comparison between that idiom and this primitive tongue; but there still exists sufficient ground to conjecture, that, at a very early period, a correspondence did subsist between these two nations. The Hindoos pretend, that the Egyptians frequented their country as disciples, not as instructors; that they came to seek that liberal education and those sciences in Hindostan, which none of their own countrymen had sufficient knowledge to impart. Perhaps we may examine the validity of this claim hereafter.

But though numberless changes and revolutions have from time to time convulsed Hindostan, that part of it which lies between the Indus and the Ganges still preserves that language whole and inviolate. Here they still offer a thousand books to the perusal of the curious; many of which have been religiously handed down from the earliest periods of human existence.

The fundamental part of the Shanfrit language is divided into three clauses: Dhuth, or roots of verbs, which some call primitive elements; Shubh, or original nouns; and Eeys, or particles. The latter are ever indeclinable, as in other languages; but the words comprehended in the two former clauses must be prepared by certain additions and inflexions to fit them for a place in composition. And here it is that the art of the grammarian has found room to expand itself, and to employ all the powers of refinement. Not a syllable, not a letter, can be added or altered but by regimen; not the most trifling variation of the sense, in the minute subdivision of declension or conjugation, can be effected without the application of several rules: all the different forms for every change of gender, number, case, person, tense, mood, or degree, are methodically arranged for the affluence of the memory, according to an unerring scale. The number of the radical or elementary parts is about 700; and to these, as to the verbs of other languages, a very plentiful flock of verbal nouns owes its origin; but these are not thought to exceed those of the Greek either in quantity or variety.

To the triple source of words mentioned above, every term of truly Indian original may be traced by a laborious and critical analysis. All such terms as are thoroughly proved to bear no relation to any one of the Shanfrit roots, are considered as the production of some remote and foreign idiom, subsequefly ingrafted upon the main stock; and it is conjectured, that a judicious investigation of this principle would throw a new light upon the first invention of many arts and sciences, and open a fresh mine of philological discoveries. We shall now proceed to give as exact an account of the constituent parts of this language as the nature of our design will permit.

The Shanfrit language is very copious and nervous. It is copious.

The first of these qualities arises in a great measure from the vast number of compound words with which it is almost overstocked. "The Shanfrit (says Sir William Jones), like the Greek, Persian, and German, delights in compounds; but to a much higher degree, and indeed to such excess, that I could produce words of more than 20 syllables; not formed ludicrously like that by which the buffoon in Aribophanes describes a feat, but with perfect seriousness, on the most solemn occasions, and in the most elegant works." But the style of its best authors is wonderfully concise. In the regularity of its etymology it far exceeds the Greek and Arabic; and, like them, has a prodigious number of derivatives from each primary root. The grammatical rules also are numerous and difficult, though there are not many anomalies. As one instance of the truth of this assertion, it may be observed, that there are seven declensions of nouns, all used in the singular, the dual, and the plural numbers, and all of them differently formed, according as they terminate with a consonant, with a long or a short vowel; and again, different also as they are of different genders; not a nominative case can be formed to any one of these nouns without the application of at least four rules, which vary likewise with each particular difference of the nouns, as above stated: add to this, that every word in the language may be used through all the seven declensions, which is a full proof of the difficulty of the idiom.

The Shanfrit grammars are called Reckhram, of which there are many composed by different authors; some too abstruse even for the comprehension of most bramins, and others too polis to be ever used but as references. One of the shortest, named the Svara-j-sotas, contains between two and three hundred pages, and was compiled by Anoobhobhoo Sreeopanam Acharige, with a conciseness that can scarcely be paralleled in any other language.

The Shanfrit alphabet contains 50 letters; and it Shanfrit is one boul of the bramins, that it exceeds all other alphabets in this respect: but it must be observed, that as of their 34 consonants, near half are combined sounds, and that fix of their vowels are merely the correspondent long ones to as many which are short, the advent

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The Shanfcrit character used in Upper Hindoostan is said to be the same original letter that was first delivered to the people by Brahma, and is now called *Dyewmager*, or the language of angels, which shows the high conceptions and vowels are wonderfully, perhaps whimsically, modified and diversified; to enumerate which, in this place, would contribute very little either to the entertainment or instruction of our readers. All these definitions are marked in the *Beids* (1), and must be modulated accordingly; so that they produce all the effect of a laboured recitative: but by an attention to the music of the chant, the sense of the passage excites equally escapes the reader and the audience. It is remarkable, that the Jews in their synagogues chant the Pentateuch in the same kind of melody; and it is supposed that this usage has descended to them from the remote ages.

The Shanfcrit poetry comprehends a very great variety of different metres, of which the most common are these:

1. The *munnes burreh chhund*, or line of 12 or 19 syllables, which is scanned by three syllables in a foot, and the most approved foot is the anapaest.

2. The *cabe chhund*, or line of 11 syllables.

3. The *snitstofe chhund*, or line of eight syllables.

The poems are generally composed in stanzas of four lines, called *ashgogues*, which are regular or irregular.

The most common stanzical is that of the *antristofe chhund*, or regular stanza of eight syllables in each line. In this measure the greatest part of the *Mahabharat* is composed. The rhyme in this kind of stanza should be alternate; but the poets do not seem to be very nice in the observance of a strict correspondence in the sounds of the terminating syllables, provided the feet of the verse are accurately kept.

This short *antristofe ashgogue* is generally written by two verses in one line, with a pause between; to the whole then assumes the form of a long duet. The irregular stanza is constantly called *anitbchhund*, of whatever kind of irregularity it may happen to consist. It is most commonly compounded of the long line *cabe chhund* and the short *antristofe chhund* alternately; in which form it bears some resemblance to the most common lyric measure of the English.

To pursue this subject to greater length is farcically possible for us, as matters stand at present. Our readers must suspend their curiosity till more volumes of the *Aziatic Researches* be published, where we make no doubt the whole mystery of this extraordinary language will be plainly unfolded.

Perhaps our readers may feel a curiosity to be informed of the origin of this oriental tongue. If we believe the bramins themselves, it was coeval with the race of man, as was observed towards the beginning of this section. The bramins, however, are not the only people who ascribe a kind of eternity to their own particular dialect. We find that the Shanfcrit in its primitive definition was appropriated to the offices of religion. It is indeed pretended, that all the other dialects spoken in Hindoostan were emansations from that fountain, to which they might be traced back by a skilful etymologist. This, we think, is an argument of no great consequence, since we believe that all the languages of Europe, by the same process, may be deduced from any one of those current in that quarter of the globe. By a parity of reason, all the different dialects of Hindoostan may be referred to the language in question. Indeed, if we admit the authority of the Mofaic history, all languages whatsoever are derived from that of the first man. It is allowed that the language under consideration is impregnated with Persian, Chaldaic, Phoenician, Greek, and even Latin idioms. This, we think, affords a presumption that the Shanfcrit was one of those original dialects which were gradually produced among the descendants of Noah, in proportion as they gradually receded from the centre of population. What branch or branches of that family emigrated to Hindoostan, it is not easy to determine. That they were a part of the descendants of Shem is most probable, because the other fepts of his posterity settled in that neighbourhood. The sum then is, that the Hindoos were a colony consisting of the descendants of the patriarch Shem.

It appears, however, by almost numberless monuments of antiquity still existing, that at a very early period a different race of men had obtained settlements in that country. It is now generally admitted, that colonies of Egyptians had peopled a considerable part of Hindoostan. Numberless traces of their religion occur everywhere in those regions. The very learned precentor himself is positive, that vestiges of those fabulous wanderers are found in India, China, Japan, Tibet, and many parts of Tartary. Those colonies, it is well known, were zealous in propagating their religious ceremonies wherever they inhabited, and wherever they travelled. There is at the same time even at this day a striking resemblance between the sacred rites of the vulgar Hindoos and those of the ancient Egyptians. The prodigious statues of Salfette and Elephanta fabricated in the Egyptian style; the vast excavations hewn out of the rock in the former; the wooly hair of the statues, their distinet attitudes, their grotesque appearances, their triple heads, and various other configurations—plainly indicate a foreign original. These phenomena suit no other people on earth so exactly as the sons of Mizraim. The Egyptian priests used a sacred character, which none knew but themselves; none were allowed to learn except their children and the choice of the initiated. All these features mark an exact parallel with the bramins of the Hindoos. Add to this, that the drefs, diet, inlurations, and other rites of both sects, bore an exact resemblance to each other. Sir William Jones hath justly observed, that the letters of the Shanfcrit, script of all adventitious appendages, are really the square Chaldaic cha-
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The Shanfscrit was gradually improved: the language of the vulgar, as is always the case, became more and different from the original archetyp. but still retained such a near resemblance to the mother-tongue as proved the verity of its extraction.

To the proceeding account of the Shanfscrit language we shall annex a few fricatures on the language of Bengal, which we believe is derived from the Shanfscrit, a line

Though most of the ancient oriental tongues are read from right to left, like the Hebrew, Chaldac, Arabic, &c. yet such as properly belong to the whole continent of India proceed from left to right like those of Europe. The Arabic, Perilsm, &c. are the grand sources whence the former method has been derived; but with these, the numerous original dialects of Hindoostan do not the smallest connection or resemblance.

The great number of letters, the complex mode of combination, and the difficulty of pronunciation, are considerable impediments to the study of the Bengal language; and the carelessness and ignorance of the people, the inaccuracy of their characters, aggravate these inconveniences. Many of their characters are spurious; and these, by long use and the hurry of business, are now almost naturalized into the language.

The Bengal alphabet, like that of the Shanfscrit, is from which it is derived, consists of 50 letters, whose alphabet, form, order, and sound, may be learned from Mr. Halhed's grammar of the Bengal language. The vowels are divided into long and short, the latter of which are often omitted in writing. Most of the oriental languages are constructed upon the same principle, with respect to the omission of the short vowels. The Hebrews had no sign to express it before the invention of the Maforetic points; in Arabic it is rarely inferred unless upon very solemn occasions, as in the Koran; in the modern Persian it is universally omitted: fo to all the connoisseurs in the Shanfscrit, the short vowel is an invariable appendage, and is never signified by any diacritical mark; but where the construction requires that the vowel should be dropped, a particular stroke is set under the letter. It is in vain to pretend, in a sketch like this, to detail the sound and pronunciation of these letters; this must be acquired by the ear and by practice.

In the Bengal language there are three genders, as in Greek, Arabic, &c. The authors of this threefold division of genders, with respect to their precedence, appear to have considered the neuter as a kind of residuum resulting from the other two, and as less worthy or less comprehensive than either (see Section of the Greek). The terminations usually applied upon this occasion are सा for the masculine, and सा for the feminine. In Shanfscrit as in Greek and Latin, the names of all things inanimate have different genders, founded on vague and incomprehensible distinctions: the same is the case with the Bengal.

(8) See that gentleman's discourse, Researches, Vol. I.
A Shanfrit noun, on its first formation from the general root, exists equally independent of case as of gender. It is neither nominative, nor genitive, nor accusative; nor is impressed with any of those modifications which mark the relation and connection between the several members of a sentence. In this state it is called an imperfect or crude noun. To make a nominative of a word, the termination must be changed and a new form supplied. Thus we see, that in the Shanfrit, at least the nominative has an equal right with any other inflexion to be called a case. Every Shanfrit noun has seven cases, exclusive of the vocative; and therefore comprehends two more than even the present tense of the Latin. Mr. Balhed above mentioned every word has only four cases besides the vocative: in which the Shanfrit has but two more than even the Latin, and also in the Peruvian, appears plainly to be derived from the Shanfrit. In the Bengalese, this word has but two divisions of time, the present and the past; the terminations of the several persons of which serves as a model for those of the same tense in all other languages respectively.

Verbs of the Bengal language may be divided into three classes, which are distinguished by their penultimate letter. The simple and most common form has an open consonant immediately preceding the final letter of the infinitive. The second is composed of those words whose final letter is preceded by another vowel or open consonant going before it. The third consists entirely of causals derived from verbs of the first and second conjugations. The reader will easily guess at the impossibility of preserving this subject to any greater length; we shall therefore conclude with a few remarks collected from the grammar to often mentioned, which we apprehend may be more amusing, if not more instructive.

The Greek verbs in μ are formed exactly upon the same principle with the Shanfrit conjugations, even in the minutest particulars. Instan of this are produced in many verbs, which from a root form a new verb by adding the syllable μ, and doubling the first consonant. This mode furnishes another presumption of the Egyptian origin of the Shanfrit. Many Greeks travelled into Egypt: many Egyptian colonies settled in Greece. By one or other of these channels the foregoing innovation might have been introduced into the Greek language.

To form the past tense, the Shanfrit applies a syllabic augment; as is done in the Greek: the future has for its characteristic a letter analogous to that of the same tense in the Greek, and it omits the reduplication of the first consonant. It may be added, that the reduplication of the first consonant is not constantly applied to the present tense of the Shanfrit more than to those of the Greek.

The natural simplicity and elegance of many of the Asiatic languages are greatly debased and corrupted by the continual abuse of auxiliary verbs; and this inconvenience has evidently affected the Persian, the Hindostan, and the Bengal idioms.
The infinitives of verbs in the Shanscrit and Bengalese are always used as substantive nouns. Every body knows that the same mode of arrangement very often occurs in the Greek.

In the Shanscrit language, as in the Greek, there are forms of infinitives and of particles comprehensive of time; there are also other branches of the verb that seem to resemble the gerunds and fipulines of the Latin.

All the terms which serve to qualify, to distinguish, or to augment, either *subjunctive or action*, are clasped by the Shanscrit grammarians under one head; and the word used to express it literally signifies *increase or addition*. According to their arrangement, a simple sentence consists of three members; the *subject*, the *action*, the *object*; which, in a grammatical sense, are reduced to two; the *noun* and the *verb*. They have a particular word to specify such words as amplify the noun which imports quality, and answer to our *adjectives* or *epithets*; such as are applied to denote relation or connection, are intimated by another term which we may translate *propinquity*.

The adjectives in Bengalese have no distinction of number or gender; but in Shanscrit these words preserve the distinction of gender, as in the Greek and Latin.

Prepositions are substituents for cases, which could not have been extended to the number necessary for expressing all the several relations and predicaments in which a noun may be found, without causing too much embarrassed in the form of a declension. Those are too few in the Greek language, which occasions much inconvenience. See sect. Greek.

The Latin is less polite than the Greek, and of consequence bears a much nearer resemblance to the Shanscrit, both in words, inflections, and terminations.

The learned are now convinced that the use of numerical figures was first derived from India. Indeed the antiquity of their application in that country far exceeds the powers of investigation. All the numerals in Shanscrit have different forms for the different genders, as in Arabic. There appears a strong probability that the European method of computation was derived from India, as it is much the same with the Shanscrit, though we think the Europeans learned it from the Arabsians. The Bengalese merchants compute the largest sums by fours; a custom evidently derived from the original mode of computing by the fingers.

The Shanscrit language, among other advantages, has a great variety in the mode of arrangement; and the words are so knit and compacted together, that every sentence appears like one complete word. When two or more words come together in *regimine*, the last of them only has the termination of a cede; the others are known by their position; and the whole sentence so connected, forms but one compound word, which is called a *foot*.

Sect. VI. Of the Chinesse Language.

The Chinesse, according to the most authentic accounts, are a people of great antiquity. Their situation was such, as, in the earliest ages of the world, in a great measure secured them from hostile invasion. Their little commerce with the rest of mankind precluded them the knowledge of those improvements which a mutual emulation had often generated among other nations, who were situated in such a manner, with relation to each other, as served to promote a mutual intercourse and correspondance. As China is a large and fertile country, producing all the necessaries, conveniences, and even the luxuries of life, its inhabitants were not under the necessity of looking abroad for the two former, nor exposed to the temptation of engaging in foreign commerce, in order to procure the latter. Perfectly satisfied with the articles which their own country produced, they applied themselves entirely to the practice of agriculture and other arts connected with that profession; and their frugality, which they retain even to this day, taught them the lesson of being contented with little; of consequence, though their population was almost incredible, the produce of their soil was abundantly sufficient to yield them a subsistence. Their inventions were their own; and as they borrowed nothing from other people, they gradually began to despise the reft of mankind, and, like the ancient Egyptians, branded them with the epithet of *barbarians*.

Those people had at an early period made amazing proficiency in the mechanical arts. Their progress in the liberal sciences, according to the latest and indeed the most probable accounts, was by no means proportioned. In mathematics, geometry, and astronomy, their knowledge was contemptible; and in ethics, or moral philosophy, the complexity of their laws and customs proves their skill to have been truly superficial. They value themselves very highly at present upon their oratorial talents; and yet of all languages spoken by any civilized people, theirs is confidedly the leaft improved. To what this untowardly defect is owing, the learned have not yet been able to determine.

The language of the Chineses is totally different from that of all other nations, and bears very strong signatures of an original tongue. All its words are monosyllabic, and compositions and derivations are all together unknown. Their nouns and verbs admit of no flexions; in short, every thing relating to their idioms is peculiar, and incapable of being compared with any other dialect spoken by any civilized people. Most barbarous languages exhibit something that resembles an attempt towards those diacritical modifications of speech; whereas the Chinese, after a space of 4000 years, have not advanced one step beyond the very first elements of ideal communication. This circumstance, we think, is a plain demonstration that they did not emigrate from that region where the primitive race of mankind is thought to have fixed its residence. Some have imagined, we believe with good reason, that they are a *Tartarian* race, which, breaking off from the main body of that numerous and widely extended people, directed their march towards the south-east. There, falling in with delightful and fertile plains which their poverty now inhabits, they found themselves accommodated so much to their liking, that they dropped all desire of changing their habitations. The country of China is, indeed, so environed with mountains, deserts, and seas, that...
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The Chinese language, it would have been difficult for men in their primitive state to have emigrated into any of the neighbouring regions. Thus excluded from the rest of mankind, the Chinese, in all probability, were left to the strength of their own inventive powers to fabricate a language, as well as the other arts and improvements necessary for the support and convenience of life.

It is indeed obvious that their flock of vocables, when they emigrated from Tartary, was neither ample nor properly accommodated to answer the purposes of the mutual conveyance of ideas. With this slender flock, however, they seem to have been satisfied; for it does not appear that any additions were afterwards made to that which was originally imported. Instead of framing a new race of terms by compounding their primitive ones, instead of diversifying them by inflections, or multiplying them by derivatives, as is done in every other language; they rather chose to retain their primitive words, and by a variety of modifications, introduced upon their orthography or pronunciation, to accommodate them to a variety of significations. Were it possible to scrutinize all the Tartarian dialects, and to reduce them to their primitive monosyllabic character, perhaps the original language of the Chinese might be investigated and ascertained. We know that attempts have been made to compare it with some of the other Asiatic languages, especially the Hebrew. This labour has, however, proved unsuccessful, and no primeval identity has been discovered. Before this comparison could be instituted with the most distant prospect of success, the language had mentioned must be stripped of all its adventitious qualities; and not only so, but it must be reduced to the monosyllabic tone, and then contrasted with the Chinese monosyllables; an undertaking which we are persuaded would not be readily executed. After all, we are convinced that no resemblance of any importance would be discovered.

The Chinese language must then, in our opinion, have been a Tartarian dialect, as the people themselves were colonists from Tartary. We have observed above, that those people have not hitherto found out the art of composition of words. This is the more surprising, when we consider that, in the characters which form their written language, they employ many compositions. For example, the character by which they represent misfortune, is composed of one hieroglyphic which represents a house, and another which denotes fire; because the greatest misfortune that can befall a man is to have his house on fire. With respect to the language which they use in speech, though they very often employ many words to express one thing, yet they never run them together into one word, making certain changes upon them that may incorporate the more conveniently, but always preserve them entire and unaltered.

The whole number of words in the Chinese language does not exceed 1200; the nouns are but 526. It must certainly appear surprising, that a people whose manners are so highly polished and refined, should be able to express so many things as much of necessity attend such a mode of life by so small a number of words, and those too monosyllables. The difficulties which attend this singular mode must be felt almost every instant; circumstances which, according to the ordinary course of things, should have induced them to attempt both an augmentation of the number of their words and an extension of those which they had by composition and derivation. We learn from Du Halde* that the Chinese have two different dialects: * Hist. of the one vulgar, which is spoken by the vulgar, and China, varies according to the different provinces; the other is called the Mandarin language, and is current only among the learned. The latter is properly what was formerly spoken at court in the province of Kiang-nan, and gradually spread among the polite people in the other provinces. Accordingly, this language is spoken with more elegance in the provinces adjoining to Kiang­nan than in any other part of the kingdom. By slow degrees it was introduced into all parts of the empire, and consequently became the universal language.

It then appears that the modern language of China was originally the court dialect, and utterly unknown to the bulk of the people. From this circumstance we think it may fairly be concluded that this dialect was deemed the royal tongue, and had been fabricated on purpose to distinguish it from the vulgar dialects. We learn from Heliodorus, that the § E. Ethiopianians had a royal language which was the same with the sacred idiom of the Egyptians. This Mandarin tongue was originally an artificial dialect fabricated with a view to enhance the majesty of the court, and to raise its very style and diction above that of the rest of mankind. The Chinese, a wonderfully inventive people, might actually contrive a language of that complexion, with an intention to render it obscure and enigmatical (s). Such a plan would excite their admiration, and would at the same time greatly exceed their comprehension. In processes of time, when the Chinese empire was extended, the Mandarin who had been brought up at court, and understood nothing of the provincial dialects, found it convenient to have the most eminent persons in every province taught the language employed by themselves, in order to qualify them for transacting the affairs of government with them in a language which both understood. By this means the royal dialect defended to the vulgar, and in processes of time became universal. The Tartar dialect formerly in use vanished; only a few vestiges of it remained; which gradually incorporating with the royal language, occasioned the variation of provincial tongues abovementioned.

We are therefore clearly of opinion, that the modern language of the Chinese was deduced from the original Mandarin, or court dialect, and that this last was an artificial speech fabricated by the skill and ingenuity of that wonderful people. The learned have long held it up as the primary dialect, because, say they, it

(s) An attempt of this nature, among a people like the Chinese, is by no means improbable; nor is its success less probable. For a proof of this, we need only have recourse to Bishop Wilkins’s Artificial Language, and Pfalmanazar’s Dictionary of the language of Formosa.
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bears all the signatures of an original unimproved language. In our opinion, nothing appears more ingeniously artificial. It is universally allowed that, in its structure, arrangement, idioms, and phraseology, it resembles no other language. Is not every learned man now convinced that all the Ahaic languages yet known, discover unequivocal symptoms of their cognition and family resemblance? The Ethiopians, Chaldeans, Arabians, Periins, Egyptians, Hebrews, Phenicians, the Brahmans, Bengalees, the Hindoos bordering upon China, all speak only different dialects of one language, varying from the original in dialect only, one in a greater form in a lesser degree; why should the Chinefe alone stand altogether insulated and unallied?

The languages of the North all wear congenial features. The Tartar, or Tatar dialects of every clan, or every canton, of every denomination, exhibit the most palpable proofs of a near affinity: the Gothic and Sceloven dialects, which pervade a great part of Europe and some parts of Asia, are obviously brethren, and may easily be traced up to an Ahaic original. Even some of the American jargon dialects contain vocabularies which indicate an Ahaic or European original. Our readers, we flatter ourselves, will agree with us, that had the language of the Chinese been the original language, a resemblance must have still existed between it and its descendants. If it had originated from any other language, it would have retained some characteristic features of its parent archetype. As neither of these are to be found in the fabric of the language under consideration, the conclusion must be, that it is a language entirely different from all other tongues; that it is constructed upon different principles, descended from different nations, and framed by different artists.

The Chinese themselves have a common and immemorial tradition, that their language was framed by Tae their first emperor, to whom they attribute the invention of every thing curious, useful, and ornamental. Traditional history, when it is ancient, uniform, and universal, is generally well founded: upon this occasion we think the tradition above mentioned may be fairly admitted as a collateral evidence.

The paucity of vocabularies contained in this singular language, we think another presumption of its artificial structure. The Chinese Onomatitha would find it an arduous task to devise a great number of new terms, and would therefore reft satisfied with the smallest number possible. In other languages we find the like economy was observed. Rather than fabricate new words, men chose sometimes to adapt old words to new, and, upon some occasions, even to contrary significations. To spare themselves the trouble of coining new terms, they contrived to join several old ones into one; whence arose a numerous race of compounds. Derivatives too were fabricated to answer the same purpose. By this process, instead of creating new vocabularies, old ones were compounded, diversified, delected, ramified, metamorphosed, and tortured into a thousand different shapes.

The Greek is defervedly esteemed a rich and copious language; its radical words have been curiously traced by several learned men, who, after the most laborious and exact scrutiny, have found that they do not amount to more than 300. The Shanfscrit language is highly compounded; its radical terms, however, are very few in number. Upon the whole, we think we may conclude, that the more any language abounds in compounds and derivatives, the smaller will be the number of its radical terms. The Arabic admits of no composition, and of consequence, its words have been multiplied almost in infinitum; the Shanfscrit, the Persian, and the Greek, abound with compounds, and we find their radicals are few in proportion.

There are, we think, three different methods which may be employed in order to enrich and extend the range of a language. 1st, By fabricating a multitude of words; the plan which has been pursued by the Arabs. 2d, By framing a multitude of compounds and derivatives; the artifice employed by the Greeks and the authors of the Shanfscrit. 3d, By varying the signification of words without enlarging their number; the method practised by the Chinese and their coloufts. The Arabians, we think, have shown the most fertile and inventive genius, since they have enriched their language by actually creating a new and a most numerous race of words. The fabricators of the Shanfscrit and the collectors of the Greek have exhibited art, but comparatively little fertility of genius. Leaving, therefore, the Arabians, as in justice we ought, masters of the field in the contest relating to the formation of language, we may range the Greek and Shanfscrit on the one side, and the Chinese on the other; and having made this arrangement, we may attempt to discover on which side the largest proportion of genius and invention seems to rest.

The Greek and Shanfscrit (for we have selected them as most highly compounded) exhibit a great deal of art in modifying, arranging, and diversifying their compounds and derivatives, in such a manner as to qualify them for answering all the purposes of speech.

That all of a race of monosyllabic notes, simple, inflexible, invariable, and at the same time few in number. The question then arises to be, whether more art is displayed in new moulding old words by means of declensions, conjugations, compounds, and derivatives; or by devising a plan according to which monosyllabic radical terms, absolutely invariable, should, by a particular modification of sound, answer all the purposes performed by the other. The latter appears to us much more ingeniously artificial. The former resembles a complicated machine composed of a vast number of parts, congenial indeed, but loosely connected; the latter may be compared to a simple, uniform engine, easily managed, and all its parts properly adjusted. Let us now see in what manner the people in question managed their monosyllabic notes, so as to qualify them for anfwering all the purposes of speech.

Though the number of words in the Chinese language does not amount to above 1200; yet that small number of vocabularies, by their artificial management, is sufficient to enable them to express themselves with ease and perspicuity upon every subject. Without multiplying words, the fene is varied almost in infinitum by the variety of the accents, inflections, tones, aspirations, and other changes of the voice and enunciation; circumstances which make those who do not thoroughly
thoughly understand the language frequently mistake one word for another. This will appear obvious by an example.

The word *word* pronounced slowly, drawing out the *v* and raising the voice, signifies a *lord* or *master*. If it is pronounced with an even tone, lengthening the *v*, it signifies a *dog*. When it is pronounced quick and lightly, it imports a *kitchen*. If it be pronounced in a strong and masculine tone, growing weaker towards the end, it signifies a *column*.

By the same economy, the syllable *po*, according to the various accents, and the different modes of pronunciation, has eleven different significations. It signifies *grief* to boil, *to winnow rice, wife, wife, to prepare, an old woman, to break or chase, inclined, a very little, to water, a slave or captive*. From these examples, and from almost numberless others which might be adduced, it is abundantly evident that this language, which at first sight appears so poor and confined, in consequence of the small number of the monosyllables of which it is composed, is notwithstanding very copious, rich, and expressive.

Again, the same word joined to various others, imports a great many different things; for example *moo, moo*, when alone, signifies a *tree, wood*; but when joined with another word, it has many other significations. *Moo lan*, imports "wood prepared for building," *moo lan*, "bars, or wooden grates;" *moo bia*, "a box;" *moo yang*, "a chest of drawers;" *moo fang*, "a carpenter;" *moo eul*, "a mushroom;" *moo mai*, "a fort of small orange;" *moo fang*, "the planet Jupiter;" *moo mien*, "cotton," &c. This word may be joined to several others, and has as many different significations as it has different combinations.

Thus the Chinese, by a different arrangement of their monosyllables, can compose a regular and elegant discourse, and communicate their ideas with perfect smoothness; and even with gracefulness and propriety. In these qualities they are not excelled either by the Europeans or Asiatics, who use alphabetical letters. In fine, the Chinese so naturally distinguish the tones of the same monosyllable, that they comprehend the sense of it, without making the least reflection on the various accents by which it is determined.

We must not, however, imagine, as some authors have related, that those people cant in speaking, and make a sort of music which is very disagreeable to the ear; these different tones are pronounced so curiously, that even strangers find it difficult to perceive their difference even in the province of *Kiang-nan*, where the accent is more perfect than in any other. The nature of it may be conceived by the guttural pronunciation in the Spanish language, and by the different tones that are used in the French and Italian: these tones are almost imperceptible; they have, however, different meanings, a circumstance which gave rise to the proverb, that the *tone is all*.

If the fineness and delicacy of their tones are such as to be scarce perceptible to a stranger, we must suppose that they do not rise high, but only by small intervals; so that the music of their language must somewhat resemble the music of the birds, which is within a small compass, but nevertheless of great variety of notes. Hence it will follow, that strangers will find it very difficult, if not impossible, to learn this language; more especially if they have not a delicate ear and a flexible voice, and also much practice. The great difference then between the Chinese and Greek accents consists in this, that the Greeks had but two accents, the grave and acute, distinguished by a large interval, and that not very exactly marked: for the acute, though it never rises above a fifth higher than the grave, did not always rise so high, but was sometimes pitched lower according to the voice of the speaker. The Chinese must have many more accents, and the intervals between them must be much smaller, and much more carefully marked; for otherwise it would be impossible to distinguish them. At the same time, their language must be much more musical than the Greek, and perhaps more so than any language ought to be; but this becomes necessary for the purposes abovementioned. Du Halde is positive, that notwithstanding the perpetual variation of accents in the Chinese tongue, and the almost imperceptible intervals between these tones, their enunciation does not resemble singing; many people, however, who have resided in China, are equally positive that the tone with which they utter their words does actually resemble *cantic*; and this, when we consider the almost imperceptible intervals by which they are perpetually raising and lowering the tone of their voice, appears to us highly probable.

As the people of whole language we are treating at present, communicate a variety of different significations to their monosyllabic words by their different accentuation, so they employ quantity for the very same purpose. By lengthening or shortening the vowels of their words, they employ them to signify very different things. The same they perform by giving their words different aspirations, as likewise by founding them with different degrees of roughness and smoothness; and even sometimes by the different motion, posture, or attitude, with which their enunciation is accompanied. By these methods of diversifying their monosyllables (says Du Halde), they make 330 of them serve all the purposes of language, and these too not much varied in their termination; since all the words in that language either terminate with a vowel or with the consonant *n*, sometimes with the consonant g annexed.

From this account, we think it is evident that the Chinese, by a wonderful exertion of ingenuity, do, by different tones and prosodical modifications, by means of a very inconsiderable number of words, all invariable radicals, actually perform all that the most polished nations have been able to achieve by their compounds, derivatives, &c. diversified by declensions, conjugations, and flexions of every kind; circumstances which, in our opinion, reflect the greatest honour on their inventive powers.

With respect to the grammar of this language, as Grammar it admits of no flexions, all their words being indeclinable. Their nouns, their nouns, their nouns are all formed by particles. They have no idea of genders; and even the distinction of numbers, which in almost all other languages, even the most unimproved, is marked by a particular word, is in the Chinese only indicated by a particle. They have only the three simple tenses, namely, the past, present, and future; and for want of different
the knowledge of above 40,000. This prodigious number of characters is collected in their great language called "Hai-pien." Their characters are the origin of words, and enable them to find out those which are derived from them; for instance, the characters of mountains, of trees, man, the earth, of a horse, under which must be sought all that belongs to mountains, trees, man, &c. In this search one must learn to distinguish in every word those strokes or figures which are above, beneath, on the sides, or in the body of the radical figure.

Clemens Alexandrinus (see Section Choldlean, &c.) informs us, that the Egyptians employed three sorts of characters; the first was called the "epithet," which was used in writing letters; the second was denominated "sacred," and peculiar to the facer ordinal order; the last "hieroglyphical," which was appropriated to monumental inscriptions and other public memorials. This mode of representation was twofold: one, and the most simple, was performed by describing the picture of the subject which they intended to present, or at least one that resembled it pretty nearly; as when they exhibit the sun by a circle and the moon by a crescent; the other was properly symbolic; as when they marked "eternity" by a serpent with his tail in his mouth, the "air" by a man clothed in an azure robe flushed with stars, &c.

The Chinese, in all probability, had the same variety of characters. In the beginning of their monarchy, they communicated their ideas by drawing on paper the images of the objects they intended to express; that is, they drew the figure of a bird, a mountain, a tree, waving lines, to indicate birds, mountains, forests, rivers, &c.

There were, however, an infinite number of ideas to be communicated, whole objects do not fall under the cognizance of the senses such as the soul, the thoughts, the passions, beauty, deformity, virtues, vices, the actions of men and other animals, &c. This inconvenience obliged them to alter their original mode of writing, which was too confined to answer that purpose, and to introduce characters of a more simple nature, and to invent others to express those things which are the objects of our senses.

These modern characters are, however, truly hieroglyphical, since they are composed of simple letters hieroglyphically which retain the signification of the primitive characters. The original character for the sun was a circle, thus ☀; this they called "ga:" They now represent that luminous by the figure ☀️, to which they still give the original name. But human institutions having annexed to these last framed characters the very same ideas indicated by the original ones, the consequence is, that every Chinese letter is actually significant, and that it still retains its signification, though connected with others. Accordingly the word "fais," which imports "misfortune, calamity," is composed of the letter "mien" "a house," and the letter "bo" "fire" so that the symbolic character for misfortune is the figure of a house on fire. The Chinese characters, then, are not simple letters without any signification, like those of the Europeans and other Asians; but when they are joined together, they are so many hieroglyphics, which form images and express thoughts.

Upon the whole, the original characters of the Chinese...
In the Chinese language there is no diversity of genders or cafes, and of consequence no declensions. Their Chinese, as they call it, consists of the names of the days and months, and of consequence no declensions. The cafes and numbers are known only by the names of the days and months. The same particle is sometimes placed after pronouns, as if they were adjectives, in another may become an adjective, and even a verb.

In the Chinese language there is no diversity of genders or cafes, and of consequence no declensions. Very often the noun is not distinguished from the verb; and the same word which in one situation is a substantive, in another may become an adjective, and even a verb.

The adjective always goes before the substantive; but if it follows, it becomes a substantive.

The cafes and numbers are known only by the composition. The plural number is distinguished by the particle men, which is common to all words; but when the noun is preceded by some word that signifies number, the particle men is not annexed.

The Chinese genitive, both singular and plural, when it comes after nouns, is often made by 仍 and there is no other cafe in that language. The same particle is sometimes placed after pronouns, as if they were derivatives.

The comparative degree is formed by adding the particle 長, which is always set before the noun, and signifies much. The particle is sometimes used, which likewise imports much.

The Chinese have only three personal pronouns, 我 "I," 你 "thou," and 他 "he:" these become plural by adding the syllable men. They are made poetical by adding the syllable 之, as 你之 "my," 他之 "thine," 伊之 "his." The patronyms are formed by putting the name of the city, county, &c. after the pronoun: 予 is the pronoun relative 予者, 予之, or 之予.

Chinese verbs have only three tenses, the preterperfect, the present, and the future. When there is not a particle added to the verb, it is the present; the preterperfect is made by adding the particle 謂: to distinguish the future tense they use the particle 業 or 會 and these are all the varieties incident to their verbs.

The Chinese language has no words that are properly adverbs; they only become so by custom, or by the place they possess in discourse. They are often obliged to employ several words to express the adverbs of other languages: they have none that are demonstrative, or proper for calling or exhorting; but in their stead they are obliged to use nouns and verbs.

Perhaps our readers may wish to know the Chinese numerals; and may imagine that they bear a resemblance to those of the European or other Asiatic dialects. In this, however, they will be disappointed.

There are a great many particles proper to numbers in the Chinese language: they are frequently used, and in a way peculiar to it; for every numeral has a particle importing the object to which it is attached. Thus 你 is used for a man, and 你 is used for a woman. The particles 之 and 前 is used for illustrious men; 之 and 前 is used for ships, dogs, hens; 前 is used for pearls and precious things; 前 is used for books; 前 is appropriated to oxen and cows; 前 is used for letters and little bundles of paper; 前 is employed for corn and pulse. These distinctions indicate a language manufactured on purpose to be employed by people who were too high and too haughty to converse with the vulgar.

The style of the Chinese, in their elaborate compositions, is mysterious, concise, and allegorical, after the eastern manner. It is often obscure to those who do not understand the language thoroughly; and it requires a considerable degree of skill to avoid mistakes in reading an author of elegance and sublimity. Their writers express a great deal in few words; and their expressions are lively, full of spirit, intermingled with bold comparisons and lofty metaphors. They affect to infer in their compositions many sentences borrowed from their five canonical books; and they compare their books to pictures, so they liken these quotations to the five principal colours employed in painting; and in this their eloquence chiefly consists.

They prefer a beautiful character to the most finished picture; and nothing is more common than to see a single page covered with old characters, if they happen to be fair and elegant, sold at a very high price. They honour their characters in the most common books; and when they happen to light by chance upon a printed leaf, they gather it up with the greatest care and respect.

In China there are three varieties of language; that of the common people, that of the people of fashion, and that employed in writing books. Though the first is not so elegant as either of the other two, it is not however inferior to our European languages; though those who are but superficially acquainted with
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The Chinese Language.

Their books may, in fact, imagine it uncouth and barbarous. This low and rude language is pronounced and written many different ways, as is generally the case in other countries.

But a more polished, and at the same time a much more energetic, language, is employed in an almost infinite number of novels; some perhaps true, but many more the vehicles of fiction. These are replete with lively descriptions, characters highly inflected, morality, variety, wit, and vivacity, in such a degree as to equal in purity and politeness the most celebrated authors of Europe. This was the language of the Mandarines; and though exquisitely beautiful in its kind, was still inferior to the language of books. This last might be styled the \textit{hyperbolicum}; and of this there are several degrees and intervals before an author can arrive at what they call the language of the \textit{kings}. This mode of writing cannot be well understood without looking upon the letters; but when understood, it appears easy and flowing. Each thought is generally expressed in four or six characters: nothing occurs that can offend the meek ear; and the variety of the accents with which it is pronounced produces soft and harmonious found.

The difference between the \textit{kings} and their other books consists in the subject of the subjects upon which they are written. Those of the former are always grand and sublime, and of course the style is noble and elevated: those of the latter approach nearer to the common affairs and events of life, and are of a simplicity detailed in the Mandarin tongue. In writing on the sublime subjects no punctuations are used. As these compositions are intended for the learned only, the author leaves to the reader to determine where the sentence is complete; and those who are well skilled in the language readily find it out.

The copiousness of the Chinese language is in a great measure owing to the multitude of its characters. It is likewise occasioned, in some degree, by the difference of their signification, as also by the artificial method of their conjunction, which is performed most commonly by uniting them two and two, frequently three and there, and sometimes four and four.

Their books are very numerous and bulky, and, of course exceedingly cumbrous. A dictionary of their language was compiled in this century. It consisted of 95 large volumes. An appendix was annexed of 25 volumes. Their other books are voluminous in proportion. The Chinese, one may say, are a nation of learned men. Few people of rank neglected the belles lettres; for ignorance in a man of any degree of eminence is deemed an indelible stain on his character.

For their manner of writing, the implements with which they write, and the materials upon which they draw their characters, we must remit our readers to the article \textit{Writing}. It would, we believe, afford our readers some pleasure, could we discover and explain the reasons which have hitherto prevented the Chinese from adopting the letters employed by time immemorial by the other nations of Europe and Asia.

The Chinese have ever looked upon themselves as greatly superior to the rest of mankind. In ancient times they entertained such contemptible notions of foreigners, that they scorned to have any further commerce with them than to receive their homage. They were indeed, at a very early period, highly revered by the Indians, Persians, and Tartars. In consequence of this veneration, they looked upon themselves as the favorites of heaven. They imagined they were situated in the middle of the earth, in a kind of paradise, in order to give laws to the rest of mankind. Other men they looked upon with contempt and disdain, and deemed them deformed in body and defective in mind, cut off into the remote corners of the world as the dross and refuse of nature. They boasted that themselves only had received from God rational souls and beautiful bodies, in order to qualify them for being sovereigns of the species.

Such are the sentiments of the Chinese, and with such sentiments it is by no means surprising that their improvements in language, in writing, and other appendages of the belles lettres, have not been proportioned to their progress in mechanics. When people are once perfectly persuaded that they have already arrived at the summit of perfection, it is natural for them to sit down contented, and solace themselves with the idea of their own superior attainments. The Chinese had early entertained an exalted opinion of their own superiority to the rest of mankind; and therefore imagined that they had already carried their inventions to the \textit{ne plus ultra} of perfection; the consequence was, that they could make no exertions to carry them higher.

The Chinese, for the space of 3000 years, had almost no intercourse with the rest of mankind. This was the consequence of their insulated situation. They, of course, \textit{compared themselves with themselves}; and finding that they excelled all their barbarian neighbors, they readily entertained an opinion that they excelled all the rest of mankind in an equal proportion. This conceit at once filled the emotions of ambition, and deprived them of all opportunities of learning what was going forward in other parts of the world.

They despised every other nation. People are little disposed to imitate those whom they despise; and this perhaps may be one reason why they are at this day so averse from adopting the European inventions.

A superstitious attachment to the customs of the ancients, is the general character of the Asiatic nations. This is evidently a kind of diachronical feature among the Chinese. The institutions of \textit{Foh} are looked up to among them with equal veneration as those of \textit{Toboth} among the Egyptians. Among the latter, there was a law, which made it capital to introduce any innovation into the music, painting, or literary art, instituted by that legislator. We hear of no such law among the former; but custom establishe
d, and that invariably, for a space of 3000 years, might operate as forcibly among them as a positive law did among the people first mentioned. An attachment to ancient customs is often more powerful and more coercive than any law that can be promulgated and enforced by mere human authority. These reasons, we think, may be aligned as the impediments to the progress of the Chinese in the belles lettres, and perhaps in the cultivation of the other sciences.

Though the language of the Chinese is confecratedly different from all the other known languages in its
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Sim, or Sing, " a constellation, a star, an element;" Hebrew, Flem; Greek, στέλλα, στήλη; Latin, stella.

Sin, "a man of learning;" Goth. Sax. Engl. " see; to see, see them.

Cem, "a priest;" Hebr. Cohen; Syr. con; Egypt, can, cun.

Quin, "a king;" Celtic, ken, kent, "head, chief;" Gothic, land; Germ. Flem. Eng. king, also queen.


Min, "a river;" Welch, men, "the water of a river;" Latin, mane, "to flow;" and perhaps amans, "pleasant;"

Hyn, "hated;" Greek, αἰνει "cruel, horrible, odious;"

Kivon, " a dog;" Greek κου, id.


Han, "the soul, breath;" Greek, anemos, Latin, anima, animus.

To these inferences of the analogy between the Chinese language and those of the other people of Asia and Europe many more might be added; but the preceding, it is hoped, will serve as a specimen, which is all that can be expected from an inquiry of the nature of the present.

Sect. VII. Of the Greek Language.

Before we enter upon the consideration of the principal and constituent parts of this noble language, we will beg leave to state a few preliminaries, which, we trust, will serve to throw some light upon many points which may come under consideration in the course of the following disquisition.

The Greeks, according to the most authentic accounts, were descended of Javan or Ion, the fourth son of Japhet, the eldest son of the patriarch Noah. The Scriptures of old, and all the orientals to this day, call the Greeks Ionim or Ionim or Iovanides. We have already observed, in the beginning of the article concerning the Hebrew language, that only a few of the descendants of Ham, and the most prolific of the posterity of Shem and Japhet, were concerned in building the tower of Babel. We shall not now resume the arguments then collected in support of that position; but proceed to investigate the character of that branch of the posterity of Javan which inhabited Greece and the neighbouring regions.

At what period the colonists arrived in these parts cannot be certainly determined; nor is it of great importance in the question before us. That they carried along with them into their new settlements the language of Noah and his family, is, we think, a point that cannot be controverted. We have endeavored to prove that the Hebrew, or at least one or other of its filter dialects, was the primeval language of mankind. The Hebrew, then, or one of its cognate branches, was the original dialect of the Ionim or Greeks.

Be that as it may, before these people make their appearance in profane history, their language deviates very widely from this original archetype. By what means, at what period, and in what length of time...
this change was introduced, is, we believe, a matter not easy to be elucidated. That it was progressive, is abundantly certain both from the rules of analogy and reason.

The colonies, which travelled a large tract of country before they arrived at their defined settlements, must have struggled with numberless difficulties in the course of their peregrinations. The earth, during the periods which immediately succeeded the universal deluge, must have been covered with forests, intersected with swamps, lakes, rivers, and numberless other impediments. As the necessaries, and a few of the conveniences of life, will always engrave the first cares of mankind, the procuring of these comforts will, of necessity, exclude all concern about arts and sciences which are unconnected with these pursuits. Hence we think it probable, that most of those colonies which migrated to a very great distance from the plains of Shinar, which we believe to have been the original seat of mankind, in a great measure neglected the practice of the polite but unnecessary modes of civilization which their ancestors were acquainted with, and practised before the era of their migration. Certain it is, that those nations which continued to reside in the neighbourhood of that centre of civilization, always appear in a cultivated state; while, at the same time, the colonies who removed to a considerable distance appear to have funk into barbarism, at a period more early than the annals of profane history can reach.

—This appears to have been the situation of the primary inhabitants of Greece. Their own historians, the most partial to their own countrymen that can well be imagined, exhibit a very unpromising picture of their earliest progenitors. Diodorus Siculus, in delineating the character of the original men, we believe sketches his draught from the first inhabitants of Greece. He represents them as absolute faves, going out in small parties to make war upon the wild beasts of the field, which (according to him) kept them in continual alarm. "Necessity obliged them to band together for their mutual security; they had not sagacity enough to distinguish between the wholesome and poisonous vegetables; nor had they skill enough to lay up and preserve the fruits of autumn for their subsistence during the winter." The scholar on Pindar describes the situation of the inhabitants of Peloponnesus in the following manner. Now some have affirmed that the nymphs who officiated in performing the sacred rites, were called Melissae. Of these Mnaeas of Patara gives the following account. They prevailed upon men to relinquish the abominable practice of eating raw flesh torn from living animals, and permitted them to use the fruits of trees for food. Melissae, one of them, having discovered bee-hives, ate of the honey-combs, mingled the honey with water for drink, and taught the other nymphs to use the same beverage. She called bee hives Melissae, from her own name, and bestowed much care on the management of them. "These things (says he) happened in Peloponnesus; nor is the temple of Ceres honoured without nymphs, because they first pointed out the mode of living on the fruits of the earth, and put an end to the barbarous practice of feeding on human flesh. The same ladies too, from a sense of decency, invented garments made of the bark of trees."

Hecataeus the Mileesian, treating of the Peloponnesians, affirms, "that before the arrival of the barbarians inhabited that region; lib. 7. and that almost all Greece was, in ancient times, inhabited by barbarians. In the earliest times (fays Fil. lib. 7. Paufanias) (o) barbarians inhabited most part of the country called Hellas. The original Greeks, if we may believe an author of deep research and superior ingenuity, were strangers to all the most useful inventions. Plin. Nat. even the use of fire was unknown till it was found out and communicated by Prometheus, who is thought to have been one of the first civilizers of mankind. Hence thechelus, introduces Prometheus, prometh commemorating the benefits which he had conferred upon mankind by his inventions, in a strain that indicates the uncultivated state of the world prior to the age in which he flourished. For the entertainment of our readers, we shall translate as much of that passage as suits our present purpose.

"Of the human race
Now hear the tale, how foolish erst they were:
I taught them thought and exercise of reason;
If taught they faw before, they faw in vain.
Hearing, they heard not; all was shapeless dreams.
For a long space of time, at random mix'd
In wild confusion: for they neither knew
Tile-cover'd houses standing in the fun,
Nor timber work; but, like the earth-bred ant
They lodg'd in unfinish'd caves dug under ground:
No certain sign had they of winter cold,
Nor of the flow'r y spring, or summer store,
But blindly manag'd all: till I them taught
What time the stars appear, what time they set,
Hard to be fcan'd: then arithmetic rare,
That queen of arts, by dint of patient thought
Defcry'd, I taught them; and how vocal sounds;
From letters join'd arose."

This character, though applied to mankind in general, was in reality that of the most ancient Greeks. These forbidding features had been transmitted to the poet by tradition as those of his ancestors; he was a Greek, and of consequence imputes them to all mankind without distinction.

Phoroneus, the son and successor of Inachus, is said to have civilized the Argives, and to have taught them the use of some new inventions. This circumstance raised his character so high among the savage barbarians of the country, that succeeding ages deemed him the first of men. Pelagius obtained the like character, because he taught the Arcadians to live upon the fruit of the fagus, to build sheds, to shelter them from the cold, and to make garments of the skins of swine.

But what clearly demonstrates the unpolish'd character of the most ancient Greeks is, the extra-
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While matters were in this situation with respect to the primitive Ionians or Greeks, a new colony arrived in Greece, called Pelasgi. The people who composed this colony were called Pelasgi; concerning whose origin, country, character, and adventures, much has been written, and many different opinions exhibited by the learned. It is not our province to enter into a detail of their arguments and systems; we shall only inform our readers, that the general opinion is, that they were natives either of Egypt or Phoenicia. We have seen a dissertation in manuscript upon this subject from which we are allowed to extract the following particulars.

The author, we think, has proved by very plausible arguments, that these people could not be descendants of the Egyptians nor Phoenicians. He maintains, that the Pelasgi were a great and numerous tribe; that they overran all the coast of Asia Minor from Mount Mycale to Troas; that they were masters at one time of all the Asiatic and Greek islands; that they overran Greece and many of the neighbouring countries; and all this in less than half a century. These facts he seems to have proved from Homer, Herodotus, Dindonius Siculus, Panasianis, and other Greek authors of approved authenticity. He shows, that they were a civilized generation; that they were well acquainted with military affairs, legislation, agriculture, navigation, architecture, letters, &c. He infers, that Phoenicia could not at any given period have furnished such a numerous body of emigrants, even supposing the whole nation had emigrated, and left their native country a desert. He believes that this event took place before the invasion of Canaan by the Israelites; that consequently the Pelasgic migration was not occasioned by that catastrophe. He has shewn, we think by very probable arguments, that the Egyptians in the earliest ages were averse to foreign expeditions, especially by sea: because that people hated this element, and besides could be under no temptation to emigrate; add to this, they were accustomed to live on small matters, and their country was exceeding fertile and easily cultivated. It appears (says he from Herodotus) that the Pelasgi were not acquainted with the religion of the Zabians, which could not have been the case had they emigrated from either of these countries. He makes it appear, at least to our satisfaction, that Herodotus is mistaken when he supposes that the deities of Greece were derived from Egypt. He demonstrates, that the names of the greatest part of these deities are of Phenician extraction; and this opinion he establishes by a very plausible etymological deduction. He afferts, that had the Pelasgi been natives of either of the countries above-mentioned, it would be absurd to suppose them ignorant of the names and religious rites of their respective nations. He finds, that the Egyptian and Phenician colonies, which afterwards settled in Greece, were enemies to the Pelasgi, and either subdued or expelled them the country, which, he imagines could scarce have been the case had both parties sprung from the same ancestors. After settling these points, he concludes, that the people in question were the progeny of the Arabian shepherds, who, at a very early period invaded and subdued both the Lower and Upper Egypt. After poising that country about a century and a half, they were conquered by Amenophis king of the Upper Egypt, who drove them out of the country. Upon this the fugitives retired to Palestine, where Manetho the Egyptian historian loses sight of them, and either through ignorance or confusion confounds them with the Israelites. This writer supposes that these fugitives gradually directed their course for the west and north west coasts of Asia Minor, whence they conveyed themselves over to Greece.

Such are the arguments by which the author of the dissertation above-mentioned supports his hypothesis. It is, for aught we know, altogether new, and to us it appears by no means improbable. If our curious readers should wish to know more of this subject, they may consult Gebelin's preliminary Discourse to his Greek Dictionary, Lord Monboddo's Inquiry into the Origin and Progress of Language, vol. i. towards the end, and Mr Bryant's Analysis of Ancient Mythology, &c.

Be this as it may, nothing is more certain than that the Pelasgi were the first people who in some degree civilized the savages of ancient Greece. It is not our business at present to enumerate the many useful inventions which they communicated to the Greeks, at that time worse than barbarians. We deem it however absolutely necessary as an introduction to our subject, to hazard a few conjectures on the language and letters of these adventurers; a point strictly connected with the subject soon to fall under consideration.

Whether we suppose the Pelasgi to have been the offspring of the Phenicians, Egyptians, or Arabian shepherds, it will make little difference as to their language; every man of learning and research is convinced that those three nations, especially at that early period, spoke a dialect of the Hebrew. The Pelasgi then, must have spoken a dialect of that language when they arrived in Greece. Perhaps it might have undergone several changes and acquired some new modifications, during so many years as had passed since they began to be a separate nation, and in the course of so many peregrinations. Some monuments of theirs still extant prove this fact beyond all contradiction.

As these people incorporated with the aborigines of Greece, the remains of the original language of mankind,
kind, or at least so much of it as had been retained by them, gradually confounded with that of the new settlers. From this, we think, it is obvious, that prior to the arrival of the new colonists from the East, the language now current among the two united tribes must have been a dialect of the Phoenician, Arabian, Hebrew, &c. Be that as it may, Herodotus affirms that the Pelasgi in his time spoke a barbarous language, quite unintelligible to the modern Greeks.

The reason of this difference between the language of the Hellenes or Greeks in the age of Herodotus and that of the remains of the Pelasgi at that period, seems to be this: Prior to the time of that historian, the Greek language had, from time to time, undergone many changes, and received vast improvements; whereas, on the contrary, that of the remnant of the Pelasgi, who were now reduced to a very low state, had remained stationary, and was then just in the same predicament in which it had been perhaps a century after their arrival in the country.

As the Pelasgi, as was observed above, were a people highly civilized and well instructed in the various arts at that time known in the eastern world, they were skilled in agriculture, architecture, music, &c. (§) : The presumption then is that they could not be unacquainted with alphabetical writing. This useful art was well known in the countries from which they emigrated; and of course it is impossible to imagine that they did not export this art as well as the others abovementioned. Diodorus Sicylus imagines that the Pelasgi knew not the use of alphabetical letters, but that they received them from Cadmus and his Phoenician followers; that these letters were afterwards called Pelasgic, because the Pelasgi were the first people of Greece who adopted them. This account must go to the score of national vanity, since very soon after he acknowledges that Linus wrote the exploits of the first Bacchus and several other romantic fables in Pelasgic characters; and that Orpheus, and Pronapides the matter of Homer, employed the same kind of letters. Zenobius likewise informs us that Cadmus flew Linus for teaching characters differing from his. These letters could be none other than the Pelasgic (†).

† Apud Dr Gregory Sharp's Greek Language.
§ Lib. 3.
† See Plato X.
† Lib. 1.
* Lib. 1.
* See Plate X.
* Lib. 1.
* Lib. 1.

Hitherto we have seen the Pelasgi and the Ionians incorporated, living under the same laws, speaking the same language, and using the same letters. But another nation, and one too of vast extent and population, had at an early period taken possession of a considerable part of the country afterwards distinguished by the name of Hellas or Greece. The Thracians were a great and mighty nation; inferior to none except the Indians, says the father of Grecian history. These people, at a very early period, had extended their quarters over all the northern parts of that country. They were, in ancient times, a learned and polished nation. From them, in succeeding ages, the Greeks learned many useful and ornamental sciences. Orpheus (a) the musician, the legislator, the poet, the philosopher, and the divine, is known to have been of Thracian extraction. Thamyris and Linus were his disciples, and highly respected among the Greeks for their learning and ingenuity. That these people spoke the same language with the Greeks, is abundantly evident from the connection between them and these Thracian bard. The Thracian language, then, whatever it was, contributed in a great proportion towards forming that of the Greeks. From the remains of the Thracian dialect there appears to have been a very strong resemblance between it and the

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(a) Orpheus seems to be compounded of two oriental words, or "light," and πόθον, "the mouth." Though some deduce it from the Arabic or, "a learned man."
We have now found out three branches of the Greek language. The old Ionic character was composed of the Cadmean and Pelasgic characters, with some variations of form, position, and sound. The Athenians continued to use this character till the year of Rome 350. The old Ionic was gradually improved into the new, and this quickly became the reigning mode. After the old Ionic was laid aside, the * (Bvotγσηγάσαν) Bulphadon came into custom, which goes backwards and forwards as the ox does with the plough. They carried the line forward from the left, and then back to the right. The words were all placed close together, and a few small letters were used before the fourth century. If our curious readers would wish to know more of letters and alphabets, we must refer them to Chifian, Morton, Potterius, the great Montfaucon, Gebelin, Ahle, &c. For our part we are chiefly concerned at present with the Phoenician and Cadmean systems; and on these perhaps we may have dwelt too long. Having now, we hope, sufficiently proved that the Greek alphabet was derived from the Phoenician, in order to convince curious but illiterate readers of the certainty of our position, as it were by Occular demonstration, we shall annex a scheme of both alphabets, to which we shall subjoin some figures upon such letters of the Greek alphabet as admit any ambiguity in their nature and application.

A, alpha, had two sounds, the one broad like a in the English word all; the other slender, as in end, bend, defend. The Hebrews certainly used it so, because they had no other letter to express that sound; the Arabs actually call the first letter of their alphabet elf; and they as well as the Phoenicians employ that letter to express both the sound of Α and E remarkably. The Greeks call their letter λιφαλτας, that is, E slender, which seems to have been introduced to supply the place of A slender.

H, eta, was originally the mark of the spiritus asper, and no doubt answered to the Hebrew h. It is still retained in that capacity in the word Ητταρα, and in words with the spiritus asper beginning books, chapters, fections, &c. Ε originally marked both the sound of Ευάν and Ηττα; that is, it was sometimes found short as at present, and sometimes long, where it is now supplied by H. As it was found convenient to distinguish these two different quantities of sound by different letters, they adopted Η, the former spiritus asper, to denote the long sound of E, and sufficed the present spiritus asper [*] in its place.

I, iota, is the Hebrew or Phoenician ΙΟΤ or ΙΟΘ. We imagine it originally served the purpose of both iota and ypsilon. It had two different sounds, the one broad and full, the other weak and slender. The latter and the sound of the modern ρος. That this was actually the case, appears in several monumental inscriptions: And upon this depends the variation of some

Exemplum Tongrarum Priscarum
Liberarum ex columna, quae, in via Æpicta reperta, postea ad hortos Scymnianos traducta est.

ODEM. QEMITON. METAKINES SAEK. TO. TPIOPIO. HO
ESTI. V. EPI. TO. TRITOE. TEI. HODIO. TEI. APAL. EL TOI
HERODO. AMO. OAM. LOION. TOI. KIVESATI. MARTVS
DALMON. ENHODIA. KAI. HOI. KIOVES. DEME TROS
KAI. KORES. ANASEMA. KAI. OOVION OEOV. KAI.

Shunert Alphabet.

Vowels.

Connected Vowels.

Consonants.

Dhunapajambharam Mulapakshmam
Sec. VII.

PHILOLOGY.

to be for the masculine, to have arranged its variations in the following manner:

<table>
<thead>
<tr>
<th>Greek</th>
<th>Plu.</th>
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<tbody>
<tr>
<td>Nom.</td>
<td>ἦν</td>
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<td>Gen.</td>
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<tr>
<td>Dat.</td>
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<td>Acc.</td>
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In the earliest stages of the Greek language, ι and its us in ι were found in the same manner, or nearly so, as of nouns of the first the nominative; for the distinction of these two cases was made to and the nominative terminated in ι, which letter was likewise adopted to dative plural; ι was annexed to the dative plural, to distinguish it from the dative singular.

The word was still without inflexion.

When the article was inflected in this manner, the process followed: we take λας for an example.

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<th>Sing.</th>
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<tbody>
<tr>
<td>Nom.</td>
<td>λας</td>
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<tr>
<td>Gen.</td>
<td>λας</td>
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<tr>
<td>Dat.</td>
<td>λας</td>
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<tr>
<td>Acc.</td>
<td>λας</td>
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In this arrangement our readers will observe, that in the time under consideration, ι was not yet introduced; and therefore small or little was the same letter in the genitive plural as in the accusative singular; but in the latter case it was found long by way of disjunction.

The article ια, which is still retained in the Doric dialect, was varied as follows:

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<tr>
<th>Sing.</th>
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<tbody>
<tr>
<td>Nom.</td>
<td>ια</td>
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<td>Gen.</td>
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<td>Acc.</td>
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These variations differ a little from those of the masculine; and they were no doubt made for the sake of disjunction, as is usual in such cases. We shall now give an example of the feminine as it must have stood before variations were introduced. We shall employ τιμά.

| Sing. | Plu.
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<tbody>
<tr>
<td>Nom.</td>
<td>τιμά</td>
</tr>
<tr>
<td>Gen.</td>
<td>τιμά</td>
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<tr>
<td>Dat.</td>
<td>τιμά</td>
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<tr>
<td>Acc.</td>
<td>τιμά</td>
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</tbody>
</table>

Afterwards, when the Chaldaean article da was adopted for the neuter gender, the letter ι or ι was changed into τι, and prefixed to it; and then the Greeks, who, in their declension of adjectives, always followed the neuter gender, began to prefix it to the oblique cases.

In this manner we think the Greek nouns found originally; the only change being made upon the article. At length, instead of prefixing that word, and expressing it by itself, they found it convenient to affix a fragment of it to the noun, and to pronounce both with more expedition. Thus λα-τιμά, e.g., became λατιμά, λατίμα became λατιμά, and of course λατιμαὶ and λατιμάμι, &c. The spiritus affer, or rough breathing, was thrown away, in order to facilitate the coalition. Nouns of the neuter gender, as was necessary, were distinguished by using τι instead of ι. In Oriental words the Greeks often change τι into τι, and τιτιντα.
In this case the Greeks seem to have copied from an eastern archetype. In Hebrew we find an arrangement exactly similar. To supply the place of the pronouns possessive, they affix fragments of the personal: Thus, they write bent "my lion," instead of ben-einu, and abet-nu "our words," instead of aben-nu, &c. The persons of their verbs are formed in the same manner. In this way, in our opinion, the variations of the first and second declensions were produced.

After that a considerable number of their nouns were arranged under these two classes, there remained an almost infinite number of others which could not conveniently be brought into these arrangements; because their terminations did not readilycoalesce with the articles above-mentioned. These, like nouns of the neuter gender, were in a manner secluded from the society of the other two classifications. It is probable that these for a long time continued indeclinable. At last, however, an effort was made to reduce them into a class as well as the others. All these excluded nouns originally terminated with s, which appears from their terminations as they stand at present. By observing this case, we are readily conducted to the termination of the prifinal vocable. The genitive always ends in σ, which ending is formed by inferring s between the radical word and s. By throwing out s we have the ancient nominative: Thus, τεσ, genitive τεσσις, taking out s we have τεσσα, the original inflexible termination. ογεντις, genitive ογεντιςσις throw out s and you have ογεντιςσις. οκεντις, genitive οκεντιςσις. τάκεντις, genitive τάκεντιςσις by throwing out s we have τάκεντις. ογοντις, genitive ογοντιςσις. οκοντις, genitive οκοντιςσις. ακοντις, genitively ακοντιςσις, because originally s had the sound of θσ, as was observed above. οκοντιςσις, genitive οκοντιςσις, genitive οκοντιςσις, οκοντιςσις, the old noun. In short, the genitive is always formed by inferring s immediately before s, which is always the termination of the nominative; and by this rule we easily discover the noun such as it was in its original form.

The dative of this declension was closed with a αφαντον; the same with that of the second, namely, a αφαντοτι. The accusative commonly terminated with s; but was originally ended with ις. The Romans imitated the Ελλειο dialect, and they commonly ended it with en or it. The Greeks, perhaps, in this imitated their progenitors, for a was their favourite vowel. The nominative plural ended in ις, which nearly resembles the English plural, and was possibly borrowed from the Thracians. The genitive plural in all the declensions ends in ις, the dative ends in ις, the s being inserted to distinguish it from the dative singular. When a strong consonant, which would not easily coalesce with ις comes immediately before it, that consonant is thrown out to avoid a harsh or difficult sound. The sum then is: the cases of nouns of the first and second declensions consist of the radical word with fragments of the articles annexed, and there were the first classifications of nouns. The other nouns were left out for some time, and might be denominated neuter; at length they too were classified, and their variations formed as above. In this process the Greeks deviated from the oriental plan; for these people always declined their nouns by particles prefixed. Whether the Greeks were gainers by this new process, we will not pretend positively to determine. We are, however, inclined to imagine that they lost as much in periphrasis as they gained by variety.

It is generally believed that the Greeks have no ablative; to this opinion, however, we cannot assent. It is true, that the dative, and what we would call the ablative, are always the same; yet we think there is no more reason to believe that the latter is wanting in Greek, than that the ablative plural is wanting in Latin, because in that language both these cases are always alike.

In the eastern languages there are only two genders, analogous to the established order of nature, where all animals are either male or female. But as the people of the East are, to this day, finely addicted to periphrasis, they ranged all objects of which they had occasion to speak, whether animate or inanimate, under one or other of these two classes. Hence arose what is now called the masculine and feminine genders. The orientals knew nothing of a neutral gender, because, indeed, all objects were comprehended under the foregoing classes. The Phoenician feminine was formed from the masculine, by adding μα or ab. In this the Greeks in many cases imitated them. The Greeks and Latins left a vast number of substantives like a kind of outcast, without reducing them to any gender; this process gave rise to the neuter gender, which imports, that such substantives were of neither gender.

This has the appearance of a defect, or rather a blemish; in both. Sometimes, too, they make words neuter, which, according to the analogy of grammar, ought to be either masculine or feminine. And again, they range words under the masculine or feminine, by which the same rule ought to have been neuter. In short, the doctrine of general distribution seems to have been very little regarded by the fabricators of both tongues. The beauty which arises from variety seems to have been their only object.

The use of the article in the Greek language is, we think, rather indeterminate; it is often prefixed to proper names, whereas there is no need of demonstration nor geometrical distinction. On the contrary, it is often omitted in proper names. The Greeks and Romans imitated the Hebrew dialect, and they commonly used it with en or im. The Greeks, perhaps, in this imitated their progenitors, for a was their favourite vowel. The nominative plural ended in ις, which nearly resembles the English plural, and was possibly borrowed from the Thracians. The genitive plural in all the declensions ends in ις, the dative ends in ις, the s being inserted to distinguish it from the dative singular. When a strong consonant, which would not easily coalesce with ις comes immediately before it, that consonant is thrown out to avoid a harsh or difficult sound. The sum then is: the cases of nouns of the first and second declensions consist of the radical word with fragments of the articles annexed, and there were the first classifications of nouns. The other nouns were left out for some time, and might be denominated neuter; at length they too were classified, and their variations formed as above. In this process the Greeks deviated from the oriental plan; for these people always declined their nouns by particles prefixed. Whether the Greeks were gainers by this new process, we will not pretend positively to determine. We are, however, inclined to imagine that they lost as much in periphrasis as they gained by variety.

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french language.

ways a relative, which affords a presumption that the greeks originally used the article in the same manner as we do at present. the fact is, that the articles having once got into vogue, were often positively used as mere expletives to fill up a gap; and that on the other hand, when there was no occasion for printing out an object, it being fully determined by the tenor of the discourse, it was often omitted.

in forming adjectives, they followed the same plan that they had done with substantives. their great effort was to make their adjectives agree with their substantives in gender, number, and case. this arrangement improved the harmony of speech: and nothing could be more natural than to make the word expressing the quality correspond with the subject to which it belonged.

as adjectives denote qualities, and thus are susceptible of degrees, nature taught them to invent marks for expressing the difference of these degrees. the qualities may exceed or fall below each other by almost numberless proportions; it was, however, found convenient to restrict the increase and decrease to two denominations. the positive is, properly speaking, no degree of comparison at all; therefore we need only point out the formation of the comparative and superlative.

the former is generally thought to be fabricated, by first adding the hebrew word oath, excellent, to the positive, and then affixing the greek termination $i$; and the latter, by affixing the syrian word sah and the syllable $o$, in the same manner.

every nation, even the most uncivilized, have early acquired the notion of number. numerical characters and names are the same in many different languages. these terms were discovered, and in use, long before grammar came to any perfection; and therefore remain either inflexible or irregular. the first way of computing among the greeks was by the letters of the alphabet; so that a signified one and a twenty-four: in this manner the rhapsodies of homer are numbered; and so are the divisions of some of the psalms, as is generally known. but a more artificial plan of computation was obviously necessary. they divided the letters of the alphabet into dec. dw. or ten, from a to i = 10. to express the number 6, they inserted 5, hew = 6; so that by this means the first decade amounted to 10. in the next decade every letter increased by tens, and so p denoted 100. in this decade they inserted 4, $5v = 50$. in the third, every letter rose by 100, so that 4 $5v = 500$. by inferring these three phonetic characters they made their alphabet amount to 900. to express chilids or thousands, they began with the letters of the alphabet as before; and to make the distinction, they placed a dot under each character, as the units, tens, hundreds, were distinguished by an acute accent over them.

but in monumental inscriptions, and in public instruments, a larger and more lafiting numerical character was fabricated. they began with 1, and repeated that letter till they arrived at 11 = 8. this is the first letter of $5m$. then they proceeded, by repeating $5$ till they came to 10, the first letter of $5n$, 10. then they repeated a over and over, so that four $a = 40$. to express 50, they used this num

3 y 2
was degraded, and instead of intimating what was doing at present, was made to import what was immediately to be done hereafter. By this means, γεγονός, contracted into γεγονώ, I am writing, came to intimate I am just going to write. This change was probably made for the sake of enriching the language, for variety, for energy. Thus γεγονός became γεγονός, τινάκα, τινάτω, &c. According to this theory, we find, that such verbs as now have no second future retain their original form, only the circumflex has been removed in order to accommodate them to the general standard. Grammarians have now chosen the three characteristic letters of active verbs from the present, first future, and perfect. The true characteristic of the original verb was that of the present second future. Many verbs are now defunct of that tense, because, since the invention of the new present, those have fallen into disuse.

Let us now take the verb λεγω, dico, in order to make a trial; and let us write the radix and the auxiliary, first separately, and then in conjunction: Thus,

λέγω, λεγει, λεγεται, λεγεταις, λεγεταιστε, λεγεταιτεστε. Then we will have contracted λέγω, λεγει, λεγεται, λεγεταις, λεγεταιστε, λεγεταιτεστε. Here we believe every thing is left evident.

The English would run thus: Saying I am, saying thou art, saying he, &c. At first the radix and the auxiliary were pronounced separately, as we do our helping verbs in English, and would have been written in the same manner had words been then distinguished in writing.

The present first future occupied the same place that it now does, and concurred in its turn to complete the future in conjunction with the radix. That the subjunctive verb was inflected in the manner above laid down, is obvious from its future middle λέγομαι, and from the future of the Latin verb faciam, which was of old efodi, &c. Verbs in καω, καει, καειται, often take και in the first future. See Fulp. Cret. ap. Macro. Oxon. l. 67. Verbs in και and και assume σ by analogy, as καιει, καιειται, καιειταιστε, καιειταιτεστε. In this verbal system, the Greek auxiliary και ε (και ειμι) and the future form και ειμι (και ειμιται, και ειμιταιτεστε) are in full use, and are adequate to the purposes of a language.

It must be observed, that the Greeks, in order to accelerate the pronunciation, always throw out the τ and τ, except in verbs ending in ταω, ταει, ταειται, where they generally change them into τα and τα. When the last letter of the radix can coalesce with τ after it is thrown out, they transform it so as to answer that purpose: if not, they sometimes throw it out. We shall now more take λεγω for an example:

λεγω, λεγει, λεγεται, λεγεταις, λεγεταιστε, λεγεταιτεστε. Throwing out τ, it would stand λεγει, λεγεται, &c. by changing τα into τε it becomes λεγεται. Λ and τ cannot coalesce with τ, therefore they throw them out: thus λεγει, future first person singular λεγεται, future first λεγαι, future first λεγαται, future first λεγαταις, future first λεγαταιστε, future first λεγαταιτεστε.

These are the general rules with respect to the formation of the present and future of active verbs in the earliest stages of the Greek language. The limits prescribed will not allow us to pursue these conjec-

The preterite tense falls next under consideration.

If we may trust analogy, this, as well as the other preterite two, must have owed its conformation to the radix tense, of the verb, and some other word fitted to eke out its terminations. It has been thought by some critics, that this addition was taken from the Hebrew word שָׁם; and we should be of the same opinion did not another auxiliary prefix itself nearer home, which appears to us much more congruous to such a purpose. Perhaps, indeed, the people from whom we suppose it borrowed, derived it from the eastern qui, the auxiliary verb. We have already observed, that the Thracians were masters of a great part of Greece in the very earliest ages. At that time they were a polite and learned people. From them a considerable part of the Greek language was derived. If, therefore, we should find a word in the language employed for the same purpose, and accommodated to coalesce with the radical verb, we feel ourselves very much inclined to prefer such a word.

The word ἡμέρα pervades many different languages as an auxiliary verb. From it we have the Italian ho, the Spanish ha, the French a; and in one shape or other it appears in all the German and Scandinavian dialects. It is the Gothic auxiliary; and, we believe, it forms the termination of the perfect active of the first conjugation in the Latin tongue: For there am is the radix of amō; in the preterite amāvi, amavit: and the preterperfect amāvī-amāveram, i.e. amāveram, compounded of amō, amāvi, and amaveram, the imperfect of the indicative of the subjunctive verb. This process, in the formation of the preterite of Latin verbs, will scarce be questioned, and forms certainly a presumptive proof that the Greeks purified the same line. From this verb is likewise derived the Latin hēc, by changing ε into δ, which are indeed the same letter. Our readers, after this detail, will not be surprised if we should now hazard a conjecture, and declare it as our opinion, that this same Gothic auxiliary ha is actually the additional part of the preterite of Greek verbs, and that part upon which the conjugation depends.

In forming this combination between the radix and the auxiliary, the Greeks were obliged to fabricate several devices. As often as the last letter of the radix could not unite with the aspirate in ha, they metamorphosed it into one of the double letters, which are capable of coalescing with it. In the verb λεγω, γεγονός became γεγονός, and so on. It must be observed, that the Greeks, in order to accelerate the pronunciation, always throw out the τ and τ, except in verbs ending in καω, καει, καειται, where they generally change them into κα and κατά. When the last letter of the radix can coalesce with κατά after it is thrown out, they transform it so as to answer that purpose: if not, they sometimes throw it out. We shall now more take λεγω for an example:

λεγω, λεγει, λεγεται, λεγεταις, λεγεταιστε, λεγεταιτεστε. Throwing out τ, it would stand λεγει, λεγεται, &c. by changing κατά into κατά it becomes λεγεται. Λ and κατά cannot coalesce with κα, therefore they throw them out: thus λεγει, future first person singular λεγεται, future first λεγαι, future first λεγαται, future first λεγαταις, future first λεγαταιστε, future first λεγαταιτεστε.
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The derivation and formation of the middle and passive voices, would certainly afford matter of curious interest to students of grammar, and perhaps philosophers, too, were employed. See Grammar.

The eastern nations have diversified their verbs, by affixing fragments of the personal pronouns to the radix, by which they gained only the advantage of exhibiting the genders of the persons engaged in being, acting, and suffering; but a perpetual repetition of these was unavoidable. The Greeks, by their artificial combination of the radix with the two auxiliaries, avoided the necessity of repeating their personal pronouns, as we and the other modern inhabitants of Europe are obliged to do; and at the same time, by diversifying the terminations of their nouns and verbs, wonderfully improved the beauty and harmony of their language. The arrangement above noticed is so very different from that of the orientals, and so entirely Gothic, that we think there can be no doubt that the Greeks borrowed this manoeuvre from the Thracian.

Every person moderately acquainted with the Greek language will, upon examination, discover a wonderful coincidence between the structure, idioms, and phraseology, of the English and Greek languages: so many congenial features must engender a strong suspicion that there once subsisted a pretty intimate relation between them.

In the preceding deduction, we find ourselves obliged once more to differ from the very learned author of the Origin and Progress of Language. As we took the liberty to question his originality of the Greek language, and at the same time presumed to attack the goodly structure imputed to philosophers, critics, and grammarians: so that we now totally differ from that learned writer as to his theory of the creation of verbs out of the inanimate matter of phia, phl, &c. This whole fabric, in our opinion, leans on a feeble foundation.

The apparatus of intermediate tenses, of augment, derivation of tenses, with their formation, participles, and idiomatical constructions, and other essentials or appendages, we omit, as not coming within the verge of our disquisition.

The derivation and formation of the middle and passive voices, would certainly afford matter of curious speculation; but the labour necessary to investigate this connection would greatly overbalance the benefit expected.

However, to complete our plan, we shall subjoin a few fricatures with respect to the formation of the middle voice, which was, in our opinion, immediately formed from the active.

We have seen already, that the active voice in its original state was formed by annexing fragments of the substantative or auxiliary verb to the radix. The fame economy was observed in fabricating the flexible parts of the verb of the middle voice. To demon-

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The future perfect active voice is, second future 

The conjuncture and formation here is obvious. Perhaps, in the second person, 

The present was never retained in this tenet, which originally seems to have been the only distinguishing character by which that tense of the middle-voice differed from the same tense of the active.

From the strict analogy between the mode of forming the three primary tenses of the active and middle voice, we are led to susped that what is now the middle was originally the passive voice.

The intermediate formation of the former, by annexing the passive auxiliary, is obvious. The middle voice still partakes of the passive signification, since it has sometimes a passive, though more frequently an active. There are several parts of the present passive quite analogous to the same tenses in the middle: and, lastly, it is the common progress, in the course of improvement, to proceed step by step, and by approximation. What is most simple and easy is the first object, then succeeds what is only a little more difficult, and so on till we arrive at the last stage, when human ingenuity can go no farther. Now it will readily be admitted, that the passive voice is much more embrazed and intricate in its texture than the middle; and, therefore, the former should have been posterior in point of time to the latter.

We are well aware, that the very learned Kistfer, and most other moderns, deeply skilled in the origin, progress, and structure of the Greek language, have thought otherwise. The general opinion has been, that the Greek middle voice answered exactly to the Hebrew conjugation bithpapul, and in its pristine signification imported a reciprocity, or when the agent acts upon itself. For our part, we only intended a few hints upon the subjunct, which our learned readers may purify, approve, or reject, at pleasure.

If we might pretend to investigate the formation of the passive voice, we should imagine that the modern
modern present was formed from the ancient one, by inserting such letters as were found necessary for beauty, variety, energy, &c.; the first future from the second future middle of the verb ἄναρχον, once ἄον. This future is βέτρομον; and, joined to the radic, always occupies that place, παραδομο, παραδεσμος, παραδεσμα, and so of the rest; whether μέν, οὖν, ετος, which occur to frequently as the terminations of the middle and passive voices, are fragments of some obsolete verb, we will not pretend to determine.

From verbs in νω, νός, νομος, are formed verbs in μεν which in the present, imperfect, and second aorist, as it is called, only have a different form, by assuming μεν with a long vowel preceding it, in the present active; which vowel is preferred in each person singular. This collection of irregular verbs seems to be formed from the verb μολομο, which in some dialects might be μολος. Indeed the imperfect μα, μας, seems, to imply as much in this: however, we dare not be positive.

In the whole of this analysis of the formation of verbs, we have laid down what to us appears most plausible. That metaphorical critics may discover inaccuracies in the preceding detail we make no doubt; but our candid readers will doubtless reflect, that no language was ever fabricated by philosophers, and that the elements of language were hammered out by peasants, perhaps, by savages. Critics have created a philosophy of language we admit, and have a thousand times discovered wonderful acuteness and ingenuity in the mechanism of words and sentences, where the original onomatopoeia never apprehended any, and which possibly never existed but in their own heated imagination. If our more enlightened readers should find anything in the preceding detail worthy of their attention, so much the better; if the contrary should happen, we presume they will take up with the hackneyed system. We have all along neglected the dual number, because it regularly follows the type of the other numbers.

Be that as it may, before we drop this subject we must take the liberty to subjoin an observation or two which refer to the consequences of the practice of new modelling the present, and of course the imperfect, tenses of verbs. If, after this arrangement they commonly retained all the other tenses exactly as they had stood connected with the primitive verb: this needs no example. 2d. They often collected the tenses of verbs, whose present and imperfect were now obsolete in order to supply this defect. Thus we have προκειμενοι, προκειμενος, προκειμενος. 3d. They often formed present and imperfect tenses without any other tenses annexed: The poets in particular seem to have fabricated these two tenses at pleasure.

If this procedure was convenient for the poets, it was certainly most incommmodious with respect to the vulgar, as well as to foreigners who had an inclination to learn the language. The vulgar, some ages after Homer, and Hesiod, must have found it as difficult to understand their poems as our people do to comprehend those of Chaucer and Spenser. By this disposition, too, the etymology of verbs was almost entirely confounded. The present, second future being, as has been observed, the ancient perfect, the attention of the curious etymologist was naturally diverted to the modern perfect, where it was utterly impossible to discover the radical word. A few examples will elucidate this point: παύειν to speak, to intend, old perfect παύειν, and so is the radical, which at once appears to be a Persian word signifying a large tract of country. Hence Mauritiania the land of the Mauri, Aquitania,Brittania; and with a prefixed Hindo-flan, Chufi-flan, Turque-flan. The obsolete verb παύειν, whence παύειμαι, is evidently derived from παο, an Egyptian name of the moon; παύειμαι, second future παύει, to flow, from the Egyptian word ἀπα ωρ, a name of the sun: παύειμαι, future second παύει, is obviously the offspring of ἀπα ωρ, "a drum or timbrel," from beating or striking, &c. In such etymological retraces, the student must be careful to turn the Ionic a into the Doric α; because the Dorics were later from the coast of Palestine, and consequently retained the largest share of the Phoenician dialect: thus ἀφεων, to rejoice, turning α into α, as σφεων instead of σφεων, &c.

It is not our intention to enter into the arrangement and peculiar constructions of the Greek language. There is, however, one, which we cannot well pass over in silence. As that tongue is delitute of those words which the Latins call gerunds, to supply this defect they employ the infinitive with the article prefixed; thus, ος το ιποτιον φιλος, in order to their being friends: απο ου τη διαλεκτικη βαρισκον, from their having elected a king; ει το οιων και νους την ελετον χορος, from their flying out of the city. In these phrases the infinitive is said to assume the nature of a substantiv noun; agreeing with the article before it, exactly as if it were a noun of the neuter gender. Idioms of this kind occur in our own tongue; only with the verb, instead of being expressed in the infinitive, is turned into the participle. According to this arrangement, the first of the preceding phrases, which according to the Greek, would stand toward to be friends, in English is, in order to their being friends. This anomaly, then, if indeed it be such, is of no manner of consequence. The French, if we are not mistaken, would express it in the very same manner with the Greek, that is, pour etre amis.

From treating of verbs, we should naturally proceed to the consideration of adverbs, which are so denominated, because they are generally the concomitants of verbs. Every thing relating to that part of speech, in the Greek tongue, may be seen in the Port Royal or any other Greek grammar. Instead therefore of dwelling upon this beaten topic, we shall hazard a conjecture upon a point to which the critics in the Greek tongue, as far as we know have not hitherto adverted.

The most elegant and most admired writers of Greece and especially Homer, and after him Hesiod, abound with small particles, which appear to us pure extractions, created as it were to produce harmony, or fill up a blank without sense or signification. How

(v) Hence it came to signify rejoicing, from the mirth and revelry attending the treading of the vine press.
one of the expulsive particles should abound in that language beyond any other, we think, is a matter not easy to account for. It has been said by the Zoilli, that if you extract these nonentities from the poems of that bard, qui fide meruit dicti po a, a magnum inane, a mighty blank would be left behind. We would willingly do justice to that pigny race of words, and at the same time vindicate the prince of poets from that groundless imputation. Plato likewise, the prince of philosophers, has been often accused of too frequently employing those superfluous auxiliaries.

These particles were no doubt imported from the East. It would be ridiculous to imagine that any description of men, however enthusiastically fond they might be of harmonious numbers, would sit down on purpose to fabricate that race of monosyllables purely to eke out their verbi; mere sounds without significance. In the first place, it may be observed, that there is a very strict connection among the particles of all cognate languages. To this we may add, that the not understanding the nature, relations, significance, and original import of these seemingly unimportant terms, has occasioned not only great uncertainty, but numberless errors in translating the ancient languages into the modern. The Greek language in particular loses a considerable part of its beauty, elegance variety, and energy, when these adverbial particles with which it is replete are not thoroughly comprehended. An exact translation of these small words, in appearance insignificant, would throw new light not only on Homer and Hesiod, but even upon poets of a much posterior date. Particles which are generally treated as mere expulsive words, would often be found energetically significant. It is, however, altogether impossible to succeed in this attempt without a competent skill in the Hebrew, Chaldaic, Arabian, Perian, and old Gothic languages. We shall here take the liberty to mention a few of these particles which are most familiar, one or other of which occur in almost every line of Homer, and which we believe are either non-understood or misunderstood. Such are εν, δι, κατ, με, μεν, ον, συν, φησιν, παν, θελει, έπεζ. As is nothing else but the Chaldaic particle ἔν, the parent of the English the. It likewise signifies by turns in your turn: ἐν, εστί, εστιν, is the same word in the Ionic dialect; με is a particle of the Hebrew affirmative με, μεν, δε, ἐπεζ, ἐπεζειν. Με, a kind of oath by the moon called μενω, alm it over all the east; hence Dor. μενα: μεν, an oath by μεν, that is, the earth: μενα, another oath by the same element, probably from the oriental word of the same import: μενα is a fragment of μεν, mentioned before; μεν of με, the earth, and ων or ον, an Egyptian name of the sun: ον, a particle which pervades all the dialects of the Gothic language. In this manner we believe all these small words that occur so frequently in the Greek tongue, and which have hitherto been held inexplicable, may be easily rendered in significant terms; and were this done, we believe they would add both beauty and energy to the clausures in which they stand. But this difficulty must be left to more accomplished adepts.

We shall not explain the nature of prepositions, because we are convinced that few people will take the trouble to peruse this disquisition who are not already acquainted with their import in language. The Greek prepositions are eighteen in number, which need not be enumerated here. Most of these might be easily shown to be particles, or fragments deduced from oriental or Gothic words. The use of these words is to connect together terms in different, and to show the relation between them. In languages where, as in English, all these relations are expressed without any change on the termination of the nouns to which they are prefixed, the process is natural and easy. The whole is performed by juxta-position. But in the Greek and Latin tongues, this effect is produced, partly by prefixing prepositions and partly varying the terminations of nouns. Had the Greeks been able to int rate all these relations by varying the terminations, or had they multiplied their prepositions to such a number as would have enabled them to express these relations without the casual variations, as the northern languages have done; in either case their language would have been left embarrassing than it is in its present state. According to the present arrangement of both prepositions and participle-particles, the process is now very frequently to answer that purpose, a method which appears to us not altogether uniform. Though this plan might occasion little embarrassment to natives, it must, in our opinion, have proved somewhat perplexing to foreigners. The difficulty would be, as to the latter, when to adopt the one and when the other expedient.

Another inconvenience arises from the exceeding small number of prepositions in that language, which bear too small a proportion to the great variety of relations which they are appropriated to intimate. This deficiency obliged them often to employ the same preposition to denote different relations: For instance, εἰ ειναι intimates, 1st, upon; 2nd, εἰς, upon; upon the stone; and then it takes the genitive. 2d, It denotes near upon; 3rd, εἰς the stone, and then it governs the dative. 3d, The same preposition signifies motion towards; κατ έπεζ, κατ επεζειν, be set upon the stone. In these instances the same preposition intimates three different relations and, which is still more embarrassing, each of these requires a different case. The difficulty in this instance is so considerable, that even the most accurate of the Greek writers themselves often either forget or neglect the true application. Many examples of this might be adduced, did the limits allow us admit such illustrations. Every man who has carefully perused the Grecian authors will readily furnish himself with examples.

Again, some prepositions, which indicate different irregularly relations, are prefixed to the same case. Thus, εἰ εινα, signifies from: εἰς εινα εις εις εις εις, from Jupiter we begin: έπεζ έπεζ έπεζ έπεζ έπεζ, from my life, or my course of life: έπεζ έπεζ έπεζ, before the doors: έπεζ έπεζ έπεζ έπεζ, on consumption before the victory: έπεζ έπεζ έπεζ, to render evil for good; έπεζ έπεζ έπεζ, against you. In these examples, and indeed everywhere, these prepositions intimate different relations, and yet are prefixed to the same cases. Sometimes the same preposition seems to assume two opposite significations: this appears from the preposition κατ, just mentioned, which intimates both in, towards and against in opposite to.

What has been observed with respect to the prepositions above mentioned, the reader will readily enough apply to κατ, κατ, κατ, κατ, κατ. These incongruities certainly imply something irregular; and seem to inti-
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Greeks have already hazarded a few conjectures with respect to the formation of the most important and most distinguished classes of words into which it has been divided by the most able grammarians, without, however, de ending to the innsatz of the language. As prepositions are the chief materials with which its other words, especially verbs, are compounded, we shall briefly consider the order in which they probably advanced in this process.

Complex ideas are compounded of a certain number or collection of simple ones. Of those complex notions, some contain a greater and some a smaller number of simple conceptions. In language, then, there are two ways of expressing those complex ideas, either by coining a word to express every simple idea separately, according to the order in which they stand in the mind; or by trying to combine two or more simple terms into one, and by approaching to intimate one complex idea, by one single word. The Arabians, notwithstanding all the boasted excellencies of their language, have never arrived at the art of compounding their words, in order to answer this noble purpose; and the Latin dialects are but slenderly provided with this species of vocables. The Greeks, of all other nations (except perhaps those who speak the Shanferit Language), are unrivalled in the number, variety, propriety, elegance, energy, and expression of their compound terms. The Greeks, like the Arabians, in the earliest stages of their language, had only a collection of radical disjointed words, consisting of the jargons of the aboriginal Greeks, of the Pelaqes, Thracians, &c. How these words were arranged and contrived, we have no data remaining upon which we can found a critical investigation. We must therefore remain satisfied with such probable conjectures as the nature of the case, and the analogy of the language, seem to suggest.

The prepositions were originally placed before the nouns, whose relations they pointed out. For example, let us take the ἐπιστήμην τοῦ ἄλλου, he died along with the other, or he died out of hand along with the others. These words were arranged thus: ἐπίστημην τοῦ ἄλλου, and ἐπίστημην τοῦ ἄλλου. In this manner the parts of every compound word were placed separately, at least as much as other words which had no connection.

The first compound words of the Greek language were the radical nouns with the article, and the radical part of the subjunctive or auxiliary verb. The success of this experiment encouraged them to attempt the same in other words. By this noble invention they found themselves able to express, in one word, with ease and significance, what in other languages, and formerly in their own, required a tedious ambauges or circumlocution. In the same manner, as their language was gradually mellowed, they increased the number of their compounds, till their language, in that respect, infinitely excelled all its present dialects. In this process they were careful to unite such letters as not only prevented asperity and difficulty of pronunciation, but even promoted harmony and elegance. But this was the labour of politer ages.

The Greeks were entirely ignorant of the derivation or etymology of their language: for this we need only consult Plato's Cratylus, Aristotle's Rhetoric, Demetrius, Phalerus, Longinus, &c. In deducing patroonyms, abstractions, poe's, gentiles, diminutives, verbalis, &c. from radicals of every kind, they have shown the greatest art and dexterity. Examples of this occur almost in every page of every Greek author. But this extended no farther than their own language; every foreign language was an abomination to the Greeks. But more of this in the sequel.

The original materials of the Greek tongue were undoubtedly rough and discordant, as we have described them above. They had been collected from different quarters, were the produce of different countries, and had been imported at very distant periods. It would therefore be an entertaining, if not an instructive speculation, if we were able to discover by what means and by what means this wonderful fabric was founded, erected, and carried on perfection. The writers of Greece afford us no light. Foreigners were unacquainted with that originally insignificant canton. Every thing beyond Homer is buried in eternal oblivion. Orphus is indeed reported to have composed poems; but these were soon obliterated by the hand of time. The verbs now ascribed to that philosophical hero are none of his. Linus wrote, in the Pelaqian dialect, the achievements of the first Bacchus; Tu-r-r'yris is the Thracian wrote; and Pronapid: the mother of Homer was a celebrated poet. The works of all these bards did not long survive; and it is a certain fact that the Greek tongue was highly polished even more early than the age in which these worthies flourished. Homer, no doubt, imitated their productions, and some are of opinion that he borrowed liberally from them. The Greeks knew no more of the original character of their language than of the original character and complexion of their progenitors. They allowed, indeed, that their language was originally barbarous and unlearned; but by what means or by what period it was polished, enriched, and finally arranged, was to them an inscrutable secret.

We have already demonstrated that the Ionim or aborigines of Greece were a race of barbarians; that consequently their language, or rather their jargon, was of the same contempt. The Pelaqes found both
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161 Which was carried to its utmost perfection at a very early period, the people and their speech in this uncultivated state. These people arrived in Greece about the year before Christ 1750. It was then that the language of Greece began to be cultivated. Before the age of Homer the work seems to have been completed. Nothing of confluence was afterwards added to the original stock; on the contrary, not a few matters were deduced from the Homeric treasure. The Pelasgi, as was said before arrived in Greece an. ant. Chr. 1750. Homer is thought to have been born an. ant. Chr. 1041; consequently the cultivation of the Greek tongue was completed in a period of about 700 years. But upon the supposition that Orpheus, Linus, Tamyris, &c. wrote long before Homer, as they certainly did, that language was arrived at the standard of perfection two centuries before; by which computation the period of its progress towards its stationary point is reduced to 750 years. But as the Pelasgi were a colony of foreigners, we ought to allow them one century at least to settle and incorporate with the natives, and to communicate their language, laws, manners, and habits to the aborigines of the country. By this deduction we shall reduce the term of cultivation to less than four centuries.

During this period Greece was furiously agitated by tumults and insurrections. That country was divided into a number of independent states, which were perpetually engaged in quarrels and competitions. The propagation of arms was absolutely necessary for the protection and preservation of the state; and the man of conduct and prowess, was honoured as a demi-god, and his exploits transmitted with eclat to posterity.

The Greek tongue was then rough and unpolished; because, like the ancient Romans, the bravest men were more disposed to act than to speak. Every language will take its colour from the temper and character of those who employ it; and had it not been owing to the chiefs of men, the Greek tongue would have continued equally rough in the era of Homer, as it had been a century after the arrival of the Pelasgi.

There has appeared among barbarous or half civilized people a description of men whose profession it has been to frequent the houses or palaces of the great, in order to celebrate their achievements, or those of their ancestors, in the sublimest strains of heroic poetry. Accordingly we find that the Germans had their bards, the Gauls their fadas, the Scandinavians their fjaelds or jaeldej, the Irish their stleafes, all retained for that very purpose. They lived with their chiefs or patrons; attended them to battle; were witnesses of their heroic deeds; animated them with martial strains; and celebrated their prowess if they proved victorious; or, if they fell, raised the song of woe, and chanted the mournful dirge over their sepulchres. These bards were always both poets and musicians. Their persons were held sacred and inviolable. They attended public entertainments, and appeared in all national conventions. The chief of them were employed in the temples of the gods; and the less illustrious, like our minstrels of old, frolicked about from place to place, and exercised their functions wherever they found employment.

Among the ancient Greeks, there was a numerous tribe of men of the very same description, who were at once poets and musicians, and whose office it was to celebrate the praiseworthy actions of the great, and to transmit their exploits to posterity in the most exaggerated manner. These poetical vagrants were styled Ἀστέρες or forgers. Some of these lived in the houses of great men; while others were skilful or less fortunate, frolicked about the country in the manner above described. The more illustrious of those Ἀστέρες who were retained in the temples of the gods, were certainly the first improvers of the language of the Greeks. Among the Hebrews, we find the first poetical compositions were hymns in honour of Jehovah, and among the pagans the same practice was established. In Greece, when all was confusion and devastation, the temples of the gods were held sacred and inviolable. There the Ἀστέρες improved their talents, and formed religious anthems on those very models which their progenitors had chanted in the east.

The language of the Greeks was yet rugged and unpolished; their first care was to render it more soft and more flexible. They enriched it with words, and gave it tone suited to the offices of religion; and these we imagine were chiefly imported from the east. Homer everywhere mentions a distinction between the language of gods and men. The language of gods imports the eternal oracles of the divinities; and treating of the ceremonies of religion; the language of men intimates the ordinary civil dialect which sprang from the mixed dialects of the country. The priests, no doubt, concurred in promoting this noble and important purpose. From this source the following toasts drew the rudiments of their art; and from these last the vulgar deduced the elements of polished style.

To these Ἀστέρες of the superior order we would ascribe those changes mentioned in the preceding part of this inquiry, by which the Greek tongue acquired that variety and flexibility, from which two qualities it has derived a great share of that ease, beauty, and versatility, by which it now surpasses most other languages. The diversity of its terminations furnishes a most charming variety, while at the same time the sense is communicated to the reader or hearer by the relation between them. By this economy the poet and the orator are left at liberty to arrange their vocables in that order which may be most soothing to the ear, and best adapted to make a lasting impression on the mind.

Few colonies have emigrated from any civilized country without a detachment of priests in their train. The supreme powers, whoever they were, have always been worshipped with music and dancing. The Hebrews, Phoenicians, and Egyptians, delighted in their musical and jocund festivals. The priests who attended the Iones, Dores, Æolians, Thébans, Athenians, &c. from the east introduced into Greece that exquisite taste, those delicate musical feelings, which distinguished the Greeks from all the neighbouring nations. Hence that numerous race of onomotopæans, by which the Greek language is invested with the power of expressing almost every passion of the human soul, in such terms as oblige it to feel and actually to assimilate to the passion it would excite. Numberless instances of this occur in every page of Homer, Hesiod, Pindar, Sophocles, Euripides, and even of Aëtio-phantas; to quote instances would be to insult the Greek student.
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Every body knows that the practice of writing in verse was antecedent to the date of prose composition. Here, then, the Greek and the ministrers of religion chiefly displayed their skill and discernment. By a judicious mixture of short and long syllables; by a junction of consonants which naturally slide into each other; by a careful attention to the rhythm, or harmony resulting from the combination of the syllables of the whole line—they completed the metrical tone of the verse, guided by that delicacy of musical feeling of which they were possessed before rules of poetry were known among men.

Much liberty was certainly used in transposing letters, in varying terminations, in annexing prefixes and suffixes, both to nouns and other kinds of words where such adjuncts were possible; and upon this occasion we think it probable, that those particles of which we have spoken above were inferred like filling stones thrust in to stop the gaps or chinks of a building. Verses were then clumsy and irregular, as the quantity of vowels was not duly ascertained, and the collision of heterogeneous consonants not always avoided. Probably these primitive verses differed as widely from the finished strains of Homer and his successors, as those of Chaucer and Spencer do from the smooth polished lines of Dryden and Pope.

The poetical compositions of the earliest Greeks were not, we think, in the hexameter style. As they were chiefly calculated for religious services, we imagine they resembled the Hebrew iambics preserved in the song of Aaron and Miriam, Deborah and Barak, Psalms, Proverbs, &c. which were indeed copied by the Egyptians. And the Hyperborean damsels used to visit Delos where they chanted sacred hymns in honour of the Delian god.

Homer and indeed the hymns commonly annexed to the Odyssey, and Iliad, are his composition. Hesiod's Theogony is too well known to need to be mentioned. From these inferences we hope it appears, that the origin of the poetry of Greece is to be found in the temples; and that there, its measure, numbers, rhythm, and other appendages were originally fabricated.

The Grecian poets, however, enjoyed another advantage which that class of writers have seldom possessed, which arose from the different dialects into which their language was divided. All those dialects were adopted indifferently by the prince of poets; a circumstance which enabled him to take advantage of any word from any dialect, provided it suited his purpose. This, at the same time that it rendered verification easy, diffused an agreeable variety over his composition. He even accommodated words from Macedonia, Epirus, and Illyricum, to the purposes of his verification: Besides, the laws of quantity were not then clearly ascertained; a circumstance which afforded him another convenience. Succeeding poets did not enjoy these advantages, and consequently have been more circumstanced both in their diction and numbers.

The Greek language, as is generally known, was divided into many different dialects. Every sept, or petty canton, had some peculiar forms of speech which distinguished it from the others. There were, however, four different dialectical variations which carried it over all the others. These were the Attic, Ionic, Eolic, and Doric. These four dialectical divisions originated from the different countries in the east from which the tribes respectively emigrated. The Attics confided, 18, of the barbarous aborigines; 2d, of an adventurous colony of Egyptian Saites; 3d, a branch of Ionians from the coast of Palestine. These last formed the old Ionian dialect, from which sprang the Attic and modern Ionians. The Eolians emigrated from a different quarter of the same coast; the inhabitants of which were a remnant of the old Canaanites, and consequently different in dialect from the two first mentioned colonies. The Doric sprung from an unpolished race of purple fitters on the same coast, and consequently spoke a dialect more coarse and rustic than any of the rest. These four nations emigrated from different regions; a circumstance which, in our opinion, laid the foundation of the different dialects by which they were afterwards distinguished.
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It is impossible in this short sketch to exhibit an exact view of the distinguishing features of each dialect. Such an analysis would carry us far beyond the limits of the article in question. For entire satisfaction on this head, we must refer the Grecian student to Mau- tair's Grecia Lingua Dialetiis, where he will find every thing necessary to qualify him for understanding that subject. We shall content ourselves with the few observations following.

The Athenians being an active, brisk, volatile race, delighted in contradictions. Their style was most exquisitely polished. The most celebrated authors who wrote in that dialect were the following: Plato, Thucydides, Xenophon, Demosthenes, and the other orators; Alcbylus, Euripides, Sophocles, Aristophanes, Menander Diphilus, with the other comic and tragic poets. That dialect was either ancient or modern. The ancient Attic was the same with the Ionic; but when that nation emigrated from Attica and settled on the coast of Asia Minor, they mingled with the Carians and Pelagi and of course adopted a number of their vocables. They were an indolent, luxurious, and indif­folute people; of course their style was indeed easy and flowing, but verbose, redundant, and without nerves. This, however, is the leading style in Homer; and after him a prodigious number of writers on every subject have used the same dialect, such as Herodotus of Halicarnassus the celebrated historian; Ctesias of Cyndus the historian of Persia and India; Hecateus of Miletus; Megasthenes the historian, who lived under Seleucus Nicanor; Hippocrates the celebrated physician of Coos; Hellenicus the historian often mentioned with honour by Polybius; Anacreon of Teius; Alcaeus, Sappho of Lesbos, excellent poets; Pherecydes Syrus the philosopher, and a multitude of other persons of the same profession, whom it would be superfluous to mention upon the present occasion.

The Aeolic and Doric were originally cognate dialects. When the Dorians invaded Peloponnesus and settled in that peninsula, they incorporated with the Aeolians, and their two dialects blended into one produced the new Doric. The original Doris inhabited a rugged mountainous region about Ota and Pindus, and spoke a rough unpolished language similar to the Grecian which they inhabited. Andreas Schottus, in his observations on poetry, proves from an old manuscript of "Theocratis, that there were two dialects of the Doric tongue, the one ancient and the other modern; that this poet employed Ionic and the modern Doric; that the old Doric dialect was rough and cumbrous; but "the Theocratis has adopted the new as being most soft and mellow." A prodigious number of poets and philosophers wrote in this dialect, such as Epicharmus the poet; Ibycus, the poet of Rhegium; Corinna the poetess of Thebes; Pherecydes of Thebes; and Corinthus, who bore away the prize of poetry from Pindar; Eurynna the poetess of Lesbos; Molochus the poet of Smyrnae; and the most eminent of the Pythagorean philosophers. Few historians wrote in that dialect; or if they did, their works have not fallen into our hands. Most of the hymns sung in temples of the gods were composed in Ionic; a circumstance which evinces the antiquity of that dialect, and which, at the same time, proves its affinity to the oriental standard.

After that the Greek tongue was thoroughly poli­shed by the steps which we have endeavoured to trace in the preceding pages, conscious of the su­perior excellence of their own language, the Grecians, in the pride of their heart, figmatized every nation whose dialect did not employ their language with the con­sequences of that tempestuous title of barbarians. Such was the delicacy of their pampered ears, that they could not endure the unmusical voice of the people whom they called Barbarians. The Athenians had preserved the Ionian dialect; and, ad, it prevented their learning the languages of the call, the knowledge of which would have opened to them an avenue to the records, annals, antiquities, laws, customs, of the people of those countries, in comparison of whom the Greeks themselves were of yesterday, and knew nothing. By this unlucky bias, not only they, but even we who derive all the little knowledge of antiquity we possess through the channel of their writings, have suffered an irreparable injury. By their transformation of oriental names they have in a manner fopped the channel of communication between the histories of Europe and Asia. This appears evident from the fragment of Ctesias' Persian history, from Herodotus, Xenophon, and all the other Grecian writers who have occasion to mention the intercourse between the Greeks and Persians. 3d, it deprived them of all knowledge of the etymology of their own language, without which it was impossible for them to understand their words, philology, and idioms, to the bottom. We mentioned Plato's Cratylus above. In that dialogue, the divine philosopher endeavours to investigate the etymology of only a few Greek words. His deductions are absolutely childish, and little superior to the random conjectures of a school boy. Varro, the most learned of all the Romans, has not been more successful. Both stumbled on the very threshold of that useful science; and a scholar of very moderate proficiency in our days knows more of the origin of these two noble lan­guages, than the greatest adepts among the natives did in theirs. By prefixes, affixes, transpositions of letters, new conjunctions of vowels and consonants for the sake of the music and rhythm, they have falsi­gued their words, that it is almost impossible to de­velop their original. As a proof of this, we remember to have seen a manuscript in the hands of a private person where the first twelve verses of the Iliad are carefully analyzed, and it appears the transposition that almost every word may be, and actually is, traced back to a Hebrew, Phoenician, Chaldæan, or Egyptian origin, and we are convinced that the same process will hold good in the like number of verses taken from any of the most celebrated poets of Greece. This investigation we found was chiefly con­ducted by reducing the words to the original invariable state, which was done by stripping them of

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The imperfections, however, are counterbalanced by numberless excellencies: and we are certainly much more indebted to that incomparable people for the information they have transmitted to us than is either to their writings, so as not to convey to us and themselves more authentic and more ample communications of ancient events and occurrences. Without fatiguing our readers with superfluous encomiums on a language which has long ago been extolled perhaps to an extravagant degree by the labours of men of the most enlarged capacity and the most refined taste, we shall now proceed to make a few observations on spiritus asper and lenis; which being rather appendix than essentials of the language, we have on purpose reserved for the last place.

Every word in the Greek language beginning with a vowel is marked with a spirit or breathing: This accent is double, namely lenis et asper, "the gentle and rough or aspirated." The gentle accent, though always marked, is not now pronounced, though in the earliest periods of the language it was undoubtedly enounced, though very softly. Both these aspiratives were imported from the east. They were actually the Hebrew ח and נ ל. The former denoted the spiritus lenis, and the latter the spiritus asper. The Hebrew prefixed ל or ל to words beginning with a vowel, and of course the Greeks followed their example. These people seem to have delighted in aspirates; and of consequence the latter כ, is, some think, raised off the penult, or penultimate syllable, of their words. Every word beginning with כ had the aspirate joined to כ, probably with a design to render the accent fuller more rough.

The Greek accents are three in number; the acute, the grave, and the circumflex. The acute accent and sharpens the voice; the grave depresses and flattens it; the circumflex first raises and sharpens the voice, and then depresses and flattens it. It is obviously composed of the other two. The learned author of the Origin and Progress of Language has taken much pains to prove that these accents were actually musical notes, invented and accommodated to raise, depress, and infund the voice, according to a scale of musical proportions. It is scarce possible, we think, for a modern Greek scholar to comprehend distinctly the ancient theory of accents. These the native Greeks learned from their infancy, and that with such accuracy, that even the vulgar among the Athenians would have huffed an actor who addressed off the stage or wrote off the punctuation, on account of a few mistakes in the enunciation of these notes.

These elevations, depressions, and infusions of the voice upon certain syllables, must have made their language found in the ears of foreigners somewhat like recitative, or something nearly resembling cant. But the little variety of these syllabic tones, and the voice not resting upon them, but running them on without intermission, sufficiently distinguished them from music or cant. Be that as it may, we think it highly probable, that the wonderful effects produced by the harangues of the orators of Greece on the enraptured minds of their hearers, were owing in a good measure to those artificial musical tones by which their syllables were so happily diversified.

To this purpose we shall take the liberty to transcribe a passage from Dion. Halic. De Structura Orat. in, which we find translated by the author of the Origin and Progress of Language, vol. ii, book 3d, chap. 7, page 381. "Rhetorical composition is a kind of music differing only from long or instrumental music, in the degree, not in the kind; for in this composition the words have melody, rhythm, variety or change, and what is proper or becoming; so that the ear in itself, as well as in music, is delighted with the melody, moved by the rhythm, is fond of variety, and defines with all these what is proper and fitable. The difference, therefore, is only of greater and less."

With respect to accents, it may be observed that only one syllable of a word is capable of receiving the acute accent, however many there be in the word. It was thought that the raising the tone upon more than one syllable of the word, would have made the pronunciation too various and complicated, and too like chantling.

The grave accent always takes place when the acute is wanting. It accords with the level of the discourse; whereas the acute raisizes the voice above it.

The circumflex accent being composed of the other two, is always placed over a long syllable, because it is impossible hirt to elevate the voice and then to depress it on a short one. Indeed among the Greeks a long syllable was pronounced like two short ones; and we apprehended it was sometimes written fo expressively. It is altogether obvious from two learned Greek authors, Dion. Halic. and Aniclis xenus, that the Greek accents were actually musical notes, and that these tones did not consist of loud and low, or simply elevating and depressing the voice, but that they were uttered in such a manner as to produce a melodic rhythm in discourse.

In a word, the acute accent might be placed upon any syllable before the antepenult, and rise to a fifth in the diatontical scale of music; the grave fell to the third below it. The circumflex was regulated according to the measure of both, the acute always preceding. The grave accent is never marked except over the last syllable. When no accent is marked, there the grave always takes place. Some words are called enclitcs. These have no accent expressed, but throw it back upon the preceding word. The circumflex, when the last syllable is short, is often found over the penult, but never over any other syllable but the last or the last but one.

The ancient Greeks had no accentual marks. They had no accentual marks. They learned them in modifications of voice by practice from their infancy; and we are assured by good authority, that in pronunciation they observe them to this day. The accentual marks are said to have been invented by a famous grammarian, Aristophanes of Byzantium, keeper of the Alexandrian library under Ptolemy Philopater, and Epiphanes, who was the first likewise who is supposed to have invented punctuation. Accentual marks, however, were not in common use till about the 7th century; at which time, they are found in manuscripts. If our curious readers would wish to enter more deeply into the theory of accents, we must
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must revert to *Origin of Language*, vol. ii. 1. 2, and to Mr. Fuller's *Essay* on the different nature of Accent and reception from the munificent family of the Yall: etc. etc. language.

**(Greek)**

The language we have selected will be a fit to lead us into the depths of this excellent language, will endeavour to be thoroughly acquainted with the books after mentioned.

Aristotle's *Rhetoric* and *Poetics*, his book *De Interpretatione*, especially with Ammonius's Commentary. Ammonius was a native of Alexandria, and by far the most acute of all the ancient grammarians.

Longinus, the prince of critics, whose remains are above commendation. Theodorus Gaza, and the other refugees from Constantinople, who found an hospitable reception from the munificent family of the Medici, and whose learned labours in their native language once more revived learning and good taste in Europe. These, with some other critics of less celebrity, but equal utility, will unlock all the treasures of Greek erudition, without however disclosing the source from which they flowed. To these one might add a few celebrated moderns, such as Monf. Fourier the Elder, Monf. Gebelin, Abbé Pezron, Salmasius, and especially the learned and industrious Lord Monboddo.

We shall now give a very brief account of the vast extent of the Greek language even before the Macedonian empire was erected: at which period, indeed, it became in a manner universal, much more than ever the Latin language could accomplish notwithstanding the vast extent of the Roman empire.

Greece, originally Hellas, was a region of small extent, and not sent our numerous colonies into different parts of the world. These colonies carried their native language along with them, and indulgently diffused it wherever they formed a settlement. The Iones, Eoles, and Dorics, polished themselves of all the west and north-west coast of the Leifer Atra and the adjacent islands; and there even the barbarians learned that polished language. The Greek colonies extended themselves along the south coast of the Euxine sea as far as Sinope, now Tbizond, and all the way from the west coast of Asia Minor; though many cities of barbarians lay between, the Greek tongue was understood and generally spoken by people of rank and fashion.

There were Greek cities on the north coast of the Euxine sea to the very eastern point, and perhaps beyond those limits; likewise in the Tailvia Cher-ponenis, or Crim Tartary; and even to the mouth of the Danube, the straits of Caffia, &c. In the neighbourhood of all these colonies, the Greek language was carefully propagated among the barbarians, who carried on Commerce with the Greeks.

A great part of the south of Italy was planted with Greek cities on both coasts; so that the country was denominated Magna Graecia. Here the Greek tongue universally prevailed. In Sicily it was in a manner vernacular. The Ionians had sent a colony into Egypt in the reign of Piaimmitichus; and a Greek settlement had been formed in Cyrena many ages before. The Phocians had built Maffilia or Marsellus as early as the reign of Cyrus the Great, where some remains of the Greek language are still to be discovered. Cæfar tells us, that in the camp of the Helvetii regiments were found in Greek letters. Perhaps no language ever had so extensive a spread, where it was not propagated by the law of conquest.

The Greek tongue, at this day, is confined within very narrow limits. It is spoken in Greece itself, except at Ephesus, and the western parts of Macedonia, present. It is likewise spoken in the Greek and Asiatic islands in Canda or Crete, in some parts of the coast of Asia Minor, and in Cyprus: but in all these regions, it is much corrupted and degenerated.

As a specimen, we shall infer a modern Greek song, and the advertisement of a quack medicine, which, with other plunder, was brought by the Russians from Coschim or Chaton in 1772.

**Song in modern Greek.**

Μα δυνασικα πολιτικα με δαντια ως το λεμο
*Ελληνικα, και αντιειλει, και πα τα' κατοικο*
Στην επαγγειλα με καταληκτων καιριων
*Ματα και ελαζον εσχατε και εντοιλη.*
Μη γίνεται πολυλατει και μω μησηι ανεκοτροκων.

Θεασαι φυσικοι, σηλον αριθμοι.

*Οσο αριθμοι και φορα με εραγισμαι παντα.*

Σοιο και ελαζοντων και εντοιλητη ημεριων,

και τα πολυ με ανεκοτρο, τα ίσα με ματια μεταροι.

*Πα και ελαζοντων ημεριων παντα ανεκοτρων.*

**Translation.**

With dire misfortunes, pains and wees,
O'erwhelm'd ingulph'd, I struggle fight;
O'er my frail bark proud billows close
To plunge her deep in lasting night.
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Rough seas ofills incessant roar,
Fierce winds adversive, with howling blasts,
Heave surge on surge. Ah! far from shore
My found'ring skiff shall flack at last.
Involved in low'ring darksome clouds,
"Mid sultry fogs, I print for breath;
Huge raining billows rend my shrouds,
While yawning guths extend beneath.
From bursting clouds loud thunders roll,
And deaf'ning peals terrific spread;
"Guide me to pleasures or other joys,
And fores, to obstructions.
When shall the friendly dawning rays
In dark despair,
"All this and much more, it is said to do in a wonderful manner;
And is declared to be the true royal balsam of Jerusalem, and an universal specific.
It is indeed next to a miracle that so many monuments of Grecian literature are still to be found among men.
Notwithstanding the burning of the famous library of Alexandria, and the almost numberless wars, massacres, and devastations, which have from time to time in a manner defolated those countries where the Greek language once flourished; we are told that there still remain about 3000 books written in that language.

We shall now conclude this section with a brief detail of the most distinguished stages and variations through which this noble tongue made its progress from the age of Homer to the taking of Constantinople, an. p. 683 Chr. 1453, a period of more than 2000 years.

Homer gave the Greek poetry its colour and consistency, and enriched as well as harmonized, the language. It seems, from the coincidence of epithets and cadence in Homer and Hesiod, that the Greek heroic verse was formed spontaneously, by the old Aeneas, a sort of improvisatori; and that Homer and his first followers adopted their versification. The Iliad and Odyssey have much of the air of extempore compositions; an epithet is never wanting to fill up a verse; and a jest of expressions are mechanically annexed to such ideas as were of frequent recurrence. Hence that copiousness and wealth of words in the old Greek bard, which forms such a contrast to the condensed and laboured composition of Virgil.

The Greek prose was of a more difficult structure; and it may be divided into different styles or degrees of purity. Of the prose authors now extant, the first and best style is that of Herodotus, and of Plato in the florid or mixed kind, of Xenophon in the pure and simple, of Thucydides and Demosthenes in the aueter. Nothing, perhaps, is so conducive to form a good taste in composition as the study of these writers.

The style of Polybius forms a new epoch in the history of the Greek language: it was the idiotic or popular manner of expression, especially among military men, in his time, about the 150th Olympiad. It became the model of succeeding writers, by introducing a more studied expression, and by emancipating them from the anxious labour of the old Greeks respecting the cadence and choice of words. The style of the New Testament, being plain and popular, frequently resembles that of Polybius, as has been shown by Raphelius, and by Kirchmaier, de parallelismo. N. T. et Polybi, 1725.

Before this historian, the Alexandrian Jews had formed a new or Hellenistic style, resulting from the expression of oriental ideas and idioms in Greek words, after that language had lost of its purity, as it gained in general use by the conquests of Alexander. The Hellenistic is the language of the Septuagint, the Apocrypha, the New Testament, and partly of Philo and Josephus. This mixture in the style of the evangelists and apostles, is one credential of the authenticity of the books of all kinds, a book which could not have been written but by Jewish authors in the first century. See the fine remarks of Bishop Warburton, Doctrine of Grace, book i. ch. 8—10. Critics lose their labour in attempting to adjust the Scripture-Greek to the standard of Atticism.

The diction of the Greek historians, and geographers of the Augustan age, is formed on that of Polybius; but improved and modernized, like the English of the present age, is compared by that of Claudian or Bacon. More periphrastic than refined, it was well suited to such compilations as were then written by men of letters, such as Dionysius, Dio-

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The Greek Language.

Rough seas of ills incessant roar,
Fierce winds adversive, with howling blasts,
Heave surge on surge. Ah! far from shore
My found'ring skiff shall flack at last.
Involved in low'ring darksome clouds,
Mid sultry fogs, I print for breath;
Huge raining billows rend my shrouds,
While yawning guths extend beneath.
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And deaf'ning peals terrific spread;
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The ecclesiastical style was cultivated in the Christian schools of Alexandria, Antioch, and Constantinople; rank and luxuriant, full of oriental idoms, and formed in a great measure on the Septuagint version. Such is, for instance, the style of Euthus. After him, the best Christian writers polished their compositions in the schools of rhetoric under the Sophists. Hence the popular and flowing purity of St. Chrysostome, who has more good sense than Plato, and perhaps as many good words.

On the Greek of the Byzantine empire, there is a good dissertation by Ducange, de causis corruptae Graecitatis, prefixed to his Glossary, together with Portius's Grammar of the modern Greek. This last stage of the Greek language is a miserable picture of Turkish barbarism. And, which is most surprising, there is no city of Greece where the language is more different from the ancient than at Athens. The reason of that is, because it has been long inhabited by a mixed multitude of different nations.

To conclude, the Greeks have left the most durable monuments of human wisdom, fortitude, magnificence, and ingenuity, in their improvement of every art and science, and in the finest writings upon every subject necessary, profitable, elegant, or entertaining. The Greeks have furnished the brightest examples of every virtue and accomplishment, natural or acquired, political, moral, or military; they excelled in mathematics and philosophy; in all the forms of government, in architecture, navigation, commerce, war: as orators, poets, and historians, they stand as yet unrivalled, and are like to stand so for ever; nor are they less to be admired for the exercises and amusements they invented, and brought to perfection, in the institution of their public games, their theatres, and sports.

Let us further observe, that in vain our readers will look for these admired excellencies in any of the best translations from the Greek; they may indeed communicate some knowledge of what the originals contain; they may present you with propositions, characters, and events; but allowing them to be more faithful and more accurate than they really are, or can well be, still they are no better than copies, in which the spirit and luftre of the originals are almost totally lost. The mind may be intruited, but will not be enchantcd: The picture may bear some faint resemblance, and if painted by a masterly hand give pleasure: but who would be satisfied with the canvas, when he may possess the real object? who would prefer a piece of coloured glass to a diamond? It is not possible to preserve the beauties of the original in a translation. The powers of the Greek are vastly beyond those of any other tongue. Whatever the Greeks describe is always felt, and almost seen; motion and music are in every tone, and enthusiasm and incantation posses the mind:

Grain ingenium, Graias dedit ore rotundo,
Musis loqui.
Hor.

This language, like every other spoken by barbarians, was in its beginning rough and uncultivated. What people the Romans were, is a point in which antiquarians are not yet agreed. In their own opinion they were sprung from the Trojans; Dion. Halicarn. derives them from the Greeks; and Ptolemy informs us that some people imagined that they were sprung from the Pelasgi. The fact is, they were a mixture of the people collected out of Latians and the adjacent parts, which a variety of accidents had drawn together, to eke out themselves on that mountainous region, in order to secure their own property, and plunder that of their neighbours. They were in all probability composed of Arcadians, Sabines, Latins, Hetrucans, Umbrians, Oicans, Pelasgi, &c; and if so, their language must have been a mixture of the different dialects peculiar to all these discordant tribes.

The Latin language ought then to be a mingled mass of the Arcadian, that is, the Eolian § Greek, § Strabo, the Pelasgic, Hetrecuan, and Celtic dialects. These jarring elements, like the people to whom they belonged respectively, gradually incorporated, and produced what was afterwards called the Latin tongue.

The Arcadians were a Pelasgic tribe, and consequently spoke a dialect of that ancient Greek produced by the coalition of this tribe with the savage aborigines of Greece. This dialect was the groundwork of the Latin. Every scholar allows, that the Eolian Greek, which was strongly tintured with the Pelasgic, was the model upon which the Latin language was formed. From this dedication it appears, that the Latin tongue is much more ancient than the modern Greek; and of course we may add, that the Greek, as it stood before it was thoroughly polished, bore a very near resemblance to that language. Hence we think we may conclude, that the knowledge of the Latin language is necessary in order to understand the Greek. Let us not then expect to find the real ingredients of the Greek tongue in the academic groves of Athens, or in Smyrna, or in Rhodope, or in Harns; but on the banks of the Tiber and on the fields of Laurentum.

A very considerable part of the Latin tongue was derived from the Hetrucan. That people were the masters of the Romans in every thing sacred. From them they learned the ceremonies of religion, the method of arranging games and public festivals, the art of divination, the interpretation of omens, the method of lustrations, expiations, &c. It would, we believe, be easy to prove, that the Pelasgi * and Hetruci were the same race of people; and if this be the case, their languages must have differed in dialect only.

The Umbrian or Celtic enters deeply into the composition of the Latin tongue. For proof of this, we need only appeal to Pelloutier, Bullet de Memoire de la Langue Celtique, partie premiere, Abbe Peron's Origin...
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Sect. VIII.

Latin Language of ancient Nations, &c. Whether the old Celtic differed essentially from the Pelasgic and Hetruscan, would be a matter of curious investigation, were this a proper subject for the present article.

The Latin abounds with oriental words, especially Hebrew, Chaldaic, and Persian. There are certainly remains of the Pelasgic and Hetruscan tongues, spoken originally by people who emigrated from regions where there were parts of the vernacular language. The Greeks, in polishing their language, gradually distorted and disguised vocal numbers of the rough eastern vocabularies, which made a very great part of it. (See the preceding section.)

The Romans, of less delicate organs, left them in their natural state, and their natural air readily betrayed their original. We had collected a large list of Latin words still current in the east; but find that Thomas Chaffery, Dacier, &c. and Ogerius (v), and especially Mons. Geberlin, in his most excellent Latin Dictionary, have rendered that labour superfluous.

In this language, too, there are not a few Gothic terms. How these found their way into the Latin, it is not easy to discover, unless, as Pelloutier supposes, the Celtic and Gothic languages were originally the same, or perhaps we may conjecture, that such words were parts of a primitive language, which was at one time universal.

There are, besides, in the Latin a great number of obsolete Greek words, which were in process of time obliterated, and others sublimated in their room; so that, upon the whole, we are persuaded, that the most effectual method to distinguish the difference between the early and modern Greek, would be to compare the ancient Latin with the latter; there being, we imagine, very little difference between the ancient Greek and Latin in the earliest periods.

However that may be, it is certain that the Roman letters were the same with the ancient Greek. — Forma literis Latinis que veterem Gracorum, says Tacitus; and Pliny; says the same thing, and for the truth of his assertion he appeals to a monument extant in his own times.

These old Greek letters were no other than the Pelasgic, which we have known from Diodorus Siculus (see preceding section) to have been prior to the Cadmean. For the figure of these letters, see Atich, Potelinus, Montfaucon, Palsgraphia Graeca, Monf. Geberlin, and our Plates IX and X.

That the Latins borrowed the plan of their declensions from the Greeks, is evident from the exact resemblance of the terminations of the cases throughout the three similar declensions. In nouns of the first declension the resemblance is too palpable to stand in need of illustration. In the second, the Greek genitive is in s, in Latin the s is thrown out, and the termination becomes s. In the Greek section, we have observed, that the sounds of s and v differed very little; therefore the Latins used s instead of v. The Latin dative ends in s, which is the Greek dative, throwing away a subscriptum, which was but faintly founded in that language. No genuine Greek word ended in m or n.

The Hellens seemed to have abhorred that bellowing liquid; it is, however, certain that they imported it from the east, as well as the other letters, and that they employed it in every other capacity, except that of closing words. In the termination of femons, they changed it into s.

The Latins retained m, which had been imported to them as a terminating letter at an era before the Greek language had undergone its last refinement. Hence the Latin accusative in m, instead of the Greek s.

The vocative case, we imagine, was in this declension originally like the nominative. The Latins have no dual number, because, in our opinion, the Etruscan dialect from which they copied, had none. It would be, we think, a violent stretch of etymological exertion, to derive either the Latin genitive plural of the second declension from the same case of the Greek, or that of the latter from the former; we therefore leave this anomaly, without pretending to account for its original formation. The third declensions in both languages are so exactly parallel, that it would be superfluous to compare them. The dative plural here is another anomaly, and we think a very disagreeable one, which we leave to the conjectures of more profound etymologists.

For the other peculiarities of Latin nouns, as they are nearly similar to those of the Greek, we must beg leave to remit our readers to that section for information.

The Latins have no articles, which is certainly a deficiency in their language. The Pelasgic, from which they copied, had not adopted that word in the demonstrative sense. Homer indeed seldom uses it; and the probability is, that the more early Greek used it less frequently, at least in the senes above-mentioned. Thus in Latin, when I say, video hominem, it is impossible to find out by the bare words whether the word hominem intimates "a man," or "the man;" whereas in Greek it would be οἱ ἄνθρωποι, I see a man, οἱ ἄνθρωποι, I see the man. Hence the first expression is indefinite, and the second definite.

The substantivum sium in Latin seems to have origin of partly formed from the Greek and partly not. Some of the substanti-
and præterperfect have nothing common with the Greek verb, and cannot, we think, be forced into an alliance with it. The future erat was of old ek, and is indeed genuine Greek. Upon the whole, in our apprehension the Latin sublative verb more nearly resembles the Persian verb byffen than that of any other language we are acquainted with.

From what exemplar the Latin verbs were derived, is not, we think, easily ascertained. We know that attempts have been made to deduce them all from the Εὐλογίας, that and the Romans themselves were extremely fond of this chimera; but the almost numberless irregularities, both in the formation and conjugation of these verbs, induce us to believe that only a part of them were formed upon that model. We are apt to think that the terminations inbam, bat, batum, &c. are produced by their union with a fragment of some obsolete verb, which is now wholly lost. The verb am, e.g., is areal that the radix am is the Hebr. word mother; but how am, ame, am-arem were fabricated, and connected with the radical am, we is not so easily determined. That Latin verbs are composed of an inflexible radix and another verbal form, as well as the Greek, cannot be doubted; but what this flexible auxiliary was, we think, cannot now be clearly ascertained. It is not altogether improbable that such parts of the verbs as deviate from the Greek archetype were supplied by fragments of the verb ba, which pervades all the branches of the Gothic language, and has, we think, produced the Latin verb habeo. When the Greeks began to etymology, they seldom overpassed the verge of their own language; the Latins pursued nearly the same course. If their own language presented a plausible etymology, they embraced it; if not, they immediately had recourse to the Greek; and this was the nec plus ultra of their etymological researches. Cicero, Quintilian, Festus, &c. and even Varro, at least of all the learned Romans, stop here; all beyond is either doubt or impenetrable darkness. The opinion above-mentioned we offer only as a conjecture; the decision we leave to more able critics.

The want of aeris or indefinite tenses seems to us a palpable defect in the Latin language. The use of these among the Greek enabled the writer to express the specific variations of time with more accuracy and precision than the Latins, who never attempted to specify them by any other tenses but the imperfect and pluperfect. Indeed we should imagine, that both the Greeks and Latins were much inferior to the English in this respect.

The Latin word ets, for example, may be translated into English three different ways: 1st, I read; 2d, I do read; 3d, I am reading. The Latins, in reducing verbs to their four conjugations, formed their inflexions in a very irregular manner. Many verbs of the first class inflect their præterite and futine like those of the second; thus domo, instead of giving ovui and atum, has ui and utum, like monui and monitum. Again, not a few verbs of the third conjugation have ousi and utum, as if they belonged to the fourth; e.g. peto, pevis, petium. Then, some verbs have ous in the present, ousi in the præterite, and utum in the future, while, contrary to the rules of analogy, they in reality belong to the third; such are capito, capitum, capiuit, capueri, &c. Some verbs of the second conjugation have their præterite and futine as if they belonged to the third; thus, jugo, jugi, jugum, jugarum, jugare, auxi, auxum, auxere. Some verbs, which are actually of the fourth conjugation, have their præterite and futine as if they were of the third; thus, festo, festi, festum, festare; haurio, hauris, haurium, haurire, &c. If these are not manifest irregularities, we cannot say what deserves the name. The fact seems to stand thus: The Romans were originally a band of robbers, bankrupts, runaway slaves, shepherds, husbandmen, and peasants, of the most unpollished character. They were engaged in perpetual broils and quarrels at home, and fielded enjoyed peace abroad. Their profession was robbery and plunder. Like old Ithmael, their hands were against every man, and every man's hand against them. In such a state of society no time was left for cultivating the sciences. Accordingly the arts of war and government were their sole profession. This is so true, that their own poet characterizes them in the following manner:

Exsudant a'isi spuria funt ursa, &c.

Another blemish in the Latin tongue is occasioned by its wanting a participle of the præterite tense in the active voice. This defect is perpetually felt, and is the cause of an awkward circumlocution whenever it happens to prevent itself. Thus, “The general having crossed the river drew up his army” Imperator cum tranfisit flumem, accidit infruxit. Here cum tranfisit flumem is a manifest circumlocution, which is at once avoided in the Greek συνελήμενος προδέλεχθη, whi. &c. This must always prove an incumbrance in the case of active intransitive verbs. When ait is demonstrated beyond a doubt by their profession was robbery and plunder. Like old Ithmael, their hands were against every man, and every man's hand against them. In such a state of society no time was left for cultivating the sciences. Accordingly the arts of war and government were their sole profession. This is so true, that their own poet characterizes them in the following manner:

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PHILOLOGY,

I. Latin Language.

Latin neglected to introduce the participle eni into their language. In this we believe they are singular. Here again a circumlocution becomes necessary in such a case as the following: "The Senate being at Rome, passed a decree." Instead of saying fenuus eni Rome, legem iuvat, we are obliged to say cum fenuus Rome, effet, &c. If the words eni or exfens had been adopted, as in the Greek, this obious circumlocution would have been avoided.

Many other defects of the like kind will occur to every person who shall choose to search for them, and those in the most approved classical authors. Perhaps our mentioning so many may be deemed invidious by the admirers of that language; but we write from conviction, and that must be our apology.

If one take the trouble to compare the structure of the Greek and Latin languages, he will, we think, quickly be convinced that their characteristic features are extremely different. The genius of the former seems easy and natural; whereas that of the latter, notwithstanding the united efforts of poets, orators, and philosophers, still bears the marks of violence and restraint. Hence it appears that the Latin language was pressed into the service, and compelled almost against its will to bend to the laws of the Greek model. Take a sentence of Hebrew, Chaldee, Arabian, &c. and try to translate it into Greek without regarding the arrangement of the words, and you will find it no difficult attempt; but make the same trial with respect to the Latin, and you will probably find the labour attended with considerable difficulty. To translate Greek into English is no laborious task; the texture of the two languages is so congenial, that the words and phrases, and even the idiomatic expressions, naturally slide into each other. With the Latin the case is quite otherwise; and before elegant English can be produced, one must deviate considerably from the original. Should we attempt to translate a piece of English into Greek, and at the same time into Latin, the translation of the former would be attended with much less difficulty than that of the latter, supposing the translator equally skilled in both languages.

This incongruity seems to spring from the following cause. Before any man of considerable abilities, either in the capacity of a poet, grammarian, or rhetorician, appeared at Rome, the language had acquired a strong and inflexible tone, too stiff to be exactly moulded according to the Greek standard. After a language has continued several centuries without receiving a new polish, it becomes like a tall grown tree, incapable of being bent to the purpose of the mechanic. For this reason, it is highly probable, that the tongue in question could not be forced into a complete assimilation with the Greek. Notwithstanding all these obstructions, in process of time it arrived at such an exalted pitch of perfection, as to rival, perhaps to excel, all the other European languages, the Greek only excepted. Had men of the same, judgment, and industry of Ennius, Plautus, Terence, Cicer, and the worthies of the Augustan age, appeared in the early phases of the Roman commonwealth, we may believe that their language would have been thoroughly reduced to the Grecian archetype, and that the two dialects might have improved each other by a rivalship between the nations who employed them.

Without pretending to entertain our readers with a pompous and elaborate account of the beauties of that imperial language which has been detailed by writers almost without number, we shall endeavour to lay before them as briefly as possible its primitive character, the steps and phases by which it gradually rose to perfection, the period when it arrived at the summit of its excellence, and by what means it degenerated with a rapid career till it was lost among those very people to whom it owed its birth.

We have observed already, that the Latin language was a collection of all the languages spoken by the various grand people who composed the first elements of that mighty republic. The prevailing dialects were the Pelasgic or Paeligic, and Celtic, which we think were the same; and the Grecian archetype, and that the two languages above-mentioned. Who those first Romans were, we believe it is impossible to determine with any degree of certainty. The Roman historians afford us as little information upon that subject, as their etymologists do upon the origin of their language. Their most celebrated writers upon this point were Lucius Gallus, Quintus Cornificlius, Nonius Marcellus, Fellus, and some others of less note. At the head of these we ought to place Terentius Varro, whom Cicerone styles the most learned of all the Romans. From these writers we are to expect no light. Their etymologies are generally childish and fictive. Of the language of the most ancient Romans we can only reason by analogy; and by that rule we can discover nothing more than what we have advanced above.

In the first place we may rest assured that the dual number, the articles, the participle above-mentioned, the aorists, and the whole middle voice, never appeared in the Latin tongue; and accordingly were not current in these languages from which it was copied, at least at the time when it was first fabricated.

Besides all this, many circumstances concur to make it highly probable that, in the earliest periods of the language, very few inflexions were introduced. 1st, When the Pelasgic left Greece, the Greek language itself was not fully polished. 2d, The Arcadians were never thoroughly cultivated. They were a rustic pastoral people, and little minded the refinements of a civilized

For proof of this our readers may consult Abbé Pezon, Pallottier, Bullet's Mem. Gebelin Pref. Diff. Int. and many others.
PHILOSOPHY.

Sect. VIII.

Latin Language.

193 Hence little infected in its original state.

194 Bent afterwards into the Grecian model.

195 The principal authors by whom it was translated. Eudoxus de Origine Ludi. a work often mentioned by the Christian fathers in their disputes with the Pagans. It is sometimes quoted by Cicer. Then followed Caius Lucilius the famous satyrifie, and a number of other writers, such as Accius, Valerius, Zcditus, Alpinus, &c. whose fragments were published by the Stephens, Paris, 1564. All these imitated the writers of Greece or translated from them. By their perseverance and active exertions the spirit of these authors was transfused into the Latin tongue, and its structure accommodated to the Grecian plan. Plautus and Terence, by translating the comedies of Menander and Diphilus into their own language, taught the Latin muse to speak Attic Greek. To speak that language was then the mark of the times, as it is now with us to chaff. French. Greek tutors were retained in every reputable family; and many Romans of the first rank were equally qualified to speak or write both in Greek and Latin. The original jargon or Latin was now become obsolete and unintelligible; and Cato the Ancient confounded to learn the Greek language at 80.

196 The gold-age of Rome.

This treaty, according to the same historian, was concluded in the consulship of Lucius Junius Brutus and Marcus Valerius, 28 years before Xerxes made his descent upon Greece.
his profession; so that one can be delighted with none before him, and admire none except such as have either seen or were seen by that orator."

From this quotation it plainly appears, that the Romans themselves were convinced of the short duration of the golden age of their language. According to the most judicious critics, it commenced with the era of Cicero's oratorical productions, and terminated with the reign of Tiberius, or perhaps it did not reach beyond the middle of that prince's reign. It is generally believed that eloquence, and with it every thing liberal, elevated, and manly, was banished Rome by the deputation of the Caesars. We imagine that the transition was too instantaneous to have been entirely produced by that unhappy cause. Despotism was firmly established among the Romans about the middle of the reign of Augustus; and yet that period produced such a group of learned men as never adorned any other nation for a short space of time. Despotism, we acknowledge, might have affected the eloquence of the bar; the noble and important objects which had animated the republican orators being now no more; but this circumstance could not affect poetry, history, philosophy, &c. The style employed upon these subjects did not feel the fetters of despotism. The age of Louis XIV. was the golden period of the French tongue; and we think that age produced a race of learned men, in every department inferior in number and equal in genius to the literati who flourished under the nobility and envied condition of Britain during the same age, though the latter is universally allowed to have been the golden period of this country. The British Isles, we hope, enjoy still as much liberty as ever; yet we believe few people will aver, that the writers of the present age are equal either in style or in genius to that noble group who flourished from the middle of the reign of Charles I. to the middle of the reign of George II., and here despotism is quite unconcerned.

In the calf the same observation is confirmed. The Persians have long groaned under the Mohamedan yoke; and yet every oriental scholar will allow, that in that country, and under the most galling tyranny, the most amazing productions of talent, genius, and industry, that ever dignified human nature, have been exhibited. Under the Arabian caliph, the successors of Mohammed, appeared writers of a most sublime genius, though never was despotism more cruelly exercised than under those fanatics. The revival of letters at the era of the reformation was chiefly promoted and cherished by petty despotic princes. We cannot therefore be persuaded to agree, that the despotism of the Caesars banished eloquence and learning from Rome. Longinus indeed has attributed this misfortune to that cause, and tells us, ἐπεὶ τὰ γράμματα τα στοιχεία τα Μεγάλα καὶ Εἰκαταρπα, &c. "It is liberty that is formed to nourish the sentiments of great geniuses, to push forward the propriety of contests, to inspire them with hopes, and the generous ambition of being the first in rank." When Longinus wrote this, he did not reflect that he himself was a striking instance of the unfoundedness of his observation.

As to science, the fact is undoubtedly on the other side. That Seneca was superior to Cicero in philosophy, cannot be reasonably contradicted. The latter had read, and actually abridged, the whole extent of Greek philosophy: this displayed his reading rather than his learning. The former had added to himself to the fullest extent; and though he does not write with the same flow of eloquence as Tully, he thinks more deeply and reasons more closely. Pliny's Natural History is a wonderful collection, and contains more useful knowledge than all the writings of the Augustan age condensed into one mass. We think the historical annals of Tacitus, if inferior to Livy in style and majesty of diction, much superior in arrangement and vigour of composition. In short, we discover in these productions a deep insight into human nature, an extensive knowledge of the science of government, a penetration which no dilution could escape, together with a sincere attachment to truth both with respect to events and characters; nor is he inferior in the majesty, energy, and propriety of his harangues, wherever an equal opportunity presents itself. Quintilian, Pliny the younger, Suetonius, Petronius Arbiter, and Juvenal, deserve high eftimation; nor are they inferior to their immediate predecessors. We think there is good reason to conclude, that the loss of liberty among the Romans did not produce the extinction of eloquence, science, elevation of sentiment, or refinement of taste. There were, we believe, other circumstances which chiefly contributed to produce that revolution.

The same Velleius Paternostus whom we have quoted assigns some plausible and very judicious reasons for this catastrophe. "Emulation (says he) is the nurfe of genius; and one while envy, and another admiration, fires imitation. According to the laws of nature, that which is purified with the greatest ardour mounts to the top: but to be stationary in perfection is a difficult matter; and by the same analogy, that which cannot go forward goes backward. As at the outlet we are animated to overtake those whom we deem before us, so when we despair of being able to overtake or to pass by them, our ardour languishes together with our hope, and what it cannot overtake it ceases to pursue; and leaving the subject as already engrossed by another, it looks out for a new one upon which to exert itself. That by which we find we are not able to acquire eminence we relinquish, and try to find out some object elsewhere upon which to employ our intellectual powers. The consequence is, that frequent and variable transitions from subject to subject proves a very great obstacle to perfection in any profession." This perhaps was the case with the Romans. The heroes of the Augustan age had borne away the prize of eloquence, of history, of poetry, &c. Their successors despairs of being able to equal, much less to surpass them, in any of these walks. They were therefore laid under the necessity of striking out a new path by which they might arrive at eminence. Consequently Seneca introduced the fide coupé, as the French call it: that is, a short, sparkling, figurative diction, abounding with antitheses, quintettes, witticisms, embellished with flowers and meretricious ornaments; whereas the style of the Augustan age was natural, simple, solid, unaffected, and properly adapted to the nature of the subject and the sentiments of the author.

The historian Sallust laid the foundation of the unnatural
The natural style above mentioned. Notwithstanding all the excellencies of that celebrated author, he every where exhibits an affection of antiquity, an antiqui-
tical cast, an air of austerity, an accuracy, exactness, and regularity, contrary to that air dégagé which na-
ture displays in her most elaborate efforts. His words, his clauses, seem to be adjusted exactly according to num-
ber, weight, and measure, without excess or defect. Velleius Paterculus imitated this writer; and, as is generally the case with imitators, succeeded best in those points where his archetype had failed most egregiously. Tacitus, however excellent in other re-
sp., c., deviated from the Augustan exemplars, and is thought to have imitated Sallust; but affecting brevity to excess, he often falls into obscurity. The other contemporary writers employ a cognate style; and because they have deviated from the Augustan standard, their works are held in less estimation, and are thought to bear about them marks of degen-
cracy.

That degeneracy, however, did not spring from the despotic government under which these authors lived, but from that affection of singularity into which they were led by an eager but fruitless desire of signa-
лизing themselves in their mode, as their predecessors had done in theirs. But the misch'ies of this rage for innovation did not reach their sentiments as it had done their style; for in that point we think they were so far from falling below the measure of the writers of the former age, that in many instances they seem to have surpassed them.

With regard to sentiment and mental exertions, the authors in question preferred their vigour, till luxury and effeminacy, in consequence of power and opulence, enervated both the bodies and minds of the Romans. The contagion soon became universal; and a slightness, or intellectual torpor, the usual concomi-
tant of luxury, spread indolence over the mental fac-
culties, which rendered them not only averse to, but even incapable of, industry and perseverance. This lethargic disposition of mind seems to have commen-
ced towards the conclusion of the silver age; that is, about the end of the reign of Adrian. It was then that the Roman eagles began to float, and the genius of Rome, as well in arts as in arms, began to decline. Once more, the declension of the intellectual powers of the writers of that nation did not arise from the firm of the government, but from the caues above specified.

As the Roman genius, about that period, began to decline, so the style of the silver age was gradually vitiated with barbarisms and exotic forms of speech. The multitudes of barbarians who flocked to Rome from all parts of the empire; the ambassadors of foreign princes, and often the princes themselves, with their at-
tendants; the prodigious numbers of slaves who were entertained in all the considerable families of the capi-
tal, and over all Italy; the frequent commerce which the Roman armies upon the frontiers carried on with the barbarians; all concurred to vitiate the Latin tongue, and to interlard it with foreign words and idoms. In such circumstances, it was impossible for that or any other language to have continued pure and untainted.

This vitiated character both of style and sentiment became more and more prevalent, in proportion as it defenced from the reign of Adrian towards the era of the removal of the imperial seat from Rome to Con-
stantinople. Then succeeded the iron age, when the Latin language became absolutely rude and barbar-
tous.

Towards the close of the silver, and during the Writers of whole c. urie of the brazen age, there appeared, how-
ever, many writers of no contemptible talents. Their most remarkable was Seneca the noted, the master of the silver and Verse, whose character both as a man and a writer is defcrib'd with great accuracy by the noble author of the 
Chastel rufiis, to whom we refer our readers.

About the same time lived Persius the satirist, the friend and disciple of the note Ccrutus: to whose pre-
cepts, as he did honour by his virtuous life, to his works, though small, shov early a probability in the science of morals.

Under the mild government of Adrian and the Anto-
nines, lived Aulus Gellius, or (as some call him) Agellius; an entertaining writer in the miscellaneous way, well 
mfulled in criticism and antiquity. His works contain a

calvaluable fragments of philosophy, which are in-
deed the most curious parts of them.

With Aulus Gellius we may range Macrobius; not becauce a contemporary (for he is supposed to have lived under Honorius and Theodotus), but from his near resemblance in the character of a writer. His works, like those of the other, are miscellaneous; filled with mythology and anciet literature, with some philo-

Elegant philosophy intermixed.

In the same age with Aulus Gellius flourished Apul-

eus of Madaura in Africa; a Platonic writer, whose

expertise in the arts of life. He is supposed to have written under the government of Adrian and the

Chaste rufis, to whom we refer our readers.

Boethius was descended from one of the noblest of the 

Elegant and deep, a number of ecclesiastical 

Christian age. The Roman authors amount to a very small number in comparison of the Greek. At the same time, when we consider the extent and duration of the Roman empire, we are justly surprized to find fo few writers of character and reputation in so vast a field. We think we have good reason to agree with the prince of 

Upon the whole, the Latin tongue deserves our 

granteur of the people by whom it was spoken;
the virtues of its writers; the empire which it still maintains among ourselves; the necessity we are under of learning it in order to obtain access to almost all the sciences, may even to the knowledge of our own laws, of our judicial proceedings, of our charts; all these circumstances, and many others too numerous to be detailed, render the acquisition of that imperial language in a peculiar manner at once improving and highly interesting. Spoken by the conquerors of the ancient nations, it partakes of all their revolutions, and bears continually their impression. Strong and nervous while they were employed in nothing but battles and carnage, it thundered in the camps, and made the proudest people to tremble, and the most despotic monarchs to bend their flabby necks to the yoke. Culpous and majestic, when, weary of battles, the Romans inclined to vie with the Greeks in science and the graces, it became the learned language of Europe, and by its influence made the jargon of languages disappear which disputed with it the possession of that quarter of the globe. After having controlled by its eloquence, and humanized by its laws, all those people, it became the language of religion. In short, the Latin language will be studied and esteemed as long as good sense and fine taste remain in the world.

Sect. IX. Celtic, Gothic, and Slavonian Languages.

§ 1. Of the Celtic Language.

In treating of the origin of the Latin tongue (see Section VIII.), we observed that a great part of it is derived from the Celtic. We shall now endeavour to give some account of the origin and extent of that ancient language; still leaving the minute to grammars and dictionaries, as we have done with respect to the other dialects which have fallen under our consideration. Our candid readers, it is hoped, will remember, that we are acting in the character of philologers, not in that of grammersians and lexicographers.

The descendants of Japhet having peopled the western parts of Asia, at length entered Europe. Some broke into that quarter of the globe by the north, others found means to cross the Danube near its mouth. Their polterity gradually ascended towards the source of that river: afterwards they advanced to the banks of the Rhine, which they pushed, and thence spread themselves as far as the Alps and the Pyrenean hills.

These people, in all probability, were composed of different families; all, however, spoke the same language; their names and customs bore a near resemblance; there was no variety among them but that difference which climate always introduces. Accordingly they were all known, in the more early times, by the general name of Celts scyeal. In process of time, becoming exceedingly numerous, they were divided into several nations, which were distinguished by different names and territorial appellations. Those who inhabited that large country bounded by the ocean, the Mediterranean, the Rhine, the Alps, and the Pyrenees, were denominated Gauls or Celts. Those people multiplied so prodigiously in the space of a few centuries, that the fertile regions which they then occupied could not afford them the means of subsistence. Some of them now passed over into Britain; others crossed the Pyrenees, and formed settlements in the northern parts of Spain. Even the formidable barriers of the Alps could not impede the progress of the Galls: they made their way into Italy, and colonized those parts which lie at the foot of the mountains; whence they extended themselves towards the centre of that rich country.

By this time the Greeks had landed on the eastern coasts of Italy, and founded numerous colonies in those parts. The two nations vying as it were with each other in population, and always planting colonies in the course of their progress, at length encountered about the middle of the country. This central region was at that time called Latium. Here the two nations formed one society, which was called the Latin people.

The languages of the two nations were blended together; and hence, according to some, the Latin is a mixture of Greek and Gaelic.

As the Galls were a brave and numerous people, they certainly maintained themselves in their pristine polities, uninvaded, unconquered, till their civil animosities and domestick quarrels exposed them as a prey to those very Romans whom they had so often defeated, and sometimes driven to the brink of destruction. They were not a people addicted to commerce; and, upon the whole, considering their situation both in their primary seats and afterwards in Italy, they had little temptation or opportunity to mingle with foreigners. Their language, therefore, must have remained unmixed with foreign idioms. Such as it was when they settled in Gaul, such it must have continued till the Roman conquests. If therefore there is one primitive language now existing, it must be found in the remains of the Gaelic or Celtic. It is not, then, surprising, that some very learned men, upon discovering the coincidence of very great numbers of words in some of the Greek dialects with other words in the Celtic, have been inclined to establish a strict affinity between those languages. The ancient Pelasgi and the Celtic at least must have nearly resembled each other, admitting a dialectical difference only, and that discrimination which climate and a long period of time must always produce.

Some have thought that the Galls lost the use of their native language soon after their country was conquered by the Romans; but Monseur Bickel, in his Mémoires de la Langue Celte, has proved almost to a demonstration, that the vulgar among those people continued to speak it several centuries after that period. When a great and populous nation has for many ages employed a vernacular tongue, nothing can ever make them entirely relinquish the use of it, and adopt unmixed that of their conquerors.

Many learned men, among whom is the lexicographer above mentioned, have shown that all the local names in the north of Italy are actually of Celtic extraction. These names generally point out or describe some circumstances relating to the nature of their situation; such as exposure, eminence, lowness, moitnens, dryness, coldness, heat, &c. This is a very characteristic feature of an original language; and in the Celtic it is so prominent, that the Erse names of places all over Scotland are even to this day, peculiarly distinguished by this quality. We have heard a gentleman, who was well skilled in the dialect of the Celtic still spoken in
The Welsh dialect cannot, we think, be pure and unmodified. The Scythians were conquered by the Romans, to whom they were actually subject for the space of three centuries. During this period, a multitude of Italian exiles must have been transplanted into their language; and indeed many of them are discernible at this day. Their long commerce with their English neighbours and conquerors hath adulterated their language, so that a great part of it is now of an English complexion. The Irish is now spoken by a race of people whose morality and ingenuity are nearly upon a level. Their Latin historians have brought them from the confines of Asia, through a variety of adventures, to people an island extra aures fidei rias. However this genealogical tale may please the people for whom it was fabricated, we must still suspect that the Irish are of Celtic extraction, and that their forefathers emigrated from the western coast of Britain at a period prior to all historical or even traditional annals. Ireland was once the native land of saints. The chief actors in this sacred stage were Romanists, and deeply tintured with the superfluity of the times. They pretended to improve the language of the natives; and whatever the success was, they improved it in such a manner as to make it deviate very considerably from the original Celtic; so that it is not in Ireland that we are to look for the genuine characters of the dialect under consideration.

Though the Hibernian tongue, in our opinion, differs considerably from the original Celtic, some very ingenious essays have been lately published by the learned and laborious members of the Antiquarian Society of Dublin; in which the coincidence of that tongue, with some of the original dialects, has been supported by diverse and plausible arguments. In a dissertation published in the year 1772, they have exhibited a collection of Panico Maltse words compared with words of the same import in Irish, where it must be allowed the resemblance is palpable. In the same dissertation they have compared the celebrated Punic scene in Plautus with its translation into the Irish; in which the words in the two languages are surprizingly similar. If these coincidences are well founded, they will prove that the Celtic is coeval and congenial with the most ancient languages of the east; which we think highly probable. Be that as it may, the Danes and Norwegians formed settlements in Ireland; and the English have long been sovereigns of that island. These circumstances must have affected the vernacular idiom of the natives; not to mention the necessity of adopting the language of the conquerors in law, in sciences, and in the offices of religion.

The inhabitants of the Highlands and islands of Scotland are the descendants of those Britons who fled from the power of the Romans, and sheltered themselves among the fens, rocks, and fastnesses of those rugged mountains and sequestered glens. They preferred these wilds and wilds, with liberty and independence, to the pleasant and fertile valleys of the south, with plenty embittered by slavery. They doubtless carried the language along with them; that language was a branch of the Celtic. With them, no doubt, fled a number of the druidical priests, who unquestionably knew their native dialect in all its beauties and
and varieties. These fugitives in process of time formed a regular government, elected a king, and became a considerable state. They were fequestered by their situation from the rest of the world. Without commerce, without agriculture, without the mechanical arts, and without objects of ambition or emulation, they addicted themselves wholly to the pastoral life as their business, and to hunting and fishing as their diversion. Those people were not distinguished by an innovating genius; and consequently their language must have remained in the same state in which they received it from their ancestors. They received it genuine Celtic, and such they preferred it.

When the Scots became masters of the low country, and their kings and a great part of the nobility embraced the Saxon manners, and adopted the Saxon language, the genuine Caledonians tenaciously retained their native tongue, dreefs, manners, clanships, and feudal customs, and could never cordially affiliate with their southern neighbours. Their language, therefore, could not be polluted with words or idioms borrowed from a people whom they hated and despised. Indeed it is plain from the whole tenor of the Scottish history, that neither Caledonian chieftains, nor their vassals, were ever steadily attached to the royal family after they fixed their residence in the low country, and became Saxons, as the Highlanders called them by way of reproach. Indeed the commerce between them and those of the south, till about a century and a half ago, was only transient and accidental; nor was their native dialect, which has thus been preserved from the Saxon language, by their countrymen.

Thick language, however, did not degenerate, because there existed among them a description of men whose profession obliged them to guard against that misfortune. Every chieftain retained in his family a bard or poet laureat, whose province it was to recite the genealogy and connections of the family; in a word, to amuse and entertain the chief and his guests at all public entertainments and upon all solemn occasions. These professors of the Parnassian art used to vie with each other; and the chiefs of families often assembled their respective bards, and encouraged them by considerable premiums to exert their poetic talents. The victor was rewarded and honoured; and the chieftain deemed it an honour to himself to entertain a bard who excelled his peers. The ancient Gauls, as we learn from Diodorus Siculus, Strabo, Tacitus, Lucas, &c., entertained persons of that profession; and certainly the ancient Britons did the same. Those bards were highly revered; their persons were decked with garlands, and they were always rewarded with victuals in lands or cattle (See feation Greek). Those poetic geniuses must have watched over their vernacular dialect with the greatest care and anxiety; because in their compositions no word was to be lost, but as many gained as possible.

The use of letters was not known among the ancient Celts; their druidical clergy forbade the use of them. All their religious rites, their philosophical dogmas, their moral precepts, and their political maxims, were composed in verses which their pupils were obliged to commit to memory. Accordingly letters were unknown to the Caledonian Scots, till they learned them either from their southern neighbours or from the Romans. The Irish, indeed, pretend to have letters of a very ancient date; the Highlanders of the country in question make no claim to the use of that invention. Their bard, therefore, committed every thing to memory; and of course the words of their language must have been faithfully preferred. We find that the celebrated poems of Ossian, and others of an inferior character, or at least fragments of such poems (see Ossian), have thus been preferred from father to son for more than two hundred years. The beauty, significance, harmony, variety, and energy of these verses, strike us even in a prose translation; how infinitely more charming must they appear in their native form and poetical attire!

In order to exhibit the genius of the Celtic in as striking a light as the nature of our present design will permit, we shall lay before our readers a very condensed sketch of the Gaelic or Caledonian dialect as it now stands; which we hope will go a great way to convince them that this is the genuine offspring of the other. In doing this we shall borrow many hints from a gentleman of the learned society, whose learning seems to equal his zeal for his native language; which, in compliance with the modern practice, we shall for the future distinguish by the name of Gaelic.

The Gaelic is not derived from any other language as far as we know, being obviously reducible to its own roots. Its combinations are formed of simple words of a known signification; and those words are reducible into the simplest combinations of vowels and consonants, and even into simple sounds. In such a language we may expect that some traces will be found of the ideas and notions of mankind living in a state of primeval simplicity; and if so, a monument is still preserved of the primitive manners of the Celtic race while as yet under the guidance of simple nature, without any artificial restraint or control.

The sudden sensations of heat and cold, and bodily pain, are expressed by articulate sounds, which, however, are not used in this language to denote heat, cold, or bodily pain. A sudden sensation of heat is denoted by an articulate exclamation which, by id; of bodily pain, by ie. All these sounds may be called interjections, being parts of speech which discover the mind to be excited with some passion. Few of the improved languages of Europe pretend to great a variety of sounds which inarticulately convey notice of a particular passion, bodily or mental feeling.

The pronouns be and fe are expressed by the simple sounds e and i; and these are the marks of the masculine and feminine genders; for a neuter gender is unknown in the Gaelic. The compositions of rude and barbarous ages are universally found to approach to the style and numbers of poetry; and this too is a distinguishing character of the Gaelic. Bodily subjection will always be the principal concern of an uncultivated people. Hence ed or ed is used upon discovery of any animal of prey or game: it is meant to give notice to the hunting companion to be in readiness to seize the animal; and hence we believe edd "to eat" in Latin, and edd in Irish signifies "cattle;" likewise in Scotch edd "cattle," literally signifies "the
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The Celtic languages were derived from the Gaelic; we rather believe that these are remains of a primeval tongue, which are still retained in all the three; and we produce them upon the present occasion as presumptions that the Gaelic is an original, undivided language, and of course the most pure and unadulterated relic of the Celtic now existing. If our readers should incline to know more of this subject, they may consult Pocock's Origin of Ancient Nations, Bullet's Memoirs, Learn. Journ. Philib. Gebelin, Monde primit.

When the Celtic language was generally spoken Copious- over Europe, it seems to have been amazingly copious. By consulting Bullet's Memoirs, it appears that its names for the common and various objects of nature were very numerous. The words denoting water, river, wood, forest, mountain, lake, &c. were most precisely accommodated to specify each modification and variety, with such peculiar exactness as even the Greek, with all its boasted idiomatical precision and copiousness, has not been able to equal. The appearances which diversify the visible face of inanimate nature, arrest the attention of men in an uncultivated state. Unaccustomed to thought and abstract reasoning, their minds expand and exercise their powers upon sensible objects, and of course mark every minima and almost imperceptible distinction with an accuracy to us seemingly impossible.

We hope it now appears to every reader, that the Celtic was one of the dialects of the primitive language; that it once spread over the greatest part of Europe; that the Gaelic now spoken in the northern parts of Scotland and the adjacent islands is the most pure and unmixed relic of that tongue now anywhere existing. We would willingly refer our readers to some well composed grammar of that language; but indeed we know of none that deserves our recommendation. Some years ago we were flattered with the prospect of seeing one published by a gentleman who has doubtless more skill in that language is universally acknowledged. We have likewise heard of an intended dictionary of the same tongue; but hitherto our hopes have been disappointed.

We are, however, happy to find that there is now publishing an excellent translation of both the Old and New Testaments into Gaelic, which has hitherto been a defideratum among those who speak this language. Such a translation will at once contribute to preserve that ancient tongue; and disseminate the knowledge of the truth among the natives of that country.

Every afflux towards acquiring the knowledge of a tongue which was once universal over a great part of Europe, will certainly be an acceptable present to the public. The antiquarian, who is desirous of tracing the affinity of languages, and wishes to mark the migrations of people, ought certainly to apply himself to the study of its remaining branches; and, if we mistake not, he will soon be convinced, that they will breathe a spirit congenial to the manners and sentiments of a people who are just entering upon the first stage of improvement and civilization.

Perhaps it may be expected, that, before we concluded this short sketch of the Celtic tongue, we should give Gal. 4 B
give some account of the origin of the words Gaul and Gal, the two names by which this people was distinguished by the Greeks and Romans. Mr McPherson imagines, that the appellation of Celt is an adjective derived from Gaul, the aboriginal name of the inhabitants of ancient Gaul. For our part, we can see no connection between Gaul and Kel, nor do we think that the latter is an adjective. We believe that those people called themselves Gaill and not Gaul. We are sure that Caledonia, or Cal-don or dun, was an ancient name of the mountainous parts of Scotland.

The many different opinions that have been advanced with relation to the etymology of this word, we imagine that none is so probable as that which supposes that it is compounded of the two Celtic words Cal or Kel, that is, "Gal or Gaul," and dun, which signifies "a hill or mountain." Upon this ground, the Caledonii will import the Gauls of the mountains, or, which is the same the Highland Gauls. The Irish and Highlanders reciprocally denominate themselves by the general title of Cael, Gael, or Gauls. They also distinguish themselves, as the Welsh originally did, and as the Welsh distinguish them both at present, by the appellation of Guibill, Gathel, and Galath. The intermediate thay, they lay, is left quiescent in the pronunciation, as it is in many words of the British language; in which Gaul would be immediately formed into Gaet, and Gathel is actually founded like Gaal by both the Irish and Highlanders at present. The appellation of Gathel, therefore, they say, was originally the same with Gaal, and the point of it. The quiescent letter in British are frequently transferred from the middle to the conclusion of the word; by which manœuvre, Gathel is changed into Galath, Galat, and Gaal. Celt. It is true, that Gael of the continent is universally denominated Galate and Celle by the Grecians, and Gallt and Gailla by the Irish. The appellations, therefore, of Gallisi, Gallat, Gallatse, Celte, An-collit se, and Celte are all one and the same denomination, only varied by the astonishing dulility of the Celtic, and disguised by the alterations ever incident to a language that has been merely oral for ages.

It may perhaps appear preumptuous in us to differ from two such respectable authorities as McPherson and Whitaker: we must, however, acknowledge, that neither the one nor the other appears to us well founded. Besides, they convey no idea of the signification of the words, though in the Celtic language they must have been significant. The name Gaal, the name with Gal was probably given them in the East from the Greek σάλ, which in many oriental languages denotes far; and φασί may be easily derived from εαρ or εαρες, Gal or Galath. This denomination might be given them by their neighbours, in allusion, to their fair complexion.

§ 2. Of the Gothic Language.

The Celtic and Gothic tongues at one time divided Europe between them. Both were of equal antiquity, both originated in Asia, both were dialects of the original language of mankind. The Celtic, however, was first imported into Europe. The Gaels or Celts had penetrated farthest towards the west; a circumstance which plainly intimates the priority of their arrival. In the population of countries, we believe it may be held as a maxim, that the colonies who emigrated first were generally impelled by succeeding emigrants; and that of consequence the most early were pushed forward to the parts most distant. The Celts, then, having overstepped the most western parts of Europe, must have arrived more early in those regions.

The Goths and Getae were the same race of people, according to Procopius, de bello Goth.; and Strabo. (b) informs us, that they spoke the same language with the Thracians, from whose confines they had spread themselves northward as far as the western banks of the Danube. Vopifcus, in the History of the Romans, tells us, that this emperor obliged "the Thracians, and all the Cetic tribes, either to surrender or accept of his friendship." This expression indicates, that the Thracians and the Cetic tribes were deemed the same race of people. From this deduction it is clear, that the Getae and Thracians were brethren; that they spoke the same language; and that their laws, manners, customs, and religious tenets, were the same, might easily be shown, were this a proper place for an inquiry of that nature.

The Thracian language, as might be demonstrated from names of persons, offices, places, and customs, among that people, was nearly related to the Chaldean and other oriental languages.

They are thought to have been the descendants of Tiras, one of the sons of Japhet, and consequently must have preferred the speech of the Noahic family. The Gothic language abounds with Pahlavi, or old Persian words, which are no doubt remains of the primeval dialect of mankind. The Thracians people a considerable part of the northern coast of Asia Minor; and consequently we meet with many names of cities, mountains, rivers, &c. in those parts, exactly corresponding with many names in Europe, evidently imposed by our Gothic progenitors. Any person tolerably acquainted with the remains of the Gothic tongue, will be able to trace these with little difficulty.

We learn from Herodotus, that Darius in his expedition against the wandering Scythians who lived paffim, on the other side of the Iber or Danube, in his progress subdued the Getæ; and in the same passage the historian informs us, that these people held the immortality of the human soul, and that they were the bravest and most just of all the Thracians. After this period, we find them mentioned by almost every Greek writer, even familiarly; for Getæ in the comedies of that nation, is a common name for a slave. The Getæ then occupied all that large tract of country

(b) Lib. vii. page 295. B. ; ibid. page 305. G. (Cafaubon). From this passage it appears, that the Greeks were of opinion that the Getæ are Thracians. Pfin. Nat. Hisl. i. iv. cap. 11. mentions a tribe of the Getæ called Gaude.
try which extended from the confines of Thrace to
the banks of the Danube: were a brave and virtuous
people; and spoke the same language with the Thra-
cians, with whom they are often confounded both by
Greek and Roman historians.

But the name of Goths is by no means so ancient.
It was utterly unknown both to the ancients the Greeks
and Romans. The first time that the name Goth is
mentioned is in the reign of the Emperor Decius,
about the year of Christ 250. About that time they
bust out of Getia, and rushing like a torrent into the
empire, laid waste every thing with fire and sword.
The name of their leader or king was Garsus. De-
cius, endeavouring to expel them Thrace, was van-
quished and slain.

After this irruption, we find them frequently in the
Latin authors under the name of Gete or Gothi; tho' the
Greeks generally denominate them Scythis. Tor-
faus tells us, that gete and got is actually the fame
word, which ancients, according to him, denoted a
"falter," Gete in Icelandic signifies a "houfe or
horfeman," and gata a "wanderer:" and this laft
was perhaps the import of the term Geta, they being
originally an unfettled vagrant people. As nations
generally assume to themselves some high aufpicious
denomination, we may believe the Goths did the fame.
We may therefore reft satisfied, that the Geta as-
sumed the Icelandic name above mentioned as their
national one: or perhaps, notwithstanding their Greek
denomination, they called themselves Gots or Goths
from the beginning.

The original feat of the Goths was the country
now called Little Scythis by the Greek writers;
and it was the fation whence those innumerable
swarms advanced, which, in conjunction with the A-
lani and other barbarous tribes, at length over-ran
and subtverted the western empire. One part of the
Gothic nation was allowed by Conftantine to fettle in
Mesia. Before the year 420 moft of the Gothic na-
tions who had fettled within the limits of the Roman
empire had been converted to the Chriftian faith;
but, unhappily, the greater part of the apoftles by
whom they had been profelyted, were Arians, which
proved fatal to many of the orthodox Chriftians; for
the Arian Goths perfecuted them with unrelenting
 cruelty.

About the year 367, Ulphilas bishop of the Me-
sian Goths, tranlated the New Testament into the
Gothic language. The remains of this tranflation
are a genuine, and at the fame time venerable, mo-
ument of the ancient Gothic dialect. No more is
now extant of that valuable tranflation than the four
Gofpels, and another fragment containing part of
the epiftle to the Romans. The Gofpels have been
repeatedly publilhed since the firft edition by Junius
1665, down to that of Mr Lye. Other fragments of
the Gothic language have also been found, which our
curious readers may fee in Lye's Notes to his Edition
of the Gothic Gofpels. The fragment of the Epiftle
to the Romans was lately discovered in the library at
Wolfenbottle, and published by Knitel archdeacon of
Wolfenbottle.

The Goths, prior to the age of Ulphilas, were ig-
norant of the use of alphabetical characters. The bi-
shop fabricated an alphabet for them, which is a med-
ley of Greek and Roman letters, but rather inclining
to the former.

This alphabet consists of 25 letters (see Plate
IX). Junius has carefully analyfed those letters, and
pointed out their powers and founds in his Gothic al-
phabet, prefixed to his Glosfarium Gothicum. They
were long, retained in all the European languages de-
derived from the Gothic source, which will be enumer-
ated in the sequel.

What kind of language the ancient Gothic was, is
plain from the fragments above mentioned; but in
what respects it agrees with the oriental tongues, or
differs from them, is not easy to aconfir with preci-
sion. We have observed in our reference on the Greek,
that a confiderable part of that language muft have
been derived from the Thracian, which, according to
Strabo there quoted, was the fame with the Getic or
Gothic. The Thracian tongue will, we are con-
vinced upon compafion, be found analogous to the Chal-
dean or Syrian. The German, which is a genuine
descendant of the Gothic, is full of Perifian words:
the old Perifian or Pahlavi appears to be a dialect of the
Chaldean. The learned Junius, near the begin-
ing of his Gothic alphabet, remarks, that a very
conliderable part of the language in quetion is bor-
rrowed from the moft ancient Greek.

Both the learned Ithae in his Glosfarium Suiq Gobi-
cum, and Wachter in his excellent German and La-
in Dictionary, often remark the coincidence of Go-
th and German words with oriental vocables of the
like found and of the fame fignification. In the old
Saxon, which is another ramification of the Gothic
tongue, numberlefs terms of the very fame complexion
appear. From this deduction we hope it will follow,
that the Gothic tongue, in its original unmixed state
as it was spoken by the ancient Geta, was a dialect
of the primeval language; that language which the
fons of Tiras brought with them from the plains of
Shinar or from Armenia, or from any other re-
gin where the primitive mortals had fixed their re-
fidence. To confirm this pofition, we fhall annex a
few inftances.

The Thracian tribes, in all probability, firft took
possession of thofe parts of Asia Minor which flirt
wards the eafth. Thence they croffed the Helle-
fpont, and spread themselves far and wide northward.
Strabo fuppofes that they firft fettled in the regions
to the north of thofe ftraits, and thence transport-
ated numerous colonies into Asia Minor. The re-
vers was probably the cafe. Population, we think,
proceeded northward, nor can be flaw that as it may, is
is universally agreed, that both fides of the Hellefpont were
peopled with Thracians.

In Asia Minor we meet with the city Perga,
which, throwing away the a, is Pery. In every
tongue defcended from the Gothic, the word Berg
signifies a " rock," and metaphorically a " town or
burgh," because towns were originally built on rocks
for the fake of defence. Hence likewise Pergamum,
the fort or citadel of Troy. Beiras in Thracian figni-
ified a " city," the Chaldean and Hebrew word Bear
imports a " well," and is poflibly the original of the
Gothic word bar, etc. In ancient times, espe-cially in

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the East, it was customary to build cities in the neighbourhood of fountains. The ancients called the Phrygians 

Modern tongues deduced from the Gothic.

the sacred name God, which is in reality the Persian word Chosra, commonly applied by them to their Hormand or Ormohases. The Persian bad or bod signifies a "city," the same word in Gothic imports a "house, a mansion, an abode." Band, in Peric, a "straight place" or "valley" in Gothic, "to bend." Heim or baum, "a house," is generally known to be Old Persian original. Much critical skill has been displayed in tracing the etymology of the Scotch and English word Yule, "Christmas." Tab, derived from ital, was a festival in honour of the sun, which was originally celebrated at the winter solstice. Wick or wick is a Gothic term still preferred in many names of towns; it signifies "a narrow corner, or small strip of land jutting into the sea, or into a lake or river." hence Latin vicus, and the Greek χωρός. In Spanish, we have many old Gothic words; among others is a "fox," the same word with the Greek υατος. In some places of Scotland, we call any thing that is little, small, υρος; originally it spelt υιος, if we mistake not, from the same word.

These few examples we have thrown together, without any regard to order, perused that almost every word of the language, truly Gothic, may with a little pains and judgment be traced to some oriental root or cognate. We may observe in passing, that many Gothic nouns end in a, like the Chaldiac and Syriac; that their sublitative verb very much resembles that of the Perlian, Greek, and Latin; and that their active and auxiliary verb has furnished the common preterperfect tense of Greek verbs in the active voice: that verb is κοίμαν, but originally ὑπείρα, as the common people pronounce it at this day, especially in the north of Scotland, and among the Swedes, Danes, Norwegians, and Icelanders.

We shall now leave the other inferior arrangements of this ancient language to grammarians and lexicographers, and proceed to inquire what modern tongues are deduced from it as their stock, and which of them makes the nearest approach to its simplicity and purity.

We have already observed that the Goths, formerly Getes, were possested of a vast extent of country, reaching from the frontiers of Thrace to the banks of the Ilfe or Danube. We have seen that a colony of them settled in Moesia under Constantine II. They then spread themselves into Dacia, and from hence into Germany. All these countries were situated in such a manner, that the progress of population was forward, and according to the natural course of emigration. Thereof we shall extend themselves into Scandinavia, that is, Sweden, Denmark, and Norway. Their whole ancient Edsa, Sagas, "Chro-

nicles," show that the Goths arrived in Scandinavia by this route, without, however, fixing the era of that event with any tolerable degree of accuracy. By the Germans, we believe the ancients understood all the nations eastward, westward, and northward, reaching from the Danube on the south up to the extremity of Scandinavia on the Northern Ocean; and from the Rhine and German Ocean on the west, to the rivers Zronus or Niemen on the east. All those nations spoke one or other of the Gothic dialects, some approaching nearer, and others deviating further from the parent language.

The Francic is a dialect of the Teutonic, Tudesque, or old German; and the Gospels of Ulpilias bear such a resemblance to the Francic, fragments of which are preferved in the early French historians, that some learned men have pronounced those gospels to be part of an old Francic version; but others of equal repectability have refuted this opinion, both from history and comparison of the dialects. Schilter has given us large monuments of the Tudesque or old German from the seventh century, which evidently prove that the Gothic of Ulpilias is the same language. Wachter's learned Glosary of the ancient German likewise confirms this position. Mr. Ihre, after hesitating whether the Gospels of Ulpilias bear most resemblance to the German or Scandinavian dialect of the Gothic, declares at last in favour of the former. The Anglo-Saxon is also known to be a venerable dialect of the Tudesque; and is so intimately connected with the Gospels, that some valuable works on this subject are wholly built upon the supposition.

The Icelandic is the oldest relic of the Scandinavian. It begins with Aenus Frode in the eleventh century, and is a dialect of the German. The remains we have of it are more modern by four centuries than those of the German: they are more polished than the other. The words are shortened, not only because they are more modern than the German, but because the Icelandic was polished by a long succession of poets and historians almost equal to those of Greece and Rome. Hence the Icelandic, being a more polished language than the German, has less affinity with the parent Gothic. The Swedish is more nearly related to the Icelandic than either the Danifh or Norwegian. That the Swedish is the daughter of the Gothic, is fully shown by Mr. Ihre above mentioned in his Glosarium Suii Gothicum. There is, therefore, no manner of doubt as to the identity of the Gothic, preserved in Ulpilias and other ancient remains, with the German and Scandinavian tongue.

The modern German, a language spoken in a far greater extent than any other of modern Europe, resembles the Gothic Gospels more than the present Danifh, Norwegian, or Swedish; and has certainly more ancient flamina. Its likeness to the Alsatian tongues, in harshness and inflexible thickness of sound, is very apparent.

Buhequeus shows, that the clowns of Crim Tartary, remains of the ancient Goths, speak a language, almost German. These clowns were no doubt descendants of the ancient Goths, who remained in their native country after the others had emigrated. It is therefore apparent from the whole of this investigation,
§ 3. Of the Slavonic Language.

There is another language which pervades a considerable part of Europe, and this, like the Gothic, seems to have originated in the East. The language we mean is the Slavonic or rather Sclavonian, which prevails far and wide in the eastern parts of this division of the globe. It is spoken by the Dalmatians, by the inhabitants of the Danubian provinces, by the Poles, Bohemians, and Russians. The word *slav,* that is, "slave" (whence the French word *esclave,* and our word *slave,* signifies "noble, illustrious," but because, in the lower ages of the Roman empire, vast multitudes of these people were spread over all Europe in the quality of slaves, that word came to denote the servile tribe by way of disfigurement, in the same manner as the words *Geta,* *Dacius,* and *Syrius,* did among the Greeks at a more early period.

The Slavs dwelt originally on the banks of the Borythenes, now the Dnieper or Nieper. They were one of the tribes of the European Sarmatians who in ancient times inhabited an immense tract of country, bounded on the west by the Vistula, now the Weifel; on the south-east by the Euxine Sea, the Bosporous, Cimmerius, the Palus Moesot, and the Tanais or Don, which divides Europe from Asia.

In this vast tract of country, which at present comprehends Poland, Russia, and a great part of Tartary, there dwelt in ancient times many considerable tribes. To enumerate these, we believe, would not much edify our readers: we shall only inform them, that among the Sarmatian clans were the Roxolani, now the Russians, and likewise the Slavs, who dwelt near the Borythenes, as was observed above.

The Slavs gradually advanced towards the Danube; and in the reign of Julian having paused that river, they made themselves masters of that part of Illyricum which lies between the Drave and the Save, and is to this day from them called *Slawonia.* These barbarians by degrees overran Dalmatia, Liburnia, the western parts of Macedonia, Epirus; and on the east they extended their quarters all along to the western bank of the Danube, where that river falls into the Euxine. In all these countries, the Sclavonians was deeply impregnated with the Greek, which was a thing of course, since the barbarian invaders settled in those regions, and mingled with the aborigines who spoke a corrupt dialect of that language.

The Poles are the genuine descendants of the ancient Sarmates (c), and consequently speak a dialect of their language, but much adulterated with Latin words, in consequence of the attachment the Polanders have long professed to the Roman tongue.

The Silefians and Bohemians have corrupted their dialects in the very same manner. In those countries, then, we are not to search for the genuine remains of the ancient Sarmatian.

The modern Russians, formerly the Rhovani or Roxolani, are the posterity of the Sarmatians, and are a branch of the Slavs; they inhabit a part of the country which that people possessed before they fell into the Roman provinces; they speak the same language, and wear the very same dress; for, on the historical pillar at Constantinople, the Sclavonians are described like the Russian boors. If then the Slavs are Sarmatians, the Russians must of course be the descendants of the same people. They were long a sequestered people, and consequently altogether unconnected with the other nations of Europe. They were strangers to commerce, inhospitable to strangers, tenacious of ancient usages, averse to improvements of every kind, wonderfully proud of their imaginary importance; and, in a word, a race of people just one degree above absolute savagism. A people of this character are, for the most part, enemies to innovations; and if we may believe the Russian historians, no nation was ever more averse to innovations than the one in question. From the ninth century, at which era they embraced Christianity, it does not appear that they moved one step forward towards civilization, till Peter the Great, not a century ago, in consequence of his despotic authority, compelled them to adopt the manners and customs of their more polished neighbors.

We may then conclude, that the Russians made as little change in their language during that period, as they did in their dress, habits, and manner of living. Whatever language they spoke in the ninth century, the same they employed at the beginning of the 18th. They were, indeed, according to *Appian de bel. Mithrid.* once conquered by Diodontus, one of Mithridates's generals; but that conquest was for a moment only: they were likewise invaded, and their country over-run, by the great Timur or Tamerlane; but this invasion was like a torrent from the mountains, which spreads devastation far and wide while it rages, but makes little alteration on the face of the country.

We find, likewise, that upon some occasions they made incursions upon the frontiers of the Roman empire; but we hear of no permanent settlements formed by them in those quarters. Upon the whole, we take the Russians to have been, with respect to their language, in the very same predicament with the Highlanders and Ilanders of Scotland, who, according to the general opinion, have preferred the Celtic dialect pure and entire, in consequence of their having never mingled with foreigners.

From this deduction we may infer two things: first, the Russian language is the genuine Sclavonian; then, secondly, that the latter is the same, or nearly so, with the ancient Sarmatian.

In the Russian, there are found a great number of words resembling the old fimple roots of the Greek both in sound and figurative sense; its grammatical genius is nearly the same; and we are informed by the very best authority, that there is in this language a translation of Epictetus, in which there are whole pages, in both the original and translation, without one single
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Sect. IX.

Monf. Leveque, who has published a translation of a history of Russia, is so entirely convinced of the strict analogy between the ancient Greek and the modern Russian, that he is positive that the former is derived from the latter. Monf. Freret, a very learned French academian, is clearly of the same opinion. We are, however, persuaded that this opinion is ill founded. We rather imagine, that those coincidences arise from the relics of the primitive language of mankind; vestiges of which, we believe, are to be found almost in every tongue now existing.

It is, however, we allow, uncommonly difficult to render a reason for the syntactical analogy of the two languages, without admitting the truth of the one or the other hypothesis. We have examined with some care a good number of Russian vocables, and compared them with Greek ones of the same signification. We have not, however, found such a resemblance as we think necessary to support the position advanced above. We have indeed found a very strong resemblance between the former and many oriental words, especially Hebrew, Chaldean, and old Persian, of which we could produce several instances, did the nature of our present inquiry admit such a deviation. Every body knows that the Sarmatians were divided into two great nations, the Asiatic and European; the former extended very far eastward, behind the mountain Caucasus, the northern shore of the Euxine Sea, and so forth. Thefe, we may believe, derived their language from the original tongue long before the Greek language existed. This, in comparison of the Hebrew, Phænician, Egyptian, Arabian, Chaldean, etc. was but of yesterday. The Greek, most learned men are now convinced, was a late composition of many different dialects, incorporated with the jargon of the aboriginal Ionian or Greeks. The Sarmatians, on the contrary, was the tongue of a great and populous nation, civilized, in all appearance, long before the Greeks began to emerge from a state of savagery. We are, therefore, by no means disposed to allow, either that the Greek is derived from the Russian, or the Russian from the Greek. We believe them to be both the same race. For this conclusion that the Abbé Peron and Monf. Gebelin pretend to have discovered, in order to support their position, that the Greek is derived from the Celtic. Certain it is, that the resemblance among the oriental languages, of which we take the Sarmatian to have been one, is so palpable, that any person of a moderate capacity who is perfectly master of one, will find little difficulty in acquiring any other. If, therefore, the coincidence between the Greek and Russian should actually exist, we think this circumstance will not authenticate the supposition, that either of the two is derived from the other.

In the course of this argument, our readers will be pleased to observe, that we all along suppose, that the Sclavonian, of which we think the Russian is the most genuine remain, is the same with the old Sarmatian. We shall now take the liberty to hazard a conjecture with respect to the syntactical coincidence of that language with the Greek; for we acknowledge that we are not so profoundly versed in the Russian dialect of the Sclavonian as to pretend to pronounce a definitive sentence.

As the Russians were a generation of savages, there is no probability that they were acquainted with the use of letters and alphabetical writing till they acquired that art by intercourse with their neighbours. It is certain, beyond all contradiction, that few nations had made less proficiency in the fine arts than they, under consideration: and we think there is little appearance of their having learned this art prior to their conversion to Christianity. Certain it is, that, the Slav, who settled in Dalmatia, Illyria, and Liburnia, had no alphabetical characters till they were furnished with them by St Jerome. The Servian character, which very nearly resembles the Greek, was invented by St Cyril; on which account the language written in that character is denominated Chiruralus. Thefle Sclavonic tribes knew nothing of alphabetic writing prior to the era of their conversion. The Moesian Goths were in the same condition till their Bishop Ulphilas fabricated them a set of letters.

If the Slav and Goths, who lived in the neighbour-hood of the Greeks and Romans, had not learned alphabetical writings prior to the era of their conversion to Christianity, it must hold a fortiori, that the Russians, who lived at a very great distance from those nations, knew nothing of this useful art antecedent to the period of their embracing the christian faith.

The Russians pretend that they were converted by St Andrew; but this is known to be a fable. Christianity was first introduced among them in the reign of the grand Duke Wolodimar, who marrying the daughter of the Grecian emperor Basilus, became her convert about the year 989. About this period, we imagine, they were taught the knowledge of letters by the Grecian missionaries, who were employed in teaching them the elements of the Christian doctrines. Their alphabet consists of 31 letters, with a few obsolete additional ones; and these characters resemble those of the Greeks so exactly, that there can be no doubt of their being copied from them. It is true, the shape of some has been somewhat altered, and a few barbarous ones have been intermingled. The Russian liturgy, every body knows, was copied from that of the Greeks; and the best specimen of the old Russian is the church offices for Easter, in the very words of Chrysostom, who is called by his name Zlato ushlii, "golden-mouthed." The power of the clergy in Russia was excessive; and no doubt their influence was proportioned to their power. The first race of clergy in that country were undoubtedly Greeks. We know how active and industrious those people were in propagating their language as well as their religion. The offices of religion might be at first written and pronounced in the Greek tongue, but it would soon be found expedient to have them translated into Russian. The persons employed in this work must have been Greeks, who understood both languages.

As it is confessedly impossible that a people so dull and uninvective as the Russians originally were, could ever have fabricated a language so artificially constructed as their present dialect; and as it is obvious, that, till Christianity was introduced among them by the Greeks, they could have no correspondence with that people—
the liberty to hazard the following conjectures, which Slavonian
people—it must appear surprising by what means their
language came to be fashioned so exactly according to
the Greek model. We have observed above, that the
Russian letters must have been invented and introduced
into that country by the Greek missionaries. We
think it probable, that those apostles, at the same time
that they taught them a new religion, likewise intro-
duced a change into the idiom of their language. The
influence of those gendly teachers over a nation of fa-
vages must have been almost boundless; the force of
their precepts and example almost uncontrollable. If
the savage converts accepted a new religion from the
hands of those Grecian apostles, they might with equal
success adopt improvements in their language. Such
of the natives as were admitted to the facerdotal func-
tion must have learned the Greek language, in order
to qualify them for performing the offices of their
religion. A predilection for that language would be the
immediate consequence. Hence the natives, who had
been admitted into holy orders, would co-operate with
their Grecian masters in improving the dialect of the
country; which, prior to the period above mentioned,
must have greatly deviated from the original standard
of the Sarmatian tongue.

Upon this occasion, we imagine the Greek apostles,
in conjunction with their Russian disciples, reduced the
language of the country to a resemblance with the
Greek idiom. They retained the radical vocabularies as
they found them; but by a variety of flexions, conjuga-
tions, derivations, compositions, and other modifica-
tions, transformed them into the Grecian air and ap-
pearance. They must have begun with the offices of the
church; and among a nation of savages newly con-
verted, the language of the new religion would quickly
obtain a very extensive circulation. When the Greci-
ian garniture was introduced into the church, the
laity would in process of time assume a similar dress.
The fabric of the Grecian declensions, conjugations,
&c. might be grafted upon Russian stocks without af-
fecting the radical parts of the language. If the dia-
lect in question, like most others of a very ancient date,
laboured under a penury of vocabularies, this
manoeuvre would contribute exceedingly to supply that
defect. By this expedient the Greek language itself had
been enlarged from about 300 radical terms to the prodi-
gious number of words of which it now consists.

The Latin tongue we have seen above in its original
constitution differed widely from the Greek; and not
withstanding this incongruity, the improvers of the
former have prefixed it into a very strict agreement with
the latter. This, we think, was still a more difficult
task; as, in our opinion, the genius of the Latin dif-
sers in a much greater degree than that of the Russian
does from the Greek. We know, that the genius of the
Gothic tongue and those of all its descendants are
much more in unison with the Greek than with that of
the Latin. The Spanish, Italian, and French, have
worked many of their Gothic, Teutonic, and Celtic
verbs, into a kind of conjugations, imitating or rather
sping tho' of the Latin. The Persians have formed
most elegant and energetic declensions and conjuga-
tions, upon inflexible roots, borrowed from the Pahlavi
and Deri, and even from Tartar originals.

Upon the grounds above-mentioned we have taken

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Sect. X.

Modern Languages.

If we call all the different dialects of the various nations that now inhabit the known earth, languages, the number is truly great; and vain would be his ambition who should attempt to learn them, though imperfectly. We will begin with naming the principal of them: There are four, which may be called original or mother languages, and which seem to have given birth to all that are now spoken in Europe. These are the Latin, Celtic, Gothic, and Slavonian. It will not, however, be imagined, from the term original, given to these languages, that we believe them to have come down to us, without any alteration, from the rape, with their respective offspring.

I. From the Latin came,

1. The Portuguese.
2. Spanish.
3. French.
4. Italian.

From the Celtic,

5. The Erse, or Gaelic of the Highlands of Scotland.
6. The Welsh.
7. The Irish.

From the Gothic,

9. The German.
10. The Low Saxon or Low German.
11. The Dutch.
12. The English; in which almost all the noun-substantives are German, and many of the verbs French, Latin, &c. and which is enriched with the spoils of all other languages.
13. The Danish.
15. Swedish.
16. Icelandic.

From the Slavonian,

17. The Polonese.
18. The Lithuanian.
20. Transylvanian.
22. The modern Vandalian, as it is still spoken in Lusatia, Prussian Vandalia, &c.
23. The Croatian.
24. The Russian or Muscovite; which, as we have seen, is the purest dialect of this language.
25. The language of the Calmucks and Collacs.
26. Thirty-two different dialects of nations who inhabit the north-eastern parts of Europe and Asia, and who are descended from the Tartars and Hu-no-Scythians. There are polyglott tables which contain not only the alphabets, but also the principal distinct characters of all these languages.

II. The languages at present generally spoken in Asia are,

27. The Turkish and Tartarian, with their different dialects.
28. The Persian.
29. The Georgian or Iberian.
30. The Albanian or Circassian.
31. The Armenian.

These languages are spoken by the Greek Christians in Asia, under the patriarch of Constantinople.
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The modern Indian languages.

The modern Indian languages.

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PHILOMELA, in fabulous history, was a daughter of Pandion king of Athens, and siter to Procne, who had married Terus king of Thrace. Procne separated from Philomela, to whom she was much attached, spent her time in great melancholy till she prevailed upon her husband to go to Athens and bring her sister to Thrace. Terus obeyed, but he had no sooner obtained Pandion's permission to conduct Philomela to Thrace, than he fell in love with her, and resolved to gratify his passion. He disfigured the guards whom the suspicions of Pandion had appointed to watch her; offered violence to Philomela; and afterwards cut out her tongue, that she might not discover his barbarity, and the indignities she had suffered. He confined her in a lonely castle; covered her with filth, and the iniquity she had committed to rove about the country, she hastened to his metamorphosis. Instead of barley. It was on this monument that the swallows' voice is peculiarly plaintive.

Procne, his wife, was much pained by the loss of Philomela; but a year passed, and he thought it time to celebrate the orgies of Bacchus, and place small pebbles in the head of Itylius, convinced the princes, and their powerful succours, he had obtained the Achaeans to that pitch of power and glory to which it arrived; but the successes of his enterprises was not so much owing to his courage and intrepidity as to his prudence and politics. As he depended on the friendship of foreign princes, and their powerful succours, he neglected the military discipline at home; but the infant Philopemen was created prætor, or commander in chief, he routed the courage of his countrymen, in order to put them into a condition to defend themselves without the assistance of foreign allies. With this view he made great improvements in the Achæan discipline; changing the manner of their exercise and their arms, which were both very defective. He had thus, in the space of eight months, exercised his troops every day, making them perform all the motions and evolutions, and accustoming them to manage with dexterity their arms, when news was brought him that Machanidas was advancing, at the head of a numerous army to invade Achaia. He was glad of this opportunity to try how the troops had profited by his discipline; and, accordingly, taking the field, met the enemy, in the territories of Mantinea, where a battle was fought. Philopemen, having killed Machanidas with his own hand, struck off his head, and carried it from rank to rank, to encourage his victorious Achaean, who continued the pursuit with great slaughter, and incredible ardour to the city of Teges, which they entered together with the fugitives. The Lacedemonians lost on
on this occasion above 8000 men, of which 4000 were killed on the spot, and as many taken prisoners. The loss of the Achaean was very inconsiderable, and those that fell were mostly mercenaries. This happened about the year before Christ 204.

But what most of all raised the fame and reputation of Philopoemen was his joining the powerful city of Lacedaemon to the Achaean commonwealth; by which means the Achaean came to eclipse all the other states of Greece. This memorable event happened in the year 191. In this transaction we can hardly help taking notice of one circumstance, which in our opinion, reflects greater lustre on Philopoemen than all his warlike exploits. The Lacedaemonians, overjoyed to see themselves delivered from the oppressions they had long groaned under, ordered the palace and furniture of Nabis to be sold; and the sum accruing from thence, to the amount of 120 talents, to be presented to Philopoemen, as a token of their gratitude. Deputies entertained by them of their regard. Timolaus, with great awe, ordered the palace and furniture of Nabis to be sold; and the sum accruing from thence, to the amount of 120 talents, to be presented to Philopoemen, as a token of their gratitude. Deputies therefore were to be appointed, who should carry the money, and deliver Philopoemen, in the name of the Senate, to accept of the present. On this occasion it was that the virtue of the generous Achaean appeared in its greatest lustre; for so great was the opinion which the Spartans had of his probity and disinterestedness, that no one could be found who would undertake to offer the present: struck with veneration, and fear of displeasing him, they all begged to be excused. At last they obliged, by a public decree, one Timolaus, to accept of the present.

Philopoemen, therefore, was to go to Megalopolis, and there to live, and offer him this testimony of their regard. Philopoemen, therefore, was to go to Megalopolis, and there to live, and offer him this testimony of their regard.

Some Greek writers in the fourth and fifth centuries speak of this art as being then known; and towards the end of the 13th century, when the learning of the East had been brought hither by the Arabians, the fame pretensions began to spread through Europe. It is supposed that this art called alchimy, was of Egyptian origin; and that, when the ancient Greek philosophers travelled into Egypt, they brought back some of the allegorical language of this Egyptian art, ill understood, which afterwards passed into their mythology. Alchemy was the earliest branch of chemistry, considered as a philosophical science; in the other parts of chemical knowledge, facts preceded reasoning or speculation; but alchemy was originally speculative.

The alchemists supposed the general principles of metals to be chiefly two substances, which they called mercury and sulphur; these, they believed also, that the pure mercurial, sulphureous, or other principles of which they imagined gold to be composed, were contained separately in other bodies; and these principles, therefore, they endeavoured to collect, and to conciliate and incorporate by long digestions; and by thus conjoining the principles of gold, they could be so procured and conjoined, it might be expected that gold would be produced. But the alchemists pretend to a product of a higher order, called the elixir, the medicine for metals, the tincture, the philosopher's stone; which, by being projected on a large quantity of any of the inferior metals in fusion, should change them into fine gold; which being laid on a plate of silver, copper, or iron, and moderately heated, should sink into the metal, and change into gold all the parts to which it was applied; which on being properly heated with pure gold, should change the gold into a substance of the same nature and virtue with itself, so as thus to be susceptible of perpetual multiplication; and which, by continued cohesion, should have its power more and more
more exalted, so as to be able to transmute greater and greater quantities of the inferior metals, according to its different degrees of perfection.

Alchemists have attempted to arrive at the making of gold by three methods: the first by separation; for every metal yet known, it is affirmed, contains some quantity of gold; only, in most, the quantity is so little as not to defray the expense of getting it out.

The second is by maturation; for the alchemists think mercury is the basis and matter of all metals; that quicksilver purged from all heterogeneous bodies would be much heavier, denser, and simpler than the native quicksilver; and that by subtilizing, purifying, and digesting it with much labour, and long operations, it is possible to convert it into pure gold.

This method is only for mercury. With respect to the other metals, it is ineffectual. 1. Because their matter is not pure mercury, but has other heterogeneous bodies adhering to it; and, 2. Because the digester, whereby mercury is turned into gold, would not succeed in other metals, because they had not been long enough in the mines.

Weight is the inimitable character of gold, &c. Now mercury, they say, has always some impurities in it, and these are lighter than mercury. Could they be purged away, which they think is not impossible, mercury would be as heavy as gold; and what is as heavy as gold is gold, or at least might very easily be made gold.

The third method is by transmutation, or by turning all metals readily into pure gold, by melting them in the fire, and calling a little quantity of a certain preparation into the fused matter; upon which the forces retire, are volatilized and burnt, and carried off, and the rest of the mass is turned into pure gold. That which works this change in the metals is called the philosopher's stone. See Transmutation.

Whether this third method be possible or not, it is difficult to say. We have so many testimonies of it from persons who on all other occasions speak truth, that it is hard to say they are guilty of direct falsehood, even when they say that they have been masters of the secret. We are told, that it is only doing that by art which nature does in many years and ages. For as lead and gold differ but little in weight, therefore there is not much in lead beside mercury and gold. Now, if we had any body which would go agitate all the parts of lead as to burn all that is not mercury therein, and had also some sulphur to fix the mercury, would not the mass remaining be converted into gold? There is nothing in nature so heavy as lead except gold, mercury, and platina, which was not known to these reformers; it is evident, therefore, there is something in lead that comes very near to gold. But in lead there is likewise some heterogeneous matter different both from mercury and gold. If therefore 19 ounces of lead be dissolved by the fire, and 8 ounces be destroyed by these means, it is argued that we shall have the rest good gold; the ratio of lead to gold being as 11 to 19. If then the philosopher's stone can purify the mercurial matter in lead, so as that nothing shall remain but the pure mercurial body, and you can fix and coagulate this by means of sulphur, out of 19 ounces of lead you will have 11 of gold; or, if you reduce the lead from 18 to 14, you will then have converted it into mercury; and if you farther purify this mercury to the proper standard, you will have gold; provided you have but a sulphur with which to fix and coagulate it. Such is the foundation of the opinion of the philosopher's stone; which the alchemists contend to be a most subtile, fixed, concentrated fire, which as soon as it melts with any metal, does, by a magnetic virtue, immediately unite itself to the mercurial body of the metal, volatilize and cleanse off all that is impure therein, and leave nothing but a mass of pure gold. Many frauds and artifices have unquestionably been practiced in this operation, and there might be political reasons why princes and others should encourage those who pretended to a power of furnishing this inexhaustible source of wealth; but it would be wrong to confine as impostors all those who have declared themselves convinced, from their own experiments, of the transmutability of base metals into gold. There are strong reasons, however, to believe that the authors have been deceived themselves by fallacious appearances. Mr Boyle gives an account of a process by which he imagines part of the substance of gold to have been transmuted into silver. He also relates a very extraordinary experiment, under the title of the degradation of gold by an anti-elixir, which was published in his own life-time, and since reprinted in 1739. Hence many have been led to conclude in favour of the alchemical doctrine of the transmutability of metals. See an account of this experiment, with remarks upon it by Dr Lewis, in his Commerce of Arts, sect. 12. p. 297, &c.

"The opinion (says Holt) that one metallic or other foreign substance might be changed into another, of the Kings and Queens of England propagated by certain chemists, whose observations on the surprising effects and alterations produced in certain substances by the force of heat carried their imaginations beyond what found judgment might warrant. The first instance of which on record is in vol. xi. p. 68, of the Fadera; wherein Henry VI. grants a licence to John Cobbe, freely to work in metals; he having, by philosophical art, found out a method of transferring imperfect metals into perfect gold and silver.

"This pretended secret, known afterwards by the name of the philosopher's stone or powder, was encouraged by four licences, granted to different projectors during this reign, and at sundry times after, during this century particularly, and in succeeding times, all over Europe. The plausibility has not entirely ceased even to this day, although it meets with neither public encouragement nor countenance from men of sober reason; the projectors having yet found nothing from their airy schemes in this mode of search but certain ruin to their property."

The same author, when speaking of the commerce of the kingdom, and the wonderful increase and riches of commercial cities, speaks thus: "This is the true philosopher's stone, so much sought after in former ages, the discovery of which has been reserved to geniuses, when studying to improve the mechanic arts. Hence a pound of raw materials is converted into flits of fifty times its original value. And the metals too are not, indeed, transmuted into gold—they are more: for..."
PHILOSOPIE.

IS a word derived from the Greek, and literally signifies the love of wisdom (A). In its usual acceptance, however, it denotes a science, or collection of sciences, of which the universe is the object; and of the term thus employed many definitions have been given, differing from one another according to the different views of their several authors. By Pythagoras, philosophy is defined: "the knowledge of things existing," by Cicero: "after Plato, scientia verum divinarum et hominum omnium curvarum;" and by the illustrious Bacon, "interpretatio naturae." Whether any of these definitions be sufficiently precise, and at the same time sufficiently comprehensive, may be questioned; but if philosophy in its utmost extent be capable of being adequately defined, it is not here that the definition should be given. "Explanation (fays an acute writer *), is the first office of a teacher; definition if it be good, is the last of the inquirer after truth; but explanation is one thing, and definition quite another." It may be proper however, to observe, that the definition given by Cicero is better than that of Pythagoras, because the chief object of the philosopher is to ascertain the causes of things; and in this consists the difference between his studies and those of the natural historian, who merely enumerates phenomena, and arranges them into separate classes.

The principal objects of philosophy are, God, nature, and man. That part of which treats of God is called theology; that which treats of nature, physics and metaphysics; and that which treats of man, logic and ethics. That these are not separate and independent sciences, but, as Bacon expresses (b), branches from the same trunk, we shall endeavour to shew, after we have given, agreeably to our usual plan, a short history of philosophy from the earliest ages to the present day.

To attempt to assign an origin to philosophy, would be ridiculous; for every man endeavouring to ascertain the causes of those changes which he observes in nature, and even children themselves are inquisitive after that which produces the found of their drums and their rattles. Children, therefore, and the most illiterate vulgar, have in all ages been philosophers. But the first people among whom philosophy was cultivated as a profession, was probably the Chaldeans. We certainly read of none earlier; for though we have more authentic accounts of the Hebrews than of any other nation of remote antiquity, and have reason to believe that no people was civilized before them, yet the particular circumstances in which they were placed, rendered all philosophical investigation to them useless, and even tended to suppress the spirit of enquiry.

The Egyptians indeed pretended to be the first of nations, and to have spread the blessings of religion and the light of science among every other people; but, from the earliest records now extant, there is reason to believe that the Chaldeans were a civilized and powerful nation before the Egyptian monarchy was founded.

Of the Chaldean philosophy much has been said, but very little is known. Astronomy seems to have been their favourite study; and at the era of Alexander's conquest of their country, they bajled that their ancestors had continued their astronomical observations through a period of 473,000 years. Extravagant claims to antiquity have been common in all nations. Calisthenes, who attended the Macedonian conqueror, was requested by Aristotle to inform himself concerning the origin of science in Chaldea; and upon examining into the grounds of this report, he found that their observations reached no further backwards than 1903 years, or 2234 years before the Christian era. Even this is a remote antiquity than Ptolemy allows to be their science: for he mentions no Chaldean observations prior to the era of Nabonassar, or

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(A) The origin usually attributed to the term philosophy has been already assigned in the article PHILOSOPHY. M. Chauvin gives it a term somewhat different. According to him, the term is derived from φιλος, δοξα or φαντασια, and σοφος, σοφια; and therefore he understands the word to mean the desire or study of wisdom; for (says he) Pythagoras, conceiving that the application of the human mind ought rather to be called study than speculation, yet affide the appellation of wise as too amusing, and took that of philosopher.

(b) Conv. n. igitur partiri philosophiam in doctrina tres; declarandam esse suadendo declarandam de naturae, declarandam de homine. Quoniam antem partiones scientiarum non sunt lineae diversae linumque, quae cussunt ad unum angulum; sed delta partias arborum, qui se juxtagunt in uno trunco, qui etiam trunca ad ipsum nonnullum integer eft e que minis, antequantum se partatur in ramos. De aeg. Scient. lib. viii. cap. 1.

(c) This claim of the Babylonians is thus rejected with contempt by Cicero: "Contemnamus Babyloniis, et cos, qui e Caueafa e ciill ligerie fervantes, numerati, et motibus, tellaram curias perigum: Condemnamus, id quam, licet aut studia, aut studia, aut imprudentia, quia 470 millia annorum, in sic dicitum, monumentis, vel colla continent, et mentiri judicemus, nec seundum religiones judicium, quod de ipsius futurum sit pertinente. De Divinatione. lib. i. § 19."
or 747 years before Christ. That they cultivated something which they called philosophy at a much earlier period than this, cannot be questioned; for Ariftotle*, on the credit of the most ancient records, speaks of the Chaldean magi as prior to the Egyptian priests, who were certainly men of learning before the time of Moses. For any other evidence than that of the stars, we do not read that the Chaldeans were famous; and this seems to have been cultivated by them merely as the foundation of judicial astrology. Perceiving the multitude that all human affairs are influenced by the stars, and professing to be acquainted with the nature and laws of this influence, their *wif e men* pretended to calculate nativities, and to predict good and bad fortune†. This was the source of idolatry and various superstitions; and whilst the Chaldeans were given up to such dotages, true science could not be much indebted to their labours. If any credit be due to Plutarch and Vitruvius, who quote Berofus, that part of the Egyptian science seems to be a compound of fanatic metaphysics and extravagant superstition, without the smallest fea-soning of rational physics. Very unlike the philosophers of modern Europe, of whom a great part labour to exclude the agency of mind from the universe, the Pandits of Hindostan allow no powers whatever to mind, and introduce the Supreme Being as the immediate cause of every effect, however trivial. "Brehm, the Spirit of God, (says one of their most revered Brarians,) is absorbed in self-contemplation. The fame is the mighty Lord who is present in every part of space, whole omnipotence, as expressed in the Rig Beid or Rigveda, I shall now explain. Brehm is one, and to him there is no second; such is truly Brehm. His omniscience is self-inspired or self-intelligent, and its comprehension includes every possible species. To illustrate this as far as I am able; the most comprehensive of all comprehensive faculties is omniscience; and being self-inspired, it is subject to none of the accidents of mortality, conception, birth, growth, decay, or death; neither is it subject to passion or vice. To it the three distinctions of time, *past, present, and future* are not. To it the three modes of being (n) are not. It is separated from the universe, and independent of all. This omniscience is named Brehm. By this omniscient Spirit the operations of God are enlivened. By this Spirit also the 24 powers (n) of nature are animated. How is this? As the eye by the sun, as the pot by the fire, as iron by the magnet (v) as variety of imitations by the mimic, as fire by the fuel, as the shadow by the man, as dust by the wind, as the arrow by the spring of the bow, and as the shade by the tree; so by this Spirit the world is endued with the powers of intellect, the powers of the will, and the powers of action; so that

*(p)* To be awake, to sleep, and to be absorbed in a state of unconsciousness—a kind of trance.

*(q)* The 24 powers of nature, according to the Brarians, are the five elements, fire, air, earth, water, and akasha (a kind of subtle aether); the five members of action, the *hand, foot, tongue, anus, and male-organ of generation*; the five organs of perception, the ear, eye, nose, mouth, and skin; the five senses which they distinguish from the organs of sensation; the three dispositions of the mind, *evil, passion, and tranquility*; and the power of *consciousness*.

*(r)* If the work from which this extract is quoted be of as great antiquity as Mr Halhed supposes, the Brarians must have been acquainted with the phenomena of magnetism at a much earlier period than any other philosophers of whom history makes mention.
PHILOSOPHY.

History of if it emanates from the heart by the channel of the ear, it causes the perception of sounds; if it emanates from the heart by the channel of the skin, it causes the perception of visible objects; if it emanates from the heart by the channel of the eye, it causes the perception of taste; if it emanates from the heart by the channel of the nose, it causes the perception of smell. This also invigorating the five members of perception, and invigorating the five elements, and invigorating the five senses, and invigorating the three dispositions of the mind, &c. cause the creation or the annihilation of the universe, while itself beholds every thing as an indifferent spectator.

* Preliminary Dife. to Halted.

Admits not the separate existence of matter, and teaches the metempyphysial.

Teaches the metaphysics of the Brahmins.

From this passage it is plain that all the motions in the universe, and all the perceptions of man, are, according to the Brahmans, caused by the immediate agency of the Spirit of God, which seems to be here considered as the soul of the world. But it appears from some papers in the Asiatic researches, that the most profound of these oriental philosophers, and even the authors of their sacred books, believe not in the existence of matter as a separate subsance, but as the immediate cause of all the phenomena, however regular, or however anomalous.

"It is sufficiently known, says Mr. Davis,† that the Hindoo division of the ecliptic into signs, degrees, Referes and places, is the same as ours; that their astronomical year is vol. ii. of their systems; but their calculations of eclipses, and their computations of time, are conducted upon scientific principles.

Their astronomy and chronology are indeed full of those extravagant fictions which seem to be essential to all their systems; but their calculations of eclipses, and their computations of time, are conducted upon scientific principles.

Mr. Davis observes, that an explanation of these matters would have led him beyond his purpose, which was only to give a general account of the method by which the Hindoos compute eclipses, and to shew that the science of astronomy is as well known among them now as ever it was among their ancestors. This he does very completely; but in the present short historical sketch, we can neither copy nor abridge his memoir. Suffice it to say, that he has shown the practical part of the Hindoo astronomy to be founded on mathematical principles; and that the learned Pandits appear to have true notions of the form of the earth, and the economy of the universe: for which they are ascribed to their countrymen in general.

The fame writer shows likewise, that the prodigious duration which the Hindoos attribute to the world, is the result of a scientific calculation founded indeed on very whimsical principles. "It has been common with alfronomers to fix on some epoch, from which, as from a radix, to compute the planetary motions; and the ancient Hindoos chose that point of time which, according to their motions as they had determined them, must have been in conjunction in the beginning of Méla or Aries, and coeval with which circumstance they supposed the creation. This, as it concerned the planets only, would have produced a moderate term of years compared with the enormous antiquity that will be hereafter stated:
PHILOSOPHY.

flated that having discovered a slow motion of the
tool of the
tion, they would require a length of time
in the computation, that is to say, and taken it into the com-
reigning with 135584890 years now expired,
when they were so situated, and 2364115110 years
more before they would return to the same situation
again, forming together the grand astromathick
period denominated a Calpha, and fancifully affigned as
the day of the world.

But though the mathematical part of the astronomy
of the Panista is undoubtedly respectable, their phy-
sical notions of the universe are in the highest degree
ridiculous and extravagant. In the Vedas and Puranas,
theology of which no devout Hindoo can dispute the
divine authority, eclipses are said to be occasioned by the
intervention of the monster Raksh; and the earth
being supported by a series of animals. "They sup-
pose," (says Mr Halhed) that there are 14 spheres,
seven below and six above the earth. The seven infer-
ior worlds are said to be altogether inhabited by an
infinite variety of serpents, described in every mon-
strosous figure that the imagination can fuggze. The
first sphere above the earth is the immediate vault of
the visible heavens, in which the sun, moon, and stars,
are placed. The second is the first paradise, and gen-
eral receptacle of those who merit a removal from the
lower earth. The third and fourth are inhabited by
the souls of those men who, by the practice of virtue
and dis of prayer, have acquired an extraordinary
degree of sanctity. The fifth is the reward of those who
have all their lives performed some wonderful act of
penance and mortification, or who have died martyrs
for their religion. The highest sphere is the residence
of Brahma and his particular favourites, such as those
men who have never uttered a falsehood during their
whole lives, and those women who have voluntarily
burned themselves with their husbands. All the are
abode in the divine essence."

On ethics, the Hindoos have nothing that can be
called philosophy. Their duties, moral, civil, and reli-
gious, are all laid down in their Vedas and Suttras;
and enjoined by what they believe to be divine author-
ity, which supersedes all reasoning concerning their
laws or utility. The business of their Pandits is to
interpret those books, which are extremely ancient,
and written in a language that has long been unmit-
table, jolte to every other order of men, but no Pandit
will alter the text however impossible to be reconciled
to principles established in his own practice of astro-
omy. On such occasions the usual apology for their
stated books is, that "such things may have been so
formerly, and may be so still; but that for astronomical
purposes, philosophical rules must be followed."
The great duties of morality have been prescribed in
every religious code; and they are not overlooked in
the Hindoo, though the highest merit that a Dranim can have consists in voluntary acts of abstinence
and mortification, and in contempt of death.

Of the ancient philosophy of the Arabsians and
Chinese nothing certain can be said; and the narrow
limits of such an abstract as this do not admit of our
mentioning the conceptions of the learned, which
contradict each other, and are all equally groundless.
There is indeed sufficient evidence that both nations
were at a very early period observers of the stars; and
that the Chinefe had even a theory by which they
there is reason to believe that the Arabians, like other
people in their circumstances, were nothing more than
judicial astrologers, who professed not the smallest
portion of astronomical science. Thiny makes mention of
their magi, whilst later writers tell us, that they were famous for their integrity in solving enigmatical questions, and for their
skill in the arts of divination; but the authors of
Greece are silent concerning their philosophy; and
there is not an Arabian book of greater antiquity
than the Koran extant. (See PHILOSOPHY, Sec-
ion II.)

Leaving therefore regions so barren of information,
Early Philo-
lets us pass to the Phcenicians, whose commercial ge-
dade of the

etaphysics of

Hindoo.

Ethics of

Hindoo.

David's

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Aftric

Researches,

vol. ii.

Prep. Ex.

Philosophy

of the Ara-

bians and

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11

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History of the time of his arrival among them, were wholly defitute of alphabetic characters (See Philology, no. 130.); yet the man who could prevail with iliterate savages to adopt the use of strange characters, must have been a great matter of the science of human nature. Several other Phenician philosophers are mentioned by Strabo; but as they flourished at a later period, and philosophied after the systematic mode of the Greeks, they fall not properly under our notice. We pass on therefore to the Philosophy of Egypt.

It has already been observed that the Egyptians boasted of being the first of nations, and the authors of all the science which in separate rays illuminated the rest of the world. But though this claim was undoubtedly ill-founded, their high antiquity and early progress in the arts of civil life cannot be controverted. The Greeks with one voice confess that all their learning and wisdom came from Egypt, either imported immediately by their own philosophers, or brought through Phenicia by the fages of the east; and we know from higher authority than the histories of Greece, that at a period so remote as the birth of Moses, the wisdom of the Egyptians was proverbially famous. Yet the history of Egyptian learning and philosophy, though men of the first eminence of all the ancients and modern have belted much pains in attempts to elucidate it, still remains involved in clouds of uncertainty. That they had some knowledge of physiology, arithmetic, geometry, and astronomy, are facts which cannot be questioned; but there is reason to believe that even these sciences were in Egypt pushed no farther than to the uses of life. That they believed in the existence of incorporeal substances is certain; because Herodotus affirs that they were the first fathers of the immortality, pre-existence, and transmigration of human souls, which they could not have without holding those souls to be at least incorporeal, if not immaterial.

The author of Egyptian learning is generally acknowledged to have been Thoth, Thet or Taaos, called by the Greeks Hermes, and by the Romans Mercury; but of this personage very little is known. Diodorus Siculus says that he was chief minister to Osiris, and that he improved language, invented letters, instituted religious rites, and taught astronomy, music, and other arts. The same thing is affirmed by Sanchoniatho, whose antiquity has been already mentioned; by Manetho an Egyptian priest, who flourished during the reign of Ptolemy Philadelphus; and by Plato whole authority, as he resided long in Egypt, and was himself an eminent philosopher, is perhaps more to be depended upon than that of the other two. In the Philebus we are told that Thoth was the inventor of letters; and left we should suppose that by those letters nothing more is meant than picture writing or symbolical hieroglyphics, it is added that he distinguished between vowels and consonants, determining the number of each. The same philosopher, in his Phaedrus, attributes to Thoth the invention of arithmetic, geometry, astronomy, and hieroglyphic learning; and fulfils a disputition laid to have been held between him and Thomas then king of Egypt, concerning the advantage and disadvantage of his newly invented letters. Thoth boasted that the invention, by aiding memory, would greatly contribute to the progress of science; whilst the monarch contended that it would engender men natural faculties by making them truant to written characters without exerting the powers of their own minds.

All this, if real, must have happened before the era of Moses; and since it is almost certain that alphabetic characters were in use prior to the exod of the Israelites from Egypt (See Philology, no. 24, 25.) we may as well allow the invention to Thoth, as give it to an earlier author of unknown name. That arithmetic, geometry, and astronomy, were cultivated in Egypt from the most remote antiquity, is affirmed by all the ancients, and made in the highest degree probable by the situation of the country. The first elements of astronomy have certainly been discovered by various nations, whose habits of life led them to the frequent observation of the heavens; and it is observed by Cicero, that the Egyptians and Babylonians, dwelling in open plains where nothing intercepted the view of the heavenly bodies, naturally devoted themselves to the study of that science. The annual overflowing of the Nile, which broke up the boundaries of their lands, would lay the Egyptians under the necessity of adopting some method of settling those boundaries anew; and necessity we know to be the parent of invention. Hence their early acquaintance with practical geometry cannot well be doubted. Their custom of embalming their dead, and the perfection to which they carried that art (a), shows infallibly their knowledge of the properties of natural substances, and gives some reason to believe that they were not altogether strangers to anatomy; but if we allow them to have been at this early period anatomists acquainted with the powers of drugs, we can hardly refuse them some skill in the art of physic, which they themselves traced up to their gods and deities, to Serapis, Isis, and her son Horus or Apollo.

The art of alchemy has been said to have been known by the ancient Egyptians; and from the author of the Egyptian philosophy it has been called the Hermetic art. But though this is unquestionably a fiction, there is evidence that they were possessed of one art which is even yet a deideratum in the practice of chemistry. "Moses (we are told) took the golden calf, which his brother had made for idolatrous purposes, and burnt it in the fire, and ground it to powder, and threw it on the water, and made the children of Israel drink of it." Had this been related by Herodotus or Diodorus Siculus, it would have been more compared with the ancient Egyptians, by whom it was known, and from whose doctrine it was derived; but it is most likely that the story was invented by the Christians to shew the great wisdom of God in the discovery of the art of alchemy; for, as we have already observed, the art of embalming, in ancient times, was the accepted name for alchemy; and it is probable that the Egyptians were the first who applied the art of the Philistines to the purpose of the sun, in order to preserve their dead from corruption for upwards of 3000 years.

(a) It is true that the distillation of some mummies has lessened the high opinion long entertained of the skill of the ancient Egyptians in the art of embalming; yet it must be granted that their knowledge of antiseptic drugs was great, since it is now certainly known even from these distillations, that by means of such drugs they contrived to preserve rags of cloth from corruption for upwards of 3000 years.
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History of Philosophy have been deemed sufficient evidence that the Egyptians were even at that early period no strangers to the art of chemistry; and surely the evidence should not be the worse for coming from the pen of the Hebrew lawyer, who was himself educated in the court of Egypt.

But though it is thus evident that the rudiments of almost every useful science were known in Egypt from the remotest antiquity, it does not appear that any of them was carried to a great degree of perfection, unless perhaps chemistry alone must be excepted. One would think that no science could have been more indispensible requisite to them than geometry. And yet though Pythagoras is said to have spent 22 years in Egypt studying that science and astronomy, he himself discovered (\(x\)) the famous 47th Prop. of Euclid's first book after his return to Samos. This, though a very useful, is yet a simple theorem; and since it was not reached by the Egyptian geometry, we cannot suppose that those people had not advanced far in such speculations. The same conclusion must be drawn with respect to astronomy; for Thales is said to have been the first that calculated an eclipse of the sun; and we nowhere read that the Egyptians pretended to dispute that honour with him. To this it may be replied, that Pythagoras was in Egypt undoubtedly taught the true constitution of the solar system, and that what is more extraordinary, the doctrine of comets in particular, and of their revolutions, like the other planets, round the sun (1) We grant that he was taught all this; but it was not scientifically, but dogmatically, as facts which the priests had received by tradition from their early ancestors, and of which they had never questioned the truth nor inquired into the reasons. Of this we need no better proof than that the Pythagorean system of the sun was totally neglected by the Greeks as soon as they began to frame History of Philosophy and to speculate in philosophy (\(x\)).

But it may seem strange, and it certainly is so, that the Egyptian priests, in the days of Pythagoras, should have preferred to great a discovery of their ancestors, and at the same time have totally forgotten the principles and reasoning which led to a conclusion apparently contrary to the evidence of sense. This is a difficulty which we pretend not to remove, though the fact which involves it seems to be beyond the reach of controversy. Perhaps the following observations may throw upon it a feeble light. According to Manetho, the written monuments of the first Thoth were lost or neglected in certain civil revolutions or natural calamities which befell the kingdom of Egypt. After many ages great part of them were recovered by an ingenious interpretation of the symbols which he had inscribed upon ancient columns; and the man who made this interpretation was called the second Thoth or Hermes Trismegistus. But three illustrious as this personage was, it is at least possible that he may have been much inferior to the former Hermes, and have read his writings and transferred his conclusions without being able to comprehend the principles or reasoning which led to those conclusions. Any man who understands Latin might translate into his own tongue the conclusions of Newton; but much more would be requisite to make him comprehend the demonstrations of his sublime geometry. By what mode of reasoning the first Hermes (L) was led to the true idea of the solar system, or whether it was by reasoning at all, cannot now be known; but it seems very evident, that when the intercourse between the Egyptians and Greeks first commenced, the wisdom of the former people conspired chiefly in the science of legislation and civil policy, and that the philosopher,

(\(x\)) This discovery he claimed; and his claim was admitted by the Greek writers without having been directly controverted since. An excellent mathematician, however, has lately shown that the equality between the square of the hypothenuse of a right angled triangle, and the sum of the squares on the other two sides, was known to the astronomers of India at a period long prior to that of Pythagoras. Notwithstanding this, it is certainly possible that the sage of Samos may have made the discovery himself, though we think the contrary much more probable; for we agree with the able writer already mentioned, that Pythagoras who is generally believed to have converted with Indian brachmans as well as Egyptian priests, may have derived from them "some of the solid as well as the visionary speculations with which he delighted to instruct and amuse his disciples.


(1) This is recorded by Aristotle and Plutarch; and thus expressed by Ammianus Marcellinus—"Stellas quaedam, ceteris nullas, quorum arbor orbisque, quibus fuit temporibus prehistoriae humanis mentibus ignarum.

(2) Histori du Mundi Systemate.

(1) Some authors, deeply skilled in the Hebrew language, have thought that the true system of the sun and planets may be perceived in the Scriptures of the Old Testament, and that it is only from the ignorance or carelessness of the translaters that it does not appear in the English Bible and other versions. The writer of this article con-
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Hitherto we have seen philosophy in its state of infancy and childhood, confining only of recollection of fententious maxims and traditionary opinions; but among the Greeks, an ingenious and penetrating people, it soon assumed the form of profound speculation and systematic reasoning. Two eminent philosophers arose nearly at the same period, who may be considered as the parents not only of Grecian science, but of almost all the science which was cultivated in Europe prior to the era of the great Lord Bacon: These were Thales and Pythagoras; of whom the former founded the Ionic school and the latter the Italic: from which two sprung the various sects into which the Greek philosophers were afterwards divided. A bare enumeration of their feats is all that our limits will admit of; and we shall give it in the peripatetic language and jilt arrangement of Dr Enfield, referring our readers for a fuller account than we can give of their respective merits to his abridged translation of Brucker's history.

Of the IONIC SCHOOL were, 1. The IONIC sect proper, whose founder Thales had as his successors Anaximenes, Anaxagoras, Diogenes Apolloniates, and Archelaus. 2. The Socratic school, founded by Socrates, the principal of whose disciples were Xenocrates, Eutiches, Simon, Cebes, Arilippus, Phado, Euclid, Plato, Antithenes, Critias, and Alcibiades. 3. The Cyrenaic sect, of which Arilippus was the author: his followers were, his daughter Arete, Hegias, Ancereis, Theodorus, and Bion. 4. The Megaron or Erilic sect, formed by Euclid of Megara; to whom succeeded Eubulides, Diodorus, and Silipo, famous for their logical subtlety. 5. The Eliac or Eretriac school, raised by Phaello of Elis, who though he closely adhered to the doctrine of Socrates, gave name to his school. His successors were Phlitanus and Mendemus; the latter of whom, being a native of Eretria, transferred the school and name to his own country. 6. The Academic sect, of which Plato was the founder. After his death, many of his disciples deviating from his doctrine, the school was divided into the old, new, and middle academies. 7. The Peripatetic sect, founded by Aristotle, whose successors in the Lyceum were Theophrastus, Strato, Lycon, Aristo, Critolus, and Diogenes. Among the Peripatetics, besides those who occupied the chair, were also Dicarchus, Eudemus, and Eudemos Phalerus. 8. The Cynic sect, of which the author was Antithenes, whom Diogenes, Oenicerus, Crates, Netrocles, Meinus, and Mendemus, succeeded. In the lift of Cynic philosophers must also be reckoned Hipparchia, the wife of Crates. 9. The Stoic sect, of which Zeno was the founder. His successors in the porch were Pericus, Anito of Chios, Herillus, Spharon, Cleanthes, and Chrys.

feelfs that his knowledge of the Hebrew is very limited, which is probably the reason that to him the arguments of these men appear weak and their criticisms fanciful. No man, however, has a higher veneration than he for the sacred volume, which he believes to have been given for nobler purposes that to teach its readers the science of astronomy; but could the principles of that science be found in it, he should be strongly inclined to think that the first Thoth was Joseph, and that the monarch to whom he was minister was the far-famed Osiris. Were there any solid foundation for this supposition, it would be easy to conceive how Thoth acquired his science, and how the Egyptian priests might retain just notions of the solar system in general, long after they had forgotten the evidence upon which he communicated those notions to their ancestors.
History of Philosophy

P H I L O S O P H Y.

CHRYSIPPUS, Zeno of Tarsus, Diogenes the Babylonian, Antipater, Panetius, and Pidionius.

Of the Italic School were, 1. The Italic felt proper: it was founded by Pythagoras, a disciple of Pherecydes. The followers of Pythagoras were Aris- tæus, Menarchus, Aleman, Echecinus, Hippo, Empe- docus, Epicam, Oeloas, Timeus, Archytas, Hippasus, Philolaus, and Eudorus. 2. The Eleatic felt, of which Xenophanes was the author: his succ- cessors, Parmenides, Melitus, Zeno, belonged to the metaphysical clafs of this felt: Leucippus Democri- tus, Protagoras, Diagoras, and Anaxarchus, to the physical. 3. The Heraclitean felt, which was founded by Heraclitus, and soon afterwards expired: Zeno and Hippocrates philosophized after the manner of Heraclitus, and other philosophers borrowed freely from his sytem. 4. The Epicurean felt, a branch of the Eleatic, had Epicurus for its author; among whose followers were Metrodorus, Polyaenus, Hermachus, Poly- lyfratus, Bafileides, and Protarchus. 5. The Pyrrho- nic or Sceptic felt, the parent of which was Pyrrho: his doctrine was taught by Timon the Phililcan; and after some interval was continued by Ptolemy a Cyr- nean, and at Alexandria by 

Of the peculiar doctrines of these feels, the reader will in this work find a short account either in the lives of their respective founders, or under the names of the feels themselves. We shall only observe at present, that though many of them were undoubtedly absurd, and many wickled, it would yet perhaps be going too far to say with some, that the philosophy of Greece became impious under Diagoras, vicious under Epicurus, hy- pocritical under Zeno, impudent under Diogenes, covetous under Democrites, voluptuous under Metro- dorus, fantastical under Crates, feurifical under Mel- nippus, licentious under Pyrrho, quarrelfome under Clearchus. Of the truth of this heavy charge ranging themfelves with fubjed of human fcience, all that could be affirmed or denied of thefe

All the fystematical philofophers, however, purifed their inquiries into nature by nearly the fame method. Of their philosophy as well as of ours, the universe, with all that it contains, was the vaf object: but the individual things which compofe the universe are infinite in number and ever changing; and therefore, according to an eftablfished maxim of theirs, incapable of being the subjects of human fcience. To reduce this infitude, and to fix thofe fleeting beings, they eftablfished certain definite arrangements or claffes, to fome of which every thing pafs, prefent, or to come, as they thought, all that could be affirmed or denied of thefe claffes, they proved, by a very fhort procefs of fylo- gical reafoning, that what is true of the clafs muft be true of every individual compreended under it. The moft celebrated of thofe arrangements is that which is known by the name of categories; which Mr Harris thinks at leaft as old as the era of Pythagoras, and to the forming of which mankind would, in his opinion, be necessarily led by the following considerations: Every subject of human thought is either fubjed or attri- bute; but fubjed and attribute may each of them be modified under the different characters of universal or particular. Hence there arifes a quadruple arrange- ment of things into fubjed universal and fubjed particular; into attribute universal and attribute particular; to fome one of which four not only our words and ideas, but every individual of that immense multitude of things which compofe the universe may be reduced. This arrangement, however, the learned author thinks too limited; and he is of opinion, that, by attending to the fubjedues with which they were surrounded, the Grecian schools muft foon have diftinguifhed be- tween the attributes of fubjedues and which are not only circumftancial, but the attributes proper to natural fubjedues or bodies, and thofe which are peculiar to intelligible fubjedues or minds. He likewise thinks, that the time and place of the existence of fubjedues not prefent, muft foon have attracted their attention; and that in confidering the place of this or that fubjedue, they could hardly avoid thinking of its position or fituation. He is of opinion, that the uniformity of one fubjedue upon another would inevitably fuggest the idea of clothing or habit, and that the variety of co-exifting fubjedues and attributes would discover to them another attribute, viz. that of relation. Instead therefore of confining themselves to the fimple division of fubjedue and attribute, they divided attribute itfelf into nine diftinguifhed farts, fome effen- tial and others circumftancial; and thus by fettin g fubjedue at their head, made ten comprehenfive and univer- sal genera, called, with reference to their Greek names, categories, and with reference to their Latin name, predicaments. These categories are, fubjedue, quali- ty, quantity, relation, action, passion, when, wheres, position, and habit; which, according to the fystematical philosophy of the Greeks, comprehend every human fcience, and every fubjed of human thought. History, natural and civil, fprings, fays Mr Harris, out of fubjedue; mathematics out of quan- tity; optics out of quality and quantity; medicine out of the fame; astronomy out of quantity and motion; music and mechanics out of the fame; painting out of quality and site; ethics out of relation; chronology out of when; geography out of where; electricity, magnetism, and attraction, out of action and passion: and fo in other inftances.

To these categories, confidered as a mere arrange- ment of fcience, we are not inclined to make many ob- jections. The arrangement is certainly not complete; but this is a matter of comparatively small importance; for a complete arrangement of fcience cannot, we believe, be formed. The greatest objection to the cate- gories arises from the fuc that was made of them by almo
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It was indeed a combination of absurd metaphysics with more absurd theology; and that which is properly called fideism, had in Europe no place in a liberal education from the end of the eighth century to the end of the fourteenth. Towards the beginning of this period of darkness, the whole circle of instruction, or the liberal arts as they were called, confined to two branches, the trivium and the quadrivium; of which the former comprehended grammar, rhetoric, and dialectics; the latter music, arithmetic, geometry, and astronony, to which was added about the end of the eleventh century the study of a number of metaphysical substances equally useless and unintelligible.

Hitherto the works of the ancient Greek philosophers had been read only in imperfect Latin translations; and before the scholastic syllogism was completely established, Plato and Aristotle had been alternatively looked up to as the oracle in science. The rigid schoolmen, however universally gave the preference to the Stagyrite, because his analysis of body into matter and form is peculiarly calculated to keep in connescence the most incredible doctrine of the Romish church (see Transubstantiation); and upon the revival of Greek learning, this preference was continued after the school philosophy had begun to fall into contempt, on account of much useful information contained in some of his writings on subjects of natural history, and his supposed merit as a natural philosopher. At last the intrepid spirit of Luther and his associates fet the minds of men free from the tyranny of ancient names, as well in human science as in theology; and many philosophers sprung up in different countries of Europe, who professed either to be eclectic, or to study nature, regardless of every authority but that of reason. Of these the most eminent by yond all comparison was Francis Bacon Lord Verulam.

This illustrious man having read with attention the Exposed as writings of the most celebrated ancients, and made full use by himself of the sciences which were then culminated, soon discovered the absurdity of pretending to account for the phenomena of nature by syllogistic reasoning from hypothetical principles; and with a boldness--becoming a genius of the first order, undertook to give a new chart of human knowledge. This he did in two admirable works, intitled, 1. De dignitate et augmentis scientiarum; and 2. Novum organum Scientiarum; for Judicia vora de interpretatione Nature. In the former of these works, he takes a very minute survey of the whole circle of human science, which he divides into three great branches, history, poetry, and philosophy, corresponding to the three faculties of the mind, memory, imagination, and reason. Each of these general heads is subdivided into minuter branches, and reflections are made upon the whole, which, though we can neither copy nor abridge them, will amply reward

\( m \) Scientiae, quas habemus, fere a Græcis fluerunt. Quæ enim scriptores Romani, aut Arabes, aut recentiores addiderunt, non multa, aut magni momenti sunt: et quidacunque sunt, fundata sunt fuper basis eorum que inventa sunt a Græcis. Bacon.
ward the perusal of the attentive reader. The purpose of the "Newe Organon" is to point out the proper method of interpreting nature; which the author shows can never be done by the logic which was then in fashion, but only by a painful and fair induction. "How nothing minister (says he) et interprets tantum facit et intelligit, quantum de naturae ordine re, vel mente observavert; nec amplius fact aut potest. Syllogismus ad principia feientiarum non adhibetur, ad media et regulam, ut verba notioneem tellere fent. Itaque fi notiones ipsae (id quod baffa rei et) confumtum fent et te mere a rebus abstraire, nihil in quae superintventur, ut firmatundis. Itaque fips els una in indagatione verum."

To hypotheses and preconceived opinions, which he calls "idolatria," this great man was not less inimical than to syllogisms; and since his days almost every philosopher of eminence, except Descartes and his follower, (see DESCARTES AND CARTESIANS), has professed to study nature: according to the method of induction so accurately laid down in the "Newe Organon." On this method a few improvements have perhaps been made; but notwithstanding these, Lord Bacon doubtlessly be considered as the author of that philosophy which is now cultivated in Europe, and which will continue to be cultivated as long as men shall have more regard for matters of fact than for hypothetical opinions. Of this mode of philosophizing we shall now give a short, though we hope not inaccurate, view, by letting its objects, comparing it with that which it superseded, explaining its rules, and pointing out its uses; and from this view it will appear, that its author shares with Aristotle the empire of science.

The universe, that unbounded object of the contemplation, the curiosity and the researches of man, may be considered in two different points of view.

In the first place, it may be considered merely as a collection of existences, related to each other by means of resemblances and distinction, situation, succession, and derivation, as making parts of a whole. In this view it is the subject of pure description.

To acquire an acquaintance with, or a knowledge of, the universe in this point of view, we must enumerate all the beings in it, mention all their sensible qualities, and mark all their relations for each. But this would be labour immense; and when done, an unprofitable chaos. A book containing every word of a language would only give us the materials, so to speak, of this language. To make it comprehensible, it must be put into some form, which will comprehend the whole in a smaller compass, and enable the mind to pass easily from one word to another related to it. Of all relations among words, the most obvious are those of resemblance and derivation. An etymological dictionary, therefore, in which words are classed in consequence of their resemblances, and arranged by means of their derivative distinctions, will greatly facilitate the acquisition of the language.

Just so in nature: The objects around us may be grouped by means of their resemblance, and then arranged in those groups by means of their distinctions and other relations. In this classification we are enabled to proceed by means of our faculty of abstracting our attention from the circumstances in which things differ, and turning it to those only in which they agree. By the judicious employment of this faculty we are able not only to distribute the individuals into classes, but also to distribute those classes into still more comprehensive, by discovering circumstances of resemblance among them: for the fewer the circumstances are which concur to form that resemblance which has engaged our attention, the greater is the number of similar circumstances which are neglected; and the more extensive will be the classes of individuals in which the resemblance is observed. Thus a number of individuals resembling each other in the history, single circumstance of life, composes the most extensive KINGDOM OF ANIMALS. If it be required, that they shall further resemble in the circumstance of having feathers, a prodigious number of animals are excluded, and we form the inferior class of BIRDS. We exclude a great number of birds, by requiring a further similarity of web feet, and have the ORDER OF ANSERES. If we add lingua citta, we confine the attention to the GENUS OF ANATIES. In this manner may the whole objects of the universe be grouped, and arranged into kingdoms, classes, orders, genera, and species.

Such a classification and arrangement is called NATURAL HISTORY; and must be considered as the only foundation of any extensive knowledge of nature. To the natural historian, therefore, the world is a collection of existences, the subject of descriptive arrangement. His aim is threefold.

1. To observe with care, and to describe with accuracy, the various objects of the universe.

2. To determine and enumerate all the great classes of objects; to distribute and arrange them into all their subordinate classes, through all degrees of subordination, till we arrive at what are only accidental varieties, which are susceptible of no farther distribution; and to mark with precision the principles of this distribution and arrangement, and the characteristics of the various assemblages.

3. To determine with certainty the particular group to which any proposed INDIVIDUAL belongs.

DESCRIPTION therefore, ARRANGEMENT, and REFERENCE, constitute the whole of his employment; and in this consists all his science.

Did the universe continue unchanged, this would constitute the whole of our knowledge of nature: but we are witnesses of an uninterrupted succession of changes, and our attention is continually called to the EVENTS which are incessantly happening around us. These form a set of objects vastly more interesting to us than the former; being the sources of almost all the pleasures or pains we receive from external objects.

We are therefore much interested in the study of the events which happen around us, and strongly excited to prosecute it: but they are so numerous and so multifarious, that the study would be immense, without some contrivance for abbreviating and facilitating the task. The same help offers itself here as in the study of what may be called QUIESCENT NATURE. EVENTS, like existences, are susceptible of classification, in consequence of resemblances and distinction; and

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by attention to these, we can acquire a very extensive acquaintance with active nature. Our attention must be chiefly directed to those circumstances in which many events resemble each other, while they differ perhaps in a thousand others. Then we must attend to their most general distinctions; then to distinctions of smaller extent, and so on.

It is in this way accordingly that we have advanced in our knowledge of active nature, and are gradually, and by no means slowly forming assemblages of events more and more extensive, and distributing these with greater and greater precision into their different classes.

In the zealous and attentive prosecution of this task a very remarkable, and interesting observation occurs: In describing these circumstances of similarity among events, and particularly in distributing them according to these similarities, it is impossible for us to overlook that constancy which is observed in the changes of nature in the events which are the objects of our contemplation. Events which have once been observed to accompany each other are observed always to do so. The rising of the sun is always accompanied by the light of day, and his setting by the darkness of night. Sound argument is accompanied by conviction, impulsion by motion, kindness by a feeling of gratitude, and the perception of good by desire. The unexpected experience of mankind informs us, that the events of nature go on in certain regular trains; and if sometimes exceptions seem to contradict this general affirmation, more attentive observation never fails to remove the exception. Molt of the spontaneous events of nature are very complicated; and it frequently requires great attention and penetration to discover the simple event amidst a crowd of unessential circumstances which are at once exhibited to our view. But when we succeed in this discovery, we never fail to acknowledge the perfect uniformity of the event to the mind: and this feeling is one of the most pleasant sensations, it is like a sweet sentiment of the truth of a mathematical proposition.

If we take any event of nature, referred, without reason, to something external as its cause; and like our sensation, it is considered as a sign of that external something. It is like the conviction of the truth of a mathematical proposition. This is referred to us by something existing in nature, to a necessary and external relation subsisting between the ideas which are the subjects of the proposition. The conviction is the sign or indication of this relation by which it is brought to our view. In precisely the same manner, the irresistible connection of ideas is interpreted as the sensation or sign of a necessary connection of external things or events. These are supposed to include something in their nature which renders them ineradicable companions. To this bond of connection between external things we give the name of CAUSATION. All our knowledge of this relation of cause and effect is the knowledge of coincidences of what passes in our own minds during the contemplation of the phenomena of nature. If we adhere to this view of it, and put this branch of knowledge on the same footing with those called the abstract sciences, considering only the relations of ideas, we shall acquire demonstrative science. If we take any other view of the matter, we shall be led into inextricable mazes of uncertainty and error.

We see then that the natural procedure of our faculty of abstraction and arrangement, in order to acquire
quire a more speedy and comprehensive knowledge of natural events, prefers them to our view in another form. We not only see them as similar events, but as events naturally and necessarily conjoined. And the expression of resemblance among events is also an expression of concomitancy; and this arrangement of events in consequence of their resemblance is in fact the discovery of those accompaniments. The trains of natural appearance being considered as the appointments of the Author of Nature, has occasioned them to be considered also as consequences of laws imposed on his works by their great author, and every thing is said to be regulated by fixed laws. But this is the language of analogy. When a sovereign determines on certain trains of conduct for his subjects, he issues his orders. These orders are laws. He enforces the observance of them by his authority; and thus a certain regularity and constancy of conduct is produced. But should a stranger, ignorant of the promulgation of these laws, and of the exerted authority of the magistrate, observe this uniformity of conduct, he would ascribe it to the genius and disposition of the people; and his observation would be as useful to him for directing the tenor of his own conduct, as the knowledge of the subject himself of the real source of this constancy is for directing his.

Just so in nature, while the theologian professes from his discoveries concerning the existence and superintendence of God, to know that the constant accompaniment of events is the consequence of laws which the great Author and Governor of the universe has imposed on his works, the ordinary philosopher, a stranger to this scene, and to the unfathomable operations of the Supreme Mind, must ascribe this constancy to the nature of the things. There is a great resemblance between the expression, natural law and grammatical rule. Rule in strict language implies command; but in grammar it expresses merely a generality of fact, whether of fiction or construction. In like manner, a LAW OF NATURE is to the philosopher nothing but the expression of a generality of fact. A natural or physical law is a generally observed fact; and whenever we treat any subject as a generally observed fact, we treat it physically. It is a physical law of the understanding that argument is accompanied by conviction; it is a physical law of the affection that distress is accompanied by pity; it is a physical law of the material world that impulse is accompanied by motion.

And thus we see that the arrangement of events, or the discovery of those general points of resemblance, is in fact the discovery of the laws of nature; and one of the greatest and most important is, that the laws of nature are constant.

There is no question that this view of the universe is incomparably more interesting and important than that which is taken by the natural historian; contemplating everything that is of value to us, and, in short, the whole life and movement of the universe. This study, therefore, has been dignified with the name of PHILOSOPHY and of SCIENCE; and natural history has been considered as of importance only in so far as it was conducive to the successful prosecution of philosophy.

But the philosopher claims a superiority on another account: he considers himself as employed in the discovery of causes, saying that philosophy is the study of the objects of the universe, as related or connected, and that it is by the discovery of those relations that he communicates to the world that important knowledge. Philosophy, he says, is the science of causes. The vulgar are contented to consider the prior of two inapparently conjoined events as the cause of the other; the stroke on a bell, for instance, as the cause of sound. But it has been clearly shown by the philosopher that between the blow on the bell and the sensation of sound there are interposed a long train of events. The blow sets the bell a trembling; this agitates the air in contact with the bell; this agitates the air immediately beyond it; and thus between the bell and the ear may be interposed a numberless series of events, and as many more between the first impression on the ear and that last impression on the nerve by which the mind is affected. He can no longer therefore follow the nomenclature of the vulgar. Which of the events of this train therefore is the cause of the sensation? None of them: It is that something which is inseparably connected any two of them, and constitutes their bond of union. These bonds of union or causes he considers as refining in one or both of the connected objects; diversities in this respect must therefore constitute the most important distinctions between them. They are therefore with great propriety called the qualities, the properties, of those respective subjects.

As the events from which we infer the existence of these qualities of things resemble in many respects such events as are the consequences of the exertion of our own powers, these qualities are frequently accompanied with the exercise of our powers, forces, energies. Thus, in the instance just now given of the sound of a bell, we infer the powers of impulse, elasticity, nervous irritability, and animal sensibility.

In consequence of this inference of a necessary connection between the objects around us, we not only infer the posterior event from the prior, or, in common language, the effect from the cause, but we also infer the prior from the posterior, the cause from the effect. We not only expect that the presence of a magnet will be followed by certain motions in iron filings, but when we observe such motions, we infer the presence and agency of a magnet. Joy is inferred from merriment, poison from death, fire from smoke, and impulse from motion. And thus the appearances of the universe are the indications of the powers of the objects in it. Appearances are the language of nature, informing us of their causes. And as all our knowledge of the sentiments of others is derived from our confidence in their veracity; so all our knowledge of nature is derived from our confidence in the constancy of natural operations. A veracity and credulity necessarily resulting from that law of our mental constitution by which we are capable of speech, conduct us in the one case; and the constancy of nature, and the principle of induction, by which we infer general laws from particular facts, conduct us in the other. As human sentiment is inferred from language, and the existence of external things from sensation; so are the laws of nature, or, the powers of...
of natural objects inferred from the phenomena. It is by the successful study of this language of nature that we derive useful knowledge. The knowledge of the influence of motives on the mind of man enables the sailor to govern kingdoms, and the knowledge of the powers of magnetism enables the mariner to pilot a ship through the pathless ocean.

Such are the lofty pretensions of philosophy. It is to be wished that they be well founded; for we may be perfused that a mistake in this particular will be fatal to the advancement of knowledge. An author of great reputation* gives us an opportunity of deciding this question in the way of experiment. He says that the ancients were philosophers, employed in the discovery of causes, and that the moderns are only natural historians, contenting themselves with observing the laws of nature, but paying no attention to the causes of things. If he speaks of their professed aim, we apprehend that the assertion is pretty just in general. With very few exceptions indeed it may be affirmed of his favourite Aristotle, the philosopher is "the servant of the laws," and of Sir Isaac Newton. We select these two infinances, both because they are set in continual opposition by this author, and because it will be allowed that they were the most eminent students of nature (for we must not yet call them philosophers) in ancient and modern times. Aristotle's professed aim, in his most celebrated writings, is the investigation of causes; and in the opinion of this author, he has been so successful that he has hardly left any employment for his successors before that of commenting upon his works. We must on the other hand acknowledge that Newton makes no such pretensions, at least in that work which has immortalized his name, and that his professed aim is merely to investigate the general laws of the planetary motions, and to apply these to the explanation of particular phenomena. Nor will we say that he has left no employment for succeeding inquirers; but, on the contrary, confess that he has only begun the study, has discovered but one law, and has enabled us to explain only the phenomena comprehended in it alone. But he has not been unsuccessful; his investigation has been complete; and he has discovered beyond all possibility of contradiction a fact which is observed through the whole extent of the solar fylem; namely, that every body, nay that every particle in it, is continually deflected toward every other body; and that this deflection is, in every infinance, proportional to the quantity of matter in that body toward which the deflection is directed, and to the reciprocal of the square of the distance from it. He has therefore discovered a physical law of immense extent. Nor has he been less successful in the explanation of particular phenomena. Of this there cannot be given a better instance than the explanation of the lunar motions from the theory of gravity begun by Newton "Mathefia fua facem praeferente," and now brought to such a degree of perfection, that if the moon's place be computed from it for any moment within the period of two thousand years back, it will not be found to differ from the place on which the was actually observed by one hundredth part of her own breadth.

We may now define the champions of the science of causes to name any one cause which has really been discovered by their great master, whether in the operations of mind or of body. But they must not on this occasion adduce the investigation of any natural law in which he has sometimes succeeded. With Still greater confidence may we challenge them to produce any remarkable instance of the explanation of natural phenomena either of mind or body. By explanation, we mean an account of the production, and an appreciation of all the circumstances, susceptible of a scrupulous comparison with fact, and perfectly consistent with it. It is here that the weakness of this philosopher's pretensions is most conspicuous; and his followers candidly acknowledge, that in the enquiries which proceed by experiment, we have not derived great assistance from Aristotle's philosophy. But this, say they, does not derogate from the pre-eminence of his philosophy, because he has shown that the particular fields of observation are to be cultivated only by means of experiment. But surely every field of observation is particular. There is no abstract object of philosophical research, the study of which shall terminate in the philosophy of universals. In every kind of inquiry, that cause alone must be supposed to act which we understand so far as to be able to appreciate its effects in particular circumstances, and compare them with fact, and see their perfect coincidence. If we have discovered causes, they are known as far as they are discovered. Their genuine effects are known, and therefore the phenomena which result from their agency are understood. When therefore it is acknowledged, as it must be acknowledged, that mankind have made but little advances in the knowledge of nature, notwithstanding the pretended discovery of causes by Aristotle, and the conducting clue of his philosophy, till of late years; and when it is also allowed that now, while we are every day making great additions to this subordinate knowledge, the causes which Aristotle has discovered are forgotten, and his philosophy is neglected; there is great room for supposing (to say the least), that either the causes which philosophy pretends to have discovered are not real, or that Aristotle and his followers have not aimed at the discovery of causes, but only at the discovery of natural laws, and have failed in the attempt.

There seems here to be a previous question: Is it philosophical to discover a philosophical cause, something which is neither the prior nor the posterior of the two immediately adjoining events, but their bond of union, and this distinct from the union itself? It is evident that this is an enquiry purely experimental. It is of the same nature as all our knowledge we speak. This must depend on the nature of the human mind. This is a matter of contingency, known to us only by experiment and observation. By observing all the feelings and operations of the mind, and classing and arranging them like any other object of science, we discover the general laws of human thought and human reasoning; and this is all.

* Ancient Metaphysics.

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all the knowledge we can ever acquire of it, or of any thing else.

Much has been written on this subject. The most acute observation and sound judgment have been employed in the study; and we may venture to say, that considerable progress has been made in pneumatology. Many laws of human thought have been observed, and very distinctly marked; and philosophers are lustily employed, some of them with considerable success, in the distribution of them into subordinate classes, so as to know their comparative extent, and to mark their distinguishing characters with a precision similar to what has been attained in botany and other parts of natural history; so that we may hope that this study will advance like others. But in all these researches, no phenomena have occurred which look like the perception or contemplation of these separate objects of thought, these philosophical causes, this power in all things. No philosopher has ever pretended to state such an object of the mind's observation, or attempted to group them into classes.

We may lay at once, without entering into any detail, that those causes, those bonds of necessary union between the naturally conjoined events or objects, are not only perceived by means of the events alone, but are perceived solely in the events, and cannot be distinguished from the conjunctions themselves. They are neither the objects of separate observation, nor the productions of memory, nor inferences drawn from reflection on the laws by which the operations of our own minds are regulated; nor can they be derived from other perceptions in the way of argumentative inference. We cannot infer the paroxysm of terror from the appearance of impending destruction, nor the fall of a stone when not supported, as we infer the incomparability of the diagonal and side of a square. This last is implied in the very conception or notion of a square; not as a consequence of its other properties, but as one of its essential attributes; and the contrary proposition is not only false, but incapable of being distinctly conceived. This is not the case with the other phenomenon, or any matter of fact. The proofs which are brought of a mathematical proposition, are not the reason of its being true, but the steps by which this truth is brought into our view; and frequently, as in the instance now given, this truth is perceived, not directly, but consequentially, by the inconceivableness of the contrary proposition.

Mr. Hume derives this irresistible expectation of events from the known effect of custom, the association of ideas. The correlative event is brought into the mind by this well known power of custom, with that vividness of conception which constitutes belief or expectation. But without inferring on the falsity of his theory of belief, it is sufficient to observe, that this explanation begs the very thing to be proved, when it attributes to custom a power of any kind. It is the origin of this very power which is the subject in dispute. Besides, on the genuine principles of scepticism, this custom involves an acknowledgment of past events of a something different from present impressions, which, in this doctrine (if doctrine it can be called), are the only certain existences in nature: and, lastly, it is known that one clear experience is a sufficient foundation for this unshaken confidence and anticipation. General custom can never, on Mr Hume's principles, give superior vivacity to any particular idea.

This certain nothingness of it as a separate object of observation, and this impossibility to derive this notion of necessary and causal connection between the events of the universe from any source, have induced two of the most acute philosophers of Europe, Mr Leibnitz and Father Malebranche, to deny that there is any such connection, and to assert that the events of the universe go on in corresponding trains, but without any causal connection, just as a well-regulated clock will keep time with the motions of the heavens without any kind of dependence on them. This harmony of events was pre-established by the Author of the Universe, in subordinancy to the purposes he had in view in its formation.

All those purposes which are cognizable by us, may certainly be accomplished by this perfect adjustment. But without inferring on the fantastic wildness of this ingenious whim, it is quite enough to observe, that it also is a begging of the question, because it supposes causation when it ascribes all to the agency of the Deity.

Thus we have searched every quarter, without being able to find a source from which to derive this perception of a necessary connection among the events of the universe, or of this confident expectation of the continuance of physical laws; and yet we are certain of the feeling, and of the persuasion, be its origin what it may: for we speak intelligibly on this subject; we speak familiarly of cause, effect, power, energy, necessary connection, motives and their influence, argument and conviction, reasons and persuasion, allurements and emotions, of gravity, magnetism, irritability, &c; and we carry on conversations on these subjects with much entertainment and feeming instruction. Language is the expression of thought, and every word expresses some notion or conception of the mind; therefore it must be allowed, that we have such notions as are expressed by cause, power, energy. But it is here, as in many cases, we perceive a distinction without being able to express it by a definition; and that we do perceive the relation of causation as distinct from all others, and in particular as distinct from the relation of contiguity in time and place; or the relation of agent, action, and patient, must be concluded from the uniformity of language, which never confounds them except on purpose, and when it is perceived. But even here we shall find, that none of the terms used for expressing those powers of substance which are conceived as the causes of their characteristic phenomena, really express any thing different from the phenomena themselves. Let any person try to define the terms gravity, elasticity, sensibility, and the like, and he will find that the definition is nothing but a description of the phenomenon itself. The words are all derivatives, most of them verbal derivations, some of adjectives, &c. As the general resemblances in figure, colour, &c, are expressed by the natural historian by generic terms, so the general resemblances in event are expressed by the philosopher in generic propositions, which, in the progress of cultivation, are also abbreviated into generic terms.

This abundantly explains the consistency of our language on this subject, both with itself and with the
the operations of nature, without however affording any argument for the truth of the assumption, that causes are the objects of philosophic research as separate existences; or that this supposed necessary connection is a necessary truth, whether supreme or subordinate. But since the perception of it has its foundation in the constitution of the human mind, it seems intitled to the name of a first principle. We are hardly allowed to doubt of this, when we consider the importance of it, and the care of nature to secure us in all things essential to our safety and well-being, from all danger, from inattention, ignorance, or indolence, by an infant inoffensive in its information, and instantaneous in its decisions. "It would not be like her usual care (says Hume), if this operation of the mind, by which we infer like effects from like causes, and vice versa, were entrusted to the fallacious deductions of our reason, which is slow in its operations, appears not in any degree during the first years of infancy, and in every age and period of human life is extremely liable to error. It is more conformable to her ordinary care (mark the acknowledgment) to secure to necessary an act of the mind by some inferred, or blind tendency, which may be inoffensive and rapid in all its operations, may discover itself at the first appearance of life, and may be independent of all the laboured deductions of reason. As he has taught us the use of our limbs, without giving us any knowledge of the nerves and muscles by which they are actuated; so he has implanted in us an infantile, which carries forward the thought in a course conformable to that established among external objects, though we be ignorant of the powers and forces on which this regularity is based."

Such a knowledge is quite unnecessary, and therefore causes are no more cognizable by our intellectual powers than colours by a man born blind: nay, whoever will be at the pains to consider this matter agreeably to the received rules and maxims of logic, will find that necessary connection, or the bond of causation, can no more be the subject of philosophical discussion by man, than the ultimate nature of truth. It is precisely the same absurdity or incongruity, as to propose to examine light with a microscope. Other rational creatures may perceive them as easily as we hear sounds. All that we can say is, that their existence is probable, but by no means certain. Nay, it may be (and we may never know it) that we are not the efficient causes of our own actions, which may be effected by the Deity or by ministering spirits; and this may even be true in the material world. But all this is indifferent to the real occupation of the philosopher, and does not affect either the certainty, the extent, or the utility of the knowledge which he may acquire.

We are now able to appreciate the high pretensions of the philosopher, and his claim to scientific superiority. We now see that this can neither be founded on any scientific superiority of his object, nor of his employment. His object is not causes; and his discoveries are nothing but the discovery of general facts, the discovery of physical laws; and his employment is the fame with that of the descriptive historian. He observes and describes with care and accuracy the events of nature; and then he groups them into classes, in consequence of resembling circumstances, detected in the midst of many others which are dissimilar and occasional. By gradually throwing out more circumstances of resemblance, he renders his classes more extensive; and, by carefully marking those circumstances in which the resemblance is observed, he characterizes all the different classes; and, by a comparison of these with each other, in respect to the number of resembling circumstances, he distinguishes his classes according to their generality and subordination; thus exhausting the whole assemblage, and leaving nothing unarranged but accidental varieties. In this procedure it is to be remarked, that every grouping of similar events is, ipso facto, discovering a general fact, a physical law; and the expression of this assemblage is the expression of the physical law. And as every observation of this constancy of fact affords an opportunity for exerting the intuitive inference of natural connection between the related subjects, every such observation is the discovery of a power, property, or quality, of natural falsity. And from what has been said, this observation of event is all we know of the connection, all we know of the natural power. And when the philosopher proceeds farther to the arrangement of events, according to their various degrees of complication, he is, ipso facto, making an arrangement of all natural powers according to their various degrees of subordinate influence. And thus his occupation is perfectly similar to that of the descriptive historian, classification and arrangement; and this constitutes all the science attainable by both.

Philosophy may therefore be defined, the study of the phenomena of the universe, with a view to discover the general laws which indicate the powers of natural substances, to explain subordinate phenomena, and to improve art: Or, in compliance with that natural instinct so much spoken of, Philosophy is the study of the phenomena of the universe, with a view to discover their causes, to explain subordinate phenomena, and to improve art.

The task is undoubtedly difficult, and will exercise all our noblest powers. The employment is mainly in itself; and the result of it important. It therefore justly merits the appellation of philosophy, although its objects are nowise different from what occupies the attention of other men.

The employment of the philosopher, like that of the natural historian, is threefold; description, arrangement, and reference; while the objects are not things but events.

The description when employed about events, may be more properly termed history. A philosophic history of nature consists in a complete or copious enumeration and narration of facts, properly selected, cleared of all unnecessary or extraneous circumstances, and accurately narrated. This constitutes the materials of philosophy. We cannot give a better example of this branch of philosophic occupation than astronomy.

From the beginning of the Alexandrian school to this day, astronomers have been at immense pains in observing the heavenly bodies, in order to detect their true motions. This has been a work of prodigious difficulty: for the appearances are such as might have been exhibited although the real motions had been extremely different. Not that our senses give
us false information; but we form hastily, and frequently, false judgments, from these informations; and call those things deceptions of sense, which are in fact errors of judgment. But the true motions have at last been discovered, and have been described with such accuracy, that the history may be considered as nearly complete. This is to be found in the usual Ifytems of astronomy, where the tables contain a most accurate and synoptical account of the motion; so that we can tell with precision in what point of the heavens a planet has been seen at any instant that can be named.

Sir Isaac Newton’s Optics is such another perfect model of philosophical history, as far as it goes. Part of philosophy may be called Phenomenology.

Having in this manner obtained the materials of philosophical description, we must put them into a compendious and perspicuous form, so that a general knowledge of the universe may be easily acquired and firmly retained. This is to be done by classification and arrangement, and this classification must proceed on resemblance observed in the events; and the subsequent arrangement must be regulated by the distinctions of those resemblances are still susceptible. This assemblage of events into groups must be explained. They are facts; therefore the expression must be propositions. These propositions must be what the logicians call general or abstract propositions; for they express not any individual fact of the assemblage, but that circumstance in which they all resemble. Such propositions are the following: Proof is accompanied by belief; kindness is accompanied by gratitude; impulse is accompanied by motion. These are usually called general facts; but there are none such; every fact is individual. This language, however inaccurate, is very safe from mistaken use, and we may use it without scruple. These propositions are natural of physical laws; and then the detecting and marking those resemblances in event, is the investigation of physical laws and we may denominate this employment of the philosopher Investigation.

In the prosecution of this task, it will be found that the similarities of fact are of various extent; and thus we shall form physical laws of various extent; and we shall also find that some are subordinate to others; for the resemblance of a number of facts in one circumstance does not hinder a part of them from also resembling in another circumstance; and thus we shall find subordinations of fact in the same way as of efficient qualities. And it is found here, as in natural history, that our assemblage of resembling events will be the more extensive as the number of resembling circumstances is smaller; and thus we shall have kingdoms, classes, orders, genera, and species of phenomena, which are expressed by physical laws of all those different ranks.

It has been already observed, that this observation of physical laws is always accompanied by a reference of that uniformity of event to a natural bond of union between the concomitant facts which is conceived by us as the cause of this concomitancy; and therefore this procedure of the philosopher is considered as the discovery of those causes, that is the discovery of those powers of natural substances which constitute their physical relations, and may justly be called their distinguishing qualities or properties. This view of the matter gives rise to a new nomenclature and language. We give to those powers generic names, such as sensibility, intelligence, irritability, gravity, elasticity, fluidity, magnetism, &c. These terms without exception, mark resembling circumstances of event; and no other definition can be given of them but a description of these circumstances. In a few cases which have been the subjects of more painful or refined discussion, we have proceeded farther in this abbreviation of language.

We have framed the verb “to gravitate,” and the verbal noun “gravitation,” which purely expresses the fact, the phenomenon; but is conceived to express the operation or energy of the cause or natural power. It is of importance to keep in mind this metaphysical remark on these terms; for a want of attention to the Aitiology, pure meaning of the words has frequently occasioned very great mistakes in philosophical science.

We may with propriety call this part of the philosopher’s employment Aitiology.

We shall give an infallibility of its most successful application to the class of events already added as an example of philosophic history or phenomenology.

Kepler, a celebrated Prussian astronomer, having maturely considered the phenomena recorded in the tables and observations of his predecessors, discovered, amidst all the varieties of the planetary motions, three circumstances of resemblance, which are now known by the name of Kepler’s laws.

1. All the planets describe ellipses, having the sun in one focus.
2. The elliptic areas described by a planet in the different parts of its orbit, are proportional to the times of description.
3. The squares of the periodic times are proportional to the cubes of the mean distances from the sun.

By this observation or discovery, the study of the planetary motions was greatly promoted, and the calculation of their appearances was now made with a facility and an accuracy which surpassed all hopes; for the determination of the place of a planet at any proposed instant was reduced to the geometrical problem of cutting off an area from an ellipse of known dimensions, which should bear the same proportion to the whole area, as the time for whose duration the motion is required, has to the known time of a complete revolution.

Long after this discovery of Kepler, Sir Isaac Newton found that these laws of Kepler were only particular cases of a fact or law still more general. He found that the deflections of the planets from uniform rectilinear motion were all directed to the sun; and that the simultaneous deflections were inversely proportional to the squares of the distances from him.

Thus was established a physical law of vast extent; but further observation showed him that the motion of every body of the solar system was compounded of an original motion of projection, combined with a deflection towards every other body; and that the simultaneous deflections were proportional to the quantity of matter in the body towards which they were directed,
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directed, and to the reciprocal of the square of the distance from it. Thus was the law made still more general. He did not stop here. He compared the deflection of the moon in her orbit with the simultaneous deflection of a stone thrown from the hand, and describing a parabola; and he found that they followed the same law, that is, that the deflection of the moon in a second, was to that of the stone in the same time, as the square of the stone's distance from the centre of the earth, to the square of the moon's distance from it. Hence he concluded, that the deflection of a stone from a straight line was just a particular instance of the deflections which took place through the whole solar system.

The deflection of a stone is one of the indications it gives of its being gravified or heavy; whence he calls it gravitation. He therefore expresses the physical law which obtains through the whole solar system, by saying that "every body gravitates to every other body; and the gravitations are proportional to the quantity of matter in that other body, and inversely proportional to the square of the distance from it."

Thus we see how the arrangement of the celestial phenomena terminated in the discovery of physical laws; and that the expression of this arrangement is the law itself.

Since the fall of a heavy body is one instance of the physical law, and since this fall is considered by all as the effect of its weight, and this weight is considered as the cause of the fall, the same cause is assigned for all the deflections observed in the solar system; and all the matter in it is found to be under the influence of this cause, or to be heavy; and thus his doctrine has been designated the system of universal gravitation.

Philosophers have gone farther, and have supposed that gravity is a power, property, or quality, residing in all the bodies of the solar system. Sir Isaac Newton does not expressly say so, at least in that work where he gives an account of these discoveries. He contents himself with the immediate consequence of the first axiom in natural philosophy, viz. that every body remains in a state of rest, or of uniform rectilinear motion, unless affected by some moving force. Since the bodies of the solar system are neither in a state of rest, nor of uniform rectilinear motion, they must be considered as so affected; that is, that there operates on every one of them a moving force, directed towards all the others, and having the proportions observed in the deflection.

Other philosophers have endeavoured to shew, that this general fact, detected by Sir Isaac Newton, is included in another still more general, viz. that every body moves which is impelled by another body in motion. They affert, that all the bodies of the solar system are continually impelled by a fluid which they call ether, which is moving in all places, and in all directions, or in circular vortices, and hurries along with it the planets and all heavy bodies. It would seem that the familiarity of motion produced by impulse, at least in those instances in which our own exertions are most employed, has induced philosophers to adopt such notions; perhaps, too, they are influenced by an obscure and indistinct notion affected to the term action, as applied to changes in the material world, and which has given rise to an axiom, "that a body cannot act at a distance, or where it is not;" and thus have thought themselves obliged to look out for an immediate and contiguous agent in all those phenomena.

But the philosophers who profess to be most scrupulous in their adherence to the rules of philosophic discussion, deny the legitimacy of this pretended investigation of causes, saying that this doctrine is in direct opposition to the procedure of the mind in acquiring the knowledge of causes. Since the fact of impulse is not readily observed in the celestial deflections, nor in the motions of heavy bodies, the law cannot be inferred. They say that it is not even necessary to show that the phenomena of the celestial motions are unlike the phenomena of impulsive, although this can be done in the most perfect manner. It is enough that neither the fluid nor the impulse are observed; and therefore they are in the right when they assert, there is inherent in, or accompanies all the bodies of the system, a power by which they deflect to one another. (See Optics, n° 66, 67.

The debate is foreign to our present purpose, which is only to shew how the observation and arrangement of phenomena terminates in the discovery of their causes, or the discovery of the powers or properties of natural substances.

This is a task of great difficulty, as it is of great importance. There are two chief causes of this difficulty.

1. In most of the spontaneous phenomena of nature there is a complication of many events, and some of them escape our observation. Attending only to the most obvious or remarkable, we confine these only in our imagination, and are apt to think these concomitant events in nature, the proper indication of the cause, and the subject of this philosophical relation, and to suppose that they are always conjoined by nature. Thus it was thought that there resided in a vibrating chord a power by which the sensation of sound was excited, or that a chord had a sounding quality. But late observations have shown clearly that there is an inconceivable number of events interposed between the vibration of the chord and the sensitive affection of our ear; and therefore, that sound is not the effect of the vibration of the chord, but of the very last event of this series; and this is completely demonstrated by shewing that the vibration and the sound are not necessarily connected, because they are not always connected, but require the interpolation of air or of some other elastic body.

These observations show the necessity of the most accurate and minute observation of the phenomena, that none of those intermediate events may escape us, and we be thus exposed to the chance of imaginary connections between events which are really far aunder in the procedure of nature. As the study has improved, mistakes of this kind have been corrected; and philosophers are careful to make their trains of events under one name as short as possible. Thus, in medicine, a drug is no longer considered as a specific remedy for the disease which is sometimes cured when it has been used, but is denominated by its most immediate operation on the animal frame; it is no longer called a febrifuge, but a febriific.

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Means of inferring success.

2. When any natural powers combine their influence in a spontaneous phenomenon of nature, it is frequently very difficult to discover what part of the complicated effect is the effect of each; and to state those circumstances of similarity which are the foundation of a physical law, or induce us to infer the agency of any natural power. The most likely method for inferring success in such cases is to get rid of this complication of event, by putting the subject into such a situation that the operation of all the known powers of nature shall be suspended, or so modified as we may perfectly understand their effects. We can thus appreciate the effects of such as we could neither modify nor suspend, or we can discover the existence of a new law, the operation of a new power.

This is called making an experiment; and is, of all the most effectual ways of advancing in the knowledge of nature, and has been called experimental philosophy. It seems, however, at first sight, in direct opposition to the procedure of nature in forming general laws. These are formed by induction from multitudes of individual facts, and must be affirmed to a greater extent than the induction on which they are founded. Yet it is a matter of fact, a physical law of human thought, that one simple, clear, and unequivocal experiment, gives us the most complete confidence in the truth of a general conclusion from it to every similar case. Whence this anomaly? It is not an anomaly or contradiction of the general maxim of philosophical investigation, but the most refined application of it. There is no law more general than this, that “Nature is constant in all her operations.” The judicious and simple form of our experiment infures us (we imagine) in the complete knowledge of all the circumstances of the event. Upon this supposition, and this alone, we consider the experiment as the faithful representative of every possible case of the conjunction. This will be more minutely considered afterwards.

The last branch of philosophical occupation is the explanation of subordinate phenomenon. This is nothing more than the referring any particular phenomenon to that class in which it is included; or, in the language of philosophy, it is the pointing out the general law, or that general fact of which the phenomenon is a particular instance. Thus the feeling of the obligations of virtue is thought to be explained, when it is shown to be a particular case of that regard which every person has for his dearest interests. The rise of water in pumps is explained, when we show it to be a particular case of the pressure of fluids, or of the air. The general law under which we show it to be properly arranged is called the principle of the explanation, and the explanation itself is called the theory of the phenomenon. Thus Euler’s explanation of the lunar irregularities is called a theory of the lunar motions on the principle of gravitation.

This may be done either in order to advance our own knowledge of nature, or to communicate it to others. If done with the first view, we must examine the phenomenon minutely, and endeavour to detect every circumstance in it, and thus discover all the known laws of nature which concur in its production; we then appreciate the operation of each according to the circumstances of its exertion; we then combine all these, and compare the result with the phenomenon. If they are similar, we have explained the phenomenon. If not, we cannot give a better example than Franklin’s explanation of the phenomena of thunder and lightning. See Lightning, and Electricity.

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If we explain a phenomenon from known principles, we proceed synthetically from the general law already established and known to exert its influence in the present instance. We state this influence both in kind and degree according to the circumstances of the case; and having combined them, we compare the result with the phenomenon, and show their agreement, and thus it is explained. Thus, because all the bodies of the solar system mutually gravitate, the moon gravitates to the sun as well as to the earth, and is continually, and in a certain determinate manner, deflected from that path which she would describe did the gravitate only to the earth. Her motion round the earth will be retarded during the first and third quarters of her orbit, and accelerated during the second and fourth. Her orbit and her period will be increased during our winter, and diminished during our summer. Her apogee will advance, and her nodes will recede; and the inclination of her orbit will be greatest when the nodes are in syzygy, and least when they are in quadrature. And all these variations will be in certain precise degrees. Then we show that all these things actually obtain in the lunar motions, and they are considered as explained.

This summary account of the object and employment in all philosophical discourse is sufficient for pointing out its place in the circle of the sciences, and will serve to direct us to the proper methods of prosecuting it with success. Events are its object; and they are considered as connected with each other by causation, which may therefore be called the philosophical relation of things. The following may be adopted as the fundamental proposition on which all philosophical discourse proceeds, and under which every philosophical discourse or discovery may be arranged:

“Every change that we observe in the state or condition of things is considered by us as an effect, indicating the agency, characterizing the kind; and determining the degree of its inferred cause.”

As thus enounced, this proposition is evidently a physical law of human thought. It may be enounced as a necessary and independent truth, by saying, every change in the state and condition of things is an effect, &c. And accordingly it has been so enounced by Dr. Reid; Essays on and its title to this denomination has been abundantly the intellectual Powers of Man.
or will ever make, a formal declaration of their opinion; but we may venture to say that all have made it, and continually do make it, virtually. What have the philosophers of all ages been employed about but the discovery of the causes of those changes that are incessantly going on? Nil sumus physeo (says Cicero) quam fieri fine causa quidquid discere. Human curiosity has directed to nothing so powerfully and so constantly as to this. Many absurd causes have been assigned for the phenomena of the universe; but no others would have profited constantly as to this. Many absurd or will ever make, a formal declaration of their opinion. The whole of this paper is a virtuoso, that magnets put iron in motion, and other like phenomena, has been very smart, so smart indeed as to shatter the glasses balls, the motion of the suspended ball was produced without impulse: that is, the two balls were not in contact during the stroke; and the distance between them was not left than the 900th part of an inch, and probably much greater. We must say farther, that it is not certain that even the most violent stroke, such as would shatter them to pieces, is enough to bring them into real contact. The proofs of this singular position are too long for this place; but the evidence will be sufficiently seen by consulting the article Optics, n° 66, 67.

Unles, therefore, our readers are willing to allow that the suspended ball was put in motion by a repulsive force inherent in one or both balls, they must acknowledge that they do not fully know all the circumstances of this so simple phenomenon, or all the train of events which happen in it; and therefore they are reduced to the necessity of supposing, although they do
not see it, an intervening fluid or matter, by the immediate action of whole adjoining particles the motion is produced.

This being the case in the simplest phenomenon that we can pitch upon, what shall we say of the numbers of multitudes which are incomparably more complex? Must we not acknowledge that the efficient causes, even in the vulgar sense of the word, the immediately preceding events, are unknown, because the conjunctions are not observed? and therefore it cannot be said that it is from experimental induction that this truth gains universal belief. Experience, so far from supporting it as a direct proof, seems rather the strongest argument against it; for we have no experiment of unquestionable authority, but the narrow circle of our own power exerted on our thoughts and actions. And even here there are perhaps causes of change where we cannot say with certainty that we perceive the efficient cause.

Nothing seems to remain, therefore, but to allow that this physical law of human judgment is instinctive, a constituent of the human soul, a first principle; and inapplicable to any other proof than the appeal to the feelings of every man.

Simply, say, that every change is considered as an effect, is not giving the whole characters of this physical law. The cause is not always, perhaps never observed, but is inferred from the phenomena. The inference is therefore in every instance dependant on the phenomenon. The phenomenon is to us the language of nature. It is therefore the sole indication of the cause and its agency. It is therefore the indication of the very cause, and of no other. The observed change therefore characterizes the cause, and marks its kind. This is confirmed by every word of philosophical language, where, as has already been observed, the names of the inferred powers of nature are nothing but either abbreviated descriptions of the phenomena, or terms which are defined solely by such descriptions. In like manner, the phenomenon determines the cause in a particular degree, and in no other; and we have no immediate measure of the degree of the cause but the phenomenon itself. We take many measures of the cause, it is true; but on examination they will be found not to be immediate measures of the cause, but of the effect. Assuming gravitation as the cause of the planetary deviations from uniform rectilineal motion, we say that the gravitation of the moon is but the part of the gravitation of a stone thrown from the hand; but we say this only from observing that the deflection of the stone is 3600 times greater than the simultaneous deflection of the moon. In short, our whole knowledge of the cause is not only founded on our knowledge of the phenomenon, but it is the same. This will be found a remark of immense consequence in the prosecution of philosophical researches; and a strict attention to it will not only guard us against a thousand mistakes into which the reasoning pride of man would continually lead us, but will also enable us fully to detect many egregious and fatal blunders made in conformation of this philosophical vanity. Nothing can be more evident than that whenever we are puzzled, it would be folly to continue groping among those obscure beings called causes, when we have their prototypes, the phenomena themselves, in our hands.

Such is the account which may be given of philosophy, the study of the works of God, as related by causation. It is of vast extent, reaching from an atom to the glorious Author of the Universe, and contemplating the whole connected chain of intelligent, sensitive, and inanimate beings. The philosopher makes use of the descriptions and arrangement of the natural historian as of mighty use to himself in the beginning of his career; confiding in the uniformity of nature, and expecting that similarity in the quiescent properties of things will be accompanied by some resemblances in those more important properties which constitute their mutual dependences, linking them together in a great and endlessly ramified chain of causes.

We have endeavoured to ascertain with precision the peculiar province of philosophy, both by means of its object and its mode of procedure. After this it will not require many words to point out the methods for prosecuting the study with expedition and with success. The rules of philosophizing, which Newton premised to his account of the planetary motions, which he so frupulously followed, and with a success which gives them great authority, are all in strict conformity to the view we have now given of the subject.

The chief rule is, that similar causes are to be affigmed to similar phenomena. This is indeed the source of all our knowledge of connected nature; and without it the Universe would only present to us an incomprehensible chaos. It is by no means, however, necessary to enjoin this as a maxim for our procedure; it is an instinctive propriety of the human mind. It is absolutely necessary, on the contrary, to caution us in the application of this propensity. We must be extremely confident in the certainty of the resemblance before we venture to make any inference. We are prone to reason from analogy: the very employment of all our knowledge of connected nature, and without it the universe would only present to us an incomprehensible chaos. It is by no means, however, necessary to enjoin this as a maxim for our procedure; it is an instinctive propriety of the human mind. It is absolutely necessary, on the contrary, to caution us in the application of this propensity. We must be extremely confident in the certainty of the resemblance before we venture to make any inference. We are prone to reason from analogy: the very employment of all our knowledge of connected nature, and without it the universe would only present to us an incomprehensible chaos.

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This propensity to analogical reasoning is aided by another equally strong, and equally useful, when properly directed, we mean the propensity to form general laws: it is in fact a propensity to discover causes, which is equivalent to the establishing of general laws. It appears in another form, and is called a love of or taste for simplicity; and this is encouraged or justified as agreeable to the uniformity and simplicity of nature. "Natura femper fibi similis et confona," says Newton; "Fructa fit per plura, quod fieri potest per primum," says another. The beautiful, the wise economy of nature, are phrases in every body's mouth; and Newton enjoins us to adopt no more causes than are sufficient to explain the phenomena. All this is very well, and is true in its own degree; but it is too frequently the subterfuge of human vanity and self-love. This inordinate admiration of the economy and simplicity of nature is generally conjoined with a manifest love of system, and with the actual production of some new system, where from one general principle some extensive theory or explanation is deduced and offered to the world. The author sees a sort of rein
To regulate such hazardous propensities, and keep philosophers in the right path, Newton inculcates another rule, or rather gives a modification of this injunction of simplicity. He enjoins, that no cause shall be admitted but what is real. His words are, that no cause shall be admitted but such as are true, and sufficient to account for the phenomena. We apprehend that the meaning of this rule has been mistaken by many philosophers, who imagine that by true he means causes which really exist in nature, and are not mere creatures of the imagination. We have met with some who would boggle at the doctrines of Aristotle respecting the planetary motions, viz. that they are carried along by conducting intelligent minds, because we know of none such in the universe; and who would nevertheless think the doctrine of the Cartesian vortices deserving of at least an examination, because we see such vortices exist, and produce effects which have some resemblance to the planetary motions, and have justly rejected them falsely because this resemblance has been very imperfect. We apprehend Newton's meaning by these words is, that no cause of any event shall be admitted, or even considered, which we do not know to be actually concurring or exerting some influence in that very event. If this be his meaning, he would reject the Cartesian vortices, and the conducting spirits of Aristotle for one of the same reason; not because they were not adequate to the explanation, nor because such causes did not exist in nature, but because we did not see them by any how concerned in the phenomenon under consideration. We neither see a spirit nor a vortex, and therefore need not trouble ourselves with enquiring what effects they would produce. Now we know that this was his very conduct, and what has distinguished him from all philosophers who preceded him, though many by following his example, have also been rewarded by similar success. This has procured to Newton the character of the modest philosopher; and modelled his procedure more, for distinction's sake, be called, because contrary to the procedure of others did not originate so much from ignorance as from vanity. Newton's conductor in this was not modelly, but sagacity, prudence, caution, and to say it purely, it was found judgment.

For the bonds of nature, the supposed philosophical causes are not observed; they are inferred from the phenomena. When two substances are observed, and only when they are observed, to be connected in any series of events, we infer that they are connected by a natural power: but when one of the substances is not seen, nor fancied, no law of human thought produces any inference whatever. For this reason alone Newton stopped short at the last fact which he could discover in the solar system, that all bodies were deflected to all other bodies, according to certain regulations of distance and quantity of matter. When told that he had done nothing in philosophy, that he had discovered no cause, and that to merit any praise he must show how this deflection was produced;—he said, that he knew no more than he had told them; that he saw nothing causing this deflection; and was contented with having described it so exactly, that a good mathematician could now make tables of the planetary motions as accurate as he pleased, and with hoping in a few years to have every purpose of navigation and of philosophical curiosity completely answered; and he was not disappointed. And when philosophers on all sides were contriving hypothetical fluids and vortices which would produce these deflections, he contented himself with showing the total inconsistency of these explanations with the mechanical principles acknowledged by their authors; showing that they had transfixed both parts of his rule, their causes neither being real nor sufficient for explaining the phenomena. A cause is sufficient for explaining a phenomenon only when its legitimate consequences are perfectly agreeable to these phenomena.

Newton's discoveries remain without any diminution or change: no philosopher has yet advanced a step further.

But let not the authority, or even the success of this doctrine be our guide. Is his rule founded in reason? It surely is. For if philosophy be only the interpretation of nature's language, the inference of reason from the phenomena, a fancied or hypothetical phenomenon can produce nothing but a fanciful cause, and can make no addition to our knowledge of real nature.

All hypotheses therefore must be banished from philosophical discussion as frivolous and useless, admitting to vanity alone. As the explanation of any appearance is nothing but the pointing out the general fact of which this is a particular instance, a hypothesis can give no explanation: knowing nothing of cause and effect but the conjunction of two events, we see nothing of causation where one of the events is hypothetical. Although all the legitimate consequences of a hypothetical principle should be perfectly similar to the phenomenon, it is extremely dangerous to assume this principle as the real cause. It is illogical to make use of the economy of nature as an argument for the truth of any hypothesis; for if true, it is a physical truth, a matter of fact, and true only to the extent in which it was observed, and we are not intended to say that it is so any further; therefore not in this case till it be observed. But the proposition that nature is so economical is false; and it is astonishing that it has been so lazily acquiesced in by the readers of hypotheses; for it is not the authors who are deceived by it, they are generally led by their own vanity. Nothing is more observable than the prodigious variety of nature. That the same phenomena may be produced by different means is well known to the astronomers, who must all grant, that the appearances of motion will be precisely the same whether the earth moves round the sun like the other planets, or whether the sun with his attendant planets moves round the earth: and that the
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View of Bacon's Philosophy

the demonstration of the first opinion is had from a fact totally unconnected with all the defections or even with their causes: for it may be afferted, that Dr Bradley's discovery of the aberration of the fixed stars, in conquence of the progressive motion of light, was the first thing which put the Copernican sytem beyond question; and even this is still capable of being explained in another way. The Author of Nature seems to delight in variety; and there cannot be named a single purpose in which the most inconceivable fertility in resource is not observed. It is the most delightful occupation of the curious mind and the sensible heart to contemplate the various contrivances of nature in accomplishing similar ends.

As a principle therefore on which to found any maxim of philosophical procedure, this is not only unjusticious, because imprudent and apt to mislead, but as false, and almost sure to mislead. In conformance to this observation, it must be added, that nothing has done so much harm in philosophy as the introduction of hypotheses.

Authors have commonly been satisfied with very slight resemblances, and readers are easily misled by the appearances of reassembling which these resemblances have countenanced. The ancients, and above all Aristotle, were much given to this mode of explanation, and have filled philosophy with absurdities. The flightest resemblances were with them sufficient foundations of theories. It has been by very few degrees that men have learned caution in this respect; and we are sorry to say that we are not yet cured of the diseafe of hypothetical systematizing, and to fee attempts made by ingenious men to bring the frivolous theories of antiquity again into credit. Nay, modern philosophers have been much given to this mode of explanation, and have filled philosophy with absurdis. Their writings abound in ethers, nervous fluids, animal spirits, vortices, vibrations, and other invisible agents. We may affirm that all these attempts may be shown to be either unintelligible, fruitless, or false. Either the hypothesis has been such that no confluence can be distinctly drawn from it, on account of its obscurity and total want of resemblance to any thing we know; or the just and legitimate consequences of the hypothesis are inconsistent with the phenomena. This is remarkably the case in the hypotheses which have been introduced for the explanation of the mechanical phenomena of the universe. These can be examined by accurate science, and the confquences compared without any mistake; and nothing else but a perfect agreement should induce us even to listen to any hypothesis whatever.

It may here be asked, Whether, in the case of the most perfect agreement, after the most extensive comparison, the hypothesis should be admitted? We believe that this must be left to the feelings of the mind. When the belief is irresistible, we can reason no more. But as there is no impossibility of a perfect agreement with some other hypothesis, it is evident that it does not convey an irrefragible title to our hypothesis. It is said, that such an agreement authorizes the reception of the hypothetical theory in the same manner as we must admit that to be the true cypher of a letter which will make perfect sense of it. But this is not true; in deciphering a letter we know the sounds which must be represented by the cyphers, and that they are really the constituents of speech: but in hypothetical explanations the first principle is not known to exist; nay, it is impossible to make two cyphers, each of which shall give a meaning to the letter. Influences of this are to be seen in treatises on the art of deciphering; and there has been lately discovered a national character (the ogam discovered in Ireland) which has this property.

We conclude our criticism on hypothetical explanations with this observation, that it is impossible that they can give any addition of knowledge. In every hypothesis we thrust in an intermediate event between the phenomenon and some general law; and this event is not seen, but supposed. Therefore, according to the true maxim of philosophical investigation, we give no explanation; for we are not by this means enabled to adjust the general law in which this particular phenomenon is included: nay, the hypothesis makes no addition to our lift of general laws; for our hypotheses must be rejected, in order to tally with all the phenomena. The hypothesis therefore is understood only by and in the phenomena; and it must not be made more general than the phenomena themselves. The hypothesis gives no generalization of facts. Its very application is founded on a great coincidence of facts; and the hypothetical fact is thrust in between two which we really observe to be united by nature. The applicability therefore of the hypothesis is not more extensive

(n) It has often been matter of amusement to us to examine the hypothetical theories of ingenious men, and to observe the power of nature even when we are transgressing her commands, Naturam expellat furca, tamen aequa revertitur. The hypothesis of an ingenious man is framed in perfect conformity to nature's dictate's: for you will find that the hypothetical cause is touched and retouched, like the first setting of a picture, till it is made to resembler the phenomena, and the cause is still inferred, in spite of all his ingenuity, from the phenomenon; and then, instead of defending the spectators to pay him the due praise, by laying that the picture is like the man, he infers that they shall say, what gives him no credit, that the man is like the picture. But, alas! this is indeed the case. The picture is generally an anamorphosis, unlike any thing extant in nature, and having parts totally incongruous. We have seen such pictures, where a wood is standing on the sea, and an eye is on the end of an elephant's trunk; and yet when this was viewed through a proper glass, the wood became an eyebrow to the eye, and the proboscis was a very pretty ringlet of hair. We beg indulgence for this piece of levity, because it is a most opposite illustration of a hypothetical theory. The resemblance between the principle and phenomenon is true only in detached unconnected straps, and the principle itself is an incongruous patchwork. But by a perversion of the rules of logic, all these incon sistencies are put out of view, and the explanation is something like the phenomenon.
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On what occasions they may be useful

The sphere of our intuitive knowledge is very limited; and we must be indebted for the greatest part of our intellectual attainments to our rational powers, and it must be deductive. In the spontaneous phenomena of nature, whether of mind or body, it seldom happens that the energy of that natural power, which is the principle of explanation, is so immediately connected with the phenomenon that we see the connection at once. Its exertions are frequently concealed, and in all cases modified, by the joint exertions of other natural powers: the particular exertion of each must be considered apart, and their mutual connection traced out. It is only in this way that we can

discovev the perhaps long train of intermediate operations, and also see in what manner and degree the real principle of explanation concurs in the oftenible processes of nature.

In all such cases it is evident that our investigation (and investigation it must frailly is) must proceed by steps, conducted by the sure hand of logical method. To take an instance from the material world, let us listen to Galileo while he is teaching his friends the cause of the rise of water in a pump. He says that it is owing to the prense of the air. This is his principle; and he announces it in all its extent. All matter, says he, is heavy, and in particular air is heavy. He then points out the connection of this general principle with the phenomenon.

Air being heavy, it must be supported: it must lie and press on what supports it; it must press on the surface AB of the water in the cistern surrounding the pipe CD of the pump; and also on the water C within this pipe. He then takes notice of another general principle which exhibits its subordinate influence in this process. Water is a fluid; a fluid is a body whose parts yield to the smallest impression; and, by yielding, are easily moved among themselves: and no little parcel of the fluid can remain at rest unless it is equally pressed in every direction, but will recede from that side where it sustains the greatest pressure. In consequence of this fluidity, known to be a property of water, if any part of it is pressed, the pressure is propagated through the whole; and if not refilled on every side, the water will move to that side where the unpressed pressure is not refilled. All these subordinate or collateral propositions are supposed to be previously demonstrated or allowed. Water therefore must yield to the pressure of the air unless pressed by it on every side, and must move to that side where it is not withheld by some opposite pressure. He then proceeds to shew, from the structure of the pump, that there is no opposing pressure on the water in the inside of the pump. For (says he) suppose the piston thrust down till it touches the surface of the water in the pipe; suppose the piston now drawn up by a power sufficient to lift it, and all the air incumbent on it, and suppose it drawn up a foot or a fathom—there remains nothing now (says he) that I know of, to press on the surface of the water. In short (says he), gentlemen, it appears to me, that the water in the pump is in the same situation that it would be in were there no air at all, but water poured into the cistern to a height AF; such, that the column of water FABG

presses
affording us no assistance in the application of the powers of nature to the purposes of life. Nor will this
excite much wonder in the mind of the enlightened reader of the present day, who reflects on the use that
in this dialectic process was made of the categories, and the method in which these categories were formed.
From first principles fo vague in themselves, and in gratuitously assumed, ingenious men might deduce many
different conclusions all equally erroneous: and that this was actually done, no surer evidence can be given,
than that hardly a lifetime elapsed in which the whole
systenm of doctrines which had captivated the minds of the
most penetrating, have not been oftener than once
exploded and overturned by another systenm, which
flourished for a while, and then was supplanted by a
third which shared the same fate. Here was an infa-
liable proof of their error, for instability is incompatible
with truth.

It is allowed by all that this has been the case in
those branches of study at least which contemplate the
philosophical relations of the material world, in astro-
nomy, in mechanical philosophy, in chemistry, in phy-
siology, in medicine, in agriculture. It is also ac-
nowledged, that in the course of less than two cen-
turies back we have acquired much knowledge on these
very subjects, call it philosophy, or by what name
you will, so much more conformable to the natural
course of things, that the deductions made from it
by the fane rules of the synthetic method are more
conformable to fact, and therefore better fitted to di-
rect our conduct and improve our powers. It is also
certain that these bodies of doctrine which go by the
name of philosophical sytems, have much more ftabi-
ity than in ancient times; and though sometimes in
part superseeded, are seldom or never wholly explo-
ded.

This cannot perhaps be affirmed with equal confi-
dence with respect to those speculations which have
our intellect or propensities for their object: and we
have not perhaps attained such a representation of hu-
man nature as will bear comparison with the original:
for will the legitimate deductions from such doctrines
be of much more service to us for directing our conduct
than those of ancient times; and while we observe
this difference between these two branches of
speculations, we may remark, that it is conjoined with
a difference in the manner of conducting the study.
We have proceeded in the old Arifotelian method
when investigating the nature of mind; but we see
the material philosophers running about, paufing much
of their time away from books, in the shop of the
artisan, or in the open fields engaged in obfervation,
labouring with their hands, and busy with experiments.
But the speculative on the intellect and the active
powers of the human soul seems unwilling to be indebted
to any thing but his own ingenuity, and his labours are
confined to the closet. In the first class, we have met
with something like success, and we have improved
many arts: in the other, it is to be feared that we
are not much wiser, or better, or happier, for all our truth,
philosophic attainments.

Here, therefore, must surely have been some great,
some fatal mistake. There has indeed been a material
defect in our mode of procedure, in the employment of
this method of reasoning as an inlet to truth. The
fact...
fact is, that philosophers have totally mistaken the road of discovery, and have pretended to set out in their investigation in the very point where this journey should have terminated. The Aristotelian logic, the syllogistic art, that art so much boasted of as the only inlet to true knowledge, the only means of discovery, is in direct opposition to the ordinary procedure of nature, by which we every day, and in every action of our lives, acquire knowledge and discover truth. It is not the art of discovering truth, it is the art of communicating knowledge, and of detecting error: it is nothing more than the application of this maxim, "whatever is true of a whole class of objects, is true of each individual of that class." This is not a just account of the art of discovering truth, nor is it a complete account of all the principles. We discover the source of that misconception, which is so much complained of in philosophy. The authors of systems give a set of consecutive propositions logically deduced from a first principle, which has been hastily adopted, and has no foundation in nature. This does not hinder the amusement of framing a system from it, nor this system from pleasing by its symmetry; and it takes a run: but when some officious follower thinks of making some use of it, which requires the comparison of experience and observation, they are found totally unlike, and the whole fabric must be abandoned as unfound: and thus the successive systems were continually pushing out their predecessors, and presently met with the same treatment.

How was this to be remedied? The rationalization was seldom egregiously wrong; the syllogistic art had ere now attained a degree of perfection which left little room for improvement, and was so familiarly understood by the philosophical practitioners, that they seldom committed any great blunders. Must we examine the first principles? This was a task quite new in science; and there were hardly any rules in the received systems of logic to direct us to the successful performance of it. Aristotle, the sagacious inventor of those rules, had not totally omitted it; but in the fervor of philosophic speculation he had made little use of them. His fertile genius never was at a loss for first principles, which answered the purpose of verbal disquisition without much risk of being belied on account of its difficility to nature; for there was frequently no prototype with which his systematic doctrine could be compared. His enthusiastic followers, found abundant amusement in following his example; and philosophy, no longer in the hands of men acquainted with the world, conversant in the great book of nature, was now confined almost entirely to recede monks equally ignorant of man and of this world. But curiosity was awakened, and the men of genius were fretted as well as disquieted with the disquisitions of the schools, which one moment raised expectations by the symmetry of composition, and the next moment blasted them by their inconstancy with experience.

They saw that the best way was to begin de novo, to throw away the first principles altogether, without exception or examination, and endeavour to find out new ones which should stand the test of logic; that is, should in every case be agreeable to fact. Philosophers began to reflect, that under the unnoted tuition of kind nature we have acquired much useful knowledge. It is therefore highly probable, that her method is the most proper for acquiring knowledge, and that by imitating her manner we shall have the like success. We are too apt to flit the occupations of children, whom we may observe continually busily turning every thing over and over, putting them into every situation, and at every distance. We excuse it, saying that it is an innocent amusement; but we should pay with an ingenious philosopher (Dr Reid), that they are most seriously and rationally employed: they are acquiring the habits of observation; and by merely indulging an undefinable curiosity, they are making themselves acquainted with surrounding objects: they are struck by similitudes, and amused with mere classification. If some new effect occurs from any of their little play, they are eager to repeat it. When a child has for the first time tumbled a spoon from the table, and is pleased with its jingling noise on the floor, if another lies within its reach, it is sure to share the same fate. If the child is indulged in this diversion, it will repeat it with a greediness that deferves our attention. The very first eager repetition shows a confidence in the constancy of natural operations, which we can hardly ascribe wholly to experience; and its keenness to repeat the experiment, shows the interest which it takes in the exercise of this most useful propensity. It is beginning the study of nature; and its occupation is the fame with that of a Newton computing the motions of the moon by his sublime theory, and comparing his calculus with observation. The child and the philosopher are equally employed in the contemplation of a similarity of event, and are anxious that this similarity shall return. The child, it is true, thinks not of this abstract object of contemplation, but throws down the spoon again to have the pleasure of hearing it jingle. The philosopher supposes that the conjunction of events is the consequence of a general law of nature, and tries an experiment where this conjunction recurs. The child is happy, and eager to enjoy a pleasure which to us appears highly frivolous; but it has the same foundation with the pleasure of the philosopher, who rejoices in the success of his experiment: and the fact, formerly a trifle to both, now acquires importance. Both go on repeating the experiment, till the fact ceases to be a novelty to either: the child is satisfied, and,
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and the philosopher has now established a new law of nature.

Such (says this amiable philosopher) is the education of kind nature, who from the beginning to the end of our lives makes the play of her scholars their most instructive lessons, and has implanted in our mind the curiosity and the inductive propensity by which we are enabled and disposed to learn them. The exercise of this inductive principle, by which nature prompts us to infer general laws from the observation of particular facts, gives us a species of logic new in the schools, but old as human nature. It is certainly a method of discovery; for by these means general principles, formerly unknown, have come into view.

It is a just and rational logic; for it is founded on, and indeed is only the habitual application of, this maxim, "That whatever is true with respect to every individual of a class of events, is true of the whole class." This is just the inverse of the maxim on which the Aristotelian logic wholly proceeds, and is of equal authority in the court of reason. Indeed the expression of the general law is only the abbreviated expression of every particular instance.

This new logic, therefore, or the logic of induction, must not be confederated as subordinate to the old, or founded on it. See Logic, Part III, chap. 5. In fact, the use and legitimacy of the Aristotelian logic is founded on the inductive:

All animals are mortal; therefore
All men are animals; therefore
All men are mortal.

This is no argument to any person who chooses to deny the mortality of man: even although he acknowledges his animal nature, he will deny the major proposition.

It is beside our purpose to show, how a point so general, so congenial to man, and so familiar, remained so long unnoticed, although the disquisition is curious and satisfactory. It was not till within these two centuries that the increasing demand for practical knowledge, particularly in the arts, made inquisitive men see how useless and insufficient was the learning of the schools in any road of investigation which was connected with life and business; and observe, that society had received useful information chiefly from persons actually engaged in the arts which the speculative were endeavouring to illustrate; and that this knowledge consisted chiefly of experiments and observations, the only contributions which their authors could make to science.

The Novum Organum of Bacon, which points out the true method of forming a body of real and useful knowledge, namely, the study of nature in the way of description, observation, and experiment, is undoubtedly the noblest preface that science ever received. It may be considered as the grammar of nature's language, and is a counter-part to the logic of Aristotle; not exploding it, but making it effectual.

As the logic of Aristotle had its rules, so has the Baconian or inductive; and this work, the Novum Organum Scientiarum, contains them all. The chief rule, and indeed the rule from which all the rest are but derivations, is, that "the induction of particulars must be carried as far as the general affirmation which is deduced from them." If this be not attended to, the mind of man, which from his earliest years shows great eagerness in searching for first principles, will frequently ascribe to the operation of a general principle events which are merely accidental. Hence the popular belief in omens, palmistry, and all kinds of fortune-telling.

This rule must evidently give a new turn to the whole track of philosophical investigation. In order to discover first principles, we must make extensive and accurate observations, so as to have copious inductions of facts, that we may not be deceived as to the extent of the principle inferred from them. We must extend our acquaintance with the phenomena, paying a minute attention to what is going on all around us; and we must study nature, not flut up in our closet drawing the picture from our own fancy, but in the world, copying our lines from her own features.

To delineate human nature, we must see how men act. To give the philosophy of the material world, we must notice its phenomena.

This method of studying nature has been pronounced during these two last centuries with great eagerness and success. Philosophers have been busied in making accurate observations of facts and copious collections of them. Men of genius have discovered points of resemblance, from which they have been able to infer many general powers both of mind and body; and resemblances, among these, have suggested powers still more general.

By these efforts investigation became familiar; philosophers studied the rules of the art, and became more expert; hypotheses were banished, and nothing was admitted as a principle which was not inferred from the most copious induction. Conclusions from such principles became every day more conformable to experience. Mistakes sometimes happened; but recourse being had to more accurate observation or more copious induction, the mistakes were corrected. In the Androcles of the present study of nature, our steps are more flow, and lying mildest and painless; our conclusions are more limited, and more modelled, but our discoveries are more certain and progressive, and the results are more applicable to the purposes of life. This pre-eminence of modern philosophy over the ancient is seen in every path of inquiry. It was first remarkable in the study of the material world; and there it still continues to be most conspicuous. But it is no less to be seen in the later performances of philosophers in metaphysics, pneumatology, and ethics, where the mode of investigation by analysis and experiment has been greatly adopted; and we may add, that it is this juncture of the employment which has restored philosophers to the world, to society. They are no longer to be found only in the academies of the sophists and the eloquents of a convent, but in the discharge of public and private duty. A philosophic genius is a genius for observation as well as reflection, and he says, Homo sum, homini a me nihil alienum puto.

After paying so much on the nature of the employment of, the mode of procedure, it requires no deep philosophical character. If there is a propensity in the human mind which
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View of Bacon's Philosophy

which distinguishes us from the inferior orders of sentient beings, without the least circumstance of interference, a propensity which alone may be taken for the characteristic of the species, and of which no trace is to be found in any other, is disinterested intellectual curiosity, a love of discovery for its own sake, independent of all its advantages.

We think highly (and with great justice do we think so) of our rational powers; but we may carry this too far, as we do every ground of self-satisfaction. To every man who enjoys the cheering thought of living under the care of a wise Creator, this boasted prerogative will be viewed with more modesty and deference; and he has given us evident marks of the rank in which He exalts the rational powers of man. In no case that is of essential importance, of indispensable necessity, not only to our well-being but to our very existence, has He left man to the care of his reason alone; for in the first instance. He has given us reason to guide the helm, while passion blows the gale.

God has not trusted either the preservation of the individual or the continuance of the race to man's notion of the importance of the task, but has committed them to the safer guardians of hunger and of sexual desire. In like manner, He has not left the improvement of his noblest work, the intellectual powers of the soul of man, to his own notions how important it is to his comfort that he be thoroughly acquainted with the objects around him. No: He has committed this also to the sure hand of curiosity; and he has made this so strong in a few superior souls, whom He has appointed to give light and knowledge to the whole species, as to abstract them from all other pursuits, and to engage them in intellectual research with an ardour which no attainment can ever quench, but, on the contrary, inflames it the more by every draught of knowledge.

But what need words
To paint its power? For this the daring youth Breaks from his weeping mother's fondling arms In foreign climes to rove. The penive sage, Headless of sleep, or midnight's hurtful vapour, Hangs o'er the flickly taper.—Hence the scorn Of all familiar prospects, though beheld With transport once. Hence th' attentive gaze Of young astonishment.

Such is the bounteous providence of Heaven, In every breast implanting the desire Of objects new and strange, to urge us on With unremitting labour to attain The sacred stores that wait the rip'ning soul In Truth's exhaustless bosom Athenides.

But human life is not a situation of continual necessity; this would ill suit the plans of its Beneficient Author; and it is from induction of phenomena totally opposite to this, and from such induction alone, that we have ever thought of a wise Creator. His wisdom appears only in his beneficence. Human life is a scene filled with enjoyment; and the soul of man is stored with propensities and powers which have pleasure in direct terms, for their object. Another striking distinction of our nature is a continual disposition to refinement, of which few traces are to be found in the actions of other animals. There is hardly a gift of nature so grateful to itself as to leave the feeble mind of man till he has moulded it to his fancy. Not contented with food, with raiment, and with shelter, he must have nice cookery, ornamental dress, and elegant houses. He hunts when he is not hungry, and he refines sexual appetite into a most elegant passion. In like manner he has improved this anxious desire of the knowledge of the objects around him, so as to derive from them the means of subsistence and comfort, in to the most elegant and pleasing of all gratifications, the accumulation of intellectual knowledge, independent of all consideration of its advantages. And as every man has a title to the enjoyment of such pleasures as he can attain without injuring his neighbour; so it is allowable to such as have got the means of intellectual improvement, without relinquishing the indispensable social duties, to push this advantage as far as it will go: and, in all ages and countries, it has been considered as forming the greatest distinction between men of easy fortune and the poor, who must earn their subsistence by the sweat of their brow. The plebeian must learn to work, the gentleman must learn to think; and nothing can be a surer mark of a groveling soul than for a man of fortune to have an uncultivated mind.

Let us then cherish to the utmost this distinguishing property of the human soul; but let us do even this like philosophers. Let us cultivate it as it is; as the handmaid to the arts and duties of life; as the guide to yet more excellent. A character is not to be estimated from what the per son knows, but from what he can perform. The accumulation of intellectual knowledge is too apt to create an inordinate appetite for it; and the man habituated to speculation is, like the miser, too apt to place that pleasure in the mere possession, which he ought to look for only or chiefly in the judicious use of his favourite object. Like the miser, too, his habits of hoarding up generally unfit him for the very enjoyment which at setting out he proposed to himself. Seldom do we find the man, who has devoted his life to scientific pursuits for their own sake, possessed of that superior mind which the active employ to good purpose in times of perplexity; and much fonder do we find him possessed of that promptitude of apprehension, and that decision of purpose, which are necessary for failing through the difficult scenes of human life.

But we may live the good things of this life without abusing them; and by moderation here, as in all other pursuits, derive those solid advantages which philosophy is able to bestow. And these advantages are great. To enumerate and describe them would be to write a great volume. We may just take notice of one, which is an obvious consequence of that strict and simple view which we have given of the subject; and this is, a modest opinion of our attainments. Appearances are all that we know; causes are for ever hid from our view; the powers of our nature do not lead us so far. Let us therefore, without hesitation, relinquish all pursuits which have such things as ultimate principles for objects of examination. Let us attend to the subordinations of things which it is our great business to explore.
PHILOSTORGIUS, an ecclesiastical historian of the 4th century, was born in Cappadocia, and wrote an abridgment of ecclesiastical history, in which he treats Athanasius with some severity. This work contains many curious and interesting particulars. The best edition is that of Henry de Valois in Greek and Latin. There is also attributed to him a book against Porphyry.

PHILOSTRATUS (Flavius), was an ancient Greek author. He wrote the Life of Apollonius Tyanaeus, and some other things which have come down to our time. Eusebius against Hierocles calls him an Athenian, because he taught at Athens; but Eunapius and Suidas always speak of him as a Læmnian: and he hints, in his life of Apollonius, that he used to be at Lemnos when he was young. He frequented the schools of the sophists; and he mentions his having heard Damasus of Ephesus, Proclus Nautcratitis, and Hippodromus of Larissa. This seems to prove that he lived in the reign of the emperor Severus, from 193 to 212, when those sophists flourished. He became known afterwards to Severus's wife Julia Augusta, and was one of those learned men whom this philosophic empress had continually about her. It was by her command that he wrote the Life of Apollonius Tyanaeus, as he relates himself in the same place where he informs us of his connections with that learned lady. Suidas and Helychius say that he was a teacher of rhetoric, first at Athens and then at Rome, from the reign of Severus to that of Philippus, who obtained the empire in 244.

Philostratus's celebrated work is the Life of Apollonius: which has erroneously been attributed to Lucian, because it has been printed with some of that author's pieces. Philostratus endeavours, as Cyril observes, to represent Apollonius as a wonderful and extraordinary person; rather to be admired and adored as a god than to be considered as a mere man. Hence Eunapius, in the preface to his Lives of the Sophists, says that the proper title of that work would have been, 'The Coming of a God to Men;' and Hierocles, in his book against the Christians which was called Philalethes, and which was refuted by Eusebius in a work (ill extant, among other things drew a comparison between Apollonius and Jesus Christ. It has always been supposed that Philostratus composed his work with a view to difcredit the miracles and doctrines of our Lord,
Philotus's Letters; but some of these, though it is not easy to determine which, were written by a nephew to our Philostratus, of the same name, as were also the last eighteen in the book of images. This is the reason why the title runs not Philotratns, but Philostratorum quae fupersunt omnia.

There were many persons of the name of Philostratus among the ancients; and there were many other works of the Philostratus here recorded, but no others are extant besides those we have mentioned.

PHILOTIS, a servant maid at Rome, saved her countrymen from destruction. After the siege of Rome by the Gauls, the Fidenates assembled an army, and marched against the capital, demanding all the wives and daughters in the city as the only conditions of peace. This demand astonished the senate; and when they refused to comply, Philotis advised them to lend all their female slaves disguised in matron's clothes, and the offered to march herself at the head. Her advice was followed; and when the Fidenates had feasted late in the evening, and were quite intoxicated and fallen asleep, Philotis lighted a torch as a signal for her countrymen to attack the enemy. The whole was successful; the Fidenates were conquered; and the senate, to reward the fidelity of the female slaves, permitted them to appear in the drefs of the Roman matrons.

PHILOXENUS, an officer of Alexander, who received Cilicia at the general division of the provinces.

—A son of Ptolemy, who was given to Pelopidas as an hostage.—A dythrambic poet of Cythera. He enjoyed the favour of Dionysius tyrant of Sicily for some time, till he offended him by cutting off one of his female fingers. During his confinement Philoxenus composed an allegorical poem called Cyclops; in which he had delineated the character of the tyrant under the name of Polyphemus, and represented his mistresses under the name of Galatea, and himself under that of Ulysses. The tyrant, who was fond of writing poetry, and of being applauded, removed Philoxenus from his dungeon; but the poet refused to purchase his liberty by laying things unworthy of himself, and applauding the wretched verbes of Dionysius. and therefore he was sent to the quarries. Being fet at liberty, he some time after was asked his opinion at a feast about some verbes which Dionysius had just repeated, and which the courtiers had received with the greatest applause. Philoxenus gav no answer, but he ordered the guards that surrounded the tyrant's table to take him back to the quarries. Dionysius was pleased with his pleasantry and with his firmness, and immediately forgave him. Philoxenus died at Ephesus about 380 years before Christ.

PHILTER, or PHILTRUM, (Philtreum), in pharmacy, &c. a strainer.

Philters, and also used for a drug or preparation, which it is pretended will excite love.—The word is formed from the Greek φιλτρον. "I love," or φιλον, "lover."

Philters are distinguished into true and phœnious, and were given by the Greeks and Romans to excite love. (See Love in medicine.) The phœnious are spells or charms, supposed to have an effect beyond the ordinary laws of nature by some magic virtue; such are those said to be given by old women, witches, &c.—The true
Philters are those supposed to work their effect by some natural and magnetic power. There are many grave authors who believe the reality of these philters, and allege matter of fact in confirmation of their sentiments: among the rest, Van Helmont, who says, that upon holding a certain herb in his hand for some time, and taking afterwards a little dog by the foot with the same hand, the dog followed him wherever he went, and quite deserted his former master; which he pretends to account for thus: The heat communicated to the herb, not coming alone, but animated by the emanations of the natural spirits, determines the herb towards the man, and identifies it to him: having then received this ferment, it attracts the spirit of the other object magnetically, and gives it an amorous motion. But this is mere cant; and all philters, whatever facts may be alleged, are mere chimeras.

PHILLYRA, in botany. See PHYLICA.

PHILIPHOAS, or, as the Jews pronounce it PINCHAS, was the son of Eleazar, and grandson of Aaron. He was the third high priest of the Jews, and discharged this office from the year of the world 2571, till towards the year 2590. He is particularly commended in Scripture for the zeal he showed in vindicating the glory of God, when the Midianites had sent their daughters into the camp of Israel, to tempt the Hebrews to fornication and idolatry. For Zimri having publicly entered into the tent of a Midianitish woman named Cushi, Phinehas arose up from among the people (Numb. xxv. 7, &c.), took a javelin in his hand, entered after Zimri into that infamous place, and stabbed both man and woman at one blow, in those parts that were chiefly concerned in this criminal commerce. Upon which the plague or divine tempest fell upon them, and they were besieged in their camp, till the Lord promised to deliver them. See SURGERY.

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PHILUS, was a son of Agenor, king of Phoenicia, or according to some of Neptune. He became king of Thrace, or, according to the greater part of mythologists, of Bithynia. He married Cleopatra the daughter of Boreas, called by some Cleobula, by whom he had Plexippus and Pandion. After her death, he married Iidea the daughter of Dardanus. Iidea, jealous of his former wife’s children, accused them of attempts upon their father’s life and crown, or, as others affirm, of attempts upon her virtue; on which they were condemned by the high-priesthood from one family to the other. This dignity continued in the race of Phinehas, from Aaron down to the high-priest Eli, for about 335 years. See Aaron.

The manner and causes of this change are unknown. It re-entered again into the family of Eleazar under the reign of Saul, when this prince having put to death Abimelech, and the other priests of Nob, he gave the high-priesthood to Zadok, who was of the race of Phinehas. At the same time, David had Abiathar with him, of the race of Eli, who performed the functions of high-priest. So that after the death of Saul, David continued the priestly function of Zadok and Abiathar conjointly. But towards the end of David’s reign, Abiathar having espoused the interest of Adonijah, to the prejudice of Solomon, he was in disgrace, and Zadok only was acknowledged as high-priest. The priestly function continued in his family till after the captivity of Babylon, and even till the destruction of the temple. But from the beginning of Zadok’s priestly function, and the exclusion of Abiathar, to the ruin of the temple, it is 1084 years.

We read of another memorable action of Phinehas, in which he still showed his zeal for the Lord. This was when the Israelites that were beyond Jordan had raised upon the banks of this river a vast heap of earth (John. xxii. 30, 31.). Those on the other side seeing they were going to forfake the Lord, and set up another religion, deputed Phinehas and other chief men among them, to go and inform themselves of the reason of erecting this monument. But when they had found it was in commemoration of their union and common original, Phinehas took occasion from thence to prave the Lord, saying, “We know that the Lord is with us, since you are not guilty of that prevarication we suspected you were.”

We do not exactly know the time of the death of Phinehas. But as he lived after the death of Joshua, and before the first servitude under Chushan-rishathaim, during the time that there were neither kings nor judges in the land, and every one did what was right in his own eyes (Judges xvii. 6. xviii. 1. xxi. 24.); his death is put about the year of the world 2590. It was under his pontificate that the story of Micah happened, as also of that of the tribe of Dan, when they made a conquest of Lachith; and the enormity that was committed upon the wife of the Levite of the mountain of Ephraim (Judges xx. 28.). Phinehas’s successor in the high-priesthood was Abiezir, or Abifhau.

The Rabbins allow a very long life to Phinehas. There are some who believe he lived to the time of the high-priest Eli, or even to the time of Samson. Others will have it, that he was the same as Eli, or rather as the prophet Elias, which would still prolong his life for several ages.

PHINEUS (fab. hist.), was a son of Agenor, king of Phoenicia, or according to some of Neptune. He became king of Thrace, or, according to the greater part of mythologists, of Bithynia. He married Cleopatra the daughter of Boreas, called by some Cleobula, by whom he had Plexippus and Pandion. After her death, he married Iidea the daughter of Dardanus. Iidea, jealous of his former wife’s children, accused them of attempts upon their father’s life and crown, or, as others affirm, of attempts upon her virtue; on which they were condemned by the
Phinehas to be deprived of their eyes. This cruelty was soon after punished by the gods; for Phinehas suddenly became blind, and the Harpies were sent by Jupiter to keep him in continual alarm, and to spoil the meats which were placed on his table. He was afterwards delivered from these dangerous monsters by his brothers-in-law Zetes and Calais, who pursued them as far as the Strophades. He likewise recovered his sight by means of the Argonauts, whom he had received with great hospitality, and whom he instructed in the easiest and speediest way of arriving in Colchis. The causes of the blindness of Phineus are a matter of disputé among the ancients; some supposing that this was inflicted by Boreas for his cruelty to his grandfather; while others attribute it to the anger of Neptune, because he had directed the sons of Phryxus how to escape from Colchis to Greece. Many, however, imagine that it proceeded from his having rashly attempted to develop futurity; while others assert that Zetes and Calais put out his eyes on account of his cruelty to their nephews. The second wife of Phineus is called by some Dias, Eurytis, Danae, and Idena.—He was killed by Hercules.

PHLEBOTOMY, the opening of a vein with a probe, whip-pot, and pointed instrument, in order to let out a certain quantity of blood either for the preservation or recovery of a person's health. See SURGERY.

PHLEGM, in the animal economy, one of the four humours whereof the ancients supposed the blood to be composed. The chemists make phlegm or water an elementary body; the characters of which are fluidity, insipidity, and volatility.

PHLEGMA GOGUES, in medicine, a term anciently made use of for such medicines as were supposed to be endowed with the property of purging off phlegm; such as hermodathyris, agaric, turbith, jalaq, &c.

PHLEGMATIC, among physicians, an appellation given to that habit or temperament of body wherein phlegm is predominant; which gives rise to catarrhs, coughs, &c.

PHLEGMON, denotes an external inflammation or tumor, attended with a burning heat.

PHLEGON, who was surnamed Trallius, was born in Trallis a city of Lydia. He was the emperor Hadrian's freed man, and lived to the 18th year of Antoninus Pius; as is evident from his mentioning the consulship of that year. He wrote several works of great erudition, of which we have nothing left but fragments. Among these was a History of the Olympiads, A Treatise of Long-lived Periôns, and another of Wonderful Things; the short and broken remains of which Xylander translated into Latin, and published at Basîl in 1568, with the Greek and with notes. Meurinus published a new edition of them with his notes at Leyden, in 1622. The titles of part of the rest of Phlegon's writings are preserved by Suidas. It is supposed that the History of Hadrian, published under Phlegon's name, was written by Hadrian himself, from this passage of Spartianus: ' Hadrian thrilled so much after fame (says he), that he gave the books of his own life, drawn up by himself, to his freemen, commanding them to publish those books under their own names; for we are told that Hadrian wrote Phlegon's books.'

Phlegon's name has been more familiar among the moderns, and his fragments have had a greater degree of regard paid to them than perhaps they deserve, merely because he has been supposed to speak of the darkness which prevailed during our Lord's passion. The book in which the words are combined is lost; but Eusebius has preserved them in his Chronicon. They are these: 'In the 4th year of the 22d Olympiad, there was a greater and more remarkable eclipse of the sun than any that had ever happened before; for at the sixth hour the day was so turned into the darkness of night, that the very stars in the firmament were visible; and there was an earthquake in Bithynia which threw down many houses in the city of Nicom.' Eusebius thinks that these words of Phlegon related to the prodigies which accompanied Christ's crucifixion; and many other fathers of the church have thought the same; but this opinion is liable to many difficulties; for no man ever a stronger desire than Phlegon to compile marvelous events, and to observe the supernatural circumstances in them. How was it then possible that a man of this turn of mind should not have taken notice of the most surprising circumstance in the eclipse which it is imagined he hints at, viz. its happening on the day when the moon was at full? But Phlegon does not; Phlegon would not have omitted it; and Origen would not have said that Phlegon had omitted this particular.

It was a matter of controversy some time ago, whether Phlegon really spoke of the darkness at the time of our Lord's passion; and many dissertations were written on both sides of the question. This dispute was occasioned by the above passage from Phlegon being left out in an edition of Clark's Lectures, published after his death, at the instance of Sykes, who had sug­gested to Clarke, that an undue stress had been laid upon it. Whitton, who informs us of this affair, expresses great displeasure against Sykes, and calls ' the sug­gestion groundless.' Upon this, Sykes published ' A Dissertation on the Eclipse mentioned by Phlegon; or, 'An Inquiry whether that Eclipse had any relation to the darkness which happened at our Saviour's Passion, 1722,' 8vo. Sykes concludes it to be most probable that Phlegon had in view a natural eclipse which happened November 25th, in the 18th year of the 22d Olympiad, and not in the 4th year of the Olympiad in which Christ was crucified. Many pieces were written against him, and to some of them he replied; but perhaps it is a controversy which concerns the learned world merely, since the cause of religion is but little affected by it.

Photius blames Phlegon for expatiating too much on trites, and for collecting too great a number of answers pronounced by the oracles. 'His style (he tells us) is not altogether flat and mean, nor does it everywhere imitate the Attic manner of writing. But otherwise, the very nice accuracy and care with which he computes the Olympiads, and relates the names of the contests, the transfigurations, and even oracles, is not only very tiresome to the reader, whereby a cloud is thrown over all other particulars in that book, but the diction is thereby rendered unpleasant and ungrateful; and indeed he is every moment bringing in the answers pronounced by all kinds of deities.'

PHLOGISTON, a term used by chemists to express a principle which was supposed to enter the composition of various bodies.
Phlogiston. The bodies which were thought to contain it in the largest quantity are the inflammable substances; and the property which these substancess posses of being susceptible of inflammation was thought to depend on this principle; and hence it was sometimes called the Principle of Inflammability. Inflammation, according to this doctrine, was the separation of the principle or phlogiston from the other matter which composed the combustible body. As its separation was always attended with the emission of light and heat, some of the chemists concluded that it was light and heat combined with other matter in a peculiar manner, or that it was some highly elastic and very subtile matter, on certain modifications of which heat and light depended.

Another class of bodies which were supposed to contain phlogiston are the metals; and the chemists supposed that the peculiar lustre of the metals depended on this principle. Of this they thought themselves convinced by the evidence of their senses in two ways; viz. first, because by exposing a metal to the action of a long continued heat, it lost its metallic lustre, and was converted into an earthy-like sub stance called calx metallica; and secondly, because by mixing this calx with any inflammable substance whatever, and subjecting the mixture to certain operations, the inflammable matter disappeared, and the metal was restored to its former lustre and lustre, without suffering much diminution in quantity, especially if the processes had been conducted with care and attention.

This fact relative to the metals was thought to be a full demonstration of itself, independent of other proofs which were brought to support the doctrine. These were, that a combustible body, by the act of inflammation (i.e., by the distillation of its phlogiston in the form of heat and light), was converted into a body that was no longer combustible, but which might have its property of combustibility restored to it again by mixing the incandescent remains with any kind of inflammable matter, and submitting the mixture to certain processes. In this way the body was restored to its former state of inflammability.

They were also at some pains to prove that the phlogiston or the principle of inflammability was the same in all inflammable bodies and in the metals. This identity of phlogiston they thought to be evident from the fact, that the calx of a metal might be restored to its metallic lustre, or that the remains after the combustion of a combustible body might be again restored to its original state of combustibility by the addition of any inflammable body whatever, taken either from the animal, vegetable, or mineral kingdoms.

These and several other facts were brought to prove, not only the existence of phlogiston, but its effects in mixture with other substances and the objections which were made against the doctrine were removed with wonderful ingenuity. The chief objection against it, was, that if the inflammation of a combustible body, or the conversion of a metal into calx, depended on the distillation or extrication of Phlogiston; then it must follow, that the remains of a combustible body after inflammation, and the calx of the metal, must be less than the matter from which they were produced: but this is contrary to fact; for when we collect with care all the vapour into which the purest inflammable bodies are converted by combustion, these incandescent substan ces are much heavier than the inflammable body phlogiston, was from which they were produced, and the calx into which a metal is converted by long exposure to the action of heat is heavier than the metal from which it was produced. This consideration made several people doubt of the truth of the doctrine; but the objection was removed by saying, that phlogiston was so subtle, as not only to have no weight, but to possess an absolute levity; and that when it was taken from an absolutely heavy body, that body must, by losing so much absolute levity, become heavier, in the same manner as the algebraists say, that a positive quantity is augmented by the subtraction of a negative quantity. This siphonism satisfied the minds of most of the chemists, especially those who were algebraists.

The opinion that phlogiston was heat and light somehow combined with other matter, was proved, not only by the fact, that heat and light were emitted from a combustible body during its combustion, but from the reduction of certain metallic calxes to their original metallic state again, at least in some degree, by simple exposure to heat and light. The white calx of silver for instance, when exposed in close sealed vessels to the light and heat of the sun, refumes a black tinge, and is part restored to its metallic lustre without any addition whatever; but then this restoration, like the others above mentioned, is attended with a loss of weight.

Besides constituting the principal part of inflammable bodies and metals, phlogiston was thought to be the cause of colour in all vegetable and animal substances. This was concluded from the fact of plants growing white when defended from the action of the sun's rays, and in having their green colour restored by exposure to his rays again; and so far did the chemists suffer themselves to be deceived, that they actually thought the green colouring matter, which they extracted from fresh plants by certain chemical processes, to be an inflammable substance. A very material objection was made to this argument, viz. if plants owe their colour to phlogiston imparted by the sun's rays, why do the sun's rays (which vegetable colours that are exposed to them know that the sun's rays are very effectual in diminishing the lustre of cloth dyed with vegetable colours, and in bleaching or taking out various stains from linen and other substances. All this was removed by saying, that the sun's rays possessed different powers on living and on dead vegetable matter, and that the living vegetables had the power of absorbing phlogiston from the sun's rays, which dead vegetable matter had not.

Since the existence of phlogiston, as a chemical principle in the composition of certain bodies, is now fully proved to be false, we shall not trouble our readers with any further observations on it, except adding, that although the chemists were satisfied with the proofs they gave of its reality, they were never able to exhibit it in a separate state, or show it in a pure form, unmixed with other matter.

Phlogiston terms to have been admitted as a principle in the composition of certain bodies, and to have been suppos'd the cause of certain modifications of matter, merely with a view to explain some of the natural phenomena which the authors of it were unable to explain on other principles. Subsequent discoveries in natural philosophy and in chemistry have repre-
that to a calx, and lost its sensible activity. Accurate observers of nature, admitted principles acknowledged, that although he made a great progress, he left much undone; and subsequent chemists, who were less accurate observers of nature, admitted principles unwarrantably. From the time of Sir Isaac Newton till the middle of the 18th century, no real improvement was made in scientific chemistry; and the progress this science has made since that period is owing to the important discovery of the existence of heat in a state of composition with other matter. Heat thus combined loses its activity or becomes insensible, just as in the same way as any other active substance loses its apparent qualities in composition. Acids, for example, when combined in a certain proportion with substances for which they have a strong attraction, as alcalis or absorbent earths, lose all their obvious acid qualities, and the compound turns out mild, and the compound conceals the heat which it contains. In a similar manner, heat, when combined in certain proportions with other matter, loses its sensible qualities, and the compound conceals the heat which it contains. Heat, in this combined state, was called by its ingenious discoverer, Dr Black, latent heat, and it was found to be very abundant in the atmosphere, which owes its existence as an elastic fluid to the quantity of latent heat that it contains. After this discovery was made, Dr Crawford, considering that air was absorbed by a burning body, concluded that the heat which appears in the combustion of a combustible body, is the heat that had before existed in the air which was consumed by the burning body. Mr Lavoisier and others, prosecuting this inquiry, found that the combustible body, while it is burning, unites with the bases of the air, and that the heat which the air contained, and which was the cause of the air existing in the state of air, is expelled. This abstraction of the bases of the air by the burning body, and the reduction of this basis to a feld form, accounts for the increase of weight which a body acquires by burning; or, in other words, gives a reason why the matter into which a combustible body is converted by combustion, is heavier than the body from which it was produced. The same abstraction of air is observable, when a metal is converted into a calx, and the additional weight of the calx is found to be precisely equal to the weight of the air abstracted during the calcination. On these principles, therefore, we now explain the phenomena in a much more satisfactory manner than by the supposition of phlogiston, or a principle of inflammability.

Thus far we have fully elucidated in several articles in the form of part of this work; we shall not, therefore, in this place, repeat what the reader may find under the words Heat, Inflammation, Flame, Phlogiston, Chemistry, Calcination of Metals, Oxygen, &c.

PHLOGONIUM, a class of compound, inflammable, and metallic fossils, found in small masses of determinately angular figures; comprehending the pyriticum, pyroctogonia, and pyriformygonia.

PHLOMIS, the Sage-tree, or Jerusalem Sage; a genus of the gynoecipernia order, belonging to the didynamia class of plants. There are 14 species, all of which have perennial roots, and of many of the stalks also are perennial. The latter rise from two to five or six feet high; and are adorned with yellow, blue or purple flowers in whorls. They are all ornamental plants; and deserve a place in gardens, as they are sufficiently hardy to endure the ordinary winters in this climate: they require, however, a pretty warm situation.

There are two species of this plant, which are peculiarly adapted to the shrubbery, viz. the Phlomis and Orna-strafolea, a native of Spain and Sicily, and the Phl. mentalis purpurea. Of the first species there are three varieties, 1. The broad-leaved Jerusalem Sage-tree, is now very common in our gardens. Its beauty is great, and its culture very easy. It grows to be about five feet high, and spreads its branches without order all around. The older branches are covered with a dirty, greasy, dead, falling, ill-looking bark; and this is the worst property of this shrub: but the younger shoots are white and beautiful; they are four-cornered, woolly, and soft to the touch. The leaves are roundish and oblong, and moderately large; and these grow opposite at the joints of the shrub on long footstalks. They are hoary to a degree of whiteness, and their footstalks also are woolly, white, tough, and strong. The flowers are produced in June, July, and August, at the top joints of the young shoots, in large whorled bunches. They are of the labiatae kind, each consisting of two lips, the upper end of which is forked, and bends over the other. A finer yellow can hardly be conceived than the colour of which they are possessed; and being large, they exhibit their golden flowers at a great distance, causing thereby a handsome show. 2. The narrow-leaved Jerusalem Sage tree, is of lower growth than the other, seldom rising higher than a yard or four feet. This shrub is in every respect like the other; only the footstalks seem to have a more upright tendency of growth. The leaves also, which are narrower, are more inclined to a lanceolate form: they are numerous in both the stems, and hide the deformity of the bark on the older stems, which renders them less exceptionable on that account. In short, these stems are qualified for shrubberies of all kinds, or to be set in borders of flower-gardens, where they will flower, and be exceeded even in that respect by very few shrubs. 3. Cretan Sage-tree, is still of lower growth than either of the former, seldom araising to a yard in height. The leaves are of the same white hoary nature; they are very broad, and stand in long footstalks. The flowers are also of a delightful yellow colour, very large, and grow in large whorls, which give the plant great beauty.

The second species, which is Purple Phlomis or Portugal Sage, is four feet high; the stalks are woody, and end in several angular branches, which are covered with a white bark. The leaves are spear-sha-
Phlox, in zoology, a genus of quadrupeds of the order of carnivora, the external muzzle being large, and four blunt, parallel, distinct, equal fore-teeth in the under jaw. There is but one dog-tooth, and five or six three-pointed grinders; and the hind feet are united so as to form one heel. There are a variety of species, the principle of which are,

1. The urina, sea-bear, or urrine seal, has external ears. The Male is greatly superior in size to the female. The bodies of each are of a conic form, very thick before, and taper to the tail. The length of a large one is eight feet; the greatest circumference, five feet; near the tail, 20 inches; and the weight is about 800 lb. The nose projects like that of a pug-dog, but the head rises suddenly; the teeth lock into one another when the mouth is shut; the tongue is large; the eyes are large and prominent, and may be covered at pleasure by a flabby membrane. The length of the fore-legs is 24 inches; they are like those of other quadrupeds, not immersed in the body like those of seals; the feet are formed with toes like those of other animals, but are covered with a naked skin, so that externally they seem to be a shapeless mass; the hind-legs are fixed to the body quite behind, like those of common seals; but are capable of being brought forward, so that the animal makes use of them to scratch its head.

These animals are found in the northern seas. They are found in amazing quantities between Kamatchka and America; but are scarcely known to land on the Atlantic shore; nor are they ever taken except in the three Kurilian islands, and from thence in the Boreo-Alaska, or Beaver Sea, as far as the Kronotka headland, off the river Kamatchka, which comprehends only from 50 to 56 north latitude. It is observable that they never do or can cross the southern cape of the cape of the peninsula, or are found on the western side in the Peninshuka sea; but their great resort has been observed to be to Bering's islands. They are as regularly migratory as birds of passage. They first appear off the three Kuril islands and Kamatchka in the earliest spring. There is not one female which does not come pregnant. Such as are then taken are opened, the young taken out and skinned. They are found in Bering's island only on the western shore, being the part opposite to Asia, where they first appear on their migration from the south.

Urne seals are also found in the southern hemisphere, even from under the line, in the isle of Gallipagos (A), to New Georgia, in south latitude 54° 15', and west longitude 37° 15'. In the intermediate parts, they are met with in New Zealand, in the isle of Juan Fernandez, and its neighbour Maffa Puerco, and probably along the coasts of Chili to Terra del Fuego and the Cape of Good Hope, where they are found in amazing quantities between Kamatchka and America; but are scarcely known to land on the Atlantic shore; nor are they ever taken except in the three Kurilian islands, and from thence in the Boreo-Alaska, or Beaver Sea, as far as the Kronotka headland, off the river Kamatchka, which comprehends only from 50 to 56 north latitude. It is observable that they never do or can cross the southern cape of the peninsula, or are found on the western side in the Peninshuka sea; but their great resort has been observed to be to Bering's islands. They are as regularly migratory as birds of passage. They first appear off the three Kuril islands and Kamatchka in the earliest spring. There is not one female which does not come pregnant. Such as are then taken are opened, the young taken out and skinned. They are found in Bering's island only on the western shore, being the part opposite to Asia, where they first appear on their migration from the south.

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Phoca

indolent life: they arrive at the islands vafully fat; but during that time they are scarce ever in motion, confine themselves for whole weeks to one spot, sleep a great part of the time, eat nothing, and, except the employment the females have in suckling their young, are totally inactive. They live in families: each male has from 8 to 50 females, whom he guards with the jealousy of an eastern monarch; and though they lie by thousands on the shores, each family keeps itself separate from the rest, and sometimes, with the young and unmarried ones, amount to 150. The old animals, which are destitute of females, or deserted by them, live apart, and are excessively plenteous, peevish, and quarrelsome: they are exceeding fierce, and fast attached to their old haunts, that they would die sooner than quit them. They are monstrously fat, and have a most horrid smell. If another approaches their station, they are roufed from their indolence, and instantly snap at it, and battle ensues; in the conflict, they perhaps intrude on the feast of another: this gives new cause of offence, so in the end the discord becomes universal, and is spread through the whole shore.

The other males are also very irascible: the causes of their disputes are generally these. The first and most terrible is, when an attempt is made by another to seduce one of their mistresses or a young female of the family. This insult produces a combat; and the conqueror is immediately followed by the whole feral-gio, who are sure of defeating the unhappy vanquished. The second reason of a quarrel is, when one invades the feast of another: the third arises from their interfering in the disputes of others. These battles are very violent; the wounds they receive are very deep, and re semble the cuts of a fable. At the end of a fight they fling themselves into the sea, to wash away the blood.

The males are very fond of their young, but very tyrannical towards the females; if any body attempts to take their cub, the male flays at the defense of it, while the female makes off with the young in her mouth; should she drop it, the former instantly quits his enemy, falls on her, and bears against the stones, till he leaves her for dead. As soon as the recover, she comes in the most fuppliant manner to the male, crawls to his feet, and washes them with her tears: he, in the mean time, talks about in the most infulting manner; but in case the young one is carried off, he melts into the deepest affliction, and shows all signs of extreme concern. It is probable that he feels his misfortunes the more sensibly, as the female generally brings but one at a time, never more than two.

They swim very swiftly, at the rate of seven miles an hour. If wounded, they will feize on the boat, and carry it along with vast impetuosity, and oftentimes sink it. They can continue a long time under water. When they want to climb the rocks, they fallen with the fore-paws, and so draw themselves up. They are very tenacious of life, and will live for a fortnight after receiving such wounds as would immediately destroy any other animal.

The Kamtchakans take them by harpooning, for they never land on their shore. To the harpoon is fastened a long line, by which they draw the animal to the boat after it is spent with fatigue; but in the chase, the hunters are very fearful of too near an approach, lest the animal should fasten on, and sink their vessel.

The uses of them are not great. The flesh of the old males is rank and nauseous; that of the females is said to resemble lamb; of the young ones roasted, a fucking pig. The skins of the young, cut out of the bellies of the dams, are esteemed for clothing, and are fold for about three shillings and fourpence each; those of the old for only four shillings.

Their remigration is in the month of September, when they depart excessively lean, and take their young with them. On their return, they again pass near the same parts of Kamtchatcha which they did in the spring. Their winter retreats are quite unknown; it is probable that they are the islands between Kuril and Japan, of which we have some brief accounts, under the name of Compagnie Land, States Land, and Offa Gaffn. However, according to others who have written on this subject, the name of sea-lion belongs not so properly to this as to another, which has a mane like a true lion. One variety of this species is described by the publisher of Ané's Voyages. However, according to others who have written on this subject, the name of sea-lion belongs not so properly to this as to another, which has a mane like a true lion. Of these we have the following account from Pernety's Historical Journal. "The hair that covers the back part of the head, neck, and shoulders, is at least as long as the hair of a goat. It gives this amphibious animal an air of resemblance to the common lion of the forest, excepting the difference of size. The teai lions of the kind I speak of are 25 feet in length, and from 19 to 20 in their greatest circumference. In other respects they resemble the common sea-lions. Those of the small kind have a head resembling a mastiff's, with close cropt ears."

The teeth of the sea-lions which have manes, are much larger and more solid than those of the rest. In these, all the teeth which are inserted into the jaw-bone are hollow. They have only four large ones, two in the lower and two in the upper jaw. The rest are not even fo large as those of a horse. I brought home one belonging to the true sea-lion, which is at least three inches in diameter, and seven in length, though not one of the largest. We counted 22 of the same kind in the jaw-bone of one of these lions, where five or six were wanting. They were entirely solid, and projected scarce more than an inch, or as inch and a half.
Mr. Pennant describes three seals of different species, which are called sea-lions, viz. the *Phoca leonina*, or hooded seal; the *Phoca lomina*, or bottlenose; and the *Lutra marina*, or leonine seal. He differs in some particulars from the author just quoted; and such of our readers as desire to know these differences, we refer to his works.

3. The *vitusina*, or common seal, inhabits the European ocean. It has a smooth head without external ears; and the common length is from five to six feet. The fore legs are deeply imbedded in the skin of the body; the hind legs are placed in such a manner as to point directly backwards: every foot is divided into five toes; and each of those connected by a strong and broad web, covered on both sides with short hair. The toes are furnished with strong claws, well adapted to affist the animal in climbing the rocks it barks on; the claws on the hind feet are slender and straight; except at the ends, which are a little incurved. The head and nose are broad and flat, like those of the otter; the neck short and thick; the eyes large and black; and only four in the lower. It has two small orifices: the nostrils are oblong: on each side the nose are several long fluff hairs; and above each eye are a few of the same kind. The form of the tongue is so singular, that were other notes wanting, that alone would distinguish it from all other sea-animals. Its power to give them suck till they are large enough to go to sea. In the evening you see them assembling in herds upon the shore, and calling their dams in cries so much like lambs, calves, and goats, that, unless apprized of it, you would easily be deceived. The tongue of these animals is very good eating; we preferred it to that of an ox or calf. For a trial we cut off a piece of the tongue hanging out of the mouth of one of these animals, which was just killed. About 16 or 18 of us eat each a pretty large piece, and we all thought it so good, that we regretted we could not cut more of it.

It is said that their flesh is not absolutely disagreeable. I have not tasted it: but the oil which is extricated from their grease is of great use. This oil is obtained two ways; either by cutting the fat in pieces, and melting it in large caldrons upon the fire; or by cutting it in the same manner upon hurdles, or pieces of board, and exposing them to the sun, or only to the air: this grease dissolves itself, and runs into vessels placed underneath to receive it.

Some of our seamen pretended, that this last fort of oil, when it is fresh, is very good for kitchen uses; this, as well as the other, is commonly used for dressing leather for vellums, and for lamps. It is preferred to that of the whale: it is always clear, and leaves no sediment.

The skins of the sea-lions are used chiefly in making portmanteaus, and in covering trunks. When they are tanned, they have a grain almost like Morocco: They are not so fine, but are less liable to tear, and keep fresh a longer time. They make good shoes and boots, which, when well scented, are water-proof.

One day Mr. Guyot and some others brought on board five sea-lions. They were about seven feet long, and three a half in circumference, tho' their intestines were drawn. These gentlemen had landed on a small island, where they found a prodigious number of these animals, and killed eight or nine hundred of them with licks. No other weapon is necessary on these occasions. A single blow with a bludgeon, three feet or three feet and a half long, almost full at the nose of these animals, knocks them down, and kills them on the spot.

This is not altogether the case with the males: their fize is prodigious. Our gentlemen encountered two of them for a long time, with the same weapons, without being able to overcome them. They lodged three balls in the throat of one while he opened his mouth to defend himself, and three musket-shot in his body. The blood gushed from his wounds like wine from a tap. However, he crawled into the water and disappeared. A sailor attacked the other, and engaged him for a long time, striking him on the head with a bludgeon, without being able to knock him down: the sailor fell down very near his antagonist; but he had the dexterity to recover himself at the instant the lion was going to gorge him. Had he once seized him, the man would infallibly have been lost: the animal would have carried him into the water as they usually do their prey, and there feated upon him. In his retreat to the sea this animal seized a penguin, and devoured him instantaneously.”
Seals are excellent swimmers, and ready divers; and are very bold when in the sea, swimming carelessly enough about boats; their dens or lodgments are in hollow rocks or caverns near the sea, but out of the reach of the tide: in the summer they will come out of the water, to bathe or sleep in the sun on the top of large stones or slabs of rocks; and that is the opportunity our countrymen take of shooting them: if they chance to escape, they hasten towards their proper element, flinging stones and dirt behind them as they scramble along; at the same time expressing their fear of piteous moans; but if they happen to be overtaken, they will make a vigorous defence with their feet and teeth till they are killed. They are taken for the sake of their skins, and for the oil their fat yields: the former fell for 4s. or 4s. 6d. a piece; which, when dried, are very useful in covering trunks, making waistcoats, shot-pouches, and several other conveniences. We remember some years ago to have seen a young seal in some degree domesticated. It was taken at a little distance from the sea, and was generally kept in a vessel full of salt water; but sometimes it was allowed to crawl about the house, and even to approach the fire. Its natural food was regularly procured for it, and it was taken to the sea every day and thrown in from a boat. It used to swim after the boat, and always allowed itself to be taken back. It lived thus for several weeks; and we doubt not would have lived much longer had it not been sometimes too roughly used by the boys who took it to and from the sea.

The fleths of these animals, and even of porpoises, formerly found a place at the tables of the great; as is now narrow towards eradicating the vulgar prejudices against that great and elegant writer.

Power of oil in filling the waves excited by a storm is mentioned by Pliny: the moderns have made the experiment with success; and thereby made one advance towards eradicating the vulgar prejudices against that great and elegant writer.

Seals are excellent swimmers, and ready divers; and are very bold when in the sea, swimming carelessly enough about boats; their dens or lodgments are in hollow rocks or caverns near the sea, but out of the reach of the tide: in the summer they will come out of the water, to bathe or sleep in the sun on the top of large stones or slabs of rocks; and that is the opportunity our countrymen take of shooting them: if they chance to escape, they hasten towards their proper element, flinging stones and dirt behind them as they scramble along; at the same time expressing their fear of piteous moans; but if they happen to be overtaken, they will make a vigorous defence with their feet and teeth till they are killed. They are taken for the sake of their skins, and for the oil their fat yields: the former fell for 4s. or 4s. 6d. a piece; which, when dried, are very useful in covering trunks, making waistcoats, shot-pouches, and several other conveniences. We remember some years ago to have seen a young seal in some degree domesticated. It was taken at a little distance from the sea, and was generally kept in a vessel full of salt water; but sometimes it was allowed to crawl about the house, and even to approach the fire. Its natural food was regularly procured for it, and it was taken to the sea every day and thrown in from a boat. It used to swim after the boat, and always allowed itself to be taken back. It lived thus for several weeks; and we doubt not would have lived much longer had it not been sometimes too roughly used by the boys who took it to and from the sea.

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firing, into the water, on the same side as the seal runs and dives; for that he does instantly like a dart. Then the Greenlander goes and takes up the shaft swimming on the water, and lays it in its place. The seal often drags the bladder with it under water, tho' it is a considerable impediment, on account of its great bigness; but it so wearies itself out with it, that it must come up again in about a quarter of an hour to take breath. The Greenlander haftens to the spot where he sees the bladder rise up, andחד the seal as soon as it appears with a great lance. This lance always comes out of its body again; but he throws it at the creature afresh every time it comes up till it is quite spent. Then he runs the little lance into it, and kills it outright, but flops up the wound directly to preserve the blood; and lastly, he blows it up, like a bladder, between skin and flesh, to put it into a better capacity of swimming after him; for which purpose he fastens it to the left side of his kajak or boat.

In this exercise the Greenlander is exposed to the most and greatest danger of his life; which is probably the reason that they call this hunt or fishery kamavok, i.e. "the extinction," vis. of life. For if the line should entangle itself, as it easily may, in its sudden and violent motion; or if it should catch hold of the kajak, or should wind itself round the oar, or the hand, or even the neck, as it sometimes does in windy weather; or if the seal should turn suddenly to the other side of the boat, it cannot be otherwise than that the kajak must be overturned by the firing, and drawn down under water. On such desperate occasions the poor Greenlander stands in need of every possible art to divertangle himself from the firing, and raise himself up from under the water several times succcessively; for he will continually be overturning till he has quite disengaged himself from the line. Nay, when he imagines himself to be out of all danger, and comes too near the dying seal, it may still bite him in the face or hand; and a female seal that has young instead of flying the field, will sometimes fly at the Greenlander in the most vehemence rage, and do him a mischief, or bite a hole in his kajak that he must sink.

In this way, singly, they can kill none but the careless stupid seal called atatarok. Several in company must pursue the cautious kajigik by the clapper-hunt. In the same manner they also surround and kill the atatarok in great numbers at certain seasons of the year for in autumn they retire into the creeks or inlets in stormy weather, as in the Nepifit found in Ball's river, between the main land and the island Kangek, which is full two leagues long, but very narrow. There the Greenlanders cut off their retreat, and frighten them under water by shouting, clapping, and throwing stones but as they must come up again continually to draw breath, then they persecute them again till they are tired, and at last are obliged to fly so long above water that they derange them, and kill them with a kind of dart for the purpose. During this hunt we have a fine opportunity to see the agility of the Greenlanders, or, if I may call it so, their flurfar-like manoeuvres. When the seal rises out of the water, they all flay upon it as if they had wings, with a desperate noise, the poor creature is forced to dive again directly; and the moment he does they disperce...
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The chase of these animals is redoubled for that purpose; and the skins, properly tanned, are in considerable use in the manufacture of boots and shoes."

4. The phoca barbata, or great seal, has long white whiskers with curled points. The back is arched; hair black, very deciduous, and very thinly diffused over a thick skin, which is almost naked in summer. The teeth of this species are like those of the common seal; the fore-feet are like the human hand, the middle toe being the longest and the thumb short. They are upwards of 12 feet long.

The inhabitants of Greenland cut out of the skin of this species thongs and lines, a finger-thick, for the seal-fishery. Its flesh is as white as veal, and is esteemed the most delicate of any. They produce plenty of lard, but very little oil. The skins of the young are sometimes used to lie on. It inhabits the high seas, but is sometimes seen on the floating ice. It breeds about the month of March, and brings forth in January on the fixed ice in the north of Spitzbergen. It has been known on the coast of Greenland, and within the polar circle from Spitzbergen to Tchuktu Nofs, and thence southward to Kamfchatka.

There are several other species of this genus, and a variety of curious particulars respecting them, which our limits permit us not to give. Such of our readers, however, as wish for further information on this subject, will find themselves amply gratified by a careful perusal of what Mr. Pennant has written on the subject, from whose labours we have extracted much of our article. See his History of Quadrupeds, Vol. II. p. 518—536, his Arctic Zoology, Vol. I. p. 151—177, and his British Zoology, as also the several authors whose works he quotes.

PHOCAEA, the last town of Ionia, (Mela, Pliony) of AEolis, (Ptolemy), because situated on the right or north side of the river Hermus, which makes the boundary of AEolis to the south. It stood far in the land, on a bay or arm of the sea; had two very safe harbours, the one called Lampter the other Nausithynos, (Livy). It was a colony of Ionians, situated in the territory of AEolis, (Herodotus). Maffilia in Gaul was again a colony from it. Phoenicians, the people, (Livy); Phocaeus, the epithet, (Lucan); applied to Marisies. It was one of the 12 cities which assembled in the panonium or general council of Ionia.

Some writers tell us, that while the foundations of ancient this city were laying there appeared near the shore a great herd of sea-calves; whence it is called Phoca, the word phoca signifying in Greek a sea-calf. Ptolemy, who makes the river Hermus the boundary between AEolia and Ionia, places Phocea in AEolis; but all other geographers reckon it among the cities of Ionia. It stood on the sea-coast, between Cuma to the north, and Smyrna to the south, not far from the Hermus; and was, in former times, one of the most healthy and powerful cities of all Asia; but is now a poor
The emperor's defence, however, returned very soon, as did the houses. Their foes of Chios, leaving the poor liegarly village, though the fee of a large sum of money, which that prince generously offered them to leave Ionia, and settle in what part of his kingdom they pleased. The Phocæans could not be prevailed upon to forfake their country; but accepted a large sum of money, which that prince generously presented them with, to defray the expense of building a strong wall round their city. The wall they built on their return; but it was unable to resist the mighty power of Cyrus, whose general Harpagus, invading the city with a numerous army, soon reduced it to the utmost extremities. The Phocæans, having no hopes of any succour, offered to capitulate; but the conditions offered by Harpagus seeming severe, they begged he would allow them three days to deliberate; and, in the mean time, withdraw his forces. Harpagus, though not ignorant of their design, complied with their request. The Phocæans, taking advantage of this consternation, put their wives, children, and all their most valuable effects, on board several vessels which they had ready equipped, and conveyed them safe to the island of Chios, leaving the Persians in possession of empty houses. Their design was to purchase the Æolian islands, which belonged to the Chians, and settle there. But the Chians not caring to have them so near, lest they should engross the whole trade to themselves, as they were a sea-faring people, they put to sea again; and, having taken Phocæa, their native country, by surprise, put all the Persians they found in it to the sword. They went to Corfica; great part of them however returned very soon, as did the rest also in a few years. They then lived in subjection either to the Persians, or tyrants of their own. Among the latter we find mention made of Laodamus, who attended Darius Hystaspis in his expedition against the Scyths; and of Dionysius, who, joining Artavages, tyrant of Miletus, and chief author of the Ionian rebellion, retired, after the defeat of his countrymen, to Phocæa, where he made an immense booty, feizing on all the ships he met with trading to that country. From Phocæa he failed to Sicily, where he committed great depredations on the Carthaginians and Tuscan; but is said never to have molested the Greeks.

In the Roman times the city of Phocæa was fited with Antonius the Great; whereupon it was besieged, taken, and plundered, by the Roman general; but allowed to be governed by its own laws. In the war which Aridonicus brother to Attalus, king of Pergamus, raised against the Romans, they destroyed the utmost of their power; a circumstance which so displeased the senate, that they commanded the town to be demolished, and the whole race of the Phocæans to be utterly rooted out. This severe sentence would have been put in execution, had not the Mauffénax, a Phocæan colony, interposed, and, with much difficulty, averted the anger of the senate. Pompey declared Phocæa a free city, and restored the inhabitants to all the privileges they had ever enjoyed; whence, under the first emperors, it was reckoned one of the most flourishing cities of all Asia Minor. This is all that we have been able to collect from the ancients touching the particular history of Phocæa.

PHOCAS, a Roman centurion, was raised to the dignity of emperor by the army, and was crowned at Constantinople about the year 604. The emperor Mauritus, who was thus deserted both by the army and the people, fled to Chalcedon with his five children whom Phocas caused to be inhumanly murdered before his eyes, and then he murdered Mauritis himself, his brother, and several other persons who were attached to that family.

Phocas, thus proclaimed and acknowledged at Constantinople, went, according to custom, his own image and that of his wife Leonitia to Rome, where they were received with loud acclamations, the people there being incensed against Mauritus on account of the cruel exactions of the exarchs, and his other ministrers in Italy. Gregory, surnamed the Great, then bishop of Rome, caused the images to be lodged in the cratory of the martyr Caflarius, and wrote letters to the new emperor, congratulating him upon his advancement to the throne, which he said was effected by a particular providence, to deliver the people from the innumerable calamities and heavy oppressions under which they had long groaned. Had we no other character of Phocas and Leonitia but that which has been conveyed to us in Gregory's letters, we should rank him among the most princes mentioned in history; but all other writers paint him in quite different colours; and his actions, transmitted to us by several historians, evidently speak him a most cruel and blood-thirsty tyrant. He was of middling stature, says Cedrenus, deformed, and of a terrible aspect: his hair was red, his eye-brows met, and one of his cheeks was marked with a scar, which, when he was in a passion, grew black and frightful: he was greatly addicted to wine and women, blood-thirsty, inexorable, bold in speech, a stranger to compassion, in his principles a heretic. He endeavoured, in the beginning of his reign, to gain the affections of the people by celebrating the Circensian games with extraordinary pomp, and distributing on that occasion large sums amongst the people; but finding that instead of applauding they reviled him as a drunkard, he ordered his guards to fall upon them. Some were killed, many wounded, and great numbers were dragged to prison: but the populace rising, set them at liberty, and thenceforth conceived an irreconcilable avercion to the tyrant.

As soon as the death of Mauritis was known, Narthes, who then commanded the troops quartered on the frontiers of Peræa, revolted. Phocas, however, managed matters so as to gain him over to his interest, and then treacherously and cruelly burnt him alive. He endeavoured to throw the blame of this deed on the heads of respectable alliances; but his cruelty was such as to render him generally hated, for he spared neither sex nor age, and amongst others he murdered Constantina the widow of Mauritus.
Mauritius, and her daughters. These cruelties were at length the cause of his downfall. He became universally hateful; and persons in great authority near his person conspired against him. This conspiracy, however, was discovered, and the persons concerned in it were all put to death. The following year, however, 610, he was overtaken by the fate he had so long deferred.

Heraclius, the son of the governor of Africa, who bore the same name, taking upon him the title of empor, and being acknowledged as such by the people of Africa, failed from thence with a formidable fleet, and a powerful army on board, for Constantinople, while Nicetas marched thither by way of Alexandria and the Pentapolis. Heraclius feered his course to Abydus, where he was received with great demonstrations of joy by several persons of rank, who had been banished by Phocas. From Abydus he failed to Constantinople, where he engaged and utterly defeated the tyrant's forces. Phocas took refuge in the palace; but one Photinus, whose wife he had formerly debauched, pursuing him with a party of soldiers, forced the gates, dragged the cowardly emperor from the throne, and having stripped him of the imperial robes, and clothed him with a black vest, carried him in chains to Heraclius, who commanded first his hands and feet, then his arms, and at last his head, to be cut off: the remaining part of his body was delivered up to the soldiers, who burnt it in the forum. We are told, that Heraclius having reproached him with his evil administration, he answered, with great calmness, "It is incumbent upon you to govern better." Such was the end of this cruel tyrant, after he had reigned seven years and some months.

PHOCILIDES, a Greek poet and philosopher of Miletus, flourished about 540 years before the Christian era. The poetical piece now extant, attributed to him, is not of his composition, but of another poet who lived in the reign of Adrian.

PHOCION was a distinguished Athenian general and orator in the time of Philip II. of Macedon. His character is thus described in the Ancient Universal History. "He was too modest to solicit command, nor did he promote wars that he might raise his authority by them; though, taken either as a soldier, orator, statesman, or general, he was by far the most eminent Athenian of his time. As he was a most disinterested patriot, he could entertain no great affection for Philip; but as he perfectly well knew the disposition of his countrymen, and how unlikely they were long to support such measures as were necessary to humble the Macedonian power, he did not express himself vehemently, but chos rather to cultivate the esteem which on all occasions Philip showed for the state of Athens, as a means of preserving her, when the should be reduced to that situation which he conceived they wanted virtue to prevent. From this character the reader will easily discern that Demosthenes and he could not well agree. The former was always warm, his language copious, and his designs extensive; and Phocion, on the other hand, was of a mild temper, delivered his opinion in very few words, and proposed schemes at once necessary and easy to be effected. Yet he seldom or never concurred with the people, but spoke as poignantly against their vices as Demosthenes himself; insomuch that this orator once told him, 'The Athenians, Phocion, in some of their mad fits, will murder thee.' 'The same (answered he) may fall to thee, Demosthenes, if ever they come to be sober.'"

He was afterwards appointed to command the army which was sent to affliat the Byzantines against Philip, whom he obliged to return to his own dominions. This truly great man, whom (though extremely poor) no sum could bribe to betray his country, and who at every risk on all occasions gave them found advice, was at length accursed by his ungrateful countrymen. This event happened in the year before Christ 318. He was sent to Athens by Polyperchon head of a faction in Macedonia, together with his friends, chained in carts, with this message, "That though he was convinced they were traitors, yet he left them to be judged by the Athenians as a free people." Phocion demanded whether they intended to proceed against him by form of law; and some crying out that they would, Phocion demanded how that could be if they were not allowed a fair hearing? but perceiving by the clamour of the people, that no such thing was to be expected, he exclaimed, "As for myself, I confess the crime objected to me, and submit to the judgment of the law; but confider, O ye Athenians, what have thes poor innocent men done that they should be involved in the same calamity with me?" The people replied with great vociferation, "They are your accomplices, and that is enough." Then the decree was read, adjudging them all to death, viz. Phocion, Nicocles, Aheudippus, Agamon, and Pythocles; these were present; Demetrius, Phalerus, Callimmedon, Charies, and others, were condemned in their absence. Some moved that Phocion might be tortured before he was put to death; nay, they were for bringing the rack into the assembly, and torturing him there. The majority, however, thought it enough if he was put to death, for which the decree was carried unanimously; some putting on garlands of flowers when they gave their votes. As he was going to execution, a person who was his intimate friend asked him if he had any message for his son? "Yes," replied Phocion; "tell him it is my last command that he forget how ill the Athenians treated his father."

The spleen of his enemies was not extinguished with his life: they passed a decree whereby his corpse was banished the Athenian territories; they likewise forbade any Athenians to furnish fire for his funeral pile. One Conopian took up the corpse, and carried it beyond Eleusina, where he borrowed some fire of a Megarian woman and burned it. A Megarian matron, who attended with her maid, railed on the place an honorary monument; and having gathered up the bones, carried them home, and buried them under her own heath, praying at the same time thus to the Furies, "You, O ye gods, guardians of this place, I commit the precious remains of the most excellent Phocion. Protect them, I beseech you, from all inlets; and deliver them one day to be repolished in the sepulchre of his ancestors, when the Athenians shall become wiser." It was not long before this opportunity occurred. When the Athenians began to cool a little, and remember the
PHO CIS, (Demoethenes, Strabo, Paunfania); a country of Greece, contained between Boeotia to the east and Locris to the west, but extending formerly from the Sinus Corinthiacus on the south to the sea of Euoea on the north, and, according to Dionysius, as far as Thermopylae; but reduced afterwards to narrower bounds. Phoenes, the people; Phocis the epithet, (Justin); Bellum Phocicum, the sacred war which the Thebans and Philip of Macedon carried on against them for plundering the temple at Delphi; and by which Philip paved the way to the sovereignty of all Greece, (Justin.) Its greatest length was from north to south, that is, from 38° 45' to 39° 20', or about 35 miles; but very narrow from east to west, not extending to 30 miles, that is, from 23° 10' to 23° 40' at the widest, but about 25 miles towards the Corinthian bay, and much narrower still towards the north. This country is generally allowed to have been principally concerned in that struggle for height and magnitude. There are remarkable cities; such as Cyrra, Baulia, which were inland towns. The country is generally allowed to have been extremely high and mountainous; there is scarcely any flat land, except at the foot of Parnassus, and near the lower lake. This country is of all Greece, (Justin.) Its pastures are the most fertile, and its pastures the most suitable for the wants of a people, and its pastures are the most in the way of a country. This second sentence exasperated the Phocians still more; who, at the inquisition of one Philomelus, or, as he is called by Plutarch, Philomedes, set upon the temple, plundered it of its treasures, and held the sacred depositum for a considerable time. This second crime occasioned another assembly of the Amphidions, the result of which was a formal declaration of war against the Phocians. The quarrel being become more general, the several states took part in it according to their inclinations or interest. Athens, Sparta, and some others of the Peloponnesians, declared for the Phocians; and the Thebans, Thebflians, Locrians, and other neighbouring states, against them. A war was commenced with great fury on both sides, and flew the holy war, which lasted ten years; during which the Phocians, having hired a number of foreign troops, made an obdurate defence, and would in all probability have held out much longer had not Philip of Macedon given the finishing stroke to their total defeat and punishment. The war being ended, the grand council assembled again, and imposed an annual fine of 60 talents upon the Phocians, to be paid to the temple, and continued till they had fully repaired the damage it had sustained from them; and, till this reparation should be made, they were excluded from dwelling in walled towns, and from having any vote in the grand assembly. They did not, however, continue long under this heavy sentence: their known bravery made their affluence so necessary to the real, that they were glad to remit it; after which remission they continued to behave with their usual courage and resolution, and soon obliteratd their former guilt.

We cannot omit this article without mentioning more particularly Daulis, rendered famous, not so much for its extent or richness, as for its fertile and fruitful of its inhabitants; but still more for the inhuman act which was served up to Teresus king of Thrace by the women of this city, by whom he was soon after murdered for the double injury he had done to his filter-in-law Philomela, daughter of Pandion king of Athens. See PHILOMELA.

PHCEBUS, one of the names given by ancient mythologists to the Sun, Sol, or Apollo. See APOLLO.

PHENCIA, or more properly PHoenicia, the ancient name of a country lying between the 34th and 36th degrees of north latitude; bounded by Syria on the north and east, by Judea on the south, and by the Mediterranean on the west. Whence it borrowed its ancient name is not absolutely certain. Some derive it from Phoenix, others from the Greek word phain, signifying a palm or date, as that tree remarkably abounded in this country. Some again suppose that Phoenice is originally a translation of the Hebrew word Edom, from the Edomites who fled thither in the days of David. By the contraction of Canaan it was also called...
Phoenicia, called Chana, and anciently Rabboth of and Colpitis (a). The Jews commonly named it Canaan; though some part of it, at least, they knew by the name of Syrophennaeus (b). Bochart tells us that the most probable etymology is Phene Anak, i.e. "the descendents of Anak." Such were the names peculiar to this small country; though Phoenice was sometimes extended to all the maritime countries of Syria and Judea, and Canaan to the Philistines, and even to the Amalekites. On the contrary, these, two names, and the rest, were most generally swallowed up by those of Palestine and Syria (c).

There is some disagreement among authors with respect to the northern limits of this country. Ptolemy makes the river Eleutherus the boundary of Phoenice to the north; but Pliny, Mela, and Stephanus, place it the island of Aradus, lying north of that river. Strabo obsevdes, that some will have the river Eleutherus to be the boundary of Seleucia, on the side of Syria. Or some credit of Phoenice, and south of the river Eleutherus, stood the following cities: Simyra, Orthosia, Tripolis, Botrys, Byblus, Palebyblus, Berytus, Sidon, Sarepta, Tybus, Palmyrus.

Phoenice extended, according to Ptolemy, even beyond Mount Carmelus; for that geographer places in Phoenice not only Ecdippa and Ptolemais, but Sesaminum and Darra, which stand south of that mountain. These, however, properly speaking, belonged to Palestine. We will not take upon us to mark out the bounds of the midland Phoenice. Ptolemy reckons in it the following towns; Areia, Palebyblus (Old Byblus), Gabala, and Cefaria Panie. This province was considerably extended in the times of Christianity; when, being considered as a province of Syria, it included not only Damascus but Palmyra alio.

The soil of this country is good, and productive of many necessaries for food and clothing. The air is wholesome, and the climate agreeable. It is plentifully watered by small rivers which, running down from mount Libanus, sometimes swell to an immense degree, either increased by the melting of the snows on that mountain, or by heavy rains. Upon these occasions they overflow, to the great danger and hindrance of the traveller and damage of the country. Among these rivers is that of Anonis.

It is universally allowed that the Phoenicians were Canaanites (d) by descent: nothing is plainer or contested, and therefore it was time lost to prove it. Phoenicia. We shall only add, that their blood must have been mixed with that of foreigners in process of time, as it happens in all trading places; and that many strange families must have settled among them, who could consequently lay no claim to this remote origin, how much soever they may have been called Phoenicians, and reckoned of the same descent with the ancient proprietors.

The Phoenicians were governed by kings; and their territory, as small a clip as it was, included several kingdoms; namely, those of Sidon, Tyre, Aradus, Berytus, and Byblus. In this particular they imitated and adhered to the primitive government of their forefathers; who, like the other Canaanities, were under many petty princes, to whom they allowed the foreign dignity, referring to themselves the natural rights and liberties of mankind. Of their civil laws we have no particular system.

With regard to religion, the Phoenicians were the most gross and abominable idolaters. Th. Baal, berith, Baalsheb, Baalsam(en, &c. mentioned in Scripture, were some of the Phoenician gods; as were also the Moloch, Aftaroth, and Thammuz, mentioned in the sacred writings. The word Baal, in itself an appellative, was no doubt applied to the true God, until he rejected it on account of its being so much profaned by the idolaters. The name was not appropriated to any particular deity among the idolatrous nations, but was common to many; however, it was generally imagined that one great God previded over all the reit. Among the Phoenicians this deity was named Baal-famen; whom the Hebrews would have called Baal fennin, or the God of heaven. In all probability this was also the principal Carthaginian deity, though his punic name is unknown. We have many religious rites of the Carthaginians handed down to us by the Greek and Roman writers; but they all bestowed names of their own gods upon those of the Carthaginians, which leads us to a knowledge of the correspondence between the characters of the Phoenician and European deities. The principal deity of Carthage, according to Diodorus Siculus, was Chronus or Saturn. The sacrifices offered up to him were children of the best families. Our author also tells us, that the Carthaginians had a brazen statue or colossus of this god, the hands of which were extended in act to receive, and bent downwards in such a manner, that the child laid thereon

(a) This last name is a translation of the first. Rabbotis is in Hebrew a great gulp or bay. From rabbotis, by changing the Hebrew ś into the Greek τ, comes rabbotis; and, with a little variation, rabbotis, λέοντος, is Greek also for a bay or gulp; whence it appears that colpis or colpites is a translation of rabbiis.

(b) Bochart supposes that the borderers, both upon the Phoenician and Syrian side, were called by the common name of Syrophellenicians, a partaking equally of both nations.

(c) Or rather Phenece, Palestine, and Syria, were promiscuously used for each other, and particularly the two former. Phenece and Paleblus, says Stephanus Byzantinus, were the same. As for Syria, we have already observed, that in its largest extent, it sometimes comprehended Phenece and Celaetyria. Herodotus plainly confounds the three names; we mean, 1st one for the other indifferently.

(d) Bochart infinuates that the Canaanites were ashamed of their name, on account of the curse denounced on their progenitor, and terrified by the wars so vigorously and successfully waged on them by the Israelites, purely because they were Canaanites; and that therefore, to avoid the ignominy of the one and the danger of the other, they abjured their old name, and changed it for Phoenicians, Syrians, Syrophellenicians, and Assyrians. Heidegger conjectures also that they were ashamed of their anceset Canaan.
invention, was such, that whatever was elegant, great, and useful commodities brought from the east. Thus, having

41 a fate
The Phoenicians, a safe coast, with convenient harbours, on one side, and excellent materials for ship-building on the other; perceiving how acceptable many commodities that Syria furnished would be in foreign parts, and being at the same time, perhaps, shown the way by the Syrians themselves, who may have navigated the Mediterranean—they turned all their thoughts to trade and navigation, and by an uncommon application soon eclipsed their masters in that art.

It was in vain to talk of the Edomites, who fled ther in David's time; or to inquire why Herodotus supposes the Phenicians came from the Red Sea: their origin we have already seen. That some of the Edomites fled into this country in the days of David, and that they were a trading people, is very evident: what improvements they brought with them into Phenice, it is hard to say; and by the way, it is as difficult to ascertain their numbers. In all probability they brought with them a knowledge of the Red Sea, and of the south parts of Arabia, Egypt, and Ethiopia; and by their information made the Phenicians acquainted with those coasts; by which means they were enabled to undertake voyages to those parts, for Solomon, and Pharaoh Necho, king of Egypt.

Their whole thoughts were employed on schemes to advance their commerce. They affected no empire but that of the sea; and seemed to aim at nothing but the peaceable enjoyment of their trade. This they extended to all the known parts they could reach: to the British isles, commonly underbod by the Caithferides; to Spain, and other places in the ocean, both within and without the Straits of Gibraltar; and, in general, to all the ports of the Mediterranean, the Black Sea, and the Lake Moesitis. In all these parts they had settlements and correspondents, from which they drew what was useful to themselves, or might be sold to others; and thus they exercised the three great branches of trade, as it is commonly divided into importation, exportation, and transportation, in full latitude. Such was their sea-trade; and for that which they carried on by land in Syria, Mesopotamia, Assyria, Babylonia, Perßia, Arabia, and even in India, it was of no less extent, and may give us an idea of what this people once was, how rich and how defervedly their merchants are mentioned in Scripture as equal to princes. Their country was, at that time, the great warehouse, where every thing that might either advantage to the necessities or luxury of mankind was to be found; which they distributed as they judged would be best for their own interest. The purple of Tyre, the glass of Sidon, and the exceeding fine linen made in this country, together with other curious pieces of art in metals and wood, already mentioned, appear to have been the chief and almost only commodities of Phenice itself. Indeed their territory was so small, that it is not to be imagined they could afford to export any of their own growth; it is more likely that they rather wanted than possessed with the fruits of the earth.

Having thus spoken in general terms of their trade, we shall now touch upon their shipping and some things remarkable in their navigation. Their larger embarkations were of two sorts; they divided them into round ships or gaul; and long ships, galleys, or trimers. When they drew up in line of battle, the gauli were disposed at a small distance from each other in the wings, or in the van and the rear: their trimers were contracted together in the centre. If, at any time, they observed that a stranger kept them company in their voyage, or followed in their track, they were sure to get rid of him if they could, or deceive him if possible; in which policy they went so far, as to venture the loss of their ships, and even their lives; so jealous were they of foreigners, and so tenaciously bent on keeping the whole trade to themselves. In order to discourage other nations from engaging in commerce, they practised piracy, or pretended to be at war with such as they met when they thought themselves strong.

This was but a natural stroke of policy in people who grasped at the whole commerce of the then known world. We must not forget here the famous fishery of Tyre, which so remarkably enriched that city in particular. See Astronomy, no. 7. Ophir, and Tyre.

PHOENICOPTERUS, or Flamingo, in ornithology, a genus of birds belonging to the order of Coccycx, grallæ. The beak is naked, teethed, and bent as if it was broken; the nostrils are linear; the feet are palmated, and four-toed. There is but one species: viz. the Bahamensis of Catesby, a native of Africa and America.

This bird resembles the heron in shape, excepting the bill, which is of a very singular form. It is two years old before it arrives at its perfect colour; and then it is entirely red, excepting the quill-feathers, which are black. A full-grown one is of equal weight with a wild duck; and when it flands erect, it is five feet high. The feet are webbed. The flesh is delicate; and most resembles that of a partridge in taste. The tongue, above any other part, was in the highest esteem with the luxurious Romans. These birds make their nests on hilltops in shallow water; on which they fit with their legs extended down, like a man sitting on a stool. They breed on the coasts of Cuba and the Bahama islands in the West Indies; and frequent saltwater only. By reason of the particular shape of its bill, this bird, in eating, twits its neck from side to side, and makes the upper mandible touch the ground. They are very stupid, and will not rise at the report of a gun: nor is it any warning to those who survive, that they see others killed by their fire; so that, by keeping himself out of sight, a fowler may kill as many as he pleases.

These birds prefer a warm climate. In the old continent they are not often met with; beyond 40 degrees north or south. They are met with everywhere on the African coast and adjacent isles, to the Cape of Good Hope; and come thence on the coasts of Spain, Italy, and those of France lying in the Mediterranean Sea; being at times found at Martilées, and for some way up the Rhine. In some feasons they frequent Aleppo and the parts adjacent. They are seen also on the Persian side of the Caspian Sea, and from thence along the western coast as far as the Wolga; tho' this is at uncertain times, and chiefly in considerable flocks coming from the north-east, mostly in October and November; but so soon as the wind changes they totally disappear. They breed in the Cape Verd isles, particularly in that of Sal. They go for the most part together in flocks, except in breeding time. Dampier says, that, with two more in company, he killed 14 at once, which was effected by secreting themselves; for...
The date tree was introduced into Jaffa, and is a native of Africa and the East Indies. Sloane found them in Jamaica; but particularly at the Bahamas Islands and at Cuba, where they breed. When seen at a distance, they appear as a regiment of soldiers, being ranged along-side one another, on the borders of the rivers, searching for food; which chiefly consists of small fish or the eggs of them; and of water-insects, which they catch after by plunging in the bill and part of the head, from time to time trampling with their feet to muddy the water, that their prey may be rafed from the bottom. Whilst they are feeding, one of them is laid to stand sentinel, and the moment he finds the alarm the whole flock takes wing. This bird, when at rest, stands on one leg, the other being drawn up close to the body, with the head placed under the wing on that side of the body it stands on.

They are sometimes caught young, and are brought up tame; but are always impatient of cold: and in this state will seldom live a great while, gradually losing their colour, flesh, and appetite, and dying for want of that food which in a state of nature at large they were abundantly supplied with.

PHOENIX, in astronomy. See there, no 406. PHOENIX, the Great Palm, or Date-tree; a genus of plants belonging to the order of palmae. There is only one species, viz. the dactylyfera, or common date-tree, a native of Africa and the eastern countries, where it grows to 50, 60, and 100 feet high. The trunk is round, upright, and fluted with protuberances, which are the vestiges of the decayed leaves. From the top it rises forth a cluster of leaves or branches eight or nine feet long, extending all round like an umbrella, and bending a little towards the earth. The bottom part produces a number of flanks like those of the middle, but seldom flowing to heights four or five feet. These flanks, says Adamson, diffuse the tree very considerably; so that, wherever it naturally grows in forests, it is extremely difficult to open a passage through its prickly leaves. The date tree was introduced into Jamaica soon after the conquest of the island by the Spaniards. There are, however, but few of them in Jamaica at this time. The fruit is somewhat in the shape of an acorn. It is composed of a thin, light, and glossy membrane, somewhat pelliculoid and yellowish; which contains a fine, soft, and pulpy ftoitn, which is firm, sweet, and somewhat vinous to the taste, effulent, and wholesome; and within this is included a solid, tough, and hard kernel, of a pale grey colour on the outside, and finely marbled within like the nucleus. For medicinal use dates are to be chosen large, full, fresh, yellow on the surface, soft and tender, not too much wrinkled; such as have a vinous taste, and do not rattle when shaken. They are produced in many parts of Europe, but never ripen perfectly there. The belt are brought from Tunis; they are also very fine and good in Egypt and in many parts of the east. Those of Spain and France look well; but are never perfectly ripe, and very subject to decay. They are preferred three different ways; some pressed and dry; others pressed more moderately, and again moistened with their own juice; and others not pressed at all, but moistened with the juice of other dates, as they are packed up, which is done in baskets or skins. Those preferred in this last way are much the best. Dates have always been esteemed moderately strengthening and altringent.

Though the date-tree grows every where indiscriminately on the northern coasts of Africa, it is not cultivated with care, except beyond Mount Atlas; because the heat is not sufficiently powerful along the coasts to bring the fruits to proper maturity. We shall here extract some observations from Mr Des Fontaines respecting the manner of cultivating it in Barbary, and on the different uses to which it is applied. All that part of the Zaara which is near Mount Atlas, and the only part of the north coast which is inhabited, produces very little corn; the soil being sandy, and burnt up by the sun, is almost entirely unfit for the cultivation of grain, its only productions of that kind being a little barley, maize, and forgo. The date-tree, however, supplies the deficiency of corn to the inhabitants of these countries, and furnishes them with almost the whole of their subsistence. They have flocks of sheep; but as they are not numerous, they preserve them for the sake of their wool; besides, the flesh of these animals is very unwholesome food in countries that are excessively warm; and these people, though ignorant, have probably been enabled by experience to know that it was salutary for them to abstain from it. The date-trees are planted without any order, at the distance of 12 feet one from the other, in the neighbourhood of rivulets and streams which issue from the sand. Forests of them may be seen here and there, some of which are several leagues in circumference. The extent of these plantations depends upon the quantity of water which can be procured to water them; for they require much moisture. All these forests are intermixed with orange, almond, and pomegranate trees, and with vines which twine round the trunks of the date-trees; and the heat is strong enough to ripen the fruit, though they are never exposed to the sun.

Along the rivulets and streams, dykes are erected to stop the course of their waters, in order that they may be distributed amongst the date trees by means of small canals. The number of canals is fixed for each individual; and in several cantons, to have a right to them, the proprietors are obliged to pay an annual sum proportionable to the number and extent of their plantations. Care is taken to till the earth well, and to have it raised a circular border around the root of each tree, that the water may remain longer and in larger quantity. The date trees are watered in every season, but more particularly during the great heats of summer.

It is generally in winter that new plantations of this tree are formed. For this purpose those who cultivate them take shoots of these which produce the best dates, and plant them at a small distance one from the other. At the end of three or four years these shoots, if they have been properly taken care of, begin to bear fruit; but this fruit is as yet dry, without sweetness,
The date trees, however, which spring from seed never produce so good dates as those that are raised from shoots; they being always poor and ill-tasted. It is undoubtedly by force of cultivation, and after several generations, that they acquire a good quality.

The date trees which have been originally fown, grow rapidly, and we have been assured that they bear fruit in the fourth or fifth year. Care is taken to cut the inferior branches of the date tree in proportion as they rise; and a piece of the root is always left of some inches in length, which affords the easy means of climbing to the summit. These trees live a long time, according to the account of the Arabs; and in order to prove it, they say that when they have attained to their full growth, no change is observed in them for the space of three generations.

The number of females which are cultivated is much superior to that of the males, because they are much more profitable. The sexual organs of the date tree grow, as is well known, upon different stalks, and these trees flower in the months of April and May, at which time the Arabs cut the male branches to impregnate the female. For this purpose, they make an incision in the trunk of each branch which they wish to produce fruit, and place in it a flake of male flowers; without this precaution the date tree would produce only abortive fruit (a). In some cantons the male branches are only shaken over the female. The practice of impregnating the date tree in this manner is very ancient. Pliny describes it very accurately in that part of his work where he treats of the palm-tree.

There is scarcely any part of the date tree which is not useful. The wood, though of a spongy texture, lasts such a number of years, that the inhabitants of the country say it is incorruptible. They employ it for making beams and instruments of husbandry; it burns slowly, but the coals which result from its combustion are very strong and produce a great heat.

The Arabs strip the bark and fibrous parts from the young date trees, and eat the fibritance, which is in the centre; it is very nourishing, and has a sweet taste; it is known by the name of the marrow of the date tree. They eat also the leaves, when they are young and tender, with lemon juice; the old ones are laid out to dry, and are employed for making mats and other works of the same kind, which are much used and with which they carry on a considerable trade in the interior parts of the country.

From the sides of the stumps of the branches which have been left arise a great number of delicate filaments, of which they make ropes, and which might serve to fabricate cloth.

Of the fresh dates and sugar, says Hafelquint, the Egyptians make a conserve, which has a very pleasant taste. In Egypt they use the leaves as fly-flaps, for driving away the numerous insects which prove so troublesome in hot-countries. The hard boughs are used for fences and other purposes of husbandry; the principal stem for building. The fruit, before it is ripe, is somewhat astringent; but when thoroughly mature, is of the nature of the fig. The Senegal dates are shorter than those of Egypt, but much thicker in the pulper, which is said to have a juicy agreeable taste, superior to that of the best dates of the Levant.

A white liquor, known by the name of milk, is drawn also from the date-tree. To obtain it, all the branches are cut from the summit of one of these trees, and after several incisions have been made in it, they are covered with leaves, in order that the heat of the sun may not dry it.

The sap drops down into a vessel placed to receive it, at the bottom of a circular groove, made below the

(a) The celebrated Linnaeus, in his Dissertation on the Sexes of Plants, speaking of the date tree, says, "A female date-bearing palm flowered many years at Berlin without producing any seeds; but the Berlin people taking care to have some of the blossoms of the male tree, which was then flowering at Leipsic, sent to them by the post, they obtained fruit by these means; and some dates, the offspring of this impregnation, being planted in my garden, sprung up, and to this day continue to grow vigorously. Kempter formerly told us, how necessary it was found by the oriental people, who live upon the produce of palm trees, and are the true Lepidopters, to plant some male trees among the females, if they hoped for any fruit; hence it is the practice of those who make war in that part of the world to cut down all the male palms, that a famine may afflict their proprietors; sometimes even the inhabitants themselves destroy the male trees when they dread an invasion, that their enemies may find no sustenance in the country."
Phoenix. The milk of the date tree has a sweet and agreeable taste when it is new; it is very refreshing, and it is even given to sick people to drink, but it generally turns four at the end of 24 hours. Old trees are chosen for this operation, because the cutting of the branches, and the large quantity of sap which flows from them, greatly exhaust them, and often cause them to decay.

The male flowers of the date tree are also useful. They are eaten when still tender, mixed up with a little lemon juice. They are reckoned to be very provocative: the odour which they exhale is probably the cause of this property being ascribed to them.

These date trees are very lucrative to the inhabitants of the desert. Some of them produce twenty bunches of dates; but care is always taken to lay off a part of them, that those which remain may become larger; ten or twelve bunches only are left on the most vigorous trees.

It is reckoned that a good tree produces, one year with another, about the value of 10 or 12 shillings to the proprietor. A pretty considerable trade is carried on with dates in the interior part of the country, and large quantities of them are exported to France and Italy. The crop is gathered towards the end of November. When the bunches are taken from the tree, they are hung up in some very dry place where they may be sheltered and secure from insects.

Dates afford wholesome nourishment, and have a very agreeable taste when they are fresh. The Arabs eat them without seasoning. They dry and harden them in the sun, to reduce them to a kind of meal, which they lay up in store to supply themselves with food during the long journeys which they often undertake across their deserts. This simple food is sufficient to nourish them for a long time. The inhabitants of the Zaara procure also from their dates a kind of honey which is exceedingly sweet. For this purpose they choose those which have the softest pulp; and having put them into a large jar with a hole in the bottom, they squeeze them by placing over them a weight of eight or ten pounds. The most fluid part of the substance, which drops through the hole, is what they call the honey of the date.

Even the stones, though very hard, are not thrown away. They give them to their camels and sheep as food, after they have bruised them or laid them to soften in water. The date, as well as other trees which are cultivated, exhibits great variety in its fruit, with respect to shape, size, quality, and even colour. There are reckoned to be at least twenty different kinds. Dates are very liable to be pierced by worms, and they soon corrupt in moist or rainy weather.

From what has been said, it may easily be perceived, that there is, perhaps, no tree whatever used for so many and so valuable purposes as the date tree. Phoenix, in ornithology, a bird famous in antiquity, but generally looked upon by the moderns as fabulous. The ancients speak of this bird as single, or the only one of its kind; they describe it as of the size of an eagle; its head finely crested with a beautiful plumage; its neck covered with feathers of a gold colour, and the rest of its body purple, only the tail white, and the eyes sparkling like stars: they hold, that it lives 500 or 600 years in the wilderness; that when thus advanced in age, it builds itself a pile of sweet wood and aromatic gums, and fires it with the wafting of its wings, and thus burns itself; and that from its ashes rises a worm, which in time grows up to be a phoenix. Hence the Phoenicians gave the name of phoenix to the palm-tree; because when burnt down to the root it rises again fairer than ever.

In the sixth book of the annals of Tacitus, feet. 28, it is observed that, in the year of Rome 787, the phoenix revisited Egypt; which occasioned among the learned much speculation. This being is facetted to the sun. Of its longevity the accounts are various. The common perplexity is, as we have mentioned above, that it lives 500 years; though by some the date is extended to 1461. The several eras when the phoenix has been seen are fixed by tradition. The first, as we are told, was in the reign of Sesostris; the second in that of Amasis; and, in the period when Ptolemy the third of the Macedonian race was seated on the throne of Egypt, another phoenix directed its flight towards Heliopolis. When to these circumstances are added the brilliant appearance of the phoenix, and the tale that it makes frequent excursions with a load on its back, and that when, by having made the experiment through a long tract of air, it gains sufficient confidence in its own vigour, it takes up the body of its father and flies with it to the altar of the sun to be there consumed; it cannot but appear probable, that the learned of Egypt had enveloped under this allegory the philosophy of comets.

Phoenix, son of Amyntor king of Argos by Cleobule of Hippodamia, was preceptor to young Achilles. His father having proved faithful to his wife, through fonnedns for a concubine called Clytie, Cleobule, who was jealous of him, persuaded her son Phoenix to ingratinat himself with his father's mistref. Phoenix easily succeeded; but Amyntor discovering his intrigue, he drew a curse upon him, and the son was soon deprived of his flight by divine vengeance. Some say that Amyntor himself put out his son's eyes, which so cruelly provoked him that he meditated the death of his father. Reason and piety, however, prevailed over passion; and that he might not become a parricide, Phoenix fled from Argos to the court of Peleus king of Phthia. Here he was treated with tendernefs; Peleus carried him to Chiron, who restored him to his eye-flight; soon after which he was made preceptor to Achilles, his benefactor's son. He was also present with the government of many cities, and made king of the Dolopes. He went with his pupil to the Trojan war; and Achilles was ever grateful for the instructions and precepts which he had received from him. After the death of Achilles, Phoenix, with others, was commissioned by the Greeks to return to Greece, to bring to the war young Pyrrhus. This commission he successfully performed; and after the fall of Troy, he returned with Pyrrhus, and died in Thrace. He was buried, according to Strabo, near Trachinia, where a small river in the neighbourhood received the name of Phoicus. There was another Phoenix, son of Agenor, by a nymph who was called Teiphobia, according to Apollodorus and Modestus, or, according to others, Epimenides, Perimenides, or Argirope. He was, like his brother Cadmus, and Cilix, sent by his
his father in pursuit of his sister Europa, whom Jupiter had carried away under the form of a bull; and when his inquiries proved unsuccessful, he settled in a country, which, according to some, was from him called Phoebus. From him, as some suppose, the Carthaginians were called Panis.

Phoebus, a genus of infects, belonging to the order of vermes teutaceae. The shell is double-valved and divaricated; the carmo is turned backwards, and connected by a cartilage. There are six species, distinguished by the figure of their shells.

The word pholas is derived from the Greek, and signifies something which lies hid. This name they derive from their property of making themselves holes in the earth, sand, wood, or stone, and living in them. The means of their getting there, however, are as yet entirely unknown. All that we can know with certainty is, that they must have penetrated these substances when very small; because the entrance of the hole in which the pholas lodges is always much less than the inner part of it, and indeed than the shell of the pholas itself. Hence some have supposed that they were hatched in holes accidentally formed in stones, and that they naturally grew of such a shape as was necessary to fill the cavity.

The holes in which the pholades lodge are usually twice as deep, at least, as the shells themselves are long; the figure of the holes is that of a truncated cone, excepting that they are terminated at the bottom by a rounded cavity, and their position is usually somewhat oblique to the horizon. The openings of these holes are what betray the pholas being in the stone; but they are always very small in proportion to the size of the fish. There seems to be no progressive motion of any animal in nature so flow as that of the pholas; it is immered in the hole, and has no movement except a small one towards the centre of the earth; and this is only proportioned to the growth of the animal. Its work is very difficult in its motion; but it has great time to perform it in, as it only moves downward, sinking itself deeper in the stone as it increases itself in bulk. That part by means of which it performs this, is a sithy substance placed near the lower extremity of the shell; it is of the shape of a lozenge, and is considerably large in proportion to the size of the animal; and though it be of a soft substance, it is not to be wondered at that in so long a time it is able, by constant work, to burrow into a hard stone. The manner of their performing this may be seen by taking one of them out of the stone, and placing it upon some moist clay; for they will immediately get to work in bending and extending that part allotted to dig for them, and in a few hours they will bury themselves in the mud in as large a hole as they had taken many years to make in the stone. They find little resistance in so soft a substance; and the necessity of their hiding themselves evidently makes them haften their work. The animal is lodged in the lower half of the hole in the horse, and the upper half is filled up by a pipe of a sithy substance and conic figure, truncated at the end; this they usually extend to the orifice of the hole, and place on a level with the surface of the stone; but they seldom extend it any farther than this. The pipe, though it appears single, is in reality composed of two pipes, or at least it is composed of two parts separated by a membrane. The use of this pipe or proboscis is the same with that of the proboscis of other shell-fish, to take in sea-water into their bodies, and afterwards to throw it out again. In the middle of their bodies they have a small green vessel, the use of which has not yet been discovered. This, when plunged in spirit of wine, becomes of a purple colour: but its colour on linen will not become purple in the sun like that of the murex; and even if it would, its quantity is too small to make it worth preferring.

The pholas is remarkable for its luminous quality. That this fish was luminous is noticed by Pliny, who observes that it shines in the mouth of the person who eats it; and if it touch his hands or clothes, it makes them luminous. He also says, that the light depends upon its moisture. The light of this fish has furnished matter for various observations and experiments to M. Reaumur and the Bolognian academicians, especially Beccarius, who took so much pains with the subject of phosphoreal light.

M. Reaumur observes, that whereas other fishes give light when they tend to putrefection, this is more luminous in proportion to its being fresh; that when they are dried, their light will revive if they be moistened either with fresh or salt water, but that brandy, immediately extinguishes it. He endeavoured to make this light permanent, but none of his schemes succeeded.

The attention of the Bolognian academicians was engaged to this subject by M. F. Marsilius in 1724, who brought a number of these fishes, and the stones in which they were inclosed, to Bologna, on purpose for their examination.

Beccarius observed, that though this fish ceased to shine when it became putrid, yet that in its moist putrid state it would shine, and make the water in which it was immered luminous when it was agitated. Galen and Montius found that wine or vinegar extinguished this light; that in common oil it continued some days, but in rectified spirit of wine or urine hardly a minute.

In order to observe in what manner this light was affected by different degrees of heat, they made use of a Reaumur's thermometer, and found that water rendered luminous by these fishes increased in light till the heat arrived to $45^\circ$, but that it then became suddenly extinct, and could not be revived again.

In the experiment of Beccarius, a solution of saltpeter increased the light of the luminous water; a solution of nitre did not increase it quite so much. Sal ammoniac diminished it a little, oil of tartar, per deliquium nearly extinguished it, and the acids entirely. This water poured upon fresh calcined gypsum, rock crystal, ceruss, or sugar, became more luminous. He also tried the effects of it when poured upon various other substances, but there was nothing very remarkable in them. Afterwards, using luminous milk, he found that oil of vitriol extinguished the light, but that of tartar increased it.

This gentleman had the curiosity to try how differently coloured substances were affected by this kind of light; and having, for this purpose, dipped several ribbons in it, the white came out the brightest, next to this was the yellow, and then the green; the other colours could hardly be perceived. It was not, however,
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however, any particular colour, but only light, that was perceived in this cafe. He then dipped boards painted with the different colours, and cover tubes filled with substanfes of different colours, in water rendered luminous by the filhes. In both these cafes, the red was hardly visible, the yellow was the brighteft, and the violet the dulleft. But on the boards, the blue was nearly equal to the yellow, and the green more languid; whereas in the glaffes, the blue was inferior to the green.

Of all the liquors to which he put the pholades, milk was rendered the most luminous. A flinge pholey made seven ounces of milk fo luminous, that the faces of persons might be distinguished by it, and it looked as if it was transparent.

Air appeared to be nece{[ary to this light; for when Beccearius put the luminous milk into glafs tubes, no agitation would make it shine unless bubbles of air were mixed with it. Also Montius and Galeatius found, that, in an exhausted receiver, the pholas lost its light, but the water was sometimes made more luminous; which they ascribed to the rising of bubbles of air through it.

Beccearius, as well as Reaumur, had many fchemes to render the light of these pholades permanent. For this purpose he kneaded the juice into a kind of paste with flour, and found that it would give light when it was immersed in warm water; but it anfwered but to préerve the fift in honey. In any other method of prefervation, the property of becoming luminous would not continue longer than fix months, but in honey it had lasted above a year; and then it would, when plunged in warm water, give as much light as ever it had at any time. See Barbut’s Genera Vermínium, p. 14. &c.

PHOLEYS, or FOLIES, are people of Africa, of very peculiar manners. Some authors tell us, that the kingdom of Pholey, from whence they derive their name, is divided from that of Jallof by a lake called in the language of the Mundingoes, Cajor; and that it stretches from caft to west about 180 miles; but that, though it extends a great way south, its limits in that direction are not exactly ascertained.

Mr Moore, however, gives a very different account, and says, that the Pholeys live in clans, build towns, and are in every kingdom and country on each side the river; yet are not subject to any of the kings of the country, though they live in their territories; for if they are used ill in one nation, they break up their towns, and remove to another. They have chiefs of their own, who rule with fuch moderation, that every act of government seems rather an act of the people than of one man. This form of government is easily administered, because the people are of a good and quiet disposition, and so well instructed in what is just and right, that a man who does ill expostulates himself to universal contempt.

The natives of all these countries, not being avaricious of lands, deare no more than they can ufe; and as they do not plough with hores or other cattle, they can ufe but very little; and hence the kings willingly allow the Pholeys to live in their dominions, and cultivate the earth.

The Pholeys have in general a tawney complexion, though many of them are of as deep a black as the Mundingoes; and it is suppos’d that their alliances with the Moors have given them the mixed colour between the true olive and the black. They are rather of a low stature, but have a genteel and easy fhape, with an air peculiarly delicate and agreeable.

Though they are bravers in the country, they are the greatest planters in it. They are extremely industrious and frugal, and raise much more corn and cotton than they consume, which they sell at reasonable rates; and are fo remarkable for their hospitality, that the natives esteem it a bleeding to have a Pholey town in their neighbourhood, and their behaviour has gain’d them fuch reputation that it is eftemed inhumane for any one to treat them in an unhofpitable manner. Their humanity extends to all, but they are doubly kind to people of their race; and if they know of any one of their body being made a flave, they will readily redeem him. As they have plenty of food, they never suffer any of their own people to want; but support the old, the blind, and the lame, equally with the others.

These people are feldom angry; and Mr Moore observes that he never heard them abuse each other; yet his mildness is far from proceeding from want of rage, they being as brave as any people of Africa, and very expert in the use of their arms, which are javelins, cutlafes, bows and arrows, and upon occasion guns. They ufually settle near some Mundingo town, there being scarce any of note up the river that has not a Pholey town near it. Moft of them fpeak Arabic, which is taught in their schools; and they are able to read the Koran in that language, though they have a vulgar tongue called Pholey. They are ftrict Mahometans, and scarce any of them will drink brandy, or any thing stronger than figar and water.

They are fo fkillful in the management of cattle, that the Mundingoes leave theirs to their care. The whole herd belonging to a town feed all day in the savannahs, and after the crop is off, in the rice-grounds. They have a place without each town for their cattle, surrounded by a circular hedge, and in this enclosure they raise a flage about eight feet high, and eight or ten feet wide, covered with a thatched roof; all the fides are open, and they affend to it by a ladder. Round this flage they fix a number of flakes, and when the cattle are brought up at night, each beaf is tied to a separate flake with a strong rope made of the bark of trees. The cows are then milked, and four or five men flay upon the flage all night with their arms to guard them from the lions, tygers, and other wild beafes. Their houfes are built in a very regular manner, they being round ftructures, placed in rows at a dinance from each other to avoid fire, and each of them has a thatched roof somewhat reeling a high crowned hat.

They are also great huntmen, and not only kill lions, tygers, and other wild beafes, but frequently go 20 or 30 in a company to hunt elephants; whole teeth they fell, and whole flax they smoke dry, and keep it for feveral months together. As the elephants here generally go in droves of 100 or 200, they do great mischief by pulling up the trees by the roots, and trampling down the corn; to prevent which, when the natives have any fufpicion of their coming, they make fires round their corn to keep them out.
They are almost the only people who make butter, and fell cattle at some distance up the river. They are very particular in their dress, and never wear any other clothe but long robes of white cotton, which they make themselves. They are always very clean, especially the women, who keep their houses exceedingly neat. They are, however, in some particulars very superstitious; for if they chance to know that any person who buys milk of them boils it, they will from thenceforth on no consideration sell that person any more, from their imagining that boiling the milk makes the cows dry.

PHOLIS, in natural history, is the name of a genus of foils of the class of gypsums or platter-flakes. Its distinguishing characters are, that the bodies of it are tolerably hard, composed of particles somewhat broad, and of a bright crystalline lustre. The name is derived from Greek, a scale or small flake, because they are composed of particles of that form.

The species of this genus are very valuable, and perhaps the most of all the gypsums, because they burn to the black, and fine plaster, but so far as is yet known, there are but two of them: the fine plater flone of Montmartre in France, called by us plater or Paris flone and purgat; and the other, the coarser and somewhat reddish kind, common in many parts of England, and called ball plater. See Plaster of Paris.

PHOLIS, in ichthyology, is the name of a small anguilliform fish. The back is brown, the belly is white, the whole back and sides are spotted, and the skin is soft, free of scales, but with a tough mucilaginous matter like the eel. This species molt of all approaches to the eel, but is finally larger yet Mr Ray doubts whether it really differs from it in any thing essential; the distinction is its colour, though a very obvious is certainly a very precarious one.

PHONICS, the doctrine or science of sounds, otherwise called Acoustics. See that article.

PHORMIUM, Flax-plant, (Phormium tenax, Forth,) is a name which we may give to a plant that serves the inhabitants of New Zealand instead of hemp and flax. Of this plant there are two sorts; the leaves of both resemble those of flags, but the flowers are smaller, and their clusters more numerous; in one kind they are yellow, and in the other a deep red. Of the leaves of these plants, with very little preparation, they make all their common apparel, and also their string, lines, and cordage, for every purpose; which are so much stronger than anything we can make with hemp, that they will not bear a comparison.

From the same plant, by another preparation, they draw long slender fibres, which shine like silk, and are as white as snow; of these, which are very strong, they make their finest cloths; and of the leaves, without any other preparation than splitting them into proper breadths, and tying the strips together, they make their fishing nets, some of which are of an enormous size.

The seeds of this valuable plant have been brought over into England; but, upon trial, appeared to have lost their vegetating power.

The filamentous parts of different vegetables have been employed in different countries for the same mechanic uses as hemp and flax among us. Putrefaction, and in some degree alkaline lixivium, destroy the pulpy or fleshy matter, and leave the tough filaments entire. By curiously putting the leaf of a plant in water, we obtain the fine flexible fibres which constituted the barks of the ribs and minute veins, and which form as it were a skeleton of the leaf. In Madagascar, different kinds of cloth are prepared from the filaments of the bark of certain trees boiled in strong ley; and some of these cloths are very fine, and approach to the softness of silk, but in durability come short of cotton; others are coarser and stronger, and last thrice as long as cotton; and of these filaments they make cords and cordage to their vessels.

The flaks or nolies are sometimes used for like purposes, even in France; and Sir Hans Sloane relates, in one of his letters to Mr Ray, that he has been informed by several, that mullein and callico, and most of the Indian linens, are made of nettles. A strong kind of cloth is said to be prepared in some of the provinces of Sweden of hop-flakes; and in the transactions of the Swedish Academy for 1750, we have an account of an experiment relating to this subject: A quantity of the flaks were gathered in autumn, which was equal in bulk to a quantity of flax sufficient to yield a pound after preparation. The flaks were put into water, and kept covered with it during the winter. In March they were taken out, dried in a stove, and dressed as flax. The prepared filaments weighed nearly a pound, and proved fine, soft, and white; they were spun and woven into six ells of fine strong cloth. Unless the flaks are fully rotted, which will take much longer time than flax, the woody part will not separate, and the cloth will prove neither white nor fine.

PHOSPHAT, is a mineral found in Estremadura, It is of a whitish colour, and of great solidity, though not sufficiently hard to strike fire with flint. If triturated in an iron mortar in the dark, or even if two pieces of it be rubbed together, it becomes luminous; but when it has once lost this property, it does not, like some natural phosphories, receive it again by being exposed to the rays of the sun. If reduced to a very fine powder, and laid on coals, it does not decrepitate, but burns with a beautiful green light; though, if the coals be very hot, and the powder coarse, decrepitation will take place.

According to the analysis made by those chemists, 100 grains of the calcareous phosphat is reducible to the following elements:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbonic acid</td>
<td>1 grain</td>
</tr>
<tr>
<td>Muratic acid</td>
<td>5</td>
</tr>
<tr>
<td>Iron</td>
<td>1</td>
</tr>
<tr>
<td>Quartzous earth</td>
<td>2</td>
</tr>
<tr>
<td>Pure calcareous earth</td>
<td>59</td>
</tr>
<tr>
<td>Phosphoric acid</td>
<td>34</td>
</tr>
<tr>
<td>Fluoric acid</td>
<td>2½</td>
</tr>
</tbody>
</table>

100 Grains.

We have the following account of an analysis of a Native phosphat of lime (earth bones) by Mr Halfenratz in the Annals of Chemistry. “The phosphat of lime of estremadura, found by Mr Prout, determined me to examine the coals a phosphorecent powder which I collected at Kobala-Polyana near Sigeth,
though this powder gives absolutely the same appearance when treated on the coals as the float of lime (flocc-flour), yet no fluoric acid is disengaged from it when heated with sulphuric acid. It diffolves in nitric acid (dephlogisticated nitrous acid); and sulphuric (vitriolic) acid precipitates from it a solution a considerable quantity of sulphate of lime (gypsum); the liquor filtered, and concentrated by evaporation, gives a new precipitate similar to the former. The liquor again filtered, and evaporated to dryness, left a slight residuum. This residuum, after having been exposed to a fire sufficiently strong to make the vessel containing it red-hot, and disengage the nitric and sulphuric acids which might have remained united with it, was soluble in distilled water, which it acidified. This acid did not precipitate baritic (barium) murris; it caused a white precipitate from the solutions of fulfit of iron (green vitriol), and nitrat of mercury (mercurial nitre), and formed a thick and copious one in lime water: hence it is evident, that this acid was the phosphoric, and the powder was phosphat of lime.'

The phosphat of soda is obtained by combining the phosphoric acid with the mineral alkali. It has, we are told, been given with success as a purgative; and M. Pelletier thinks it may be applied to the folding of metals instead of borax; and indeed it resembles this substance so much in many of its properties, that it has been supposed that phosphoric acid is one of the constituent principles of borax. See Chemistry, n° 904.

PHOSPHORUS, a name given to certain substances which flime in the dark without emitting heat. By this circumstance they are distinguished from the pyrophori, which though they take fire on being exposed to the air, are yet entirely destitute of light before this explosure.

Phosphorii are divided into several kinds, known by the names of Bolognian phosphorus, Mr. Canton's phosphorius, Baronet's phosphorus, phosphorus of urine, &c., of which the last is by far the most remarkable both with respect to the quantity of light which it emits, and its property of taking fire and burning very fiercely upon being slightly heated or rubbed. For the method of preparing these, see Chemistry, Index.

Besides these, however, it has been found that almost all terrestrial bodies, upon being exposed to the light, will apparently disappear for a little time in the dark, metals only excepted. This points out a general division of the phosphorii into two classes; namely, such as require to be exposed to the light either of the sun or of some artificial fire, before they become luminous; and such as do not. Of the former kind are the Bolognian phosphorius, Mr. Canton's phosphorus, the phosphorus from earths, &c. Of the latter kind are rotten-wood, the skins of fishes, and the phosphorus of urine. To these we may add some other substances which become luminous in another way; viz. the masts which remains after the distillation of volatile fat amoniac with chalk, leaf-sugar, and the phosphorus of urine dissoluted in spirit of wine. The first, which is a composition of the marine acid of the amoniac with the chalks, after being fused in a crucible, becomes luminous when truck with any hard body; white figs is luminous phosphorius when grated or scraped in the dark; and the solution of phosphorus in spirit of wine is luminous only when dropped into water; and even then the light is only perceived when the drops fall into the liquid. One part of phosphorus communicates this property to 60,000 parts of spirit of wine.

There is a remarkable difference between the light Remarks of rotten wood, fishes, and that of phosphorus of urine, even when it is not in an ignited state; for this last does not cease to be luminous even when included between the light by means of an exhausted receiver; the contrary of which happens to rotten wood and fishes. If air is strongly phosphorius blown upon this phosphorus from a pair of bellows, it will extinguish its light for some time, which is not the case with the other kinds. When kept in water, and placed in a warm air, the phosphorus of urine discharges such large and bright flashes into the air above the flask, as are apt to surprize and even frighten those who are unacquainted with it. The effects are contrived in their passage through the water, but expand as soon as they get above it; however, the experiment can only be tried to advantage in warm weather, and in a cylindrical flask not above three quarters filled with water.

The phenomena exhibited by the earthy phosphorii are very curious; both on account of the singular circumstances in which they exhibit their light, and the varieties observed in the light itself. All these, as has been already mentioned, emit no light till they have been first exposed to the light of the sun, or some other luminous body. After that, they are luminous in the dark for a considerable time; but by degrees their light dies away, and they emit no more till another exposure to the sun. But if this happens to be too long continued, they are then irrecoverably spoilt. The same thing will happen from being too much heated without any exposure to light. Indeed, if a phosphorus, which has just ceased to be luminous, be heated, it will again emit light without any exposure to the sun; but by this its phosphoric quality is weakened, and will at last be destroyed. Indeed these phosphorii are so tender, and impatient either of light or heat, that the best method of rendering them luminous occasionally is by discharging an electric bottle near them. The light of the flash immediately kindles the phosphorus, and it continues luminous for a considerable time, after which it may again be revived by another flash, and so on. However, with all the care that can be taken, these phosphorii are very far from being perpetual; nor has any method been yet fallen upon to render them so.

The singularites in the light of the phosphorii above mentioned are, that they emit light of many different and most beautiful colours. This difference of colours seems to be natural to them; for some will at first emit a green, others a red, others a violet, &c. at their formation. However, the best kinds agree in this strange property, that if they are exposed to a red light, they emit a red light in the dark; and the fame of other colours. But this must not be understood without limitation; nor is the phosphoreal light at any time so bright as the luminous body, whatever it was, by which it was kindled. Neither are we to imagine, that any particular phosphorus has a particu-
Phosphorus is a kind of light appropriated to; for the same phosphorus which at one time emits a purple light, will at another perhaps emit a green, or a light of some other colour.

The explanation of the principal phenomena of phosphorus is deducible from what has been shown concerning the nature of fire, compared with what is mentioned under the article Quicklime. Under this last article it is shown, that, when calcareous earths are deprived of their fixed air, a proportional quantity of active fire is absorbed by them; that is, the eterial fluid which pervades all bodies, has a violent tendency to expand itself, or to act all around every particle of the calcined earth, as from a centre. Of consequence, if this tendency was not counteracted by some other power, these substances would emit a perpetual flame. This power, however, is found in our atmosphere; which has already been shown either to be the positive principle of cold, or to contain it. Hence, the latent fire in these substances is checked, and cannot act, excepting within the very substance itself. But if any other body comes in contact with the calcined earth, in which the principle of cold is less vigorous than in the atmosphere, the active fire in the quicklime immediately shows itself, and the body either becomes hot, or is consumed as if by fire. Hence it will follow, that if a very inflammable body is touched by quicklime, it will be set on fire. But of this we have no instance, because it is impossible for the quicklime to part with any of its fire, unless it receives something in exchange. This indeed it might receive from the atmosphere; which could supply it either with more fire, if it was in a state of ignition; or with fixed air, if any substance was at hand to receive the fire. But the atmosphere refuses to part with the fire which it contains, because the effort of the fire in the quicklime is not sufficiently strong to overcome the opposition it meets with in other bodies; and, on the other hand, the effort of the fire in the quicklime is sufficient to keep the earth from attracting fixed air out of the atmosphere. But when water, for instance, is poured on the quicklime, the dry earth absorbs it very greedily, and parts with a proportional quantity of its latent fire, which the water also absorbs much more readily than the atmosphere. Hence the mixture becomes so exceedingly hot as sometimes to fire combustible bodies. Now if, instead of water, we suppose the lime to be mixed with oil, this also will absorb the fire, but not with such force as the water; neither is the heat by any means so considerable; because oil is capable of detaining a vast quantity of heat in a latent state, the only consequence of which is an increase of its fluidity, without any very perceptible change of temperature. At the same time, however, we must remember, that if the oil is in very small quantity, and intimately combined with the quicklime in that peculiar state which was formerly called phlogiston, it is easy to conceive, that it may be so much saturated with fire, as to be unable to contain any more without being ignited. In this case, if more fire is forced into the compound, a quantity of the phlogistic matter which it contains will be decomposed; and of consequence, the fire which it has imbibed will be thrown out, as in the common ignition of vapour; and in proportion to the degree of heat thus communicated, will the degree of ignition and the continuance of it be. If the quantity of phosphorus heat is very great, the phlogiston will be dissipated all at once; but if otherwise, the ignition will continue for a much greater length of time, as is the case with a common fire.

To apply this to the accession of phosphori, we must consider that these substances, are all formed by calcining calcareous substances, and combining them with some portion of phlogistic matter. Baldwin's phosphorus is made by dissolving chalk in the nitrous acid, afterwards evaporating the solution, and driving off most of the acid. The consequence of this is, that the earth is left in an exceedingly caustic state, as the acid expels the fixed air more completely than could be done almost by any calcination whatever; at the same time that any phlogistic matter which might have been contained in the mixture is most accurately diffused through it, and combined with it. The Bolognian phosphorus is composed of a gypseous earth, which contains a quantity of vitriolic acid; and as no mineral is to be found perfectly free from phlogistic matter, the vitriolic acid unites with it during the calcination, and turns into an exceedingly inflammable phlogiston; for the greater the quantity of acid there is in proportion to the phlogiston, the more inflammable is the compound. Thus the Bolognian, as well as Baldwin's phosphorus, is a compound of quicklime and inflammable matter; and the case is much more plain with regard to Mr Canton's, where the quicklime is mixed with sulphur, and both calcined together. Neither are the phosphori made by calcining oyster-shells without addition to be accounted any way different from those already mentioned; since the shells always contain some portion of inflammable matter, which, being reduced to a coal by the action of the fire, furnishes a quantity of phlogiston, and imparts it to the whole of the calcareous matter.

Having thus seen that the phosphorus of which we speak are all composed of pure calcareous earth, phlogiston, and phlogiston, we are next to consider, that the phlogiston must be in such a state as it is when saturated with fire and ready to inflame. It is not indeed in the state of vapour, because this would require a quantity of fire detached from any other substance, and interposed between the particles of the vapour, in order to keep them at a distance, or to give it elasticity. But the fire which ought to do this is confined by the calcarious earth, which also detains the phlogiston itself. As long as therefore the balance is thus preserved, the phosphorus cannot shine; but as soon as a fresh quantity of light is discharged upon it, then more light or fire (for they are the very same in this case) enters the quicklime in proportion to the degree of heat thus communicated, will the degree of igni-

8 See the article Gypsum.
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Phosphorus will kindle it again; but thus a larger quantity of phlogistic matter is dissipated, and the phosphorus is soon destroyed. Light does the same, but in a much more moderate degree; and therefore the phosphorus may be frequently rekindled by means of light, and will continue its splendor for a long time. But if the light is too long continued, or too violent, it will produce the same consequence whether it is attended with perceptible heat or not.

With regard to the phosphorus of urine, the case is the same; only, instead of the calcareous earth, we have here an acid joined with phlegition. The latter is in an exceeding small quantity, and of consequence so loaded with fire that the least additional heat, rubbing, or alteration in the weather, forces more fire upon it than it can bear, and therefore part of it is continually flashing off in these corruptions formerly mentioned. The reason why this phosphorus flashes like lightning, and the others give only a steady light like coals, is, that the compound is very volatile. It requires indeed a violent fire to distil it at first; but in the distillation so much fire is imbided, that it seems ever afterwards ready to evaporate spontaneously; and therefore phosphorus, when once made, is easily redistilled in close vessels.

It now remains only to show the reason why the phosphorus of urine and some others will shine under water, or in an exhausted receiver, while rotten wood, &c. will not. This seems to arise from the quantity of fire which they have internally, and which requires no supply from the external air, as in the case of common fire; and hence the phosphorus of urine furnishes more briskly in vacuo than in the air; because the pressure of the atmosphere is then taken off, and the evaporation of the phlogistic matter promoted. The light of fishes and rotten wood seems to be of an electric nature; and therefore ceases when the air is exhausted, as on this fluid all the phenomena of electricity are found to depend.

With regard to the various colours of phosphoric light some have imagined that the earthy sublimates was capable of imbibing a certain quantity of light, and emitting it afterwards in the very same state, and having the same colour which it had before. But this is now known to be a mistake, and the light of the phosphors is found to be owing to a true accension, though weak, as in other burning bodies. Hence it is very probable that the colour of the light depends upon the degree of accension; for we find that even in common fires the colour depends in a great measure on the strength of the flame. Thus the flame of a candle, where it is not well kindled at bottom, always appears blue. The flame of a small quantity of sulphur, or of spirit of wine, is blue; but if a large quantity of either of these sublimates be set on fire, the flame will in many places appear white. A strong flame mixed with much smoke appears red; a weak one in similar circumstances appears brown, &c.—Hence if the phosphoric is weakly kindled it will emit a brown, violet, blue, or green flame; if strongly, a red or white one.

It has already been mentioned, that almost all terrestrial bodies have a phosphoric quality; however this, in most of them, is extremely weak, and continues only for a very short time. Signor Beccaria, who discovered this property, in order to find out what sublimates were phosphoric and what were not, had a machine contrived like a dark lantern, in which he included himself, in order to perceive with the greater facility any small quantity of light which might be emitted by the sublimates which he designed to examine. In the side of the machine was a cylinder capable of being turned about without admitting any light. Upon this were placed the sublimates he designed to examine, and by turning the cylinder he immediately brought them from the light of the sun into intense darkness; in which situation there were but few sublimates which did not afford a sufficient quantity of light to render themselves visible. This phenomenon, however, is evidently similar to an optical illusion by which we are made to see what is not present before us; for if we look very intensely upon any thing for some time, suffring no more light to enter our eyes than what is reflected from that object, we will imagine that we still see it, though we remove into the dark or shut our eyes. The reason of this is, that the nervous fluid being once put in motion after a certain manner, continues that motion for a short space of time after the moving cause is removed. In like manner, as the light is partly reflected from bodies, and partly penetrates them, when any body is exposed to the light, and then is suddenly brought into a dark place, the ethereal fluid within its sublimates being once put into motion does not cease to move immediately, but for a time produces that vibration which we call light; for the sublimates of the fluid is present in the most intense darkness as well as furnishing. Hence almost all sublimates are capable of emitting light in the dark, after being exposed to a vigorous sunshine; though the reason of their doing so may be very different from that by which the phosphorus becomes luminous.

Many entertaining experiments may be made with other experiment the various kinds of phosphors, especially with that of urine. This last, however, is sometimes dangerous on account of the violence with which it burns. If dissolved in oil of cloves, it loses this property, but continues to be as luminous as before; so that this mixture, called liquid phosphorus, may be used with safety. As on some occasions it may be wished to have it in powder, it is proper to observe that this may be done with safety by pouring some hot water upon the phosphorus in a glass mortar. The compound melts, and while in a soft state is easily reducible to powder of any degree of fineness.

Mr Margraff endeavoured to combine phosphorus with metals by distillation; but zinc and copper were the only two metals that showed any signs of combination (See Chemistry, p. 543). The great analogy, with however, that has been observed between the properties of phosphorus and those of sulphur and arsenic, induced M. Pelletier long ago to suspect, that phosphorus would really combine with metals; and that the effective point was to retain the phosphorus in contact with the metal in a state of fusion. This happy idea led him to a method from which he has obtained all the effects that could be desired. Of this we have already given a very contracted account after the word Phosphorus.
Phosphorus phorus in the Index to our article Chemistry, we shall now extend that account, by giving that in the first volume of Annals of Chemistry.

Phosphoret of gold.

"Each of the combinations which are now to be described, M. Pelletier has termed phosphorated metal.

"M. Pelletier mixed half an ounce of gold of parting; in powder, with an ounce of phosphoric glass and about a dram of powdered charcoal; he put this mixture into a crucible, covering it with a small quantity of charcoal powder; and then applied a degree of heat sufficient to melt the gold. During the operation, a considerable quantity of vapours of phosphorus was difengaged, but all the phosphorus which was produced was not dispersed; a small quantity united with the gold, which was whiter than in its natural state, broke under the hammer, and had also a crystallized appearance.

"Twenty-four grains of this phosphoret of gold, placed on a cupel in a heated muffle, left only one grain, and the button of gold that remained had the peculiar colour of that metal.

Of Platina.

"A mixture, consisting of an ounce of platina, an ounce of phosphoric glass, and a dram of powdered charcoal, being put into a crucible, and covered with a little charcoal powder, M. Pelletier gave it a degree of heat nearly equal to what would have fused gold: this he continued for an hour. Having broken the crucible, he found underneath a blackish glass, a small button of a silver white, weighing more than an ounce.

On the inferior part of the button were well defined crystals of the same substance, the figure of which was a perfect cube. The same experiment, frequently repeated, constantly afforded the same result.

"The phosphoret of platina is very brittle, pretty hard, and flints fire with fleel: it is not acted upon by the magnet, and when it is exposed naked to a fire capable of fusing it, the phosphorus is difengaged, and burns on its surface. Exposed to the fire in a cupelling furnace on porcelain tets, the phosphoret of platina leaves a black glass, which surrounds the metallic substance. The colour of the glass is owing to iron contained in the platina; and if it continue exposed to the same heat in fresh tets, the portions of glasses that form latterly have not so deep a colour, are more or less greenish, have sometimes a bluish tinge, and become at last of a transparent white. This observation led M. Pelletier to imagine, that phosphorous was well adapted for separating iron from platina, and that it was one of the best means of separating it entirely from that metal. But the glasses which result from the combustion of the phosphorus and its combination with the oxyt (calx) of iron, forms a crust which obstructs the combustion of the phosphorus that still remains combined with the platina. To overcome this obstacle, M. Pelletier thought of exposing the phosphoret of platina to the fire, in cupels made of calcined bones, which, in the they easily absorb the glasses of lead, ought also to have the property of absorbing the phosphoric glass. He repeated the operation, therefore, several times successively, changing the cupel. A button of platina, which had been thus operated on four times, he presented to the academy: in this state it was capable of being reduced into plates, but was brittle when heated.

Since the reading of his memoir, M. Pelletier has pursued his process, and has advanced so far as to be able totally to free the platina from the phosphorus, so that it may be worked when heated: thus he has procured us a method of purifying this metal more advantageous probably than any hitherto attempted. The phosphoret of platina detonates strongly when it is thrown on nitre in fusion. A mixture of phosphoret of platina, and oxygenated muriat of potash (diphosphic digluciferous salt), thrown into a red hot crucible, produces a brillk detonation, and the platina remains pure in the crucible.

Half an ounce of silver, treated with an ounce of Of silver, phosphoric glass and two drams of charcoal, acquired an increase of weight of one dram. The phosphoret formed was white: it appeared granulated, and as it were crystallized: it broke under the hammer, but was capable of being cut with a knife. Placed in a cupel in a heated muffle, the phosphorus was disengaged, and the silver remained quite pure.

In preparing phosphorus in the large way, M. Pelletier observed, that the phosphoric acid attacked in some degree the copper basons, which are in other respects very convenient for this operation; and in the retorts which he made use of for the distillation, he found phosphoret of copper, sometimes in small distinct grains, at others in large masses, according as the degree of heat which finished the operation was more or less intense. This phosphoret he exhibited to the academy, and thence it was mentioned in the chemical nomenclature. The phosphoret of copper is also obtainable by a process similar to that which we have described for obtaining that of gold, silver, and platina. The proportions which M. Pelletier employed were an ounce of shreds of copper, an ounce of phosphoric glass, and a dram of powdered charcoal. This phosphoret appears whitish, is sometimes variegated with the different colours of the rainbow; changes on exposure to the air like pyrites, loses its lustre, and assumes a blackish hue.

Margraff had formed phosphoret of copper by distilling the oxyd of copper, called crocus venenæ, with phosphorus; and M. Pelletier also obtained it by the same process: but he did not observe the property attributed to it by Margraff, of running when applied to a candle. Having placed the phosphoret in a cupel in a heated muffle, it was fused, the phosphorus inflamed on its surface; a blackish substance resembling scorie remained in the cupel, which was penetrated with a glass that gave it a blue colour.

The phosphoret of iron produced by the fusion of an ounce of phosphoric glass, and an ounce of shreds of iron, mixed with half a dram of powdered charcoal, was very brittle, and broke white, with a vitreous and granulated appearance: in one cavity it was crystalized in rhomboidal prisms. It is the same substance which Bergman conceived to be a peculiar metal.

This phosphoret, placed in a cupel in a heated muffle, soon entered into a state of fusion; in the cupel remained a brittle substance, which is an oxyd of iron, and the cupel was penetrated with a matter similar to that which M. Pelletier had observed on treating in the same manner phosphoret of platina, obtained from platina not purified.

The
The phosphoehet of lead, obtained by the processes already described, appears little different from common lead. It is malleable, and easily cut with a knife, but it loses its luster sooner than lead, and when melted on charcoal by the blow-pipe, the phosphorus burns, leaving the lead behind.

The phosphoehet of tin, which M. Pelletier obtained by his processes, was divided into several grains, because he had not given a sufficient degree of fire to unite them. These grains did not appear different from the metal itself; but when melted with the blow-pipe, the phosphorus burnt on the surface of the metal, as in the similar experiment with lead.

In fusing tin or lead with the charcoal powder and phosphoric glafs, care must be taken not to urge the fire, as the phosphorus easily flies off from either of those metals.

From the experiments of M. Pelletier, it appears that phosphorus may be combined with gold, platinum, silver, copper, iron, tin, and lead; and that it deprives the five former metals of their ductility. M. Pelletier proposes to make further experiments, to ascertain whether it is possible or not to combine a greater quantity of phosphorus with the two latter, and whether they will retain their malleability in that case. In another memoir he will examine the action of phosphorus on ferreous metals: he proposes also to ascertain the order of its affinity with the metals and ferreous metals.

It is much to be wished that M. Pelletier may carry to perfection a work which will enrich chemistry with a species of combination hitherto almost entirely unknown, and which he has discovered means of effecting by a process equally simple and ingenious.

In the 12th volume of the Annals we find an account of the action of lime, and of some metallic oxys of phosphorus, by Dr Raymond.

M. Gengembre discovered, that by boiling phosphorus in a solution of potash, a peculiar kind of gas was produced, which had the singular property of taking fire on coming into contact with the atmosphere, and to which the French chemists have given the appellation of phosphorized hydrogen gas. Dr Raymond thought of varying the process, in order to discover whether this gas might not be produced in some other way. He took two ounces of lime flaked in the air, a dram of phosphorus cut small, with half an ounce of water, which he mixed up into a soft paste, and put into a stone retort; to this retort a tube was fitted, the internal diameter of which, he says, ought not to exceed a line and a half, communicating with a receiver full of water. As soon as the retort was well heated, the phosphorized hydrogen gas was generated so abundantly, that, from the quantity of ingredients here mentioned, no less than three quarters of it were obtained. The residuum was found to have all the characters of the native phosphat of lime. Hence the Doctor supposes, that the water was decomposed during the process, and that its oxygen served to acidify the phosphorus; which, in this state, was combined with the lime, and formed the phosphat; while its hydrogen, affminating a gaseous state, carried with it a part of the phosphorus, to which the property of taking fire by contact with the air must be ascribed. The gas soon loses this property, and the phosphorus is condensed on the sides of the receiver: great caution, however, is necessary; for though a part of the gas may seem to have deposited its phosphorus, and to be reduced to pure hydrogen, yet another part, in the same receiver, may retain enough to cause a formidable explosion, when in contact with air.

The facility with which water was thus decomposed led the author to suspect that a similar effect might be produced by the same mixture in the mean temperature of the atmosphere. Accordingly he found that in ten days time a small quantity of hydrogen gas was generated in the vials, in which the ingredients were placed: this, however, was not phosphorized, the heat not being sufficient to volatilize the phosphorus.

Animated by this success, Dr Raymond resolved to try what could be effected by metallic oxyds. He made two mixtures like the former: but instead of lime, he sublimated in the one the white oxyd of zinc, and in the other the black oxyd of iron. After long distillation with great heat, he obtained from both phosphorized hydrogen gas; but it was produced in much less time, and in greater quantity, from the oxyd of zinc than from that of iron; which he ascribed to the close affinity of the former to the phosphoric acid.

In the 12th volume of the same valuable work, we find proccefs for have an account of a proccefs for making phosphorus from urine, which is shorter and more economical than that by which Meeff Scheele and Ghan extracted it from the bones of animals, by M. Gibert. This method is founded on the property of the metallic salts to separate the phosphoric acid from urine, which Margraf, we believe, first discovered; but M. Gibert has greatly improved on the proccefs directed by the German chemist, as he avoids the tedious and disgusting operations of evaporating the urine, and expelling it to purefaction. He tells us, that it is indifferent whether the urine be that of healthy or diseased persons; and that horses is nearly as good for this purpose as that which is human. He gradually pours it into a solution of lead in the nitric acid, till the precipitation ceases which this had occasioned; the whole is then diluted with a considerable quantity of water, and afterward filtered through a linen cloth. The precipitate, which is phosphat of lead, must be made up into a paste with powder of charcoal, and well dried in an iron or copper pan: it must afterward be distilled; when it will yield, first, an ammoniacal, and then an empyreumatic, oil; these oils proceed from the urine, from which it is difficult to purify the phosphat. As soon as the oil ceases to come over, a clean receiver must be applied, and the fire be greatly increased. The phosphorus generally appears in about half an hour; and, within eight hours, twelve or fourteen ounces of it may thus be obtained. If the process be conducted with care, M. Gibert thinks that a hundred parts of phosphat of lead will yield between fourteen and eighteen of phosphorus.

If on the phosphat of lead thus precipitated from urine, a solution of sulphat of ammoniac be poured, and this, after digesting during twelve hours, be filtrated and evaporated, the phosphat of ammoniac will be obtained; and if sulphat of soda be used, the result will be phosphat of soda.

**Acid of Phosphorus.** This acid, called also the microphosphoric acid.
PHOTINANS, in ecclesiastical history, were a body of heretics in the fourth century who denied the divinity of our Lord. They derive their name from Photinus, their founder, who was bishop of Sirmium, and a disciple of Marcellus. Photinus published in the year 343 his notions respecting the Deity, which were repugnant both to the orthodox and Arian systems. He asserted, that Jesus Christ was born of the Holy Ghost and the Virgin Mary; that a certain divine emanation, which he called the Word, descended upon Him; and that because of the union of the divine word with his human nature, He was called the Son of God, and even God himself; and that the Holy Ghost was not a person, but merely a celestial virtue proceeding from the Deity. Both parties condemned the bishop in the councils of Antioch and Milan, held in the years 345 and 347. He was condemned also by the council at Sirmium in 351, and was afterwards degraded from the episcopal dignity, and 45 left in exile in the year 372 or 375. His opinions were afterwards revived by Secinus.

PHOTIUS, patriarch of Constantinople, was one of the finest geniuses of his time, and his merit raised him to the patriarchate; for Bardas having driven Ignatius from the see, Photius was consecrated by Athanasius in 859. He condemned Ignatius in a synod, whereupon the pope excommunicated him, and he, to balance the account, anathematized the pope. Basilius of Macedon, the emperor whom Photius had reproved for the murder of Michael, the late emperor, expelled him, and restored Ignatius; but afterwards re-established Photius; upon Ignatius’s death, in 878. At last, being wrongly accused of a conspiracy against the person of Leo the Philosopher, the son and successor to Basilisus, he was expelled by him in 886, and is supposed to have died soon after. He wrote a Bibliotheca, which contains an examination of 280 authors; he has also 253 epitiles of his; the Nomocanum under 14 titles; an abridgment of the acts of several councils, &c. This great man was born in Constantinople, and was descended from a very illustrious and noble family. His natural abilities were very great, and he cultivated them with the greatest industry. There was no branch of literature, whether sacred or profane, and scarcely any art or science, in which he was not deeply versed. Indeed he appears to have been by far the greatest man of the age in which he lived; and was so intimately concerned in the chief transactions of it, that ecclesiastical writers have on that account called it Schedon Photianum. He was first raised to the chief dignities of the empire, being made principal secretary of state, captain

PHOSPHORUS croscopic acid, has already been described. See Chemistry-Index at Phosphoric Acid (a). It has been discovered by Mr. Scheele, that an acid capable of making phosphorus is producible from calcined bones or hartthorn and the vitriolic acid. The processes for procuring this acid recommended by that gentleman was to dissolve the bones in nitrous acid; afterwards to precipitate the earth by means of the vitriolic acid; to filter and evaporate the liquor to dryness; and, after driving off the nitrous acid, the phorphoric acid remains. This process, however, is expensive on account of the waste of nitrous acid; and is likewise very inconvenient, because a great deal of the earthly matter continues dissolved even after the vitriolic acid is poured in; and therefore the phosphoric acid is never to be obtained pure: for which reason the following process is preferable.

Take of calcined bones or hartthorn, one pound; oil of vitriol, 14 ounces. Let the bones be reduced to fine powder; then pour on the acid undiluted, and rub both together till they are as accurately mixed as possible. Having let them remain for some hours in this situation, pour on as much water, filtering and dispersing the lump, into which the mass will now be concreted, till it is all equally distributed through the liquid, and has the consistence of thick gruel. Let it remain 24 hours, and then pour it into a canvas cloth in order to let the liquor drain from it. This is a very tedious operation, as fresh water must continually be pouring on till all the saline matter is washed off. When this is done, pour into the liquid a quantity of caustic volatile alkali, which will occasion a copious precipitation; for the earth of bones is much less strongly attracted by acids than even the caustic volatile alkali. The liquid being now filtered a second time, which will be done with sufficient ease, and afterwards evaporated, there remains a mass composed of phosphoric acid and vitriolic sal ammoniac. By increasing the fire, the latter is disiplated in vapour; and if the process has been successful, four ounces or more of pure phosphoric acid will remain.

With regard to the properties of this acid, it is not yet ascertained whether they are exactly the same with the microscopic acid or not. Indeed, as far as yet appears, they seem to be different; and there are very strong reasons for supposing that the phosphoric acid thus produced is no other than the vitriolic altered by its combination with the earth of bones. See the article Bones.

Liquor of Phosphorus. See Chemistry, n° 2d 957.

1521.

(a) See particularly n° 604. In addition to what has been already said on the acid of phosphorus, we may just observe, that M. Pelletier has a memoir on this subject in the 14th volume of the Chemical Annals. The philosopher’s method of preparing the phosphorous acid differs little from that which was some years ago proposed by M. Sage, and which, we believe, is now pretty generally known. The principal alterations made by the author of the present memoir consist in his putting each fliick of phosphorus into a glass pipe, the lower part of which is shaped like a funnel terminating in a very small opening; and in covering the apparatus with a tubulated receiver, which can open at pleasure. By these means he can diffuse a greater quantity of phosphorus without danger of an explosion. His method of converting the phosphorus into the phosphoric acid, by the nitric or the oxygenated muriatic acid, is the same with that discovered by M. Lavoisier, which is described in his Elements of Chemistry.
The long and filiform. It is true.

Phryganea is a genus of insects, of which Barbut gives the following characters. The mouth is without teeth, but furnished with four palpi: the flammata are three in number: the antennae are filiform, and longer than the thorax. The wings are incipient; the under ones are folded.

The name is derived from Phrygus, considered as an inhabitant of the air, has lived under-water, lodged in a kind of tube or sheath, the inward texture of which is silk; outwardly covered with sand, straws, bits of wood, shells, &c. When the hexapod worm is about to change to a chrysalis, he flops up the opening of his tube with threads of a loose texture, through which the water makes its way, but prevents the approach of voracious insects. The chrysalis is covered with a thin gauze, through which the new form of the insect is easily discerned. The phryganea, on the point of changing its element, rides to the surface of the water, leaves its tube, rises into the air, and enjoys the sweets of the country, flutters upon flowers and trees, but is soon called away to the water side to deposit its eggs; whence proceeds the new poltery. These aquatic larvae are often found in stagnating water, where they wrap themselves up in the water-lentil, cut out into regular figures, and fitted one to another. Trouts are very greedy of these larvae; which is the reason, that in some countries, after stripping them of their coats, they make use of them for fishing-baits.

There are a variety of different species of the phryganea; but except the phryganea bicauda and striata, they do not materially differ from one another, except in size and colour. The bicauda is of a deep dark-brown colour; having a single yellow longitudinal band running across the head and thorax. The legs are of a brown colour, as are the antennae; which are also long and filiform. Two brown threads, almost as long...
Phrygia.

Ancient

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PHRIGIA, a country in Asia. From whence it derived its name is not certain; some say it was from the river Phryx (now Sarabat), which divides Phrygia from Caria, and empties itself into the Hermus; others from Phrygia, the daughter of Afopus and Europa. The Greek writers tells us, that the country took its name from the inhabitants, and these from the town of Brygium in Macedonia, from whence their first settled into Asia, and gave the name of Phrygia or Brygia to the country where they settled. Bochart is of opinion, that this tract was called Phrygia from the Greek verb ἐφίσσω, "to burn or parch," which, according to him, is a translation of its Hebrew name, derived from a verb of the same signification.

No less various are the opinions of authors as to the exact boundaries of this country; an uncertainty which gave rise to an observation made by Strabo, viz. that the Phrygians and Myrians had distinct boundaries; but that it was scarce possible to ascertain them. The same writer adds, that the Trojans, Myrians, and Lydians, are, by the poets, all blended under the common name of Phrygians, which Claudian extends to the Bithynians, and Ionians. Phrygia Proper, according to Pto-lemy, whom we choose to follow, was bounded on the north by Pontus and Bithynia; on the west by Myria, Troas, the AIgæan Sea, Lydia, Macedonia, and Caria; on the south by Lyca; and on the east by Pamphylia and Galatia. It lies between the 37th and 41st degrees of north latitude, extending in longitude from 56 of 62 degrees. The inhabitants of this country, mentioned by Ptolemy, are the Lycaonians and Anthemifini, towards Lyca; and Moeccadis or Moccadina, the Cyddefes or Cydifies towards Bithynia; and between these the Peltini or Speltini, the Moxiani, Phylacae, and Hierapolitana. To these we may add the Be recyntes mentioned by Strabo.

Phrygia is commonly divided into the Greater and Lesser Phrygia, called also Troas. But this division did not take place till Troas was subdued by the Phrygians; and hence it is more considered. By some Roman writers as a part of Phrygia, than Bithynia, Cappadocia, or any other of the adjacent provinces.

In after ages, the Greater Phrygia was divided into two districts or governments; one called Phrygia Pasticana, from Pactianus, who, under Constantine, bore the great office of the praefectus priorior of the East; the other Phrygia Salutaris, from some miraculous cures suppose to have been performed there by the archangel Michael.

This country, and indeed all Asia Minor, as lying in the fifth and sixth northern climates, was in ancient times greatly celebrated for its fertility. It abounded in all sorts of grains; being, for the most part, a plain country covered with a deep rich soil, and plentifully watered by small rivers. It was in some parts productive of bittmen and other combustible substances. It was well stocked with cattle, having large plains and pastures. The air was anciently esteemed most pure and wholesome, though it is now in some parts thought extremely gross, and very far removed from the great part of the country lying uncultivated.

In Phrygia Major were anciently several cities of great celebrity, such as Apamea, Laodicia, Hierapolis, Gordium, &c.—There were also some famous rivers; such as Maris, Mazander, &c. The Meander is now called Madre or Mindo, and was much celebrated by the ancients for its windings and tur­nings; from whence all such windings and turnings have been denominated meanders.

The Phrygians accounted themselves the most ancient people in the world. Their origin, however, is extremely dark and uncertain. Josephus and St. Jerome say, they were descended from Oyga, one of Gomer's sons; and that they were known to the Hebrews under the name of Tigrannacces. The Heathen authors derive them from the Brygians, a people of Macedonia. But this is but mere conjecture; and it is a conjecture totally unsupported, except by the similarity of names. Bochart thinks that the Phrygians were the offspring of Gomer the eldest son of Japhet; the word Phrygia being the Greek translation of his name. Josephus makes Gomer the father of the Galatians; but he, by the Galatians must necessarily mean the Phrygians inhabiting that part of Phrygia which the Galatians had made themselves masters of; the descendants of Gomer being placed by Ezekiel northward of Jeduah, near Togarmah (which Bochart takes to be Cappadocia), long before the Gauls passed over into Asia. We are willing to let Gomer enjoy the fine country which Bochart is pleased to give him, and allow him the honour of being the progenitor of the Phrygians, since we know no other person on whom it can be conferred with any degree of probability.

The ancient Phrygians are described as superstitious, voluptuous, and effeminate; without any prudence or forecaht, and of such a servile temper, that nothing but trigger and ill usage could make them comply with their duty; which gave rise to several trite and well known proverbs (a). They are said to have been the first inventors of divination by the singing, flying, and feeding

(a) "Ih yges fero sçipnt, Phryx vèberatus melior, Phryx non minus quam Spyndius, &c. ;" which proverbs
The Phrygian mood, Their music, commonly called the Phrygian mood, is alleged by some as an argument of their effeminacy.

Their government was certainly monarchical; for all Phrygia was during the reigns of some kings, subject to one prince. Nimnachus, Midas, Manis, Gordius, and his descendants, were undoubtedly sovereigns of all Phrygia. But sometime before the Trojan war, we find this country divided into several petty kingdoms, and read of divers princes reigning at the same time. Apollodoros mentions a king of Phrygia contemporary with Iulus king of Troy. Codrus and others speak of one Teuthras king of a small country in Phrygia, whose territories were ravaged by Ajax, himself slain in single combat, his royal seat laid in ashes, and his daughter, by name Teemeefa, carried away captive by the conqueror. Homer makes mention of Phoreys and Afcanius, both princes and leaders of the Phrygian auxiliaries that came to the relief of Troy. Tantalus was king of Sipylos only, and its district; a prince no less famous for his great wealth, than infamous for his covetousness and other detestable vices. That Phrygia was subdued either by Ni. nus, as Diodorus Siculus informs us, or by the Amazon, as we read in Suidas, is not sufficiently ascertained. Most authors that speak of Gordius tell us, that the Phrygians having sent to consult an oracle in order to know how they might put an end to the intestine broils which rent their country into many factions and parties, received for answer, that the most effectual means to deliver themselves and their country from the calamities they groaned under, was to commit the government to a single prince. Thither reforted merchants and traders of all parts of Greece, Italy, and the neighbouring islands. Besides, we know from Syncellus, that the Phrygians were for some time masters of the sea; and none but trading nations ever prevailed on that element. The country produced many choice and useful commodities which afforded considerable exports. They had a safe coast, convenient harbours, and whatever may incline us to think that they carried on a considerable trade. But as most of the Phrygian records are lost, we will not dwell on conjectures difficult to be ascertained.

We have no set form of their laws; and as to their learning, since we are told that for some time they enjoyed the sovereignty of the sea, we may at least allow them a competent skill in geography, geometry, and astronomy; and add to these, from what we have said above, a more than ordinary knowledge of music.

Some have been of opinion that the Phrygian language bore a great resemblance to the Greek; but the contrary is manifest from the few Phrygian words which have been transmitted to us and carefully collected by Bochart and Rudbechius. To these we may add the authority of Strabo, who, after attempting to derive the name of a Phrygian city from the Greek, concludes, that it is a difficult matter to discover any similitude between the barbarous words of the Phrygian language and the Greek. The Phrygian tongue, after the experiment made by Pammethinus king of Egypt, was looked upon by the Egyptians as the most ancient language of the world. But other nations, particularly the Scythians, refused to submit to their opinion, as founded on an argument of no real weight. "As the two children (say they), had never heard the voice of any human creature, the word bes, or bokkas, the first they uttered, was only an imitation of the goats that had fudcked them, and happened to be a Phrygian word signifying bread (a)."

We have already said, that the Phrygians were superstitious; their idols were consequently very numerous. The chief of these was Cybele, who went by a variety of names. (See Cybele.) They also worshiped Bacchus under the name of Sabazios; and his priests they called Sabai.

The history of their kings is dark and uncertain, and the dates of their several reigns and actions cannot now be fixed; we shall refer such of our readers, therefore, as wish to know what is certain relating them, to the Ancient Universal History, already quoted more than once in the present article. See also Gordius, Midas, &c. For Phrygia Minor, see Troy.

PHRYGIAN STONE, in natural history, is the name of a stone described by the ancients, and used by them in dying; perhaps from some vitriolic or alumious salt contained in it, which served to enliven or fix the colours used by the dyers. It was light and spungy, resembling a pumice; and the whitest and lightest were reckoned the best. Pliny gives an account of the method of preparing it for the purpose of dying, which was by moistening it with urine, and then heating it red hot, and suffering it to cool. This calcination was repeated three times, and the stone was then fit for use. Dioscorides recommends it in medicine after burning; he says it was drying and altringent.

PHRYGIANS, a Christian sect. See Cataphrygi ans and Montanism.

PHRYGE, was a famous prostitute who flourished at Athens about 328 years before the Christian era. She was mistress of Praxiteles, who drew her picture, which

proverbs intimate their servile temper; and show that they were more fit to bewail misfortunes in an unmanly manner, than to prevent them by proper measures. Their music, too, was suited to their effeminate temper. The Doric mood was a kind of grave and solid music; the Lydian a doleful and lamentable harmony; but the Phrygian chiefly calculated to effeminate and enervate the mind. But this character is contradicted by others.

(a) Goropius Becanus makes use of the same argument, to prove that the High-Dutch is the original mother-tongue of the world, because the word beker in that language signifies "a baker."
Phryneus, which was one of his best pieces, and was placed in the temple of Apollo at Delphi. We are told that Apelles painted his Venus Anadyomene after he had seen Phryne on the sea-shore naked, and with dishevelled hair. Phryne became so very rich by the liberality of her lovers, that she offered to rebuild Thebes at her own expense, which Alexander had destroyed, provided this inscription was placed on the walls: Alexander, dedit pedem Phrynec receptis; which was refused. See Plin. 34. c. 8.—There was another of the same name who was accused of impiety. When she found that she was going to be condemned, she unveiled her bosom, which so influenced her judges that she was immediately acquitted.

PHRYNICUS, a general of Samos, who endeavoured to betray his country, &c. A flatterer at Athens. A tragic poet of Athens, disciple to Theophrastus. He was the first who introduced a female character on the stage.

Phrynis was a musician of Mytilene. He was the first who obtained a musical prize at the Panaeas at Athens. He added two strings to the lyre, which had always been used with seven by all his predecessors. He flourished about 438 years before the Christian era. We are told that he was originally a cook at the house of Hiero king of Sicily. There was another of the same name, a writer in the reign of Commodus, who made a collection, in 36 books, of epistles and sentences from the belly: Greek authors, &c.

Phrynisus (fab. hist.), was a son of Athamas, king of Thebes, by Nephele. When his mother was repulsed, he was perfecuted with the most invertebrate fury by his step-mother Ino, because he was to fit on the throne of Athamas, in preference to the children of a second wife. His mother apprized him of Ino's intentions upon his life; or, according to others, his preceptor; and the better to make his escape, he secured part of his father's treasures, and privately left Beoitia with his father Helle, to go to their friend and relation Eetes king of Colchis. They embarked on board a ship, or, as we are informed by the fabulous account of the poets and mythologists, they mounted on the back of a ram, whose fleece was of gold, and proceeded on their journey through the air. The height to which they were carried made Helle giddy, and she fell into the sea. Phrynis gave his father a decent burial on the sea-shore, and after he had called the place Helleponi from her name, he continued his flight, and arrived safe in the kingdom of Eetes where he offered the Ram on the altars of Mars. The king received him with great tenderness, and gave him Chalciope his daughter in marriage. She had by him Phrontis Melas, Argos Cylindrus, whom some call Gytaurus. He was afterwards murdered by his father-in-law, who envied him the possession of the golden fleece; and Chalciope, to prevent her children from sharing their father's fate, sent them privately from Colchis to Beoitia, as nothing was to be dreaded there from the jealousy or resentment of Ino, who was then dead. The fate of the flight of Phrynis to Colchis on a ram has been explained by forms; who observe, that the ship on which he embarked was either called by that name, or carried on her prow a figure of that animal. The fleece of gold is accounted for, by observing that Phrynis carried away immense treasures from Thebes. Phrynis was placed among the constellations of heaven after death. The ram which carried him to Asia is said to have been the fruit of Neptune's amour with Theophane the daughter of Altis. This ram the gods had given to Athamas in order to reward his piety and religious life; and Nephele procured it for her children, just as they were going to be sacrificed to the jealousy of Ino. Phrynis's murder was some time after amply revenged by the Greeks; it having occasioned the famous expedition achieved under Jafon and many of the princes of Greece, which had for its object the recovery of the golden fleece, and the punishment of the king of Colchis for his cruelty to the son of Athamas.

Phthirias, the lothy evil from σμυρν., "a loath." It was a lothy disease; children are frequently its subjects, and adults are sometimes troubled with it. The increase of lice, when in a warm moist situation, is very great; but a cold and dry one soon destroys them. On the human body four kinds of lice are distinguished: 1. The pediculi, so called because they are more troublesome with their feet than by their bite. These are in the heads of children, especially if sterile or scabby; and often in those of adults, if they are flothful and naffy. 2. Crab-lice, see Crab Lice. 3. Body lice; these infet the body, and breed in the clothes of the naffy and slothful. 4. A fort which breed under the cuticle, and are found in the hands and feet: they are of a round form, and so minute as often to escape the sight; by creeping under the scarfskin they cause an intolerable itching; and when the skin bursts, where they lodge, clusters of them are found there. See Acarus.

A good diet and cleanliness conduces much to the destruction of lice. When they are in the head, comb it every day; and, after each combing, sprinkle the pulv. fem. flaph. agr. or coccul. Ind. among the hairs every night and confine it with a tight cap.

Codorrhius, in his treatise on lice, says, that the powdered cocc. Ind. exceeds all other means; and that it may be mixed in the pulp of apple, or in hard, and applied every night to the hair. Some writers affirm that if the pulv. cort. rad. fassafr. is sprinkled on the head, and confined with a hair-chief, it destroys the lice in one night.

The body-lice are destroyed by any bitter, four, falt, or mercurial medicine, if applied to the skin.

The black soaps, and the flowers called cardamine or lady's-smock, are said to be specifics in all cases of lice on the human body.

Phthirias, a species of consumption, occasioned by an ulcer in the lungs. See Medicine, n. 237, &c.

Since our article Medicine was published, Dr Beddoes has suggested a new theory of phthisis, founded on the prevailing pneumatic doctrine in chemistry. Thinking that much cannot be gained by adhering to established principles and modes of practice, and being unawed by any pretensions to success from experience, he enters into the province of speculation. He fixes &c. on the effect of pregnancy in suspending the progress of phthisis, as a fact which, by its mode of operation, might
might suggest a method of diminishing the havoc occasioned by this distemper. We shall give his explanation of this interesting fact:

"The fetus has its blood oxygenated by the blood of the mother through the placenta. During pregnancy there seems to be no provision for the reception of an unusual quantity of oxygen. On the contrary, in consequence of the impeded action of the diaphragm, lefts and lefts should be continually taken in by the lungs. If, therefore, a somewhat diminished proportion of oxygen be the effect of pregnancy, may not this be the way in which it arrests the progress of phthisis? and if so, is there not an excess of oxygen in the system of consumptive persons? and may we not, by pursuing this idea, discover a cure for this fatal disorder?"

Dr Beddoes thinks, that this supposition is countenanced by the deficiency of oxygen in the blood of pregnant women, of phthisical patients, and of those who labour under fever; and by the superabundance of it in the blood of phthisical persons, indicated by its colour, as well as by the aggravation of the symptoms of consumption by breathing oxygenated air, and by the relief from inhaling atmospheric air mixed with carbonic acid air; and, lastly, from the small proportion of deaths among febrile persons. Supposing acids to act by decomposition, their alleged effects in producing consumption are consistent with the author's doctrine, as well as the emaciation preceding and accompanying phthisis. From these facts, Dr Beddoes concludes, that "1. The phthisical inflammation may so alter the structure of the lungs, as to cause them to transmit a more than ordinary portion of oxygen to the blood; or, 2. Some unknown cause having enabled them to transmit, or the blood itself to attract, more oxygen, an inflammation of the lungs might ensue.

From these principles, the Doctor thinks himself justified in proposing, in a disease which is incurable by present modes of practice, to diminish the supply of oxygen by the two channels through which it is introduced; namely, through the lungs, by lowering the atmospheric air with azotic or hydrogenic air; and through the stomach, by giving such nourishment as contains a small portion of oxygen.

Such is Dr Beddoes's theory of consumption; on which the following remark has been made by a critic who possesses an equal degree of candour and judgment. It is assumed by Dr Beddoes, that the blood of pregnant women has a diminished proportion of oxygen; but pregnant women have the same circumscribed spot of florid red in their concomitance which is apparent in heathies. If, then, the presence of this colour be sufficient to prove an excess of oxygen in the one case, it must have the same weight in the other. Another question is, whether less oxygen be really taken in by the lungs during pregnancy? For although the diaphragm be impeded in the freedom of its action, the frequency of breathing is proportionally increased.—A third circumstance which demands attention is, in what degree the fetus has its blood oxygenated by the blood of the mother through the placenta. It appears highly probable, that the fetal blood receives a very trifling supply of oxygen from the blood of the mother; that the fetal heart contains only a small portion of blood, which has been conveyed to the placenta; and that the blood in the heart and arteries of the fetus is not florid.——For many ingenious arguments on this subject, we may refer to Mr Coleman's Dissertation on suspended Respiration.——Leaving these things to Dr Beddoes's consideration, we will present our readers with his concluding remarks on this subject:

"The more you reflect, the more you will be convinced, that nothing would so much contribute to refine the art of medicine from its present helplessness, as the discovery of the means of regulating the constitution of the atmosphere. It would be no less desirable to have a convenient method of reducing the oxygen to 18 or 20 in 100, than of increasing it in any proportion. The influence of the air we breathe is as wide as the diffusion of the blood. The minute portions of the organs of motion, sense, and thought, must be affected by any considerable change in this fluid. Whether it be that the brain must be washed by streams of arterial blood, or that the action of every organ is a stimulus to the system in general, and consequently to every other organ in particular; it is certain, that when the access of oxygen is cut off from the lungs, the functions of the brain cease: perhaps there may be a mixture of azotic and oxygen airs, more favourable to the intellectual faculties than which is found in the atmosphere; and hence chemistry be enabled to exalt the powers of future poets and philosophers. That diseases of excitement on the one hand, and debility on the other, might be cured almost solely by a proper air, one can hardly doubt, as well as several disorders at present highly dangerous or desperate, which one cannot, upon the faith of any obvious phenomena, refer to either head. The materia medica might, therefore, undergo a still greater reduction than it has lately undergone, in consequence of the purification of medicine from its groffier aburdities; and hence the treatment of diseases be at once rendered infinitely more pleasant and more efficacious."

Our author, in a subsequent publication* gives an account of his treating with success several cases of phthisis according to the principles of this theory. After distilling consumptions into two kinds, the florid and the pituitous or catarhali, he observes, that the system may be as variously affected by means of the lungs as of the stomach: that it is impossible to doubt that we are nourished by the lungs as truly as by the stomach: and what we take in at the former entrance, becomes, like our food, a part of the substance of our solids as well as of our fluids. By the lungs we can also introduce effeetual alternates of the blood, and by consequence of all the parts nourished by the blood.

He then acquaints us more particularly with the apparatus requisite for the practice proposed. All, it should be able to furnish azotic, hydrogenic, carbonic, and oxygenic airs: our author having, as he says, "no intention to confine himself to one incurable disorder. 2dly. The reservoirs should be large, that the patients may be supplied with any quantity that their symptoms may require: and, 3dly. It is necessary that the apparatus be able to mix these airs with one another, as well as with atmospheric air, in any proportion." These objects, we
PHYLACTERY, in the general, was a name given by the ancients to all kinds of charms, spells, or characters, which they wore about them, as amulets, to preserve them from dangers or diseases.

Phylacteries particularly denoted a slip of parchment, wherein was written some text of Holy Scripture, particularly of the decalogue, which more devout people among the Jews wore on the forehead, the breast, or the neck, as a mark of their religion.

The primitive Christians also gave the name phylacteries to the cases wherein they inclosed the relics of their dead.

Phylacteries are often mentioned in the New Testament, and appear to have been very common among the Pharisees in our Lord’s time.

PHYLICA, BARTAD ALATERNUS; a genus of the monogynia order, belonging to the pentandria class of plants. There are six species, of which three are kept in the gardens of Britain; but by reason of their being natives of warm climates, they require to be kept in pots, and housed in winter. They are all shrubby plants, rising from three to five or six feet high, and adorned with beautiful clusters of white flowers. They are propagated by cuttings.

PHYLANTHUS, sea-side laurel; a genus of the triandria order, belonging to the monoeica class of plants. There are six species, all of them natives of warm climates; and rise from 12 or 14 feet to the height of middling trees. They are tender, and cannot be propagated in cold countries without artificial heat.

PHYLIS (fab. hist.), was a daughter of Sithon, or, according to others, of Lycurgus king of Thrace, who received Demophoon the son of Teleus; who, at his return from the Trojan war, had dropped on her coasts. She became enamoured of him, and did not find him insensible to her passion. After some months of mutual tenderness and affection, Demophoon set sail for Athens, where his domestic affairs recalled him. He promised faithfully to return as soon as a month was expired; but either his dislike for Phyllis, or the irreparable situation of his affairs, obliged him to violate his engagement: and the queen grown desperate on account of his absence, hanged herself; or, according to others, threw herself down a precipice into the sea and perished. Her friends raised a tomb over her body, where there grew up certain trees, whose leaves, at a particular season of the year, suddenly became wet as if shedding tears for the death of Phyllis. According to an old tradition mentioned by Servius, Virgil’s commentator, Phyllis was changed by the gods into an almond tree, which is called phylla by the Greeks. Some days after this metamorphosis, Demophoon revisited Thrace; and when he heard of the fate of Phyllis, he ran and clasped the tree, which, though at that time tipped of its leaves, suddenly shot forth, and bloomed as if still sensible of tenderfefts and love. The absence of Demophoon from the house of Phyllis has given rise to a beautiful epilogue of Ovid, supposed to have been written by the Thracian queen about the fourth month after her lover’s departure.—A country woman introduced in Virgil’s eclogues.—The nurse of the emperor Domitian.—A country of Thrace near mount Pangaeus.

PHYSALIS. See Scrofpendra.

PHYSETER, or Spermaceti-fish, in zoology, a genus belonging to the order of cetes. There are four species; the most remarkable are,

1. The microps, or black-headed cachalot, with a long fin on the back, and the upper jaw considerably longer than the under one. A fish of this kind was cast afloat on Cramond isle, near Edinburgh, December 22. 1769; its length was 54 feet; the greatest circumference, which was just beyond the eyes, 30: the upper jaw was five feet longer than the lower, whose length was ten feet. The head was of a most enormous size, very thick, and above one-third the size of the fish: the end of the upper jaw was quite blunt, and near nine feet high; the spout-hole was placed near the end of it. The teeth were placed in the lower jaw, 23 on each side, all pointed outwards; in the upper jaw, opposite to them, were an equal number of cavities, in which the ends of the teeth lodged when the mouth was closed. One of the teeth measured eight inches long, the greatest circumference the same. It is hollow within-fide for the depth of three inches, and the mouth of the cavity very wide; it is thickest at the bottom, and grows very small at the point, bending very much; but in form the flexure is more than in others. These, as well as the teeth of all
I. Definition of Physic.

Physic, or physic, the art of healing; properly called medicine. The word is formed from the Greek χαράκτης, "nature," in regard medicine consists principally in the observation of nature. See Physics and Medicine.

PHYSICAL, something belonging to, or really existing in, nature. In this sense we say a physical point, in opposition to a mathematical one, which only exists in the imagination; a physical substance or body, in opposition to spirit, or metaphysical substance, &c.

PHYSICIAN, a person who professes medicine, or the art of healing diseases. See Physician.

PHYSIAN, College of in London and Edinburgh. See College of Physicians.

PHYSICO-MATHEMATICS, includes those branches of physic which, uniting observation and experiment to mathematical calculation, undertake to explain the phenomena of nature.

PHYSICS,

TAKEN in its most enlarged sense, comprehends the whole study of nature; and NATURAL PHILOSOPHY is a term of the same extent; but ordinary language, and especially in this country, employs both of these terms in a much narrower sense, which it is proper in this place to determine with some precision.

Under the article PHILOSOPHY, we gave a particular account of that view of nature in which the objects of our attention are considered as connected by causation; and we were at some pains to point out the manner in which this study may be successfully cultivated. By a judicious employment of the means pointed out in that article, we discover that the objects of our contemplation compose an UNIVERSE, which consists, not of a number of independent existences solitary and detached from each other, but of a number of substances connected by a variety of relations and dependencies, so as to form a whole which may with great propriety be called the System of Nature.

This assemblage of the individual objects which compose the universe into one system is by no means the work of a hasty and warm fancy, but is the result of sober contemplation. The natural historian attempts in vain to describe objects, by only informing us of their shape, colour, and other sensible qualities. He finds himself obliged, in describing a piece of marble for instance, to tell us that it takes a fine polish; that it strikes fire with ease; that it burns to quicklime; that it dissolves in aquafortis, and is precipitated by alkalies; that with vitriolic acid it makes gypsum, &c. &c. &c. and thus it appears that even the description of any thing, with the view of ascertaining its specific nature, and with the sole purpose of discrimination, cannot be accomplished without taking notice of its various relations to other things.

But what do we mean by the nature of any thing? We are ignorant of its essence, or what makes it that thing and no other thing. We must content ourselves with the discovery of its qualities or properties; and it is the assemblage of these which we call its nature. But this is very inaccurate. These do not constitute its essence, but are the consequences of it. Yet this is all we shall ever know of its nature. Now the term property is nothing but a name expressing some relations which the substance under consideration has to other things. This is true of all such terms. Gravity, elasticity, sensibility, gratitude, and the like, express nothing but certain relations to other things. This is true of all such terms. Gravity, elasticity, sensibility, gratitude, and the like, express nothing but certain relations to other things. This is true of all such terms. Gravity, elasticity, sensibility, gratitude, and the like, express nothing but certain relations to other things. 

The flightest observation of the universe shows an all parts of evident connection between all its parts in their various properties. All things on this earth are connected with each other by the laws of motion and of mind. We are connected with the whole of the solar system by gravitation. If we extend our observations to the most remote stars, the connection seems to fail; but even perties, here it may be observed. Their inconceivable distance, it is true, renders it impossible for us to obtain any exact information as to their nature. But these bodies are connected with the solar system by the firmness of the light which they emit with that emitted by our sun or any shining body. It moves with the same velocity, it consists (in most of them at least) of the same colours, and it is reflected, refracted, and inflected, according to the same laws.

In this unbounded scene of contemplation, our attention will be directed to the different classes of objects.
jeals nearly in proportion to the interest we take in them. There is nothing in which we are so much interested as our fellow men; and one of the first steps that make us in our knowledge of nature, is an acquaintance with them. We learn their distinct nature by attending to their characteristic appearances; that is, by observing their actions. We observe them continually producing, like ourselves, certain changes in the situation or condition of surrounding objects; and these changes are evidently directed to certain ends which respect themselves. Observing this subservency of the effects which they produce to their own accommodation, we consider this adjustment of means to ends as the effect of an intention, as we experience it to be in our own cafe, where we are conscious of this intention, and of these its effects. We therefore interpret those actions of other men, where we observe this adjustment of means to ends, as marks or signs of intention in them similar to our own. And thus a quality, or power, or faculty, is supposed in them by means of the sign, although the quality itself is not immediately cognizible by our senses. And as this intention in ourselves is accompanied by perception of external objects, knowledge of their properties, desire of good, aversion from evil, volition, and exertion, without all of which we could not or would not perform the actions which we daily perform, we suppose the same perception, knowledge, desire, aversion, volition, and exertion in them.

Thus, by the constitution of our mind, we consider the employment of means, by which ends terminating in the agent are gained, as the natural signs of design or intention. And therefore or the employment of means, is the natural sign of intention; and wherever we observe this adjustment of means to ends, we infer the agency of design.

A small acquaintance with the objects around us, obliges us to extend this inference to a great number of beings besides our fellow men, namely, to the whole animal creation: for in all we observe the same subserviency to the ends of the agent, in the changes which we find them continually producing in the objects around them. These changes are all adjusted to their own well being. In all such cases, therefore, we are forced, by the constitution of our own minds, to infer the existence of design or intention in these beings also.

But in numberless changes produced by external objects on each other, we observe no such fuitness in the effects, no such subserviency to the well being of the agent. In such cases, therefore, we make no such inference of thought or design.

Thus, then, there is presented to our observation an important distinction, by which we arrange all external objects into two classes. The first resembles ourselves, in giving external marks of that thought or intention of which we are conscious; and we suppose in them the other properties which we discover in ourselves, but cannot immediately observe in them, viz. thought, perception, memory, forethought, and all that collection of faculties which we feel in ourselves, and which constitute the animal. The other class of objects exhibit no such appearances, and we make no such inference. And thus we divide the whole of external nature into the classes of thinking and unthinking beings.
PHYSICS.

Introduction.

The distinction between material and immaterial substances is very important.

Property which our senses can discover; and we can have no evidence of their having any other, nor indeed any conception of their having them. This class is not confined to the unorganized masses of matter; for we see that the bodies of animals lose after death that organical form, and are affiliated to all the rest of unthinking beings. It has arisen from such views as this, that while all nations have agreed to call this class of objects by the name body, which originally expressed our organical frame, some nations, farther advanced in cultivation or refinement, have contrived an abstract term to express this general substance of which all inanimate beings are composed. Such a term we have in the words materiae, &c.

Matter, then, is that substance which is immediately cognizable by our senses. Whatever, therefore, is not thus immediately cognizable by our senses is not material, and is expressed by a negative term, and called immaterial; hence it is that mind is said to be immaterial. It is of importance to keep in mind this distinction, merely grammatical. Little more is necessary for detecting the sophisms of Helvetius, Mirabeau, and other fages of the Gallic school, who have been anxious to remove the ties of moral and religious obligation by lowering our conceptions of our intellectual nature. It will also serve to show how habitually they have formed their opinions who have ascribed to the immediate agency of mind all those relations which are observed in the actions of bodies on each other at a distance. The connecting principles of such relations are diffusus (if there are any such), are not the immediate objects of our senses: they are therefore immaterial. But it does not follow that they are minds. There may be many immaterial substances which are not minds. We know nothing of any object whatever but by the observation of certain appearances, which fugget to our minds the existence and agency of its qualities or powers. Such phenomena are the natural signs of these qualities, and it is to these signs that we must always have recourse when we wish to conceive without ambiguity concerning them. What is the characteristic phenomenon of mind, or what is the distinguishing quality which brings it into view? It is intention: and it may be ascertained with the utmost confidence, that we have no other mark by which mind is immediately fuggeted to us, or that would ever have made us suppose that there existed another mind besides our own. The phenomenon by which this quality is suggeted to us is art, or the employment of means to gain ends; and the mark of art is the fuggeted conduciveness of these ends to the well-being of the agent. Where this train is not observed, design or intention is never thought of; and therefore where intention is not perceived in any immaterial substance, if any fugget has ever been observed, it is an abufe of language to call it mind. We do not think that even perception and intelligence intitle us to give the name mind to the substance in which they are inherent, because it is from marks of intention alone that we infer the existence of mind; and although these must be accompanied with perception and intelligence, it does not follow that the substance which can perceive and understand must also desire and propose. However difficult we may find it to separate them, they are evidently separable in imagination. And let not this affertation be too hastily objected to; for the separation has been made by persons most eminent for their knowledge and discernment. When Leibnitz ascribed to his monades, or what we call the ultimate atoms of matter, a perception of their situation in the universe, and a motion precisely suited to this perception, he was the farthest in the world from supposing them animated or endowed with minds. It is true indeed that others, who think and call themselves philosophers, are much more liberal in their application of this term. A modern author of great metaphysical eminence says, “I call that mind which moves, and that body which is moved.” This class of philosophers affect that no motion whatever is begun except by the agency of an animating principle, which (after Aristotle) they call Nature, and which has in these days been exalted to the rank of a god. All this jargon (for it is nothing else) has arisen from the puzzle in which naturalists think themselves involved in attempting to explain the production of motion in a body at a distance from that body which is conceived as the cause of this motion. After having reluctantly obliged, by the reasonings of Newton, to abandon their methods of explaining such phenomena by the impulses of an intervening fluid, nothing seemed left but the assertion that these motions were produced by minds, as in the case of our own exertions. These explanations (if they deserve the name) cannot be objected to in any other way than as an abuse of language, and as the introduction of an unmeaning jargon. We have, and can have, no notion of mind different from those of our own minds; and we discover the existence of other minds as we discover the existence of bodies, by means of phenomena which are characteristic of minds, that is, which resemble those phenomena that follow the exertion of our own mental faculties, that is, by the employment of means to attain selfish ends; and where such appearances are not observed, no existence of a mind is inferred. When we see a man fall from the top of a house, and dash out his brains on the pavement, we never afcribe this motion to his mind. Although the fitness of many of the celestial motions for most important purposes makes us suppose design and contrivance somewhere, and therefore a Supreme Mind, we no more think of inferring a mind in the earth from the fitness of its motions for purpoises most beneficial to its inhabitants, than of inferring a mind in a bit of bread from its fitness for nourishing our bodies. It is not from the mere motions of animals that their minds are inferred, but from the conduciveness of these motions to the well-being of the animal.

The mind of all men, is applied to what desires and wills at the same time that it perceives and understands. If we call that mind which produces motion, we must derive our notions of its qualities or attributes from observing its effects. We must therefore discover the general laws by which they act, that is, the general laws observed in those motions which we consider as their effects. Now these are the general laws of motion; and in none of these can we find the least coincidence with what we are accustomed to call the laws of mind. Nay, it has been the total want of similarity which has given rise to the distinction which all men, in all ages and
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This distinction is found in all languages; and it is an unpardonable liberty which men take with languages when they use a term of distinction, a specific term, to express things of a different species. What these authors have been pleased to call mind, the whole world besides have called by another name, forces; which, though borrowed from our own exertions, is yet sufficiently diffusive, and never leads us to confound things that are different, except in the language of some modern philosophers, who apply it to the laws of the agency of mind; and, when speaking of the force of motives, &c. commit the same mistake which the followers of Aristotle commit in the use of the term mind. Force, in the language of these philosophers, means what connects the operations of mind; as mind, in the language of Lord Monboddo, is that which connects the operations of body.

The principle of motion not defined from matter and mind.

These are not less to blame who consider this Nature of Aristotle, this principle of motion, as an existence or subsistence different both from matter and from the minds of intelligent creatures. Aristotle calls it in some places "etern," 4\(\gamma\). He might with equal propriety, and equal consistency with his other doctrines, have called mind "etern" 4\(\gamma\), or an "etern" 4\(\gamma\)nies. Before we have no evidence for the separability of this "etern" 4\(\gamma\)s from body as we have for the separability of such minds as our own, the genuine 4\(\gamma\)s. Nay, his whole doctrines, when maturely considered, assume their absolute ineflability.

Elemental minds are an abuse of language.

This doctrine of elemental minds, therefore, as the immediate causes of the phenomena of the material world, is an abuse of language. It is a jargon; and it is a frivolous abuse, for it offers no explanation whatever. The phenomena are totally unlike the phenomena of ordinary minds, and therefore receive no explanation from them; and since our knowledge of these "etern" minds must be derived entirely from the phenomena, it will be precisely the same, although we express it in common language. We shall not indeed raise the wonder of our hearers, as those do who fill the world with minds which they never suspect to exist; but we shall not bewilder their imaginations, confound their ideas, and mislead their judgment.

We flatter ourselves that our readers will not think these observations unreasonable or misplaced. Of all mistakes that the naturalist can fall into, there is none more fatal to his progress in knowledge than the confounding things which are essentially different; and of all the distinctions which can be made among the objects of our contemplation, there is none of equal philosophical importance with this between mind and matter: And when we consider the consequences which naturally follow from this confusion of ideas and particularly those which follow from mixing the mental faculties of man to a level with the operations of mechanics or chemisty, consequences which a little serious reflection will show to be destractive of all that is noble as desirable in human nature, and of all that is comfortable in this life, and which blasts every hope of future excellence—we cannot be too anxious to have this capital distinction put in the brightest point of view, and expressed in the most familiar characters, "So that he who runneth may read." When we see the frenzy which the reasoning pride of man has raised among some who call themselves philosophers, and hear the dictates of philosophy incessantly appealed to in defence of whatever our hearts shudder at as shocking and abominable; and when we see a man (a), of great reputation as a naturalist, and of professed humanity and political moderation, congratulating his countrymen on the rapid improvement and almost perfection of philosophy; and after giving a short sketch of the constitution of the visible universe, summing up all with a table of elective attractions, and that particular combination and mode of crystallization which constitutes God (for I forget names)—is it not full time for us to stop short, and to ask our own hearts whether we are you wandering?—But found philosophy, reasoning from effects to their causes, which were then to the words of our sacred oracles: "By their fruits ye shall know them. Do men gather grapes of thorns, or figs of thistles?" The absurd consequences of the sceptical philosophy of Berkeley and Hume have been thought, by men of undoubted discernment, sufficient reasons for rejecting it without examination. The no less absurd and the shocking consequences of the mechanical philosophy now in vogue should give us the same abhorrence and should make us abandon its dangerous road, and return to the delightful paths of nature, to survey the works of God, and feast our eyes with the displays of mind, which offer themselves on every hand in designs of the most extensive influence and the most beautiful contrivance. Following the guidance of heavenly wisdom we shall indeed find, that all these ways are ways of pleasantness, and all her paths are peace.

The dreadfull consequences of materialism.

Such is the scene of our observation, the subject of the present philosophical study. Its extent is almost unbounded, of philosophical study. It is absolutely necessary for the successful cultivation of this immense field of knowledge that it be committed to the care of different cultivators, and that its various portions be treated in different ways; and, accordingly, the various tables of men have given this curiosity different directions; and the study, like all other tasks, has been promoted by this division of labour.

Some philosophers have attended only to the appearances of fineness which are exhibited in every quarter of the universe; and by arranging these into different classes, and interpreting them as indications of thought and intention, have acquired the knowledge of many classes of sentient and intelligent beings, actuated by propensities, and directed by reason.

While the contemplation of these appearances indicates thought and design in any individual of one of these classes, and brings its propensities and purposes of action, and the ends gained by these actions, into view, the contemplation of their propensities, purposes, and ends, occasions an inference of a much more general

(a) M. de la Metherie, editor of the Journal de Physique. See his preface to the volumes for 1792 and 1793, January and July.
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All these intelligent beings give indications of knowledge and of power; but their knowledge bears, in general, no proportion to their power of producing changes in nature, and of attaining important ends; and their power is neither always, nor in the most important cases, the consequence of their knowledge. Where the effect of their actions is most entirely conducive to their important interests, the power of attaining these valuable ends is generally independent on any attention to the forms of the means, and the exertion is frequently made without even thinking of the important end. The well being of the individual is secured against any danger from its ignorance, indolence, or want of a proper degree of self-interest, by an instinctive propensity, which leads it to the performance of the necessary action, which is thus made immediately and ultimately desirable, without any regard to its ultimate and important end. Thus, in our own nature, the support of animal life, and the improvement of the means of subsistence by a knowledge of the objects which surround us, are not intuited to our apprehension of the importance of these ends, but are committed to the frugal guides of hunger and curiosity.

The same observers discover a connection between the individuals of a class, different from that which arises from the mere resemblance of their external appearance, or even of their propensities and pursuits; the very circumstances which produced the classification. They observe, that these propensities are such, that while each individual seeks only its own enjoyment, these enjoyments are in general such as contribute to the support of the species and the enjoyment of the whole, are not entrusted to the apprehension we entertain of the importance of these ends, but are produced by the operation of sexual love and the love of society.

The same observers find that even the different classes of sentient beings are connected together; and while the whole of each class aim only at their own enjoyment, they contribute, in some way or other, to the well being of the other classes. Even man, the sibyl of this sublunary world, is not the unconnected inhabitant of it. He cannot, in every instance, reap all the fruits of his situation, without contributing to the enjoyment of thousands of the brute creation. Nay, it may be proved to the satisfaction of every intelligent man, that while one race of animals, in consequence of its peculiar propensities, subsists by the destruction of another, the sum total of animal life and enjoyment is propticipally increased. See a very judicious dissertation on this curious and puzzling subject, entitled A Philosophical Survey of the Animal Creation; where it appears that the increase of animal life and enjoyment which is produced by this means, beyond what could possibly obtain without it, is beyond all conception. See likewise the last edition of King's Origin of Evil, by Dr. Law late bishop of Cardile.

Thus the whole appearance seems connected, and jointly employed in increasing the sum total of possible happiness. This sameness of the various propensities of sentient and intelligent beings, this sublimity to a general purpose, strikes these observers as a mark of intention, evidently distinct from, and independent of, all the particular intentions, and superior to them all; and thus it irresistibly leads them to infer the existence of a SUPREME MIND, directing the whole of this INTELLECTUAL SYSTEM, while the individual of which it confides appears the uncoercious instruments in the hand of a great Artist, with which he executes his grand and beneficent purposes.

But the observation goes yet further. The bodies of All nature of the inanimate creation are not only connected by the same, and inanimate, thinking and unthinking, but also the connection is perpetuated between the individuals of each other by a mutual dependence of properties, and the relation of causation, but they are also connected with the sentient beings by a subervency to their purposes of enjoyment. The philosopher observes, that this connection is admirably kept up by the conformity of natural operations and the expectations of intelligent beings. Had either of these circumstances been wanting, had either the operations of nature been without rule, or had sentient beings no perception or expectation of their uniformity; the subervency would be totally at an end. This adjustment, this fitness, of which the effect is the enjoyment of the sentient inhabitants of the universe, appear to be the effect of an intention of which this enjoyment is the final cause.

This confluence therefore in the operations of nature, both in the intellectual and material world, and the concomitant expectation of sentient beings, appear the effects of law imposed on the different parts of the universe by the Supreme Mind, who has formed both these classes of beings to admirably suited to each other.

To such observers the world appears a WORK OF ART. The origin of a system of means employed for gaining certain prop. of natural and intellectual, and we infer a degree of skill, power, and good intention in this Artiff, proportioned to the ingenuity, extent, and happy effect which we are able to discern in his works. Such a contemplation of nature, therefore, terminates in NATURAL THEOLOGY, or the discovery of the existence and attributes of God.

Our notions of this Supreme Mind are formed from our notions, the indications of design which we observe, and which we interpret in the same way as the actions of men, in the operations of nature, and in the actions of God.

These notions, therefore, will differ from our notions of other minds only in the degrees which we are able to discern, and which we assign to these faculties; for the phenomenon or the effect is not only the mark, but also the measure of its supposed cause. These degrees must be ascertained by our own capacity of appreciating the extent, the multiplicity, and the variety of the contrivance. Accordingly, the attributes of the Supreme Mind, in the theological creed of a rude Indian, are much more limited than in that of a European philosopher. In proportion as our understandings are enlarged, and as our acquaintance with the operations of nature around us is extended, we shall perceive higher degrees of power, of skill, and of kind intention; and since we find that the scene of observation is unbounded, we cannot affix any boundaries to these attributes in our own imagination, and we are ready to suppose that they are infinite or unbounded in their own nature. When our attentive survey of this universe, and a careful comparison of all its parts, as far as we can understand or appreciate them, have made us conclude that it is one design, the work of one
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Artif: we are under the necessity of inferring, that, with respect to this universe, his power, wisdom, and benevolence, are indeed infinite.

When men have been led to draw this conclusion from the appearances of things which are observed everywhere around them, they consider that conceptions which they observe in natural operations, whether in the material or the intellectual system, and that expectation of, and confidence in, this conceptions, which renders the universe a source of enjoyment to its sentient inhabitants, as the consequences of laws imposed by the Almighty Artif on his works, in the same manner as they would consider the confidence in the conduct of any people as the consequences of laws promulgated and enforced by the supreme magistrate.

There can be no doubt of this view of nature being extremely captivating, and likely to engage the curiosity of speculative men; and it is not surprising that the phenomena of mind have been keenly studied in all ages. This part of the study of nature, like all others, was first cultivated in subserviency to the wants of social life; and the general laws of moral sentiment were the first phenomena which were considered with attention. This gradually ripened into a regular system of moral duty, accompanied by its congenial study, the investigation or determination of the summun bonum, or the confines of human felicity; and these two branches of intellectual science were always kept in a state of association by the philosophers of antiquity. Jurisprudence, the science of government, legislation, and police, were also first cultivated as arts, or at least in immediate subserviency to the demands of cultivated society; and all these were nearly related parts of the study of human nature, had made a very considerable progress, in the form of maxims or precepts, for directing the conduct, before speculative men, out of mere curiosity, treated them as subjects of philosophical study. Our moral sentiments, always involving a feeling of obligation, are expressed in a language considerably different from the usual language of pure philosophy, speaking of things which ought to be, rather than of things which are; and this distinction of language was increased by the very aim of the writers, which was generally to influence the conduct as well as the opinions of their scholars. It was reserved for modern times to bring this study into the pure form of philosophy, by a careful attention to the phenomena of moral sentiment, and cladding these according to their generality, and afterwards their respective ranks by an appeal to experiment, that is, to the general conduct of mankind; and thus it happens that in the modern treatises on ethics, jurisprudence, &c. there is less frequent reference made to the officia or duties, or to the constituents of the summun bonum, than among the ancients, and a more accurate description of the human mind, and discrimination of its various moral feelings.

It was hardly possible to proceed far in these disquisitions without attending to the powers of the understanding. Differences of opinion were supported by reasonings, or attempts at reasoning. Both sides could not be in the right, and there must be some court of appeals. Rules of argumentation behaved to be acquiesced in by both parties; and it could hardly elude the notice of some curious minds, that there were rules of truth and falsehood as well as of right and wrong. Thus the human understanding became an object of study, first in subserviency to the demands of the moralists, but afterwards for its own sake; and it gradually grew up into the science of logic. Still further refinement produced the science of metaphysics, or the philosophy of universals. But all these were in fact posterior to the doctrines of morals; and disquisitions on beauty, the principles of taste, the precepts of rhetoric and criticism, were the last additions to the study of the phenomena of mind. And now, since the world seems to have acquired in the mode of investigation of general laws by experiment and observation, and to agree that this is all the knowledge that we can acquire of any subject whatever, it is to be expected that this branch of philosophical disquisition will attain the same degree of improvement (estimated by the coincidence of the doctrines with fact and experience) that has been attained by some others.

The occupations, however, of ordinary life have directed our efforts towards material objects, industrial pursuits, and engaged our attention on their properties and relations; and as all sciences have arisen from arts, and the natural philosophers preceded its study with their curiosities, the knowledge of the material system of the world was posessed in detached scraps by the practitioners in the various arts of life long before the natural philosophers thought of collecting them into a body of scientific doctrines. But there have not been wanting in all ages men of curiosity who have been struck by the uniformity of the operations of nature in the material world, and were eager to discover their causes.

Accordingly, while the moralists and metaphysicians turned their whole attention to the phenomena of mind and have produced the sciences of pneumatology, logic, ethics, jurisprudence, and natural theology, these observers of nature have found sufficient employment in considering the phenomena of the material world.

The bodies of which it consists are evidently connected by means of those properties by which we observe that they produce changes in each other's states, and with the definition of that and other terms.

The nature of the material system. It is frequently termed nature; and the terms natural appearances, natural causes, natural laws, have been generally restricted to those which take place in the material system. This restriction, however, is improper, because there is no difference in the manner in which we form our notions of those laws, and reason from them, both with respect to mind and body. Or if there is to be any restriction, and if any part of the study of the universe is to be excluded in the application of these terms, it is that part only which considers moral obligation, and rather treats of what ought to be than of what is. As has been already observed, there is a considerable difference in the language which must be employed; but full there is none in the principles of investigation. We have no proof for the extent of any moral law
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The term *natural philosophy*, including both natural history and philosophy, has been used very generally and in place of *physics* and *disciplina physica*, more particularly in the natural sciences. The term *natural philosophy*, in its common acceptation, is of less extent. The field of physical investigation is still of prodigies extent; and its different quarters require very different treatments, make very different returns, and accordingly have engaged in their particular cultivation perfections of very different talents and titles. It is of some importance to perceive the distinctions, and to see how the wants and propensities of men have led them into the different paths of investigation; for as has been more than once observed, all sciences have sprung from the humble arts of life, and both go on improving by means of a close and constant correspondence.

All the phenomena of the material system may be arranged into two classes, distinguished both by their objects and by the proper manner of treating them.

The first class comprehends all the appearances which are exhibited in the *infensible* motions of bodies, and their actions on each other producing *infensible motion*.

The second class comprehends the appearances which are exhibited in the *infensible* motions and actions of the invisible particles of matter.

Of the phenomena of the first class we have examples in the planetary motions, the motions of heavy bodies of those of the phenomena of impulse, the motions and actions of the first machines, the preface and motions of fluids, the electric actions of magnetical and electrical bodies, and the motions of light.

We have examples of the second class in the phenomena of heat and mixture, and those exhibited in the sense of the growth of animals and vegetables, and many phenom. sec. mena of solid, fluid, magnetical, electrical, and luminous bodies, in which no change of place can be observed.

Thus it appears that there is a distinction in the phenomena sufficiently great to warrant a division of range among the study, and to make us expect a more rapid improvement by this division. Nay, the division has been made by nature herself, in the acquaintance which men have attained with her operations without study, before science appeared, and while art constituted all our knowledge.

Before man had recourse to agriculture as the most certain means of procuring subsistence, our acquaintance with external substances was principally that of the natural historian; consisting of a knowledge of the in rude their fins for food, medicine, or accommodation, ages, their places of growth or habitation, and the means of procuring...
The circumstances of soil and weather which matriculate the rigia.

The literature to the proceedings on the observation of changes produced by the frequent recourse to the vegetable kingdom for greater quantity of work by the same exertion. The economy of animal life.

His art now becomes a science, by this time familiar; and thus the general properties of matter, and the general laws of the actions of bodies on each other, become gradually matter of observation and reflection; and the practical mechanic will be frequently improving his tools and machines. The general aim is to produce a greater quantity of work by the same exertion. The attempts to improvement will be awkward, and frequently unsuccessful. When a man finds, that by increasing the length of his lever he increases his power of overcoming a resistance, a small degree of curiosity is sufficient to make him inquire in what proportion his advantage increases. When he finds that a double length gives him a double energy, he will be surprised and mortified to find, that at the end of the day he has not performed twice the quantity of work: but, after much experience, he will learn that every increase of energy, by means of a machine, is nearly compensated by an increase of time in the performance of his talk; and thus one of the great and leading principles of practical mechanics was inculcated in a manner not to be forgotten, and the practical mechanic was brought to speculate about motion and force, and by gradual and easy steps the general laws of simple motions were established.

It is evident that these speculations cannot be carried on, nor any considerable knowledge acquired, of mathematics without some acquaintance with the art of measurement; and the very questions which the mechanic wishes to solve, presuppose some advances in this art, which in process of time refined itself into mathematics, the most perfect of all the sciences. All the phenomena of sensible motion afford employment to the mathematician. It is performed in a double or triple time, through a double or triple space, by a double or triple body, by the exertion of a double or triple force, produces a double or triple effect, is more to the right or to the left, upwards or downwards, &c. In short, every affection of motion is an object of mathematical discussion. Such a science must have appeared ere now in the form of an art, in consequence of the mutual transactions of men. These among an uncultivated people are chiefly in the way of barter. If I want corn from a peasant, and have nothing to give for it but the cloth which I have made, we must fall on some way
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way of adjusting our terms in respect of the quantity. We should soon discover that the length, and breadth, and depth, of the box or bag, were equally important; and it was not difficult to see, that if any of them were doubled or tripled, the quantity of grain would be too; if two of them were doubled, the grain would be quadrupled; and if all the three were doubled the quantity of grain would be increased eight times; the same thing would be observed with respect to my cloth. By such transpositions as these, a few of the properties of plane and solid numbers and figures would become known, and the operations of multiplication and division, where arithmetic is combined with geometry, and daily observation shows us, that the more abstruse properties of number and figure, which to the generality of mankind are so insignificant, lay hold on the fancy of some individuals with such force, as to make them the means of elegant amusement alone but not the objects of study, and facilitated its progress, both in mechanics, and we know to what extent they profecu. The procedure of nature ill produces the change is unknown to us, because it is not the immediate object of our perception. In both classes of phenomena already distinguished by the same assiduous study, the immediate exertion of this principle, whatever it may be; we can observe the exertion with accuracy; we can determine its kind and degree, which are the signs and measures of the kind and degree of the unperceived prime causer. This exertion, being always some modification of motion, allows us to call in the aid of mathematical knowledge, and thus to ascertain with the precision peculiar to that science the energy of the cause, judging of the tendency and quantity by the tendency and the quantity of the observed effect.

But in the second class of phenomena the cause is very different. In the operations of chemistry, for instance, the immediate exertion of the cause is not perceived: all that we observe is the effusion of particles which obtain, before mixture, and that which takes place when it is completed, and which we consider as its result. The procedure of nature in producing the change is unknown and unknown. The steps are hid from our observation. We are not only ignorant of the cause which determines one particle of our food to become a part of our body while others are rejected, but we do not see the operation. The particles and their motions are not the objects of our senses; and all that we see is the Epithel silt and common salt separated from the water in which we had formerly dissolved the salt invisible and the muriated magnesia. The motions, which are the immediate effects of the changing causes, and therefore their only indications, characters, and measures, fitted to show their nature, are hid from our view.

Our knowledge therefore of these phenomena must be perfect than that of the phenomena of the former class; and we must here content ourselves with the discovery of more remote relations and remote causes, second class and with our ignorance of the very powers of nature are left only by which these changes are brought about, and which are known, are cognizant only by their immediate effects (via, viz., the motions which they produce unseen. The knowledge which we do really acquire is somewhat similar to what the mechanical philosopher has acquired when he has discovered, by many experiments and investigations, that magnets attract each other by their dill

This short sketch of what may be called the natural history of physical science will not, we hope, be thought improper or unprofitable. It tends to confirm an affection often alluded to, that the profession of the study of nature will be more useful and will make use of the mode of proceeding, and divide the labour. It will be still further confirmed by attending to the scientific difference of the phenomena, which marks out a different mode of proceeding, and a difference in the knowledge which we shall ultimately acquire, after our most successful researches.

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Though some philosophers have attempted to explain them by the doctrine of motion; and the motions, though unisoned, and the moving forces are perfectly similar. They have therefore employed similar modes of investigation, applying the laws of impulsion, and calling in the aid of mathematical knowledge.

Of this we have many examples in the writings of Dr. Freind, Keil, Bernoulli, Hellgham, Boerhaave, Hartley, and others, who have delivered theories of formation, solition, precipitation, crystallization, nutrition, excitation, muscular action, nay even of sensation and intelligence, founded, as they think, on the laws of motion, and illustrated and supported by mathematical reasoning. Lord Bacon himself, that careful and sagacious dilinguisher of intellectual operations, has gone into the same track in his explanation of the phenomena of fire and combustion; and Sir Isaac Newton has made several attempts of the same kind, although with peculiarities which always characterize his discursions, and make them very different from those of an inferior class.

But the success of these philosophers hitherto has been very discouraging; indeed they had no title to expect any; for their whole trains of reasoning have proceeded on analogies which were not observed, but assumed or putted without any authority. There is not that similarity in the phenomenon, or in the visible effect, which is absolutely necessary for a successful reasoning by analogy. We do not observe any local motion, any change of place, which alone enables us to reason mathematically on the subject. And to make the case desperate, this ill-founded analogy has been mixed with hypotheses completely gratuitous. Certain forms have been alligned to the particles, and certain modes of action have been laid down for them, for whose reality we have not the least argument or indication: and to complete the matter, these fancied forms and laws of action have been such as are either self contradictory and inconsistent, or they have been such as, if allowed to act in a way analogous to what we observe in the sensible motions of bodies, would produce effects totally different from those which are observed. These atomical theories, as they are called, transgress every rule of philosophical discussion, and even the bent of them are little better than trifling amusements. By far the greatest part of them only serve to raise a smile of pity and contempt in every perfin at all acquainted with mechanical philosophy. Whenever we see an author attempting to explain these hidden operations of nature by invisible fluids, by ethers, by collitions, and vibrations, and particularly if we see him introducing mathematical reasonings into such explanations—the best thing we can do is to shut the book, and take to some other subject. That we may not be thought to speak prematurely on this occasion, we only beg leave to remind our readers that the united knowledge of the most eminent mathematicians of Europe has not yet been able to give anything more than an approximation to the solution of the problem of three bodies; that is, to determine with accuracy the motions of three particles of matter acting on each other in the simplest of all possible manners, viz. by forces varying as the squares of the distances inversely: and the vibrations of elastic bodies, of any but the very simplest possible forms, are to this day beyond the reach of investigation. What then should be our expectations in cafes where millions of particles are acting at once, of forms unobserved, and with forces unknown, and where the object is not a determination of an average result of many, where the precise state of an individual particle need not be known, but where it is this very precise state of each single particle that we want to know? What can it be but uncertainty and mistake?

Notwithstanding these discouraging circumstances, we must observe that this kind of inquiry has greatly improved of late years, along with the improvement and extension of mathematical philosophy, and since philosophers have given over their incessant attempts to explain everything by impulsion; and we need not despair of making still farther advances, if we will content ourselves with going no farther than Newton has done in his explanation of the planetary motions. He has immortalized his own name, and has added immensely to our stock of useful knowledge; yet he has stopped short at the discovery of the fact of universal gravitation; and all who have endeavoured to explain or account for this fact have only exposed themselves to pity. We may perhaps be one day able to demonstrate from the phenomena that the particles of matter have certain mutual tendencies to or from each other, exerted according to fixed or invariant rules; and from these tendencies we may be able to explain the other phenomena, and predict the consequences, with as much certainty and evidence as an astronomer calculates a future eclipse. This would be a great acquisition, and perhaps more is impossible: and the road to this has been hinted by Sir Isaac Newton, who has expressed his satisfaction, that as the great movements of the solar system are regulated by universal gravitation, so the mutual actions of the particles of matter are produced and regulated by tendencies of a similar kind, equally but not more inexplicable, and of which the laws of action are to be discovered by as careful an attention to the phenomena, and by the same patient thinking, which he has employed on the planetary motions. And a beautiful introduction to this new and almost unbounded field of enquiry has been given us by the celebrated Abbé Boſcovich, in his Theory of Natural Philosophy, where he has shown how such mutual tendencies, similar in every ultimate particle of matter, and modified by conditions that are highly probable, may almost demonstrably, will not only produce the sensible forms of solidity, hardness, elasticity, malleability, fluidity, and vapour, under an inconceivable variety of circumstances, but will, if you will, produce new forms and properties.
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Natural philosophy and chemistry have generally been made particular institutions in our seminaries of learning, but physiology has more commonly been taught in conjunction with anatomy, medicine, and botany.

The phenomena of the first class have been usually called mechanical, in order to distinguish them from those observed in the operations of chemistry, and in the animal and vegetable economy; and the explanations which have been attempted of some of the latter, by applying the laws observed in the phenomena of the first class, have been called mechanical explanations.

As this first class is evidently but a part of general physics, there is some impropriety in giving the name natural philosophy to a course of doctrines which is confined to these alone. Indeed at the first institution of universitites, the lectures given in the *Sylla Physica* were much more extensive, comprehending almost all the phenomena of the material world; but as all arts and sciences have improved most where the labour has been most divided, it was found more conducive to the advancement of knowledge that separate institutions should be founded for the studies of natural history, chemistry, physiology, &c.; and thus the phenomena, purely mechanical, and a few others in magnetism, electricity, and optics which either were susceptible of mathematical treatment, or had little connection with the studies of chemistry and physiology, were left to the care of the professors of natural philosophy.

As the terms chemistry and physiology have been applied to two very important branches of general physics, we think that a more specific or characteristic name might be appropriated to the other, and that it might very properly be termed mechanical philosophy.

It only remains to make a few observations on the distinctive means of protecting these studies with success, and to point out some of the advantages which may reasonably be expected from a careful prosecution of them: and as the second branch has been fully treated under the several articles of Chemistry, Physiology, &c. we shall confine ourselves to what is usually called natural philosophy.

Mechanical Philosophy may, in conformity with the foregoing observations, be defined, "the study of the sensible motions of the bodies of the universe, and of their actions producing sensible motions, with the view to discover their causes, to explain subordinate phenomena, and to improve art."

The principle upon which all philosophical discussion proceeds is, that every change which we observe in the condition of things is caused by us as an effect, indicating the agency, characterizing the kind, and measuring the degree, of its cause.

In the language of mechanical philosophy, the cause of any change of motion is called a moving or changing force.

The disquisitions of natural philosophy must therefore begin with the consideration of motion, carefully noticing every affection or quality of it, so as to establish marks and measures of every change of which it is susceptible; for these are the only marks and measures...
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Mechanical Philosophy

The laws of motion and their application.

The phenomena of the changing forces. This being done, it only remains to apply them to the motions which we observe in the universe.

From the general principle of philosophical diffusion already mentioned, there flow directly two axioms.

1. Every body perseveres in a state of rest or of uniform rectilinear motion, unless affected by some moving force.

2. Every change of motion is in the direction and in the degree of the force impressed.

These are usually called the laws of motion. They are more properly laws of human judgment, with respect to motion. Perhaps they are necessary truths, unless it be alleged that the general principle, of which they are necessary consequences, is itself a contingent though universal truth.

By these two axioms, applied in abstracto to every variety of motion, we establish a system of general doctrines concerning motions, according as they are simple or compounded, accelerated, retarded, rectilinear, curvilinear, in single bodies, or in systems of connected bodies; and we obtain corresponding characters of measures of accelerating or retarding forces, centripetal or centrifugal, simple or compound.

We have an illustrious example of this abstract system of motion and moving forces in the first book of Sir Isaac Newton's Mathematical Principles of Natural Philosophy. Euler's Mechanica sive Scientia Motus, and D'Alembert's Traité de Dynamique, are also excellent works of the same kind. In this abstract system no regard is paid to the causal differences of moving forces, or the forces from which they arise. It is enough to characterize a double accelerating force, for instance, that it produces a double acceleration. It may be a weight, a stream of water, the pressure of a man; and the force, of which it is said to be double, may be the attraction of a magnet, a current of air, or the action of a spring.

Having established these general doctrines, the philosopher now applies them to the general phenomena of the universe, in order to discover the nature of the forces which really exist, and the laws by which their operations are regulated, and to explain interesting but subordinate phenomena. This is the chief business of the mechanical philosopher; and it may with some propriety be called the mechanical history of nature.

Some method must be followed in this history of mechanical nature. The phenomena must be classified by means of their resemblances, which infer a resemblance in their causes, and these classes must be arranged according to some principle. We have seen no method which appears to us less exceptions than the following.

The principle of arrangement is the generality of the phenomena; and the propriety of adopting this principle, arises from the probability which it gives us of more readily discovering the most general actuating forces, whose agency is implicated in all other phenomena of lesser extent; and therefore should be previously discussed, that we may detect the discriminating circumstances which serve to characterize the subordinate phenomena, and are thus the marks of the distinguishing and inferior natural powers.

The most general of all phenomena is the curvilinear motion of bodies in free space; it is observed through the whole extent of the solar system. The mechanical history of nature begins therefore with astronomy. Here, from the general phenomena of the planetary motions, is evinced the fact of the mutual deflection of every body towards every other body, and this in the inverse proportion of the squares of the distance, and the direct proportion of the quantity of matter. This is the fact of universal gravitation, indicating the agency, and measuring the intensity, of the universal force of mutual gravity.

Having established this as an universal fact, the natural philosopher proceeds to point out all the particular facts which are comprehended under it, and whose peculiarities characterize the different movements of the solar system. That is, in the language of philosophy, he gives a theory or explanation of the subordinate phenomena: the elliptical motions of the planets and comets, their mutual disturbances; the lunar irregularities; the oblate figure of the planets; the nutation of the earth's axis; the precession of the equinoxes, and the phenomena of the tides and trade winds; and he concludes with the theory of the parabolic motion of bodies projected on the surface of this globe, and the motion of pendulums.

As he goes along, he takes notice of the applications which may be made to the arts of life of the system of motions which are successively established; this such as chronology, astronomical calculation, dialling, navigation, gunnery, and the measuring of time.

If a square parcel of sand be lying on the table, and the finger be applied to any part of it to push it along the table, that part is removed where you will, but the rest remains in its place; but if it is a piece of sandstone of the same materials and shape, and the finger is applied as before, the whole is moved; the other parts accompany the part impelled by the finger in all its motions.

From the moon's accompanying the earth in all its motions round the sun, we infer a moving force which connects the moon and earth. In like manner, we must conclude that a moving force connects the particles of the stone; for we give the name force to every thing which produces motion: We call it the force of cohesion; a term which, like gravitation, expresses merely a fact.

This seems to be the next phenomenon of the universe in point of extent.

Having from the general phenomenon, established the existence of this force, the philosopher proceeds to ascertain the laws by which its exertions are regulated; this which is the ascertaining its distinctive nature and properties. This he does in the same way that he ascertained the nature of planetary gravitation, viz. by observing more particularly the various phenomena.

Here is opened a most extensive and varied field of observation, in which it must be acknowledged that very little regular and marked progress has been made. The variety in the phenomena, and the consequent variety in the nature of the connecting forces, appear as yet inconceivably great, and there seems little probability
Mechanical bility of our being able to detect in them all any
sane effects, combined with the other distinguishing cir-
cumstances, as we have done in the ion of cafe of gravity.
Yct we should not despair. Boscovich has shown, in
the most unexceptionable manner, that although we
shall suppose that every atom of matter is endued
with a perfectly fimilar force, acting in a certain
determined ratio of the small and imperceptible dis-
ances at which the particles of matter are arranged with
respect to each other, the external or sensible appearances
may, and have, in all that variety which we ob-
serve. He also flew very distinctly bow, from the
operation of this force, much arise some of the most
general and important phenomena which characterize
the different forms of tangible bodies.

We observe the chief varieties of the action of this
corpuscular force on the bodies which we denomi-
nate hard, soft, solid, fluid, vaporous, brittle, ductile, elastic.
We see instances were the parts of bodies avoid each
other, and require external force to keep them toge-
ther, or at certain small distances from each other.
This is familiar in air, vapours, and all compressible
and elastic bodies.

This is evidently a most curious and interesting sub-
ject of investigation. On the nature and action of these
corpuscular forces depends the strength and firm-
ness of solids, their elasticity, their power of commun-
icating motion, the prefire, and motion, and impulse
of fluids; nay, on the same actions depend all the che-
mical and physiologial phenomena of expansion, fu-
sion, corruption, vaporisation, condensation, solution,
precipitation, abstraction, secretion, fermentation, and
animal and vegetable concoction and affimilation.

Out of this immeasurable store of phenomena, this inex-
hauizable fund of employment for our powers of inves-
tigation, the natural philosopher selects those which
lead directly to the production or modification of sen-
fible motion.
He will therefore consider,
1. The communication of motion among detached
and free bodies, establishing the laws of impact or colli-
ion. This has always been considered as the element-
ary doctrine of mechanical philosophy, and as the
most familiar fact observed in the material world; and
in ages philosophers have been anxious to reduce all
actions of bodies on each other to impact, and have
never thought a phenomenon completely explained or
accounted for till it has been shown to be a cafe of
impact. This is what has given rise to the hypo-
theticals of vortices, ethers, magnetic and electric fluids,
animal spirits, and a multitude of fancied intermedi-
cations between the sensible masses of matter, which are
said in common language to act on each other. A heavy
body is supposed to fall, because it is impelled by a
stream of an invisible fluid moving according to cer-
tain conditions fixed to the cafe. The filings of iron
are supposed to be arranged round a magnet, by means
of a stream of magnetic fluid issuing from one pole,
cir-
culating perpetually round the magnet, and entering
at the other pole, in the same manner as we observe
the flores graves arranged by the current of a brook.
But the philosopher who has begun the mechanical
study of nature by the abstract doctrines of dynamics,
and made its first application to the celestial phenome-
nas, and who has attended carefully to the many ana-
logies between the phenomena of gravitation and colli-
ciafion, will be at least ready to entertain very different
notions of this matter. He will be far from think-
ing that the production of motion by impulse is the
most familiar fact in nature, that he will acknowledge
it to be comparatively very rare; nay, there are some
appearances in the facts which are usually confided
as instances of impulsion, which will lead him to dub
and, almost to deny, that there has ever been observed
an instance of one body putting another in motion by
coming into absolute contact with it, and striking it;
and he will be disposed to think that the production
of motion in this case is precisely similar to what we
observe when we gently push one floating magnet to-
wards another, with their familiar poles facing each
other. There will be the same production of motion
in the one and diminution of it in the other, and the
same uniform motion of the common center of gravi-
ty: and, in this case of the magnets, he sees complete-
ly the necessity of a law of motion, which is not an
axiom, but is observed through the whole of nature, res-
dom, and which receives no explanation from any hypo-
thesis of an intervening fluid, but is even totally inconfi-
ient with them. We mean, that every action of one
body on another is accompanied by an equal and op-
opote action of that other on the first." This is usu-
ally called the equality of action and reaction: it is not
intuitive, but it is universal; and it is a necessary con-
fluence of the perfect similitude of the corpuscular
forces of the same kinds of matter. This general fact,
unaccountable on the hypothesis of impelling fluids, is
considered in the planetary motions as the unequivocal
indication of the sameness of that gravity which regul-
ates them all. The rules of good reasoning should make
us draw the same conclusion here, that the particles
of tangible matter are connected by equal and mutual
forces, which are the immediate causes of all their sen-
sible actions, and that these forces, like gravitation,
vary with every change of distance and situation.

The laws of collision and impulsion being now estab-
ilished, either as original facts or as consequences of
the agency of equal and mutual forces which connect
the particles of matter, the philosopher considers,
2. The production of motion by the intervention Of
motion of solid bodies, where, by reason of the cohesion
matter, some of the motions are necessarily confined
the theory of machines, to certain determinate paths or directions. This is
the cafe in all motions round fixed points or axes, &c.
or along plans or curves which are oblique to the ac-
tion of the forces.

This part of the study contains the theory of ma-
chines, pointing out the principles on which their en-
ergy depends, and consequently furnishing maxims for
their constriction and improvement. But these obser-
vations do not complete the discussion of the mecha-
nism of solid bodies: they are not only solid and inert,
but they are also heavy; therefore the action of gravity
must be combined with the consequences of solidity.
This will lead to discussions about the centre of gra-
vity, the theory and construction of arches and roofs,
the principles of stability and equilibrium, the atti-
udes of animals, and many particulars of this kind.

3. The philosopher will now turn his attention to
another form, in which tangible matter exhibits many
interesting phenomena, viz. fluority. The first thing
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Mechanical to be attended to here is, *What is that particular form of existence?* What is the precise phenomenon which characterizes fluidity? What is the definition of a fluid? This is by no means an easy question, and considerable objections may be raised against any definition that has been given of it. Sir Isaac Newton says, that a fluid is a body whose particles yield to the smallest impression, and by its yielding are easily moved among themselves. It may be doubted whether this be sufficiently precise; what is meant by the smallest impression? and what is easily moving? Is there any precise degree of impression to which they do not yield; and do they oppose any resistance to motion? And a stronger objection may be made? It is not clear that a body so constituted will exhibit all the appearances which a body acknowledged to be fluid does really exhibit. Euler offers some very plausible reasons for doubting whether it will account for the horizontal surface, and the complete propagation of pressure through the fluid in every direction; and therefore prefers selecting this as the phenomenon, the propagation of pressure quod-aera-v晃em, as the characteristic of fluidity, because a body having this constitution (on whatever circumstances it may depend) will have every other observed property of a fluid. But this definition is hardly simple or periphrastic enough; and we think that the objections against Newton's more simple and intelligible definition are not unanswerable. Bokovitch defines a fluid to be, a body whose particles exert the same natural forces in all directions; and shows, that such particles must be indifferent, as to any position, with respect to each other. If no external force act on them, they will remain in every position, and will have no tendency to arrange themselves in one position rather than another; differing in this respect from the particles of solid, or soft, or viscous bodies, which require some force to change their respective positions, and which recover these positions again when but gently disturbed. He illustrates this distinction very beautifully, by comparing a parcel of balls thrown on quicksilver, and attracting each other, with a parcel of magnets in the same situation. The balls will stick together, but in any position; whereas the magnets will always affect a particular arrangement.

When the characteristic phenomenon of fluidity has been selected, the philosopher proceeds to combine this property with gravity, and establishes the doctrines of *hydrostatics*, or of the pressure and equilibrium of heavy fluids, the propagation of this pressure in every direction; and demonstrates the horizontality of surface assumed by all perfect fluids.

These doctrines and principles enable us to determine several very interesting circumstances, respecting the mutual pressure of fluids and fluids on each other; the pressures exerted on the bottoms and sides of vessels; the support and whole mechanism of floating bodies, &c.

He then considers how fluids will move when their equilibrium of pressure is destroyed; and establishes the doctrines of *hydraulics*, containing all the modifications of this motion, arising from the form of the vessels, or from the intensity or direction of the pressure which occasions it. And this subject is completed by the consideration of the resistance which fluids oppose to the motion of solid bodies through them, and their impulse on bodies opposed to their action.

These are very important matters, being the foundations of many mechanical arts, and furnishing us with some of our most convenient and efficacious powers for impelling machines. They are also of the utmost difficulty, and are by no means completely investigated or established. Much remains yet to be done both for perfecting the theories and for improving the arts which depend on them.

It is evident, that on these doctrines depend the knowledge of the motions of rivers and of waves; the buoyancy, equilibrium, and stability of ships; the motion of ships through the waters; the action of the winds on the sails; and the whole arts of marine contrivance and seamanship.

There is another general form of tangible matter, which exhibits very different phenomena, and which is extremely interesting; we mean that of *vapour*.

A vapour is a fluid, and all the vapours which we know are heavy fluids; they are therefore subject to all the laws of pressure and impulse, which have been considered under the articles *hydrostatics* and *hydraulics*. But they are susceptible of great compression by the action of external forces, and expand again when these forces are removed. In consequence of this compression and expansion, the general phenomena of fluidity receive great and important modifications; and this class of fluids requires a particular consideration. As air is a familiar instance, this branch of mechanical philosophy has been called *pneumatics*.

Under this head we consider the pressure of the atmosphere, and its effects, both on solid and fluid bodies. It produces the rise of waters and other fluids in vases; pumps and syphons, and gives us the theory of their construction: it explains many curious phenomena of nature, such as the motions of the atmosphere, and their connection with the pressure of the air, and its effect on the barometer or weather-glass. Air, when in motion, is called wind, and it may be employed to impel bodies. The theory of its action, and of its resistance to moving bodies, are therefore to be considered in this place.

But besides their motions of progression, &c., such as we observe in winds, compressible or elastic fluids are susceptible of what may be termed *internal motion*; a kind of undulation, where the contiguous parts are thrown into tumultuous vibrations, in which they are alternately condensed and rarefied; and these undulations are propagated along the mass of elastic fluid, much in the same way in which we observe waves to spread on the surface of water. What makes this an interesting subject of consideration is, that these undulations are the more ordinary causes of sound. A trembling chord, or spring, or bell, agitates the air adjoining to it; these agitations are propagated along the air, and by its intervention agitate the organ of hearing. The mechanism of these undulations has been much studied, and furnishes a very beautiful theory of musical harmony.

The philosopher examines the *law of compressibility* of the air and other elastic fluids; and thus gets the knowledge of the constitution of the atmosphere, and of the action of those fluids when employed to impel solid bodies. Gunpowder contains an immense quantity of its constituents, and emits quantities of permanently elastic air, which may be set at liberty by inflammation. When this is done at the bottom of a piece of ordnance, it will impel a ball along the barrel,
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and discharge it from the muzzle, in the same way that an arrow is impelled by a bow. And thus having discovered in what degree this air pressures in proportion to its expansion, we discover its action on the ball through the whole length of the piece, and the velocity with which it will finally communicate to it. Here then is contained a theory of artillery and mines.

Chemistry teaches us, that most bodies can be converted by fire into elastic fluids, which can be employed to act on other bodies in the way of pressure or impulse. Thus they come under the review of the mechanical philosopher, and they have become interesting by being employed as moving forces in some very powerful machines.

These discussions will nearly exhaust all the general mechanical phenomena. There remain some which are much more limited, but furnish very curious and important subjects of investigation.

The phenomena exhibited between loadstones or magnets and iron have long attracted attention; and the use to which the polarity of the loadstone has been applied, namely, the directing the course of a ship through the pathless ocean, has rendered these phenomena extremely interesting. They are specified by the term magnetism. Considerable progress has been made in the arrangement and generalization of them; but we have by no means been able hitherto to bring them all under one simple fact. The attention has been too much turned to the discovery of the ultimate cause of magnetism; whereas we should have rather employed our ingenuity in discovering all the general laws, in the same manner as Kepler and Newton did with respect to the celestial phenomena, without troubling themselves with the cause of gravitation.

Dr Gilbert of Colchester was the first who considered the magnetic phenomena in the truly philosophical manner; and his treatise De Magnete may be considered as the first and one of the most perfect specimens of the Baconian or inductive logic. It is indeed an excellent performance; and when we consider its date, 1600, it is a wonder. Epinicus's Tentamen Theoriae Magnetismi is a most valuable work, and contains all the knowledge which we have as yet of the subject.

There is another class of mechanical phenomena which have a considerable affinity with the magnetic; we mean the phenomena of electricity. Certain bodies, when rubbed or otherwise treated, attract and repel other bodies, and occasion a great variety of sensible motions in the neighbouring bodies. Philosophers have paid much attention to these appearances of late years, and established many general laws concerning them. But we have not been more successful in bringing them all under one fact, and thus-establishing a complete theory of them, than in the case of magnetism. Franklin and Epinicus are the authors who have been most successful in this respect. Dr Franklin in particular has acquired great celebrity by his most sagacious comparison of the phenomena; which has enabled him to establish a few general laws, almost as precise as those of Kepler, and of equally extensive influence. His discovery too of the identity of thunder and electricity has given an importance and dignity to the whole subject.

There are many phenomena of electricity which cannot be called mechanical, and are of the most curious and interesting kind. As these have little connection with any of the other great branches of physical science, they have generally been considered in treatises of natural philosophy; and along with inquiries into the original cause of electricity in general, continue to engage much of our attention.

The appearances which are preferable to us by our sense of feeling form another class, which have always been considered as making a branch of natural philosophy in all seminaries of learning. It does not, however, obviously appear, that they are mechanical phenomena. The intimate nature of light is full a secret. Fortunately it is not necessary to be known to give us a very perfect theory of the chief phenomena. The general laws of optics are few, so simple, and so precise, that our theories are perhaps more perfect here than in any other branch of physics; but these theories are as yet far removed from the rank of primary facts. Many unknown events happen before the phenomena come under the hands of the ordinary optician, so as to become the subjects of the simple laws of reflection and refraction. It may even be doubted, and has been doubted, whether the phenomena of optics are causes of body in motion; whether all the lines which the optician draws are any thing but corporeal. The directions along which certain qualities are exerted. The side of a ball which is next the candle may be bright and the other side dark, just as the side of a ball which is next the electrical globe is minus and the other side plus; and all this without any intervening medium. Apparition or visibility may be a quality of a body, depending on the proximity and position of another body, without any thing between them, just as weight is; and this quality may be cognizable by our faculty of seeing alone, just as the pressure of a heavy body is by our feeling alone.

The first thing which made it probable that mechanical philosophy had anything to do with the phenomena of optics, was the discovery of Mr. Roemer, with the words, that apparition was not instantaneous; that some time elapsed between the illumination of a body and its being seen at a distance. He discovered, that it was not till 40 minutes after the sun illuminated one of Jupiter's satellites that it was seen by an inhabitant of this globe. If therefore a fire were just created, it would be 40 minutes before Jupiter would be illuminated by him, and 200 before the Georgian planet would be illuminated. Here then is motion. It is therefore highly probable that there is something moving; but it is full doubted whether this something, which we call light, is a matter emitted from the shining body, and moving with great velocity, and terminated actuating and affecting other bodies, in the various phenomena of optics; or whether it is a corpuscular fluid of a medium which is thus propagated, as we see that waves are propagated along the surface of water, or formidable undulations through the mass of air, while the water or air itself is hardly moved out of its place. Either of these suppositions makes optics a legitimate branch of mechanical philosophy; and it is the philosopher's business to examine both by the received laws of motion, and fee which of them gives consequences which tally with the phenomena. This has been done; and we imagine that a complete incompatibility has been demonstrated between the consequences of the un-
The term **inertia** has occasioned much wrangling and misconception on this subject.

But these are questions similar to those about the cause of gravity, and totally unnecessary for establishing a complete theory of the optical phenomena, for explaining the nature of vision, the effects of optical instruments, the cause of colours, the phenomena of the rainbow, halos and periheliums, &c. &c. &c. Only all this theory is unconnected with the principles called mechanical.

Such is the field of observation to the mechanical philosopher of the present day. We may hope to extend it, and by degrees apply its doctrines even to the unseen motions which take place in chemistry and phylus that, but we must, in the first place, perfect our knowledge and description of the sensible motions and actions of bodies. Those of fluids still demand much investigation; and till these are thoroughly understood, it is not time to attempt penetrating further into the recesses of nature.

In the prosecution of this study, it is found that every change which can be observed in the state of a body, with respect to motion by the action of another body, is accompanied by an equal and opposite change in the state of that other body. Thus in the phenomena of gravitation, it is observed that the deflections of the sun and planets are mutual. The same thing is observed in the actions of magnets on each other and on iron; it is also observed in the attractions and repulsions of electrical bodies; and it also obtains in all the phenomena of impulse and of corporeal preface. It is therefore an universal law of motion, that **action is always equal and opposite to reaction**. This must be considered merely as a matter of fact, a contingent law of nature, like that of gravitation. The contrary is perfectly conceivable, and involves no contradiction. That this is so, is evident from the proceedings of philosophers, who in every new case make it their business to discover by experiment whether this law was observed or not. It was among the last discoveries made by Sir Isaac Newton in his examination of the celestial motions. This being the case, it should never be assumed as a principle of reasoning till its operation has been ascertained by observation. It has been owing to this improper procedure that much false reasoning has been introduced into mechanical philosophy, and particularly into the theory of impulsion or the communication of motion by impulse. In confiding this subject, a term has been introduced which has occasioned much wrangling and misconception; we mean the term **inertia**. It serves indeed to abbreviate language, but it has often misled the judge-
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when it has advanced about nine inches, will have a
velocity of about two inches per second, with which
it will continue to move uniformly. Now what is
inferred from these phenomena? Because the motion
of A is gradually retarded, we infer that a retarding
force, that is, a force in the direction BA has acted
on it. And since this would not have happened if B
had not been there, and always happens when B is
there, we infer that B is either its cause or the oc-}
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The meaning of some terms used in speaking of the celestial motions, with which it is described, we know nothing of the forces which actuate the moon in her orbit.

When Newton says that the forces by which she is retained in this elliptical orbit are directed to the earth, what does he mean? Only this, that the deflection from that uniform rectilinear motion which the would otherwise have performed are always in this direction. In like manner, when he says that these forces are inversely proportionate to the squares of her distances from the earth, he only means that the deflections made in equal times in different parts of her motion are in this proportion. These deflections are considered as the characteristics and measures of the forces. We imagine that we have made all plain when we call this indicated cause a tendency to the earth; but we have no notion of this tendency to the earth different from the approach itself. This word tendency, so fashionable among the followers of Sir Isaac Newton, is perverted from its pure and original sense. Tendere verbis solis, is, in the language of Rome, and also of Newton, to go towards the sun; but we now use the words tend, tendency, to signify, not the approach, but the cause of this approach. And when called upon to speak full plain, we direct the safe paths of plain language, and we express ourselves by metaphor; speaking of nius, consus foje minus accedenter, vis continet, &c. When these expressions have become familiar, the original sense of the word is forgotten, and we take it for granted that the words never had another meaning; and this metaphor, sprung from the poverty of language, becomes a fruitful source of misconception and mistake. The only way to secure ourselves against such mythical notions as are introduced by these means into philosophy, is to have recourse to the way in which we acquire the knowledge of those fancied powers; and then we see that their names are only names for phenomena, and that universal gravitation is only an universal mutual approach among the parts of the solar system.

There is one cause in which we fondly imagine that we know the cause independent of the effect, and that we could have predicted the phenomenon a priori: we mean the cause of impulsion; and hence it is that we are so prone to reduce every thing to causes of impulsion, and that we have fallen upon all these subterfuges of others and other subtile fluids. But we might have saved ourselves all this trouble: for after having, by much false reasoning and gratuitous assumptions, shown that the phenomenon in question might have been produced by impulsion, we are no nearer our purpose, because that property by which matter in motion puts other matter in motion, is known to us only by and in the effect.

The fair and logical deduction from all this is, that we must not expect any knowledge of the powers of nature, the immediate causes of the motions of bodies, but by means of a knowledge of the motions themselves; and that every mistake in the motions is accompanied by a similar mistake in the causes. It is impossible to demonstrate or explain the gravitation of the planets to him who is ignorant of the properties of the ellipse, or the theory of gunnery to him who does not know the parabola.

A motion has of late gained ground, that a man may become a natural philosopher without mathematical knowledge; but this is entertained by none who have any mathematics themselves; and surely those who are ignorant of mathematics should not be permitted as judges in this matter. We need only appeal to fact. It is only in those parts of natural philosophy which have been mathematically treated, that the investigations have been carried on with certainty, success, and utility. Without this guide, we must expect nothing but a school-boy's knowledge, resembling that of the man who takes up his religious creed on the authority of his priest, and can neither give a reason for what he imagines that he believes, nor apply it with confidence to any valuable purpose in life. We may read and be amused with the trifling or vague writings of authors of this class; but we shall not understand, nor profit by the truths communicated by a Newton, a D'Alembert, or De la Grange.

These observations, on the other hand, show us the nature of the knowledge which may be acquired, and the rank which natural philosophy holds among the sciences.

Motions are the real and only objects of our observation, the only subjects of our discussion. In motion is included no ideas but those of space and time, and the objects of pure mathematical disquisition. As soon, therefore, as we have discovered the fact, the motion, all our future reasonings about this motion are purely mathematical, depending only on the affections of pure figure, number, and proportion, and must carry along with them that demonstration and irresistible evidence which is the boast of that science. To this are we indebted for that accuracy which is attained, and the progress which has been made in some branches of mechanical philosophy; for when the motions are distinctly and minutely understood, and then considered only as mathematical quantities, independent of all physical considerations, and we proceed according to the just rules of mathematical reasoning, we need not fear any intricacy of combination or multiplicity of steps; we are certain that truth will accompany us, even though we do not always attend to it, and will emerge in our final proposition, in the same manner as we see happen in a long and intricate algebraic analysis.

Mechanical philosophy, therefore, which is cultivated in this way, is not a system of probable opinions, but a definitio accurata, a demonstrative science. To possess it, however, in this form, requires considerable preparation. The mere elements of geometry and algebra are by no means sufficient. Newton could not have proceeded fine "esse mathe:is faciens praecedent?" and in creating a new science of physics, he was obliged to search for and discover a new source of mathematical knowledge. It is to be lamented that the talk of the mathematicians has so prodigiously declined among philosophers of late years; and that Britain, which formerly took the lead in natural philosophy, should now be the country where they are least cultivated.

Few at present know more than a few elementary doctrines of equilibrium; while, on the continent, we find many authors who cultivate the Newtonian philosophy with great affidity and success, and whose writings are consulted as the fountainknowledge by all those gentlemen who have occasion to employ the discoveries in natural philosophy in the arts of life. It is to
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Mechanical philosophy is almost wholly a mathematical study, and that it is to be successfully professed only under this form: but in our endeavours to initiate the young be:inner, it will be often found to require more steadiness of thought than can generally be expected for keeping the mind engaged in such abstract speculations. The object presented to the mind is not readily apprehended with that vivacity which is necessary for enabling us to reason upon it with clearness and steadiness, and it would be very desirable to have some means of rendering the conception more easy, and the attention more lively. This may be done by exhibiting to the eye an experiment, which, though but a single fact, gives us a sensible object of perception, which we can contemplate and remember with much more steadiness than any mere creature of the imagination. We could, by a concise description, give such a conception of a room that the hearer should perfectly comprehend our narration of any occurrence in it; but one moment's glance at the room would be infinitely better. It is usual therefore to employ experiments to afflft the imagination of the beginner; and most courses of natural philosophy are accompanied by a series of such experiments. Such experiments, conducted by a short train of argumentative discourses, may even serve to give a notion of the general doctrines, sufficient for an elegant amusemen, and even tending to excite curiosity and engage in a serious prosecution of the study. Such are the usual courses which go by the name of experimental philosophy: but this is a great misapplication of the term; such courses are little more than illustrations of known doctrines by experiments.

Experimental philosophy is the investigation of general laws, as yet unknown, by experiment; and it has been observed, under the article Philosophy, that this is the most infallible (and indeed the sole) way of arriving at the knowledge of them. This is explained by Lord Bacon. It was new in his time, though not altogether without example; for it is the procedure of nature, and is followed whenever curiosity is excited. There was even in his time a very beautiful example of this method, viz. the Treatise of the Loadstone, by Dr Gilbert of Colchester; a work which has hardly been excelled by any, and which, when we consider its date, about the year 1600, is really a wonderful performance.

The most perfect model of this method is the Optics of Sir Isaac Newton. Dr Black's Essay on Magnesia is another very perfect example. Dr Franklin's Theory of Electricity is another example of great merit. That the investigation is not complete, nor the conclusions certain, is not an objection. The method is without fault; and a proper direction is given to the mind for the experiments which are still necessary for establishing the general laws.

It was much to be wished that some perfons of talents and of extensive knowledge would give a treatise on the method of inquiry by experiment. Although many beautiful and successful examples have been given of inquiry as particular branches of inquiry, we have but too many instances of very inaccurate and inconclusive inquiries necessary. Experiments made at random, almost without a view, serve but little to advance our knowledge. They are like shapeless lumps of stone, merely detached from the rock, but still wanting the skill of the builder to fashion them for the different purposes which they may chance to serve; while well contrived experiments are blacks cut out by a skilful workman, according as the quarry could furnish them, and of forms suited to certain determined uses in the future edifice. Every little series of experiments by Margraaf terminates in a general law, while hardly any general conclusion can be drawn from the numberless experiments of Pott. Lord Bacon has written much on this subject, and with great judgment and acuteness of distinction; but he has exceeded in this, and has fatigued his readers by his numerous rules; and there is in all his philosophical works, and particularly in this, a quaintness and affectation that greatly obv:ores his meaning, so that this most valuable part of his writings is very little read.

A formidable objection has been made to this method of inquiry. Since a physical law is only the expression of a general conclusion, and when we have it, as for instance, the law of gravitation, we can by experiment also confirm it, it would seem that experiments are unnecessary. But this is a great mistake. An object, no matter what, can only be known by the method of inquiry. A general conclusion is a fact to be remembered, not an object to be known. The laws of Mechanics, for instance, are certainly the most certain and infallible, and yet we would not think of substituting a general conclusion for the experiment. It is the same with all sciences. A general conclusion is only a description of known facts; but if we publish a new fact, we must, in order to make it known, substitute a general conclusion for the experiment. If there is a man in a room to whom we tell that a stone will fall to the ground in a descent of 38.2 seconds, he will think it a new assertion. We must therefore either publish the experiment by which it is known, or give a general conclusion based on the experiment. We can never substitute a general conclusion for the experiment.
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The objection answered, with examples showing the nature and certainty of this mode of inquiry, will inform us that they are generally of a complicated nature, not only as consisting of a complication of those qualities of things called accidents, such as gravity, mobility, colour, figure, solidity, which are common to all bodies; but also as consisting of a mixture of a variety of substances, very different in their nature and properties; and each of these is perhaps compounded of ingredients more simple.

Moreover, the farther we advance in the knowledge of nature, we find the more reason to be convinced of her constancy in all her operations. Like causes have always produced like effects, and like effects have always been preceded by like causes. Inconstancy sometimes appears in Nature’s works at first sight; but a more refined experience shows us that this is but an appearance, and that there is no inconstancy; and we explain it to our satisfaction in this way.

Most of the objects being of a complicated nature, we find, on an accurate scrutiny, that the effects ascribed to them ought often to be solely ascribed to one or more of these component parts, while the others either do not contribute to them, or hinder their production; and the variety of nature is so great, that hardly any two individuals of the same species are in every respect like any other. On all these accounts we expect difficulties in the phenomena accompanying perfectly similar treatment of different subjects of the same kind; but we find, that whenever we can be assured that the two substances are perfectly alike, the phenomena arising from similar treatment are the same; and long and extensive observation teaches us, that there are certain circumstances which infure us in the perfect similarity of constitution of some things. Whenever we observe the effect of any natural agent on one, and but one, of these, we invariably expect that the same will be produced on any other.

Should a botanist meet with a plant new to him, and observe that it has seven monopetalous flowers, he will conclude with the utmost confidence that every plant of this species will have seven monopetalous flowers; but he will not suppose that it will have seven, and no more than seven, flowers. Now these two facts seem to have no difference to warrant such a difference in the conclusion; which may therefore seem capricious, since there is but one example of both.

But it is not from this example only that he draws the conclusion. Had he never before taken notice of any plant, he would not have reasoned at all from these remarks. But his mind runs immediately from this unknown species to all the known species of this genus, and to all the genera of the same order; and having experienced in the figure of the flower an uniformity in every species, genus, and order, which admits of no exception, but, in the number of flowers, a variety as boundless as are the circumstances of soil, climate, age, and culture, he learns to mark the difference, and draws the abovementioned conclusions. Thus we learn, that perfect uniformity is not to be expected in any instance whatever, because in no instance is the simplicity of constitution sufficiently great to give us assurance of perfect uniformity in the circumstances of the case; and the utmost that our experience can teach us is a quick discrimination of those circumstances which produce the occasional varieties.

The nearer that our investigations carry us to the knowledge of elementary natures, the more are we convinced by general experience of the uniformity of the operations of real elements; and although it may perhaps be impossible for us ever to arrive at the knowledge of the simplest elements of any body, yet whenever any thing appears simple, or rather so exactly uniform, as that we have invariably observed it to produce similar effects on discovering any new effect of this substance, we conclude, from a general experience of the efficient, a like constancy in the energy as to the result. For conjoined wood, melts lead, and hardens clay. In these instances it acts uniformly, but not in these only. We have always found, that whatever of any species is confounded by it in one instance, has been confounded by it on trial at any time. If therefore a trial be made for the first time of its influence on any particular substance, he who makes it is warranted to conclude that the effect, whatever it may be, is a faithful representative of its effects on this substance in all past and future ages. This conclusion is not founded on this single instance, but upon this instance combined with the general experience of the regularity of this element in its operations.

This general conclusion, therefore, drawn from one experiment, is by no means in opposition to the great rule of inductive logic, but, on the contrary, it is the most general and refined application of it. General laws are here the real subject of consideration; and a law still more general, viz. that nature is constant in all its operations, is the inference which is here applied as a principle of explanation of a phenomenon which is itself a general law, viz. that nature is constant in this operation.

The foundation of this general inference from one experiment being so firmly established, it is evident that experiments must be an infallible method of attaining to the knowledge of nature; and we need only be solicitous that we proceed in a way agreeable to the great rule of inductive logic; that is, the subject must be cleared of every accidental and unknown circumstance, and put into a situation that will reduce the interesting circumstance to a state of the greatest possible simplicity. Thus we may be certain that the event will be a faithful representative of every similar case: and unless this be done in the preparation, nothing can result from the most numerous experiments but uncertainty and mistakes.

The account which has been given of mechanical philosophy would seem to indicate that experiment was not of much use in the farther prosecution of it. The two laws of motion, with the affiance of mathematics, seem fully adequate to the explanation of every phenomenon;
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105 Phenomenon; and so they are to a certain degree. But this degree is as yet very limited. Our mathematical knowledge, great as it is in comparison with that of former times, is still insufficient for giving accurate solutions even of (comparatively speaking) very simple questions. We can tell, with the utmost precision, what will be the motions of two particles of matter, or two bodies, which act on each other with forces proportioned to the squares of the distances inversely; but if we add a third particle, or a third body, acting by the same law, the united science of all Europe can only give an approximation to the solution.

We are continually before us, where millions of particles are above one part in ten in any cafe which has yet come to our knowledge; and for determining what may be called the velocity of water issuing from a hole in the bottom of a vessel when urged by its weight alone, and the attempts of the others have hardly succeeded better. Experiment is therefore absolutely necessary on this head.

Those who have aimed at the discovery of rules purely experimental on this subject, have also been pretty successful; and the Chevalier Buat has, from a comparison of an immense variety of experiments made by himself and various authors, deduced an empirical rule, which will not be found to deviate from truth above one part in ten in any cafe which has yet come to our knowledge.

This influence may serve to show the use of experiments in mechanical philosophy. It is proper in all cafes by way of illustration; and it is absolutely necessary in most, either as the foundation of a characteristic of a particular class of phenomena, or as argument in support of a particular doctrine. Hydrostatics, hydraulics, pneumatics, magnetism, electricity, and optics, can hardly be studied in any other way; and they are at present in an imperfect state, and receiving continual improvement by the labours of experimental philosophers in all quarters of the world.

Haven in the preceding paragraphs given a pretty full enumeration of the different subjects which are to be considered in the study of natural philosophy, it will not be necessary to spend much time in a detail of the advantages which may reasonably be expected from a succesful prosecution of this study. It stands in no need of panegyric: its intimate connection with the arts gives it a sufficient recommendation to the attention of every perfon. It is the foundation of many arts, and it gives liberal allience to all. Indebted to them for its origin and birth, it has ever retained its filial attachment, and repaid all their favours with the most partial affection.

To this science the navigator must have recourse for that astronomical knowledge which enables him to find his place in the trackless ocean; and although very small scraps of this knowledge are sufficient for the mere pilot, it is necessary that the study be prosecuted to the utmost by some persons, that the unlearned pilot may get that scanty pittance which must direct his routine. The few pages of tables of the sun's declination, which he rules every day to find his latitude, required the suecive and united labours of all the astronomers of Europe to make them tolerably exact: and in order to ascertain his longitude with precision, it required all the genius of a Newton to detect the lunar irregularities, and bring them within the power of the calculator; and till this was done, the position of the different parts of the earth could not be ascertained. Vain would have been the attempt to do this by geodetical surveys independent of astronomical observation. It is only from the most refined mechanics that we can hope for sure principles to direct us in the construction and management of a ship, the boast of human art, and the great means of union and communication between the different quarters of the globe.

A knowledge of mechanics not much inferior to this is necessary for enabling the architect to execute his intended objects,
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Experimental Philosophy

In gunnery and other engines, etc.

some of his greatest works, such as the erection of domes and arches, which depend on the nice adjustment of equilibrium. Without this he cannot unite economy with strength; and his works must either be clumsy masses or clumsy shells.

The effects of artillery cannot be understood or secured without the same knowledge.

The whole employment of the engineer, civil or military, is a continual application of almost every branch of mechanical knowledge; and while the promises of a Smellett, a Watt, a Belidor, may be confided in as if already performed, the numberless failures and disappointed hopes in the most important and costly projects show us daily the ignorance of the Pretendre Engineers.

The microscope, the steam engine, the thunder-rod, are pretexts which the world has received from the natural philosopher; and although the compacts and telescope were productions of chance, they would have been of little service had they not been studied and improved by Gilbert, Halley, and Dollond.

But it is not in the arts alone that the influence of natural philosophy is perceived: it lends its aid to every science, and in every study.

It is often necessary to have recourse to the philosopher in disputes concerning property; and many examples might be given where great injustice has been the consequence of the ignorance of the judges. Knowledge of nature might have prevented many disgraceful condemnations for forgery.

The historian who is ignorant of natural philosophy easily admits the miraculous into his narratives, accompanies these with his reflections, draws consequences from them, and fills his pages with prodigies, fables, and absurdity.

It is almost needless to speak of the advantages which will accrue to the physician from this study. So close is the connection between it and medicine, that our language has given but one name to the naturalist and to the medical philosopher. Indeed, the whole of his study is a close observation of the laws of material nature, in order to draw from them precepts to direct his practice in the noble art of healing. During the immaturity of general knowledge, while natural philosophy was the only study which had acquired any just pretension to certainty either in its principles or method of investigation, the physicians endeavoured to bring the objects of their study within its province, hoping by this means to get a more distinct view of it; and they endeavoured to explain the abstruse phenomena of the animal functions by reducing them all to motions, vibrations, collusions, impulses, hydrostatic and hydraulic pressures and actions, with which the mechanical philosophers were so ardently occupied at that time. But unfortunately their acquaintance with nature was then very limited, and they were but little habituated to the rules of just reasoning; and their attempts to explain the economy of animal life by the laws of mechanics did them but little service either for the knowledge of diseases or of the methods of cure.

The mechanical theories of medicine, which had considerable reputation about the end of last century, were many of them very ingenious, and had an imposing appearance of symmetry and connection; but are now forgotten, having all been formed on the narrow supposition that matter was subject only to mechanical laws.

But the discovery of error diminishes the chance of again going wrong, especially when the cause of error has been discovered, and the means pointed out of detecting the mistakes; and the vital principle must combine its influence with, or operate on, the properties of rude matter. It appears therefore evident that a knowledge of the mechanical laws of the material world is not only a convenient, but a necessary, accomplishment to the physician. We are fully justified in this opinion, by observing medical authors of the present day introducing into medicine theories borrowed from mechanical philosophy, which they do not understand, and which they continually misapply. Appearance of reasoning frequently conceals the errors in principle, and seldom fails to mislead.

But there is no class of men to whom this science in religion, is more service than to those who hold the honourable office of the teachers of religion. Their knowledge in their own science, and their public utility, are prodigiously hurt by ignorance of the general frame and constitution of nature; and it is much to be lamented that this science is so generally neglected by them, or considered only as an elegant accomplishment: nay, it is too frequently shunned as a dangerous amusement, as likely to unhinge their own faith, and taint the minds of their hearers. We hope, however, that few are either so feebly rooted in the belief of the great doctrines of religion as to fear this, or of minds so base and corrupted as to adopt and inculcate a belief which they have any suspicion of being ill-founded. But many have a sort of horror at all attempts to account for the events of nature by the intervention of general causes, and think this procedure derogatory to the Divine nature, and inconsistent with the doctrine of his particular providence; believing, that "a sparrow does not fall to the ground without the knowledge of our heavenly Father." Their limited conceptions cannot perceive, that, in forming the general law, the Great Artist did at one glance see it in its remotest and most minute consequence, and adjust the vast assemblage so as completely to answer every purpose of His providence. There never was a more eager inquirer into the laws of nature, or more ardent admirer of its glorious Author, than the Hon. Robert Boyle. This gentleman says, that he will always think more highly of the skill and power of that artist who should construct a machine, which, being once set in motion, would of itself continue its motion for ages, and from its inherent principles continue to answer all the purposes for which it was first contrived, than of him whose machine required the continual aid of the hand which first constructed it. It is owing to great inattention that this aversion to the operation of secondary causes has any influence on our mind. What do we mean by the introduction of secondary causes? How do we infer the agency of any cause whatever? Would we ever have supposed any cause of the operations of nature, had they gone on without any order or regularity? Or would such a chaos of events, any more than a chaos of existences, have given us any notion of arranging and directing hand? No surely. We see the hand of God in the regular and unvaried course of nature, only because it is regular and unvaried. The philosopher
But besides these advances which accrue to different classes of men from this study, there are some effects which are general, and are too important to be passed over unnoticed.

That spirit of dispassionate experimental inquiry and in which it has so greatly promoted this study, will carry it, into every subject of inquiry, that precision and that constant appeal to fact and experience which characterise it. And we may venture to assert, that the superior good order and method which distinguished some of the later productions in other sciences, have been in a great measure owing to this mathematical spirit, the successes of which in natural philosophy has gained it credit, and thus given it an unperceived influence even over those who have not made it their study.

The truths also which the naturalist discovers are more general advantages of philosophy. They are not in general affect the passions of men and have therefore a good chance of meeting with a candid reception. Those whose interest it is to keep men in political or religious ignorance, cannot easily suffer bad consequences from improvements in this science; and if they did, have hardly any pretext for checking its progress. All discoveries acclimatise the mind to novelty; and it will no longer be startled by any consequences, however contrary to common opinion. Thus the way is paved for a rational and discreet scepticism, and a free inquiry on other subjects. Experiment, not authority, will be considered as the test of truth; and under the guidance of fair experience we need fear no ill as long as the laws of nature remain as they are.

Lastly, since it is the business of philosophy to describe the phenomena of nature, to discover their causes, to trace the connection and subordination of these causes, and thus obtain a view of the whole constitution of nature; it is plain that it affords the surest path for arriving at the knowledge of the great cause of all, of God himself, and for forming proper conceptions of him and of our relations to him: notions infinitely more just than can ever be entertained by the careless spectator of his works. Things which to this man appear solitary and detached, having no other connection with the rest of the universe but the shadowy and fleeting relation of co-existence, will, to the diligent philosopher, declare themselves to be parts of a great and harmonious whole, connected by the general laws of nature, and tending to one grand and beneficent purpose. Such a contemplation is in the highest degree plesant and cheering, and cannot fail of impelling us with the wish to co-operate in this glorious plan, by acting worthy of the place we hold among the works of God, and with the hopes of one day enjoying all the satisfaction that can arise from conscious worth and consummate knowledge; and this is the worship which God will approve. "This universe (says Boyle) is, the magnificent temple of its great Author; and man is ordained, by his powers and qualifications, the high priest of nature, to celebrate divine service in this temple of the universe."
PHYSIOGNOMY,

A word formed from the Greek φυσις nature, and γνωσις I know. It is the name of a science which occupied much of the attention of ancient philosophers, and which, since the revival of learning, has in a great degree been disregarded. Till of late it has seldom in modern times been mentioned, except in conjunction with the exploded arts of magic, alchemy, and judicial astrology. Within the two last centuries, no doubt, the bounds of human knowledge have been greatly extended by means of the patient pursuit of fact and experiment, instead of the hasty adoption of conjecture and hypothesis. We have certainly discovered many of the ancient mythical beings to be merely creatures of imagination. Perhaps, however, in some instances, we have decided too rapidly, and rejected real knowledge, which we would have found it tedious and troublesome to acquire. Such has been the fate of the science of physiognomy; which certainly merits to be considered in a light very different from alchemy and some other fanciful studies with which it had accidentally been coupled. The work lately published by M. Lavater on the subject has indeed excited attention, and may perhaps tend to replace physiognomy in that rank in the circle of the sciences to which it seems to be intitled.

It does not appear that the ancients extended the compass of physiognomy beyond man, or at least animated nature: But the study of that art was revived in the middle ages, when, milled probably by the comprehensiveness of the etymological meaning of the word, or incited by the prevalent taste for the marvellous, those who treated of the subject stretched the range of their speculations far beyond the ancient limits. The extension of the signification of the term was adopted universally by those naturalists who admitted the theory of signatures (see Signature) and physiognomy came thus to mean, the knowledge of the internal properties of any corporeal existence from the external appearances. Joannes Baptista Porta, for instance, who was a physiognomist and philosopher of considerable eminence, wrote a treatise on the physiognomy of plants (philognosmica), in which he employs physiognomy as the generic term. There is a treatise likewise De Physiognomia Avium, written we believe by the same person. In the Magna Physiognosmica of Gaspar Schottus, physiognomia humana is made a subdivision of the science.

Boyle too adopts the extensive signification mentioned, which indeed seems to have been at one time the usual acceptation of the word (a). At present physiognomy seems to mean no more than "a knowledge of the moral character and extent of intellectual powers of human beings, from their external appearance and manners." In the Berlin Transactions for the years 1769 and 1770 there appears a long controversial discussion on the subject of the definition of physiognomy between M. Pernetty and M. Le Cat, two modern authors of some note. Pernetty contends, that all knowledge whatever is physiognomy; Le Cat confines the subject to the human face. Neither seems to have hit the medium of truth. Soon after the celebrated book of Lavater appeared. He indeed defines physiognomy to be, "the art of discovering the interior of man by means of his exterior; but in different passages of his work he evidently favours the extended signification of Pernetty. This work gave occasion to M. Forney's attack upon the science itself in the fame Berlin Transactions for 1775. Forney strenuously controverts the extent assigned by Lavater to his favourite science.

Before the era of Pythagoras the Greeks had little physiognomia or no science, and of course could not be scientificaly probably physiognomists. Physiognomy, however, was much cultivated in Egypt and India; and from these countries the sage of Samos probably introduced the rudiments of this science, as he did those of many others, generally deemed more important, into Greece.

In the time of Socrates it appears even to have been adopted as a profession. Of this the well-known anecdote of the decision of Zopyrus, on the real character of Socrates himself judging from his countenance, is sufficient evidence. Plato mentions the subject; and by Aritotle it is formally treated of in a book allotted to the purpose.

It may be worth while to give a brief outline of Aristotle's sentiments on the subject.

Physiognomy, he in substance observes, had been treated in three ways: Some philosophers clasped the animals into genera, and ascribed to each genus a certain mental disposition corresponding to their corporeal appearance. Others made a farther distinction of dividing the genera into species. Among men, for instance, they distinguished the Thracians, the Scythians, the Egyptians, and whatever nations were strikingly different in manners and habits, to whom accordingly they ascribed the distinctive phynomical characteristics. A third sort of physiognomists judged of the actions and manners of the individual, and presumed that certain manners proceeded from certain dispositions. But the method of treating the subject adopted by Aristotle himself was this: A peculiar form of body is invariably accompanied by a peculiar disposition of mind, as in the case of the body; so in the case of the soul, mind, and body being conjoined, the disposition of the one is implanted by that of the other, and vice versa. One of the greatest of ancient philosophers is thus represented as the first who established the true definition of physiognomy, and opened the door to all subsequent inquiries into the subject. (b) They'll find it the physiognomies of the planets all men's definitions.

(1) They'll find it the physiognomies of the planets all men's definitions.
PHYSIOGNOMY.

The disposition of mind; a human intellect is never found in the corporeal form of a beast. The mind and body reciprocally affect each other: thus in intoxication and mania the mind exhibits the affections of the body; and in fear, joy, &c. the body displays the affections of the mind.

From such facts he argues, that when in man a particular bodily character appears, which by prior experience and observation has been found uniformly accompanied by a certain mental disposition, with which therefore it must have been necessarily connected; we are intitled in all such cases to infer the disposition from the appearance. Our observations, he conceives, may be drawn from other animals as well as from men: for as a lion poiffeys one bodily form and mental character, a hare another, the corporeal characters of the lion, such as strong hair, deep voice, large extremities, difeurable in a human creature, denote the strength and activity of that noble animal; while the slender extremities, soft down, and other features of the hare, visible in a man, betray the mental character of that pufllainous creature.

Upon this principle Aristotle treats of the corporeal features of man, and the correspondent dispositions, so far as observed: he illustrates them by the analogy just mentioned, and in some instances attempts to account for them by physiological reasoning.

At the early period in which Aristotle wrote, his theory, plausible certainly, and even probable, displays his usual penetration and a considerable degree of knowledge. He diiinually notices individual physiognomy, national physiognomy, and comparative physiognomy. The state of knowledge in his time did not admit of a complete elucidation of his general principles; on that account his enumeration of particular observations and precepts is by no means so well founded or so accurate as his method of study. Even his style, concise and energetic, was inimical to the subject; which, to be manifest, comprehensible, must require anterior paraphrase. Aristotle's performance, however, such as it is, has been taken as the ground work and model of every physiognomical treatise that has since appeared.

The imitators of this great man in the 16th and 17th centuries have even copied his language and subject. As a lion poiffeys a certain and important branch of physiognomy, and imitations of La Bruyere are so excellent, that by referring to them we do greater justice than would otherwise be in our power, both to Theophrastus and to our readers. We cannot, however, omit observing, that the accuracy of observation and liveliness of description displayed in the work of Theophrastus will preserve it high in classical rank, while the science of man and the prominent characteristics of human society continue to be objects of attention.

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6 Other Greek authors, several others, wrote on the subject about the same period. Lately there was published a collection of all those on the Greek authors on physiognomy: the book is intitled Physiognomia veteris scriptores Graeci, Gr. & Lat. a Francesco Altenber, 1780, 8vo. From the number of thefie authors, it appears that the science was much cultivated in Greece; but the profeflors feem foon to have con­ nected with it something of the marvellous. This we have cause to fufpect from the story told by Apion of Apelles: Imaginem ad modum indifferenter pinxit, ut (incrivelis diis) Apion Gramaticus Scripium religierv. quaedam ex facie hominis additumnam (quas melopopos adnotavit, &c.) in divination. Socrates, Polyaenus, &c.

The novities of the Pythagorean school were subjected to the physiognomic observation of their teachers, and it is probable the first physiognomists by profession, among the Greeks were of this fex. They, too, to whose因为我们 have cause to suspect from the story told by Apion of Apelles: Imaginem ad modum indifferenter pinxit, ut (incrivelis diis) Apion Gramaticus Scripium religierv. quaedam ex facie hominis additumnam (quas melopopos adnotavit, &c.) in divination. Socrates, Polyaenus, &c.

From the period of which we have been treating to The obfervation of the Roman republic, nothing worthy of notice occurs in the literary history of physiognomy. Roman physiognomy about the laft mentioned era, however, and from thence and other writers, the science appears to have been cultivated as an important branch of erudition, and allmed as a profession by persons who had acquired a superior knowledge in it.

In the works of Hippocrates and Galen, many phyllognomical observations occur. Ciceron appears to have been peculiarly attached to the science. In his oration against Pirritius, he tells us, that in favour of Romius, the reader will at the same time perceive in what manner the orator employs physiognomy to his purposes, and find a curious instance of the ancient manner of oratorical abuse.

Many physiognomical remarks are to be found likewise in the writings of Salut, Suetonia, Seneca, Pliny, Aulus, Gellius, Petronius, Plutarch, and others. That in the Roman empire the science was practiced as a profession, ample evidence appears in the writings of several of the authors just mentioned. Suetonia, for instance, in his Life of Titius, mentions that Narcisis employed a physiognomist to examine the features of Britannicus, who predicted that Britannicus would not succeed, but that the empire would devolve on Titius.

The science of physiognomy shared the same fate with all others, when the Roman empire was overthrown by the northern barbarians. About the beinning of the sixteenth century it began again to be noticed. From that time till the close of the seventeenth, it was one of the most fashionable studies. Within that space have appeared almost all the approved modern authors on the subject. (s)
Physiognomy.

It has been unfortunate for physiognomy, that by many of these writers it was held to be connected with doctrines of which the philosophy of the present day would be ashamed. With these doctrines it had almost sunk into oblivion.

In every period of the history of literature there may easily be marked a prevalence of particular studies. In the early period, of Grecian literature, mythological morality claimed the chief attention of the philosophers. In the more advanced state of learning in Greece and in Rome, poetry, history, and oratory, held the pre-eminance. Under the latter emperors, and for some time afterwards, the history of theological controversy occupied the greatest part of the works of the learned. Next succeeded metaphysics, and metaphysical theology. These gave place to alchemy, magic, judicial astrology, the doctrine of signatures and sympathies, the mystic, theosophic, and Robertsonian, until physiognomy, such were the pursuits contemporary with the science which is the object of our present inquiry. It is no matter of surprise, that, so associated, it should have fallen into contempt. It is not unusual for mankind hastily to reject valuable opinions, when accidentally or artificially connected with others which are absurd and untenable. Of the truth of this remark, the history of theology, and the present tone of theological opinions in Europe, furnish a pregnant example.

To physiognomy, and the exploded sciences last mentioned, succeeded classick philosophy; which gave place to modern poetry and natural philosophy; to which recently have been added the studies of rational theology, chemistry, the philosophy of history, the history of man, and the science of politics.

About the commencement of the eighteenth century, and thence forward, the occult sciences, as they are termed, had declined very considerably in the estimation of the learned; and those who treated of physiognomy forborne to disgrace it by a connection with those branches of ideal learning with which formerly it had been invariably conjoined. In Britain, Dr. Gwther noticed it with approbation. His remarks are published in the Philosophical Transactions, vol. xvii.; and Dr. Parsons chose it for the subject of his lectures, published at first in the second supplement to the 44th volume of the Philosophical Transactions, and afterwards (1747) in a separate treatise, entitled Human Physiognomy explained.

The observations, however, of these writers, as well as of Lascaris, Haller, and Buffon, relate rather to the transient expression of the passions than to the permanent features of the face and body. The well-known characters of Le Brun likewise are illustrative of the transient physiognomy, or (as it is termed) pathognomy. —See Passions in Painting.

During the present century, although physiognomy has now been and is greatly attended to, nothing of importance appeared on the subject till the discussion already mentioned between Pernetty and Le Cat, in the Berlin Transactions. The sentiments of these authors, in so far as relates to the definition of physiognomy, have been above noticed. Their essays are besides employed in discussing the following questions: I. Whether it would or would not be advantageous to society, were the character, disposition, and abilities, of each individual so marked in his appearance, as to be discovered with certainty?

No reasoning a priori can possibly determine these questions. Time and experience alone must ascertain the degree of influence which any particular acquisition of knowledge would have on the manners and characters of mankind; but it is difficult to conceive how the result of any portion of knowledge, formerly unknown, and which mankind would be permitted to discover, could be anything but beneficial.

Soon after this controversy in the Berlin Transactions, appeared the great work of M. Lavater, dean of Zurich, which has excited no considerable portion of attention in the literary world. The work itself is magnificent: that circumstance, as well as the nature of the subject, which was supposed to be fanciful, have contributed to extend its fame; and certainly, if we may judge, the book, though many faults may be detected in it, is the most important of any that has appeared on the subject since the days of Aristotle. Lavater professes not to give a complete synthesis of physiognomy, but, aware that the science is yet in its infancy, he exhibits fragments only illustrative of its different parts. His performance is no doubt definitive and unconnected. It contains, however, many particulars much superior to anything that had ever before appeared on the subject.

With the scholastic and systematic method adopted by the physiognomists of the last and preceding centuries, Lavater has rejected their manner of writing, which was dry, concise, indeterminate, and general: his remarks, on the contrary, are for the most part precise and particular, frequently founded on definite and extremely acute. He has omitted entirely (as was to be expected from a writer of the present day) the ariettological metaphysics, and such like, which deform the writings of former physiognomists; and he has with much propriety introduced his physiological observations but seldom from anatomical or physiological reasoning. Such reasoning may be perabs at some future period become important; but at present our knowledge of facts, although extensive, is not so universal as to become the stable foundation of particular deductions. Lavater has illustrated his remarks by engravings; a method first adopted by Bapista Porta. —

Lavater's
Lavater's engravings are very numerous, often expressive, and tolerably executed.

The opinions of this celebrated phthisiologus are evidently the result of actual observation. He appears indeed to have made the science his peculiar study, and the grand pursuit of his life. His performance exhibits an extended comprehension of the subject, by a particular attention to \textit{affect} phthisiologus; and the effect of \textit{profiles} and \textit{contours}. His style in general is forcible and lively, although somewhat declamatory and digressive. His expressions are frequently precise, and strikingly characteristic; and the spirit of piety and benevolence which pervade the whole performance render it highly interesting.

The defects of the work, however, detract much from the weight which Lavater's opinions might otherwise have. His imagination has frequently so far outstripped his judgment, that an ordinary reader would often be apt to reject the whole system as the extravagant reverie of an ingenious theorist. He has clothed his favourite science in that affected mysterious air of importance which was so usual with his predecessors, and describes the whole material world to be objects of the universal dominion of phthisiologus.* He whimsically conceives it necessary for a phthisiologus to be a well-shaped handsomeman†. He employs a language which is often much too peremptory and decisive, disproportioned to the real substance of his remarks, or to the occasion of making them. The remarks themselves are frequently opposite in appearance to common observation, and yet unsupported by any illustrations of his.

Lavater certainly errs in bellying too great a reliance on single features, as the foundation of decision on character. His opinions on the phthisiologus of the eyes, hands, nails, and feet, of the human species, on handwriting, on the phthisiologus of birds, insects, reptiles, and fishes, are obviously premature, as hitherto, to no sufficient number of accurate observations have been made, in regard to either of these particulars, to authorize any conclusion. He has erred in the opposite extreme, when treating of the important topic of national phthisiologus, where he has by no means proceeded so far as facts might have warranted. We must farther take the liberty to object to the frequent introduction of the author's own phthisiologus throughout the course of his work. His singular remarks on his own face do not serve to prejudice the reader in favour of his judgment, however much his character may justify the truth of them. We must regret the same, for the credit of the science, that the author's singularly fanciful theory of apparitions should so nearly resemble a revival of the antiquated opinions of the syphilitists.

To these blemishes, which we have reluctantly enumerated, perhaps may be added that high impassioned tone of enthusiasm in favour of his science everywhere displayed throughout the work of this author, which is certainly very opposite to the cool patient investigation befitting phthisiologus. To that enthusiasm, however, it is probable that in this instance (as is, indeed, no unfrequent effect of enthusiasm) we are indebted for the excellency which the author has attained in his pursuit; and it poiseffes the falutary tendency of putting us on our guard against a too implicit acquiescence in his phthisiologusical decisions.

In the Berlin Transactions for 1775, there appears an article attacking the work of Lavater, written by M. Formey, as an attack upon Lavater's work, which has been already noticed. After disputing the propriety of the extensive signification applied by Lavater and Perceval to the term phthisiologus, M. Formey adopts nearly the same definition which we forementioned to be the most proper, and which we have put down as such near the beginning of this article. He allows that the mental character is intimately connected with, and feebly influenced by, every fibre of the body; but his principal argument against phthisiologus is, that the human frame is liable to innumerable accidents, by which it may be changed in its external appearance, without any correspondent change of the disposition; so that it surpasses the extent of the skill of mortals to distinguish the modifications of feature that are natural from those which may be accidental. Although, therefore, the science of phthisiologus may be founded in truth, he infers that the Deity only can exercise it.

M. Formey further contends, that education, diet, climate, and fudden emotions, may even the temperaments of ancestors, affect the cast of human features; and so that the influence of mental character on these features may be so involved with, or hidden by, accidental circumstances, that the study of phthisiologus must ever be attended by hopeless uncertainty. These objections are worthy of notice, but they are by no means conclusive.

We shall give a specimen of M. Lavater's manner of treating the subject on the opposite side of the question: a specimen, not in Lavater's precise words, but conveying more shortly an idea at once of his sentiments, and of his manner of expressing them.

No study, says he, excepting mathematics, more phthisiologusfully deserves to be termed a science than phthisiologus. It is a department of physiog., including theology and belles lettres, and in the same manner with these sciences may be reduced to rule. It may acquire a fixed and appropriate character; it may be communicated and taught.

Truth or knowledge, explained by fixed principles, become ficlic. Words, lines, rules, definitions, are the medium of communication. The question, then, with respect to phthisiologus, will thus be fairly stated. Can the trifling and marked differences which are visible between one human face, one human form, and another, be explained, not by obscure and confused conceptions, but by certain characters, signs, and expressions? Are these signs capable of communicating the vigour or imbecility, the sickness or health, of the body; the wildness, the folly, the magnanimity, the meanness, the virtue, or the vice, of the mind?

It is only to a certain extent that even the experimental philosopher can pursue his researches. The active and vigorous mind, employed in such studies, will in common form conceptions which he shall be incapable of expressing in words, so as to communicate his ideas to the feeble mind, which was itself unable to make the discovery: but the lofty, the exalted mind, which soars beyond all written rule, which poiseffes feelings and
PHYSIOGNOMY.

21 Phygenomical truth may be communicated to a certain length.

It will be admitted, then, that to a certain degree phylognomical truth may as a science be defined and communicated. Of the truth of the science there cannot exist a doubt. Every countenance, every form, every created existence, is individually distinct, as well as different, in respect of class, race, and kind. No one being in nature is precisely similar to another. This proposition, so far as regards man, is the foundation of phylognomics. There may exist an intimate analogy, a striking similarity, between two men, who yet being brought together, and accurately compared, will appear to be remarkably different. No two minds perfectly resemble each other. Now, is it possible to doubt that there must be a certain native analogy between the external varieties of countenance and form and the internal varieties of the mind? By anger the muscles are rendered protuberant: Are not, then, the angry mind, and the protuberant muscles, as cause and effect? The man of acute wit has frequently a quick and lively eye. Is it possible to refute the conclusion, that between such a mind and such a countenance there is a determinate relation?

Every thing in nature is estimated by its phylognomny; that is, its external appearance. The trader judges by the colour, the fineness, the exterior, the peculiar feature separately.

That knowledge and science are detrimental to man, that a state of rudeness and ignorance are preferable and productive of more happiness, are tenets now deservedly exploded. They do not merit serious opposition. The extension and increase of knowledge, then, is an object of importance to man: and what object can be so important as the knowledge of man himself? If knowledge can influence his happiness, the knowledge of himself must influence it most. This useful knowledge is the peculiar province of the science of physiognomy. To conceive a just idea of the advantages of physiognomy, let us for a moment suppose that all phylognomical knowledge were totally forgotten among men; what confusion, what uncertainty, what numberless mistakes, would be the consequence? Men defined to live in society must hold mutual intercourse. The knowledge of Man imparts to this intercourse its spirit, its pleasures, its advantages.

Phylognomics is a source of pure and exalted mental gratification. It affords a new view of the perfection of Deity; it displays a new scene of harmony and beauty in his works; it reveals internal motives, which without it would only have been discovered in the world to come. The physiognomist distinguishes accurately the permanent from the habitual, the habitual from the accidental, in character. Difficulties, no doubt, attend the study of this science. The most minute shades, scarcely discernible to the unexperienced eye, denote often total opposition of character. A small inflexion diminution, lengthening or sharpening, even though but of a hair's breadth, may alter in an astonishing degree the expression of countenance and character. How difficult then, how impossible indeed, must this variety of the same countenance render precise? The face of character is often so hidden, so masks

ed, that it can only be detected in certain, perhaps uncommon, positions of the countenance. These positions may be so quickly changed, the signs may so instantaneously disappear, and their impresson on the mind of the observer may be so slight, or these distinguishing traits themselves so difficult to seize, that it shall be impossible to paint them or describe them in language. Innumerable great and small accidents, whether physical or moral, various incidents and passions, the diversity of drees, of position, of light or shade, tend to display the countenance often in so disadvantageous a point of view, that the physiognomist is betrayed into an erroneous judgment of the true qualities of the countenance and character. Such causes often occasion him to overlook the essential traits of character, and to form a decision on what is purely accidental.

How surprisingly, for instance, may the smallpox disfigure the countenance, and destroy or confound, or render imperceptible, traits otherwise the most decisive?

We shall, then, continues Lavater, grant to the May one opper of physiognomy all he can ask; and yet we do day be not live without hopes that many of the difficulties viated.

He then proceeds to a specific illustration of his Thespian subject under a great variety of titles, in which he treats of treated of human nature in general, and of each particu-

lar feature separately.

To enumerate the different divisons of his book would not be more satisfactory to our readers than the perusal of the contents of the book itself; and an attempt to epitomize even the essential substance of the vast multiplicity of matter contained in his essays, (which are yet only fragments, and to which indeed he himself does not pretend to give any higher appellation), would extend this article to a disproportionate length. Such an abridgement, after all, would convey no solid information on a subject which merits all the time and study that an attentive perusal of Lavater's works at large would require.

From the historical deduction of the literary progress of phylognomics which we have thus attempted to lay causes of before our readers, it appears, that although the science has fallen into disrepute, there can scarcely be a period in which any cultivation of science has taken place when phylognomics was not likewise the fallen. Study, nay sometimes even the profession, of men of the most eminent abilities and the greatest learning.

The reasons why at present so little attention is paid to the subject probably are,

That it has been treated in conjunction with subjects now with propriety exploded: And,

That it has been injured by the injudicious assertions and arguments of those who have undertaken its defence.

Sometimes, however, the wife and the learned may err. The use of any thing must not be rejected for no better reason than that it is capable of abuse. Perhaps the era is not distant when phylognomics shall be reinstated in the rank which the merits among the valuable branches of human knowledge, and be studied with that degree of attention and perseverance which a subject deserves to be essentially connected with the science of man.

That there is an intimate relation between the dispositions
There is a relation between the dispositions of the mind and the features of the countenance, which cannot be questioned. He who is lacking under a load of grief for the death of an affectionate wife or a dutiful child, has a very different cast of features from the man who is happy in the prospect of meeting his mistress. A person boiling with anger has a threatening air in his countenance, which the most heedless observer never mistakes; and if any particular disposition be indulged till it become habitual, there cannot be a doubt that the corresponding traces will be fixed in the face as to be discernible by the skilful physiognomist, under every effort made to disguise them. But when we attempt to decide on a man's intellectual powers by the rules of this science, we are often deceived; and in this respect we have reason to believe that Lavater himself has fallen into the grossest mistakes.

PHYSIOGNOMY.

PHYSIOLOGY,

Definition. A Greek word, which, in strict etymology, signifies that which discourses of nature: but in its common use, it is restricted to that branch of physical science, which treats of the different functions and properties of living bodies; while by living bodies are meant those which are by a certain organized structure enabled to grow and propagate their kind.

By this definition, physiology must necessarily have for its object the explanation of that internal organic economy in plants and animals, which nature has devised for the preservation of the individual, and for the continuance and propagation of the species.

Division. It is naturally divided into two kinds, particular and general. The former treats of the properties and functions of the individual or species, as may be seen in the article Anatomy; the latter is the subject of our present discussion, and treats of those functions and properties which are general or common to all living bodies.

Utility of physiology. To the genuine naturalist no subject presents such a field of amusement and instruction. When complete as the state of contemporary science will admit, it will exhibit a general result of all those experiments and observations which have purposely been made or occasionally contributed to illustrate the phenomena of animated matter; and when it shall reach that summit of perfection to which the efforts of genius may carry it, it may be enabled to diffuse a light, of which the naturalist of the present day can have no just or adequate conception: Particularly in physiology, anatomy, botany, and in natural history, its happy effects may be numerous and great. On many occasions it may therefore introduce order for confusion, certainty for doubt; and may be expected to enthuse science in various places which are now occupied by fancy and conjecture.

Of all the branches of physical science it certainly makes the nearest approach to the region of metaphysics; but yet there is a difference between these, though it may not be very easy to point out the precise line of termination. Physiology, as already defined, being that science which has for its object the organic economy of living bodies, the word organical, we think, here should mark the distinction.

Wherever the economy of living bodies indicates design, and cannot result from any combination or structure of organs, it must be supposed the effect of something different from matter, and whole explanation belongs to that which is called metaphysics, or which we might term the philosophy of mind. By ascribing indeed to the glandular contents within the cranium and to that fiction animal spirits, the motives of action, the Preliminary, superficial and ill-informed may have been led to an opinion that perception, memory, and imagination, are the functions of the cerebrum, the medulla oblongata, and cerebellum; that the soul is a consequence of organization; and that the science which treats of it only a particular branch of physiology. But mind and its faculties are now so well understood and investigated, that this opinion can seldom prevail but where penetration is not remarkable for its acuteness, or where reflection, reading, and research, have long been confined within the limits of a narrow circle.

Instead of mind being the effect of organization, we readily allow that every living system of organs supposes mind; and that in the study of such systems the physiologist must often meet with many phenomena that are less singular than simple perception, and yet for which he cannot account by any knowledge which he possesses of organic powers. This truth we partly acknowledge, when, like ancient Athens erecting her altars to unknown gods, we retreat to those asylums of ignorance, the vis initia, the vis nerva, the vis vitalis, the vis medicatrix, and a number of others of the same kind.

We choose here to mark precisely the bounds of The bounds of physiology, because we have always been led to doubt of physical science, that it would be extremely fortunate for science, that all its divisions were accurately defined, that each would be limited to its own sphere, where alone it is useful and were never allowed to make encroachments on the province of another, where its only tendency can be to muddle and subvert all ideas of arrangement.

In its progress of improvement, physiology has been much and often retarded from a want of attention to this circumstance. The time has been when its place was occupied almost entirely by an absurd and ridiculous philosophy, which accounted for every thing by an hypothesis, and which pretended to cure wounds a hundred miles distant by a power of sympathy.

Nay, as if its nature were not yet ascertained, in introducing some books whose titles promise much information on the functions of organs, we meet with only a pleasing account of design and intelligence, and a few lessions, when the fancy is warm, how to exclaim and how we should wonder; or, after similar professions in the titles of others, we are presented with only a curious display of the art of logic. To a fact or two we fee numerous chains of reasoning appended. On these chains are hanging important and general conclusions; and these conclusions afterwards uniting, suspend an elusive
Preliminary observations.

Extended by Borelli.

Physiology.

A system of pathology. The whole has a wonderfully specious appearance; but upon applying the touchstone of experiment, the system fails, the conclusions turn out to be false, the chains are found connected with the fact by only a conjecture or some popular opinion of the time; most of their links are creations of fancy, and their jointings such logical affiliations as have no analogy or prototype in nature.

Indeed of logic, however, a pompous parade of mathematical learning has been sometimes introduced. This has always an imposing aspect, and its presence here may require to be examined with some care. It must be allowed, that it would have indeed been rather surprising if logic and metaphysics had been employed, and mathematics carrying science in their name had deservedly high; and there was scarcely a department of knowledge to which they had not in some motions which arise from percussion and gravitation; shown the velocity, magnitude, and orbits of the planets; they had taught the origin of tides; had informed the historian to arrange his events: they had pointed out the wonders of mechanics; and, diffusing light of the periods of time, and how he might best assist the philosopher how to describe the earth, and the geographer how to describe the globe:

Mechanical, and its presence here was not wholly extinguished, phylogeny continued to be much infected with its metaphysical and logical disputes, and with its physical doctrines of forms of particular ferments, its antipathies, its occult qualities, and subtle atoms.

For these reasons, in his inaugural dissertation at Leyden, delivered in the year 1692, the learned Pitcairn expressed with that medicine were made a diffusing science; that it were established on mechanical principles, on fewer postulates, and more data; and that it was supported by a clear train of mathematical reasoning, which would defy the attacks of the sophist, and which would not be liable to the fluctuations of opinion and prejudice. These sentiments were warmly supported by the great Boerhaave, who, in his aphorisms, has founded his reasonings on the structure of the parts and the laws of mechanics, and to whom an edition of Borelli was dedicated in 1710.

Pitcairn, however, was not content with barely expressing his wishes. Seeing with regret that the fate of medicine could never be improved as long as it was connected with the philosophy which was then in fashion, he seemed anxious to effect a separation; and for such a purpose, despite the ridicule that this might have well presented itself to his fancy. It occurred to him that the study of medicine was prior to philosophy; that it had begun its course with astronomy, at the time when eclipses were supposed the consequence of offended Deity; that all along, as it had shared the fate of astronomy, and had equally suffered in the common disgrace of judicial astrology, it was highly reasonable, in his opinion, that it should fill follow the fate of its friend; that it should be established on similar principles, and should be demonstrated by that reasoning which might experience the check of ages without being moved. So attached was he to the geometrical mode of demonstration, that in his dissertations he appeared to consider it as indeed the only species of evidence, excepting the senses, that could be relied on. But here he was certainly venturing too far; so rash an opinion, and on which had he previously consulted with prudence, might have been suppressed, was fatal to his cause. We must here therefore date the commencement of those attacks to which his system was afterwards exposed. Such an indirect species of pedantry was but ill calculated to procure a generally favourable reception for a book with so extraordinary a title as the Physiological mathematics.
PHYSIOLOGY.

mathematical Elements of Medicine. Many learned and ingenious men, the greater part of whose knowledge had depended chiefly on the evidence of testimonies, were now disposed to examine, with a steady and awakened eye, his bold demonstrations. The consequence was that which might have been expected: the result of their inquiries was wholly unisagnostic to those new applications of geometry; they found that his facts and experiments were few, that his postulates were endless, and that no mathematical reasoning whatever could extract truth from a false hypothesis, or could fairly deduce a general conclusion from particular premises. The Doctor, they observed, had imposed upon himself, in imagining that either certainty or truth was naturally inherent in any mere geometrical forms; these forms, they said, had been often abused: Plato had thought them somewhat divine; the superstitious had employed them as charms; Pythagoras had made them the symbols of his creed; and even in the writings of the learned professor himself they frequently served no other purpose but to give an air of importance to trifles; to befaw on error the appearance of importance; and to give a simple and a trite remark the look of research, and of accurate and profound erudition.

It is unnecessary to recall here the fatyrical wis, or more properly the scurrilous abuse, with which this fystem, and its author were treated. The mechanic who first of all inquired, as he had been himself instructed, to kindle and explode with a loud noise. All, however, act not alike upon all bodies; those acids which dissolve iron remain quite harmless upon gold. And chemistry here has been led to observe that particular facts show a preference for particular bodies, that there is in them an appearance of choice, and that their character is never to be known but by studying their different elective attractions.

Besides facts, chemistry of late has also discovered a number of bodies that are still more wonderful, still more active, and some of them at least still more widely diffused over nature. These are certain aeriform fluids which are called gases: these gases, like the mind itself are discernible only by their effects; all are elastic, and all are combined with the principle of heat. Their kinds are various; some are inflammable, some are flable, and soluble in water, some are either the one nor the other, and some distinguished by the name of airs, maintaining combustion and respiration: their importance is such that there is not a single process in chemistry, nor perhaps one regular process in nature, “in which the phenomena of the disengagement or fixation of heat and the disengagement or fixation of elastic fluids, are not observed either separately or together.”

Two of these fluids compose water, two the nitric acid, two ammonia, and three of them are found in atmospheric air; one of them is thought, with a good deal of reason, to be the alkaligenous principle in bodies, and two of them to be the constituents of oil: the principle of acidity is already known to be one of the two which compose water. The same fluid oxidates metals, supports flame during combustion, communicates heat to the circulating blood, and maintains life in the act of respiration. By that knowledge which it thus has acquired of facts and of gases, by its more ingenious modes of analyzing, and by some discoveries which it has made concerning the nature of heat and of light, chemistry is now able to account for many phenomena that before were inexplicable. In France particularly it has been recently extending its researches with a good deal of ardour towards the phenomena of both the animal and vegetable kingdoms: there it has found its tale and its gases, its heat, and its light, active and busy.

It is more than a century since it observed that plants of the food were nourished by pure water and atmospheric air: of plants, that from these alone they derived their extracts, their mucilage, their oil, their coal, their acids, their alkalies, and aroma. But since the discovery of different kinds:
of elastic fluids, it has farther remarked that they grow rapidly in hydrogenous gas (A), and in air mixed with carbonic acid; that applied by light their leaves absorb hydrogen from water, carbure from the acid of which they are composed; and thus decomposing the one and the other, different from both the exogenous principle or vital air, and restore to the atmosphere fulness and health.

Leaving vegetables, which, by analysis in cold vessels and in red-hot pipes, it has reduced to hydrogene, oxgene, azote, and charcoal, it has made discoveries no less important in the animal kingdom. It has found that the food of the nobler animals, which immediately or remotely is prepared by vegetables, is generally acted upon by a solvent: it has proved by experiment that the animal organs can fix azote; can decompose atmospheric air; can form lime, iron, and carbonic acid, as well as vegetables, produce a number of saline substances, which no art could detect in their food. Nor is it here that such discoveries are meant to terminate; these seemingly creative powers of vegetation and of animalization, with other phenomena in the structure and economy of living bodies, chemistry imagines that it will yet be able to explain. We may safely venture, however, to predict that something more than its present knowledge of the various effects of heat and of mixture will in this case be found necessary to ensure success. The late discovery of elastic fluids and their singular properties afford the strongest grounds to suspect that we yet may be ignorant of many agents which nature employs in the functions of bodies. But whatever be the truth, we are almost certain that these agents discovered by the chemists are not alone concerned. Electricity, magnetism, and what have been called animal electricity and animal magnetism, must not be excluded from acting some part. The growth of plants, it is well known, is considerably affected by the electrical state of the atmosphere; it is sensibly promoted by a proper use of the vegetal electroscope, and has been said to indicate a difference between the negative and positive electrifications, whether these be kinds or states of the fluid. Such too is our present knowledge that electricity as yet seems the only cause to which we can ascribe the seeming chemical affinities of the dew; its confant practice in avoiding some bodies its predilection for others, and particularly its attachment to the living points of plants and of leaves; nor is this electricity wholly unconnected with the animal kingdom; when we think of its singular fondness for points, it occurs that one intention of our hairs may probably have been to collect and diffuse it. It is plainly excited in crofs rubbing the hair of some animals, and when we wear silk, it is frequently accumulated upon the surface of our own bodies.

The iron found in plants and in animals is certainly in some degree of a striking circumstance, and cannot be denied to be one reason why magnetism should not be wholly overlooked.

As for animal electricity, or what has been called so, it is now, we believe, generally allowed to hold an important place in the system. It is very perceptible in all those nerves which are subservient to voluntary motions; nor is it limited to these alone. In several instances where metals were applied to the nerves of the heart, which nature has at first permitted spontaneous motions, they were seen to awaken the dormant powers in the muscular fibres of that viscus. We here speak only of the nerves; but the Torpedo, the Gymnotus electricus, and Silurus electricus, possess a particular structure of organs for collecting this fluid, for discharging it at pleasure, and for giving a shock. If those who are accustomed to the common kind of electrical experiments, may at first be surprised that this electrical fluid in the animal is not discharged from the nerves by water, or any other metallic conductor that is pure and unmixed, another fact, which is fully as striking, though it has not been hitherto mentioned by any observer known to us, appears to merit equal attention: Cut away the leg of a frog, uncover a part of the crural nerves, place the limb now on a table on which an electrifying machine is working, you will see the muscles strongly convulsed at every spark which you draw from the conductor, but remaining motionless upon the discharge of the Leyden phial.

Animal electricity naturally suggests animal magnetism. And animal magnetism. This last has been productive of more wonders than all the preceding agents together. Under the management of Mesmer at Paris, and his pupil Deflon, it filled all who observed its effects with surprise and astonishment. It seemed to unhinge the powers of the mind, and affect the whole animal economy; it excited the most extraordinary emotions; it roused and alayed the different passions; it changed aversion into love, and love into aversion; it created pain, it healed wounds, and cured diseases as if by enchantment.

These discoveries were made by a quack, who knew not the cause by which he produced so singular appearances. The celebrated Franklin, who first supposed that the electrical fluid was the lightning, was placed at the head of those gentlemen who declared that this species of magnetism was the same power that had long been known under the name of imagination.

This last discovery, if the blushing pride of modern philosophy could but stoop to improve an important hint, though originally suggested an by empiric, might greatly enlarge our knowledge of mind, and explain some things in the animal economy which appear yet to require a solution. At any rate, it sufficiently proves that the influence of mind is very extensive in the higher parts of animal creation. Many facts would argue that it increases as we rise in the scale; but the sole intention here was to show, that chemical agents are neither almighty nor everywhere present; that in the internal organical economy of living bodies they act but a part; and that, like the other agents in nature, they are obliged to confine their operations within those limits which the great Author of being has prescribed.

The aid which anatomy affords to physiology is that of study philosophy.

(A) Hydrogenous gas adds with more energy than any other substance in dissolving carbon; it mixes with carbonic acid and with azote, and sometimes holds in solution sulphur and phosphorus. See Fourcroy's Discourse on modern chemistry.
PHYSIOLOGY.

Anatomy a distinguished branch of human knowledge.

The illiberality of some of its professors.

Study of anatomy are so closely connected, that, as Haller imagined, they can hardly be separated even in idea. In his opinion, the men who should attempt to become a physiologist without anatomy, would act as wisely as the mathematician who, without seeing the wheels or the pinions, or without knowing the size, the proportions, or the materials of any machine, would yet presume from mere calculation to determine its powers, its properties, and uses. In this comparison, the importance of anatomy, we are really persuaded, is not represented in a light to strong; nor does that medium through which it has been viewed appear to have magnified beyond nature.

Whether art or science, anatomy is one of those eminent accomplishments without which no one is able to prosecute his studies with half that pleasure and success which he might in either the animal or vegetable kingdoms. Having been always accustomed to allot it one of the highest and most honourable places among those branches of human knowledge which are styled liberal, we must be excused if we dwell a little in exposing an attempt to convert it to a crotch.

It is with surprize, and a mixture of regret, that we see a writer of distinguished merit wishing thus to degrade it, and seeking to confine it as well as phihology to that profession which chanced to be his own. The dignity of a science, which he considered as his glory and pride, should have certainly extinguished in a generous mind the low and degrading policy of his trade. It is indeed with reason that he thinks it unfortunate, "that those who, from the nature of their education, are best qualified to investigate the intricacies, and improve our knowledge of the animal economy, are compelled to get their living by the practice of a profession which is confituent employment." We lament the misfortune as much as he can; but we reason not from it in the same way. Instead of complaining that "idle professors," particularly "of the church, should become philosophers and physiologists as it were infinuously," we are happy to learn that men of enlightened and cultivated minds are thus disposed to affix us; that nature conducts them as it were by instinct; and that happily they enjoy all that leisure which is deemed so necessary for such an undertaking. The genius of some, and the liberal education which they all must have had opportunities of acquiring, by no means impress us with any unavourable ideas of their aid.

Our author allows them to look through microscopes and examine the red globules of the blood: They may too, he says, view animalcules, and give us a candid relation of what they see; but should not presume to carry their reasoning into a science of which they can know nothing, or hope to throw light on a subject which it is impossible they can understand. But to speak freely, after considering the great physiological discovery of Priestley, with respect to respiration, the most important probably, not even excepting that of the system of objects, that the science has witnessed in the present age, we see no grounds for prefuming such laws or fixing such limits: and although he may treat the illustrious Reaumur and Abbé Spallanzani as nothing more than makers of experiments, and declare a resolute to place no confidence in those which are made by gentlemen and priests; he will not certainly deny that others have as well as he a right just to think for themselves.

Were such sentiments to become universal, it is difficult to say what would be the consequence. In Britain, the law and the church require from their members a formal certificate, that, besides the professional, they have also attended some literary claffes at the university. To their medical claffes boys are admitted from the shop and from the school, and may afterwards pass the two colleges of surgeons and physicians, by exhibiting a little skill in their art, or at leaft by paying the ilated fees. On these accounts, being anxious already for the fate of a profession which they respect, and considering the degeneracy to which it is exposed, not the hope the degeneracy into which it is sinking, they should be forry to see it deprived of that respectability which it may derive from the countenance of men professing general literature and science.

It is very true, that gentlemen and priests may not be anatomists; and not a few anatomical disputes might seem to intimate, that persons may be very eminent anatomists without being either gentlemen or priests. Still, however, there is nothing incompatible in those characters; and, were we to judge from their writings, it was certainly a thing of which Bacon, Newton, and Locke, never dreamed, that the study of the priest, or the mere circumstance of being a gentleman, was to blunt their acuteness for physical research, or in after times to affect their reputation as men of genius.

"When men have begun to reason correctly (says Dr. Hunter), and to exercise their own judgment upon their observations, there must be an end to delusions. Many doctrines of old physicians and of old women will meet with proper contempt; the tyranny of empty pomp and mystery of physic will be driven out of the land, and forced to seek shelter among less cultivated societies of men."

If the learned professions with to be respected, let them respect each other: for our part we esteem them all: and whatever assistance either they or others may afford to physiology, they may be assured that they will not find us anywise disposed to detract from its merits. Divested of prejudice, we value as highly the discovery of Priestley, which explains respiration, as if it had come from Albinus or Haller; and with as much readiness acknowledge obligations to the celebrated painter Leonardo da Vinci, as if he had been a doctor of phycice. See Anatomy, p. 667.

But while we are thus impartial to others, we would not be unjust to professional anatomists. Their learning, their patience, and arduous, have been great; and candour obliges us to affect their claim to the most numerous and important discoveries that have yet been made in physiological science. The pains which they have taken, the prejudices which they have surmounted, and those feelings which they have sacrificed in describing the parts of the dead body, place their labours beyond all praise.

But their discoveries have not been confined to a mere knowledge and description of parts. In the five books and discoveries of the fabric, just as in a time piece or a broken orery without motion, the whole presents a very confused and even an uninteresting appearance. In this case, should the man of reflection happen to ask, where are the organs of the different functions? all would be silence, and
and nothing would be found to make a reply to such an inquiry. The arterial sytem is relaxed and empty; the muscular fibre cannot be roufed: the heart has ceafed from its wonted beatings; and the nerve refutes to convey fenfations. On this fceene the eye of the anatomift could not be expected to dwell long with much fatisfaction. Curiosity would induce him to look beyond it, and fudy the defign. He would foon perceiue, that to know the ufe of the feveral parts, they muft be feen alive and in action. But here new difficul­ties would arife, and feelings of compafsion would ex­claim againft any farther purfuit. The natural zeal, however, of inquiry, the good of mankind, and the love of science in a generous mind, are not eafily refifted.

To his lafting praise, and the fingular improvement of true physiology, the anatomift has examined the living body, and has there obferved, that all motion proceed immediately from the muscular fibre; that the muscular fibre again derives its power from the nerve, which terminates in the brain; that fibre, and nerve, and the whole sytem, are nourifhed by the blood which comes from the heart; and that the waffe of blood is supplied by the lafeals, which absorb nutrients matter from the food as it paffes along the ifential canal.

He has als0 obferved, that the blood, which is in continual motion, has a circular course; that other vefSels along with the lafeals are employed to absorb; and by means of injection has fhown the route of the different fluids as clearly in the dead as they could have been feen in the living fubjeft.

When his eyes have failed in tracing objects that were too minute for unaided fight, he has called in the help of the microscope, and discovered the red globules of the blood, animafules in the fermen, and the animafules of the arteries and veins; and when the micro­fcope could lead him no farther, he has had recourse to chemical analysis, and made discoveries equally impor­tant in demonftrating the bodies which compofe the several fluids and the folid.

Besides these fervices which the anatomift has ren­dered to physiology, the science is likewise greatly in­debted to him for thofe various and ingenious methods which he has taken to diffuse his knowledge. What­ever has occurred remarkable or rare, he has studied to prefervel either dried or in fluids that retell putrefaction. By correlling the parts which he has injected in a cer­tain acid, he has given an idea of the vascular sytem, which is at once inductive and elegant. Where it has been neceffary to defroy the parts when incapable of prefervation, or where the prefervation would have been expensive, he has not refrained to reprefent them in models of wax, or to perpetuate them in ac­curate carvings of lead or of flucno; and, laftly, that the valuable fruits of his labours might not be confined in his room of preparations or to his pupils, he has de­scribed most of them in drawings, has multiplied his drawings by correct engravings; he has even publifhed his numerous engravings, and to render them intelligible, has illuftrated each with copious explanations.

From this account it might be fuppofed that the anatomift has done all that can be reaoningly ex­pected from him. If we drew, however, fuch a conclu­sion, we might certainly be charged with precipitat­ion. His views have hitherto been too confined, nor have they been directed with a ftill which a ra­tional and comprehensive phyfiology would require. As if chiefly guided by the rant of the poet, that "the nobleft fluid of mankind is man," he has cul­tivated his art principally with an eye to medicine and surgery; and while he has defcribed the human body with a tedious minutenes, he has seldom looked into thofe of brutes but when he has wilhed to illustrate a theory or eftablifh an hypofethes.

As fome apology for fuch a conduct, there is indeed but little immediate or pecuniary advantage to be derived from comparative anatony; and thofe who have heard of the fox and the grapes will readily per­ceive, that few will be disposed to commend a fci­ence which reflects not much credit on their knowledge, and which they are led from fenfiments of pride to treat as either contemptible or uilefs.

The difcife tone and affected air of superior difcernment being not unfually a very tender part of the charater, they often form that mark of difdination which is seldom re­figned but with the utmost degree of reluctance. It is, however, allowed, that any oppofition from thofe caufes ought not to frighten an afpiring genius. His nobler mind should look beyond pecuniary prospects; and he ought to have fufficienc enough to defpire the fiers and malevolence of pompos ignorance. The other difficul­ties which he has to encounter in his own elification may not be fo small.

In feeing to enlarge the field of inquiry, he will not foone fpeak of his experience that he wants a language, or at leat a nomenclature fifted to exprw the different objects which muft neceffarily occur in his refarches. He will find too that he wants thofe proper clasifications of the animal kingdom, which are equallly neceffary both to abridge and direct his labours.

The firft nomenclature of the anatomift was formed upon the defection of brutes; and moft of its terms, as the rete mirabile, are now ulefs, or tend to mislead those who employ them in their defections of the human body. The few of its parts which are remain­ed, as the different names and divisions of the gut, are much more applicable to the uial appearances in certain quadrupeds, than to any thing which we meet with in man.

This firft nomenclature declined with the fuddies which gave it birth, and with the decline of that fu­perfusion which permitted no other studies of the kind. Since the days of Vesalius the human body has been chiefly defcribed; and the nomenclature which has thence ariene, and has since been aifuming the form of a language, if adapted at all, is peculiarly adapted to that fubject. Were we now therefore defirous to ex­amine the internal economy of animals in general, we fhou'd fee at once that the preffent nomenclature is as ill defined to comparative anatomy as the former nomenclature was to the defection of the human body. The feveral facts which confirm this afserion are but too numerous. To give one or two: In a late work, The Phyfology of Fijhes, the celebrated author is obliged to inform his reader in a note, that when he makes use of the following terms, superior, inferior, anterior, and posterior, the fih is fuppofed to be (anding erect, in the attitude of man: and in his ingenious Contem­pation on Nature, Bonnet, besides the abfurp practice of calling nerve by the name of marrow, his teen pleased to observe that in certain (pells the spinal mar­row
row is not in the spine, but in the opposite fat of the body, running longitudinally along the breast.

Applying occasionally this nomenclature to the small number of birds and quadrupeds which we have described, it was much strained with respect to their skeletons. Even forced analogy could not bring it to express many distributions of the nerves and blood vessels; and when it was employed in naming the muscles, in most cases it turned out to be useless or absurd.

We were first led to observe its defects on hearing the names of bones of the pelvis, called the os ilium, the os ischium, and the os pubis, united behind by an os sacrum, which is tipped with a coccyx or bone of a cuckow: we thought it likewise somewhat remarkable to find a goat, a boat, and a conch shell, among the external parts of the ear; and within the tympanum a hammer and its shaft, a flitty, a stirrup, and a periwinkle. But these defects were most seriously felt in raising the different muscles of a dog, and comparing them severally with Albinus's tables. These tables and muscles, to our great surprise, did not agree with one another which we expected. To obtain more accurate ideas we got the comparative myography of Douglas. At one glance the etymological table of this work demonstrated the confusion and the imperfection of the nomenclature. In his, as in other books of myography, the muscles are explained by describing their origins, insertions, and uses: but the table shows, that their names are never, or at the least, always varying by many circumstances, which in every description are uniformly noticed in all muscles. Their names on the contrary are never explained by the position, usage, or appearance in the human body, or from those circumstances which are constantly varying in every animal; just as if muscles of the same origin, insertion, and use, should in all animals have a similar colour, a similar mode of infection and origin, a similar composition and variety of parts, a similar course and direction of fibres, a similar figure and shape, a similar passage through certain places, a similar proportion with respect to one another, or should be formed of a similar substance.

If we pass to the membranes, as expressed in this nomenclature, we shall not discover that their names are more philosophical. A pericardium covers the bones, a pericranium the skull; the cavity of the thorax is lined with a pleura, that of the abdomen with a peritoneum; and what is purely somewhat remarkable, bones which are hollow have a peritoneum on their inside: the membranes in the skull are by way of distinction denominated meninges; the one which lies next to the cranium is the dura mater or hard-hearted mother, while that which immediately covers the brain is the mater pia or affectionate mother.

Of all the terms, however, that occur, the cavity of the skull contains the most extraordinary collection: we there meet with a Turkish fiddle and with the feet of a sea horse, with a ring, with a lyre, with a sickle, with a bridge, with a writing pen, and a wine press.

A few of these names belong to the substance of the brain itself: where one part is called from its hardness the callous body, another from some fancied analogy the medullary substance, and a third from being on the outside is named the corticile, and from its colour the cinerous. These are not all: there are besides footstalks of the cerebrum and cerebellum; the thighs and arms and fore and hind legs of a grand division, the medulla oblongata; there is also a vault and two or three pillars, one pair of flattered bodies, two beds, and a couple of horns: some cavities which, from a supposed resemblance to flomachs are called ventricles choroid cisterns; two bodies, named from the olive, two from a pyramid, and one from a vine, which is chiefly remarkable for having once been thought the residence of the soul. At some distance in the cerebellum we are however pleased to meet with a name that is somewhat elegant, the tree of life. In this there is a degree of refinement, which must strike one as it comes unexpectedly. The following names are in the lowest style of obscenity: they are wormlike and mammillary processes, they are nates, testes, an anus, and a vulva; which, in order to save the blushes of our readers, we shall leave in the language in which they were conceived. A singular part is placed immediately under a funnel, and is named from its use the pituitary gland; it was meant originally to create a phlegm, but it holds that office now as a fine ure (a).

Ridiculous and whimsical as many of these appellations are, they generally have some allusion to their subject; and are by now and then considered with admiration in this nomenclature. The names of discoverers which have been imposed upon various parts, contain no description at all; and the only purpose which they can serve is not to promote the interest of science, but to immortalize the anatomists. As many of these have not been more than infamous to fame, they or their friends have taken the freedom to introduce parts to our notice, not by telling us what is their nature, but by demonstrating who was the first that observed them. Upon reading therefore the catalogue of names that occur in anatomy, one would imagine that many of these ingenious discoverers had supposed themselves not the discoverers but the inventors of several parts in the animal economy. In our vascular system is the ring of Wi lis, the vein of Galen, and the large wine press of Herophilus. We have in our brain the bridge of Varelius; and in our nerves we poise the property of various discoverers. The holes of Vidius, and the cavities of Highmore, are in our bones; some small muscles in the sole of our foot is the flitty mass of Jaco bar Sylvius; a part of our eye is the membrane of Raynich; and in those cases where they are to be found, Couper lays claim to particular glands; two canals from our mouth to our ears are the tubes of Eutachius.

(a) That our readers may judge whether or not these names be fairly translated, we subjoin the originals here in a note. In the ear, tragus, staphe, concha, malleus, incus, flapes, cocucle: in the cavity of the skull, sella turcica, pedes hippocampi, annulus Williams, pileuli ves vel lyra, tule dura mater, pons Varolii, calyces orificiorum, torcular Herophilis, corpus callosum, substantia medullaris, substantia corticalis vel cinerea, pedunculi cerebri et cerebelli, femora, brachia, cura anteriora et posteriora medullae oblongatae, folium corporis sphenoidis, tubulus opticorum, coruna nervorum opticorum, corpora olivaria, corpora pyramidalia, glandula pinealis, arbor vitis, tubera manillaria, appendices verruciformes.
PHYSIOLOGY.

Preliminary observations.

1. The homunculus; the skull of our pancreas is the right of Virchow; Poupart has a ligament almost in our groin; alobe of our liver belongs to Spigelius; and the female would certainly state at being told, that among the distinguishing marks of her sex are the tubes of Fallopian, a trench's mouth, and several vestiges of the devil's teeth.

The man who will readily observe the effects of this nomenclature is not he who has learned it already, and who no longer is acquiring his ideas through its imperfect and confused medium; nor is it he whose studies are confined to the human body, the particular subject on which it was formed: He who will sensibly feel its inconvenience is the young anatomist, who must receive his knowledge through its channel, commit its vocables to his memory, and use them afterwards in recollecting his ideas. Another who must soon perceive its failings, is he who engages in comparative anatomy, and who is anxious to extend his views beyond that which the foolish indulgence of conceited bombast has called the microcosm. A third will be he who has remarked the numerous synonyms which different authors have thought themselves warranted to substitute in place of the old terms: for these repeated attempts at amendment are a strong proof of the weakness in which it is held by the anatomical writers in general: And, lastly, that man cannot hesitate long to pass upon it a condemnatory sentence, who, like Wilkins, Locke, Condillac, and Reid, is a person of extensive and profound reflection, who is well acquainted with the intimate connection between accurate expressions and accurate ideas; who knows how much the improvements of language are able to facilitate the progress of science; or who has experienced the wondrous effects that have already resulted from the example and labours of Linnaeus, and particularly from the new nomenclature in chemistry, which can hardly be too much valued and admired.

Our intention here is not to suggest a particular plan for any new anatomical nomenclature; the state of our knowledge may in this respect be yet too imperfect, and perhaps it may be necessary to see more of the animal economy, before we should venture on such an undertaking. We may however, in general, observe, that this nomenclature, like the languages of nations, ought not to be formed with any view to an individual, a species, or genus; and after that be carefully extended by fanciful analogies to new objects, and from these again be extended to others; thus making metaphor and fable out of metaphor without end, until the original figure be lost, and revived and lost again, times without number. It ought to contain as many as possible of those terms which, understood in their primary sense, might apply to the whole animal kingdom and living bodies, without any metaphorical expressions, if, in describing the tissues and colours, such expressions can be avoided. Instead of the words anterior, posterior, inferior, and superior, which are perpetually shifting their meaning with a change of attitude, it ought to have words of one confant invariable import, expressing the regions of the head and the back and their two opposite.

These terms, with right and left, would be found in anatomy to answer nearly the same purpose that the degrees of longitude and latitude, or the points of the compass, do in geography. Every part would then be considered as by preliminary observations, within or as pointing to six different regions, the right, the left, the head, the back, and their two opposites. If more particular descriptions were wanted, the definitive terms might then be taken from the more immediately surrounding parts; thus giving an account of the ethmoid bone, D'Azyl borrows the definitive words from the regions of the cranium, the frontal, basilar, facial; and occipital; or from the regions in immediate contact, the cerebral, palatine, nasal, and sphenoidal.

If an object attainable, this nomenclature too should be derived from one origin, and not like the present be a wild incoherent Babylonish gibberish of a number of mixtures. It ought to aim at conveying its ideas with clearness and precision, and yet fully, concisely, and promptly. In point of simplicity it ought to study the ease of the memory in receiving, retaining, and in recollecting. To prevent a needless multiplicity of terms, it ought to avoid puerile minutiae, which serve no end but to render description tedious and confused; it ought to avoid such trivial divisions, as those of the gut into duodenum, jejunum, ileum; or those of the artery into subclavian, axillary, brachial; and, lastly, it ought to be formed on a plan containing certain rules of conformation for giving names not only to parts already discovered, but to those parts which are still unknown, or which distinguish individual and species.

In imposing names, it might perhaps be of some advantage to examine not only together, but separately, the great constituent parts of the system; as the bones, the ligaments, the cartilages, the muscles, the membranes, and the glands; the nervous, the glandular, and absorbent systems; and all these with their properties and uses peripherously arranged. How far a regularity in composition, and an uniform variety of terminations, might be of use in this nomenclature, can be discerned from their great importance in the new philosophical language of chemistry.

It has been observed, that such a nomenclature, to encourage and assist the comparative anatomist, is still wanting; and it also was remarked, that we yet are unacquainted with proper classifications of animals, peculiarly fitted to direct and abridge the anatomist's labour, and to satisfy the inquiries of the physiologist.

Our present physiological arrangements are, like our vegetable nomenclature, principally fitted to the human body. Let us take our instance from the celebrated Haller, he classifies his animals under the different organs, and all those with their properties and uses peripherously arranged. How far a regularity in composition, and an uniform variety of terminations, might be of use in this nomenclature, can be discerned from their great importance in the new philosophical language of chemistry.

The physiological arrangement of organs begins his Outlines with the simplex fibre, and the cellular texture, of which he is anxious to compose as many of the folds as he can. He then proceeds to more of the organs, describing with great erudition and care their different uses and structure in man. These organs, however, which he describes, and those analogous with respect to their structure, are confined to a part of the animal creation. As different classes of the animal kingdom have with similar functions various, according to the func-

2. Two kinds of arrangement of organs, and as one function is consequentially performed in different ways, it is evident that organs ought not to form the general divisions in any physiological system of arrangement, because we should then have a new arrangement for every new species of organs. Of this truth Haller and others have not been ignorant. They have also divided their subject into functions;
functions; but still they are functions in the manner performed by the human body. This body has engrossed so much of physiology, that we often see the functions explained with scarcely any allusion to their organs; as there are supposed to be always the same, and already known from the usual distinctions.

Haller's physiology is professedly that of the human body. His conduct here was seemingly the effect of general custom: it did not arise from any contempt of comparative anatomy. There have been few who esteemed it so highly, who have studied it more, or applied it so skillfully. He declares that there are many parts of our bodies whose functions can never be fully explained, unless we examine their structure in quadrupeds, in birds, in fishes, and even in insects; though he therefore had dissected of human subjects to the number of 350, yet the number which he dissected of brutes, and what is more, dissected alive, was much greater. Numerous, however, as were his dissections, they were too confined for general physiology. That requires a range more extensive; and, to shorten the labour different classifications of animals from any of those to be usually met with. This attention hardly needs a proof.

There is nothing more certain, than that were the anatomist to dissect animals as they occur in the system of Linneus, or any other naturalist, his toil would be immense, and the knowledge which he thence would acquire of functions would scarcely be found to bear to it even the smallest proportion. By this observation we mean not to object to those ingenious classifications which Linneus and others have employed to facilitate the study of zoology. All their classifications may be useful; and many display that extent and clearness of comprehension, that distinguishing acuteness, and that laudable ardour for the interest of science which ought to render their authors immortal, and intitle them to the gratitude of future ages. Yet these systems are formed with a view different from that which principally ought to direct the physiologist. They were meant to contain a full enumeration of the objects of zoology so far as known; to exhibit them arranged in different classes and subordinate divisions, according to such obvious and distinct marks as might strike at a glance, or appear on a cursory examination. To him who is entering on the study of zoology, they show at once the extent of his subject; they elevate his mind by the grandeur of the prospect; and when better employed than in pleasing the fancy or in routing the rapturous feelings of a poet, they draw his attention to those significant and marked signs in which the language of nature is written. They affilt his judgment in the art of arrangement, and give to his memory a power of recollection, which it had not before. To the natural historian they perform a Preliminary service equally important, if not essential, to his undertaking: to him they supply the place of chronology; and instruct his readers by the chain of connection which they give to his thoughts, and by that perspicuity which they invariably bestow on his language.

These arrangements, however, with all their advantages, are not the arrangements which the physiologist would with the anatomist to observe in his dissections. They are certainly useful in studying the manners, dispositions, and habits of different animals, and all that part of the outward economy which indicates something of their wisdom and design. But they little illustrate that internal structure on which this outward economy is founded, or tend to explain the more secret functions which, not depending on the will of the creature, only display the power and omniscience of him who made it. This consequence is easily conceived, from considering the difference between zoology and what has been here defined physiology. Zoology is chiefly led to examine the animal kingdom as it usually presents itself to the eye, including a great variety of objects; physiology only that single part of the animal economy which is chiefly made known by anatomy and chemistry. Zoology has been wont to divide its kingdom into so many classes or orders of animals; physiology would naturally divide its economy into so many functions. Zoology has subdivided its classes by certain obvious and exterior marks, as the teeth and the claws; physiology would naturally subdivide its functions by the many varieties of those organs which are defined to perform them, as the different kinds of lungs and of stomachs. Zoology but curiously mentions the functions as forming a part of the hierarchy of animals; physiology takes notice of animals only when they are of use to illustrate its functions. From this comparison it will readily appear, that things which are primary in a zoological will often be secondary in a physiological species of arrangement; and that things which are primary in a physiological will often be no more than secondary objects in a zoological.

This is very conspicuously the case in one of the grand divisions of Linneus into mammals, where the important secretory organs of the milky fluid are noticed only, like the colour of hair or the length of a tail, as a good outward mark of distinction; and likewise in the excellent table of D'Aubenton, where the function of digestion is not even alluded to at all; although he had complained that there was more of art than of nature in the common arrangements, that classification by outward marks had confused things of a different structure, and that the lesser divisions should be made only by marks relating to the functions.
<table>
<thead>
<tr>
<th>ANIMALS</th>
<th>With a Head</th>
<th>Without a Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nostrils</td>
<td>Without Nostrils</td>
<td></td>
</tr>
<tr>
<td>Ears</td>
<td>Without Ears</td>
<td></td>
</tr>
<tr>
<td>Two ventricles in the Heart</td>
<td>One Ventricle in the Heart</td>
<td></td>
</tr>
<tr>
<td>Warm Blood</td>
<td>Blood nearly cold</td>
<td></td>
</tr>
<tr>
<td>Inspiration and Expiration of the Air at short Intervals</td>
<td>Inspiration and Expiration of the Air at long Intervals</td>
<td></td>
</tr>
<tr>
<td>Viviparous</td>
<td>Oviparous</td>
<td></td>
</tr>
<tr>
<td>With Teats</td>
<td>Without Teats</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1st Order</th>
<th>2nd Order</th>
<th>3rd Order</th>
<th>4th Order</th>
<th>5th Order</th>
<th>6th Order</th>
<th>7th Order</th>
<th>8th Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUADRUPEDS</td>
<td>CETACEOUS ANIMALS</td>
<td>BIRDS</td>
<td>OVIPAROUS QUADRUPEDS</td>
<td>SERPENTS</td>
<td>FISHES</td>
<td>INSECTS</td>
<td>WORMS</td>
</tr>
<tr>
<td>Four Feet and hairy Skin</td>
<td>Fins and no Hair</td>
<td>Feathers</td>
<td>Four Feet and no hair</td>
<td>Scales without Feet or Fins</td>
<td>Scales with Fins</td>
<td>Antennæ</td>
<td>Neither Feet nor Scales</td>
</tr>
</tbody>
</table>
It is plain from this table, and from what we have mentioned concerning Haller, that it would be injustice to anatomists and naturalists to say they have never paid any attention to the physiological modes of arrangements. It can only be said that they have not paid to them all that attention which they deserve; and that no general physiological system of arrangement, excepting D'Azyr's, has, so far as we know, been yet attempted.

How such an arrangement ought to be made is easily described, though by no means very easily executed. It needs not a proof that functions should form its primary divisions; that its subdivisions should be the varieties of these functions; that the whole should be both distinguished and explained by the kinds and varieties of those organs, by which they are performed; that the descriptions of these organs might partly be collected from the several works of natural historians and comparative anatomists, as from the dissections of the French academy, from numerous fragments of the Curieux de la Nature, from the collections of Blaffius, and Valentinii, from the writings of Haller, from the works of the celebrated Hunters and Monroes, from the publications of Hewson and Cruikshank, and those who have lately been making discoveries in the system of aborberts. D'Azyr has mentioned a great many more. He particularly recommends Perrault, Du Verney, Collins, and D'Aubenton, on Birds and Quadrupeds; Charas, Roesel, and Fontana, on Reptiles; Ray and Willoughby, Arcti, the Gonat, and Broussonet, on Fishes; Swammerdam, Malpighi, and Reaumur, the Geoffroys, Bonnet, and Lyonnets, on Insects; and, lastly, the curious researches of Willis, El'lis, and Donati; of Trembley, Baker, Baffier, and Boadich; of For
dalian, of Muller, Pallass, Spalanzani, and Diquemare, concerning Worms, Zoophytes, and Polyphyes. Where any errors are to be corrected, or where any deficiencies are to be supplied, it is needless for us to observe that recourse must be had to new examinations and to new dissections, where it may be of some use to attend to the foods of animals, to their places of abode, and their modes of life, as circumstances leading to some internal varieties of structure. To the list of authors we might have added Campfer on Fishes; and we should not forget the excellent writings of D'Azyr himself, whose table of physiological arrangement is a work of merit that bespeaks reflection, ingenuity, and labour, and which follows here, with only a small variation in form.

A TABLE of the Functions or Properties of Living Bodies.

1. Digestion. 4. Respiration. 7. Generation.

Every body in which one or more of these functions are observed is to be considered as possessing organization and life.

1. Digestion.

Living Bodies Which have

One or more stomachs, easily distinguishable from the oesophagus and intestinal canal, Man.
Cetaceous animals.
Quadrupeds.
Birds.
Crustaceous animals.
Oviparous quadrupeds.
Serpents.
Cartilaginous fishes.
Fishes properly so called.
Insects.
Worms.
Zoophytes.
Plants.


Living Bodies Whosenutritions receive absorbed

By vessels beginning from internal cavities Man.
Cetaceous animals.
Quadrupeds.
Birds.
Oviparous quadrupeds.
Serpents.
Cartilaginous fishes.
Fishes properly so called.
Insects.
Worms.
Crustaceous animals.
Plants.

By vessels opening upon the external surface,
PHYSIOLOGY.


Living Bodies

With blood

| Having a heart with two ventricles and two auricles, |
| With one ventricle divided into several cavities and two auricles, |
| With one ventricle and one auricle, |

| Whose heart is formed of one longitudinal vessel, tuberous and contractile, in which there is a whitish fluid instead of blood. |

| In which no heart has been yet observed, but only vessels filled with juices of a nature different from that of blood, |

| By lungs free from all adhesion, and spongy, |
| By lungs free from all adhesion, vesicular, and muscular, |
| By lungs adhering to the ribs, and provided with appendages, |
| By gills of different forms, |
| By siphon or holes in different rings, |
| By an opening called trachea, or by external fringes, |
| By trachea, |

| In which there have been discovered neither siphon nor trachea, |

4. Respiration.

Living Bodies

Which require

| There are no bodies in which secretions are not carried on. |

5. Secretion.

Living Bodies

| Internal and osseous, |

| Internal and cartilaginous, |
| External and corneous, |
| External and crenate, |
| External and ligneous, |
| Which have no skeleton, |

6. Ossification.

Living Bodies

Whole skeleton is

| There are no bodies in which secretions are not carried on. |

| Internal and osseous, |
| Internal and cartilaginous, |
| External and corneous, |
| External and crenate, |
| External and ligneous, |
| Which have no skeleton, |

7. Ge-
PHYSIOLOGY.

The above table, which has its divisions marked by the functions, and their kinds and varieties by the kinds and varieties of those organs by which they are performed, differs considerably from a zoological. Borrowing its several marks of distinction from internal characters, it more clearly demonstrates the difference between the mineral, vegetable, and animal, than any system that attempts to arrange by outward appearances.

No minerals, whatever be their forms or the regularity and beauty of their figures were ever said to possess any thing like organs of nutrition; and however frequently some may recover their lost shapes, they are never supposed to either produce, or assist in producing, their own kind by generative powers. And no plants, however much may be said of animals that want a nervous system and a heart, and are fixed, without the power of locomotion, to one place; we say no plants, though some may represent a few of the simpler effects of sensation, and others may be free to float through the ocean, were ever said to discover any signs of voracity, to possess any thing resembling a stomach, to distend their body by swallowing their food, to apply their food to the mouths of absorbers opening internally; and when the nutritious juices were extracted, to eject it in cumulo. It has been said that zoophytes present similar phenomena. But what are zoophytes? One half of their name would imply that they are animals, and another half would indicate that they are plants. D'Aubenton reasons with clearness on this subject. True, says he, the greatest part of them are branched like plants, and like plants are composed of concentric circles. Some have a soft exterior substance which is called, bark, and a hard interior which
PHYSIOLOGY.

which is called wood. Along their branches, and at
their extremities, they put forth vehicles which resemble
buds; and when a part falls from the whole, it is suf-
ficient, like a vegetable flip, to produce a zoophyte:
but do these appearances prove that they are plants?

If ramifications constitute a plant, then many crys-
talizations will be plants; the showers of frosts on
our windows will be plants; the silver tree of Diana
a plant; our veins will be plants, our arteries plants;
and our very feet which ramify into toes, and our
hands into fingers, will have some title to be called
plants. The truth is, ramifications is not universal in
the vegetable kingdom; and although it be general,
it is no more peculiar to plants than swimming is to
fishes or flying to birds. If concentric circles con-
stitute a plant, some bones of animals will then be
plants, and some minerals must also be plants. The
wood and the bark are only two metaphorical expan-
sions, which with equal propriety might have been
used of the bone and periftem. But once suppose
the zoophyte a plant, it was natural to carry on the
analogy and certainly necessary to have it provided
with wood and bark; though it must be allowed that
a corneous substance is not what we commonly mean
by bark, nor an evidently hard calcareous substance
what we mean by wood. The small vehicles, except in
appearance have no similarity to buds or fruits: they
are the residences of small polypes, to whom the whole
structure has been owing, by whom the whole either
is now or has been inhabited, and to whom it answers
the same purpose as the shell does to tesselate ani-
mals.

After thus endeavouring to point out the bounda-
dary between the mineral, the plant, and the animal (A),
before we begin to treat of the functions, we must also
take notice of another distinction; the want of which
has occasioned much unnecessary trouble, and has given
rise to not a few ridiculous disputes. This is the dis-
section between living bodies and some ingenious contrivances of art, which are called machines. It
has not been averted that any machine can either grow
or propagate its kind; that it can assimilate the par-
ticles of matter that come in contact; that it is able
to repair the injuries which it may suffer; that it can
accommodate itself to circumstances, can create heat
when the cold is keen, or cold when the heat becomes
too violent; yet it has been supposed, from estab-
lished prejudices, and from the sucesive evolution of parts
in plants and in animals, that there is an analogy be-

between a machine and a living body. The living body
has been called a machine; and notwithstanding the
acknowledged truth of that observation so often re-
peated since the days of Hippocrates, That the whole
is a circle, that nothing is first and nothing last in the
animal economy, we are still talking as if living
bodies were nought but machines; we are still reason-


ing as if their parts had existed in succession, had
acted in succession, were combined in succession; we
are still seeking for what is prior and what is posterior,
for what is derived and what is original in point of
structure, as if we were examining a work of art; we
speak gravely of the viscera, of the thorax deriving a
coat from the membranous pleura, the abdominal vis-
cera from the peritoneum, and the branches of nerves
deriving a pair from the dura and pia mater of the
head; we argue with people who maintain that
fata are nervous expansions, and the muscles them-

selves but nervous productions; and although we be
hardly able to conceive how the brain could be nou-


rished without blood drawn from the heart, or the
heart move without the assistance of nerves from the
brain, we are still disputing about which was prior and
which was posterior in point of existence; a dispute
that will probably terminate as soon as that of the an-

cients, whether the first eggs were from birds, or the
first birds were hatched out of eggs.

These dark and ininterpretable mysteries of nature we
presume not to explain; they point out almost the
creative hand, and bring us almost in the immedi-
ate presence of that Being by whom we live, move, and
exist; and before whom the truly feeling and elevated
mind is left disposed to examine than adore. We are
only to observe, that from this coeval formation of
parts which the microscopical part of anatomy has of-
ten disengaged from their evolutions, and from this
mutual dependence of organs one on another, we are
left at freedom to begin at any part of the circle, and
treat of the general properties and functions of living
bodies.

We now venture on a rude sketch of the order and
manner in which these properties may be explained,
and in which the facts in general physiology may be
afterwards arranged. Another opportunity may pro-
duce something more full and correct. In the present
sketch, many imperfections will no doubt be found;
we already are able to foresee many from our own
inability to treat the subject according to its merit.
And perhaps the reader, who is possessed of temper
and candour, will impute some to the naivety of the
plan, and the present infant state of the science.

Without blaming the arrangement of D'Auzoy,
who is chosen no doubt be found; we,
we are able to foresee many from our own
inability to treat the subject according to its merit.
And perhaps the reader, who is possessed of temper
and candour, will impute some to the naivety of the
plan, and the present infant state of the science.

Without blaming the arrangement of D'Auzoy,
whole genius and labours we shall almost receive,
we have been induced to adopt the following, from those
reasons with which the reader is now to be acquaint-
ed.

Attending minutely to a living body, which alrea-
dy has escaped from the seed, the egg, or members
of the parent, which is wholly disengaged from the
placenta,

A) It is curious to observe how careless we are in annexing precise ideas to our words. Bonnet supposes
that in some world more perfect than ours, the rocks may be organized, plants may feel, brutes may reason, and
men may be angels. In this passage the form was all that seems to have entered into his idea of the man and
the brute, and so new was his notion of a perfect world, that one who believed in the metamorphosis, would
naturally imagine that he here had been fancying a state for the damned, where angry heaven was to fetter
the angel in the form of a man, a man in that of a brute, a brute in that of a vegetable, and a vegetable in
that of an uncouth rock. How much to be pitted would the creatures be that reasoned and felt, and were at
the same time more incapable of moving than an oyster or a limpet!
PHYSIOLOGY.

Preliminary observations.

The arrangement of functions in this article.

Placent, and depends for the future on the operations of its own organs (a), we may observe, that in order to live, it must be allowed the free use of air, as applied by the organs of—Respiration.

That, in order to grow, it must have likewise a supply of food, which is a subsistence somehow adapted to its constitution; and which, on being received into the system, is Prepared by—Digestion, Taken up by—Assimilation, Distributed by—Circulation, Affiliated by—Nutrition, And the whole carried on by means of—Stircation.

We next may observe, that in order to enjoy the free exercise of these functions, it must be freed from the more common and external injuries of its situation; and that this is done by certain integuments originally produced, and when it is necessary, afterwards renewed by that function; which, till we receive a new nomenclature, we shall venture to call by what may be rather an uncouth word—Integration.

We again may perceive, that these functions are all dependent on a general principle—Irritability:

% By which the system is rendered by its multitudinous susceptible of—Motion;
% Accommodates itself, to different circumstances by means of—Habit;
% Alters its shape by successive—Transformation;
% Produces the species by—Generation;
% And when the business of life is finished, is, after many a languid affection from the influence of—Sleep,
% At last subjected to the general fate of all living bodies—Death.

There we imagine are the general properties of living bodies; and such is the order in which we are now to take a short and cursory view of them.

Sect. I. Respiration

Is that function by which air is brought into the system, and by which it is prepared in particular organs, that in some respect succeed the placenta in the general economy. For as any interruption of the usual intercourse between the placenta and fetus in ovo proves soon fatal, so when that communication naturally ceases, and the new one succeeds between the lungs and external air, it is likewise found, that any preternatural interruption of this last is in all living bodies prefently attended with various symptoms of increasing languor, and in many with an almost insatiable death.

So essential is respiration to the system, that death its importance to living bodies.

Other phenomena equally demonstrate the importance of air to the living body. The frog leaps away wanting its heart; it survives the loss of the greatest part of its spinal marrow. Without its head, it lives for some days, and its heart continues to circulate its blood (c). Spallanzani took one from the back of a female, cut off his head, and after performing this whimsical experiment, saw the gallant return to his mistress grasp her in his arms, and finish the task which he had begun; And Borelli found, that eels and serpents, though their bodies be opened, and the whole of their vitæra be taken out, are able to move for a day after; and yet notwithstanding, in all these animals, the life is observed to be suddenly extinguished when the all-vivifying air is excluded. Even the smallest insect has died, and the plant lost its vegetative power, when retained for any while in a vacuum. Two fish was, when placed under the exhausted receiver, has started anxiously to the surface of the water in quest of fresh air; and finding none, has sunk to the bottom and expired in convulsions.

(a) To give a general view of the manner in which living bodies are nourished and supported in the egg and uterus, and before they begin to depend entirely on their own organs, we have subjoined a Plate (see Plate CCCXCL.) representing embryos of various kinds. The three first figures are from Swammerdam: the first is the membrane containing the infect, the second the membrane after the escape of the infect, the third is the infect itself, fed by absorbers, opening on different parts of the body.

The fourth, fifth, and sixth, figures, are from Grew: the fourth is a bean, spreading its seminal roots into the lobes. In the fifth, and sixth the lobes of the seed are seen converted into seminal leaves.

The seventh to the twelfth represent the transformations of the chick in ovo: the first of these figures is from Aquapendens; the rest are from Blanius, who got them from Malpighi.

The remaining figures are all from Aquapendens: the two last represent a fish that is sometimes oviparous and sometimes viviparous.

Plants and animals are here observed spreading their roots in a similar manner. The proper proportions are overlooked, not being necessary to convey the idea which is here intended.

(c) "Two days (says Dr Mooro) after cutting off the head of a frog at its joining with the first vertebra, I found it fitting with its legs drawn up in its usual posture; and when its toes were hurt it jumped with very considerable force. Its heart likewise continued to beat about forty times in a minute, and so strongly as to empty itself and circulate the blood.

"In several frogs, after cutting off the back part of the fix undermost true vertebra, I took out all that part of the spinal marrow with the cauda equina which they cover. The lower extremities were rendered insensible to common injuries, and lay motionless: yet the frogs lived several months thereafter, and the wounded parts of their backs cicatricized, and the bones of their legs which I fractured were reunited, the blood circulating freely in their vessels." Experiments on the Nervous System, made chiefly with the view of determining the nature and effects of animal electricity.
If objections should be made to these trials performed in a vacuum, if it should be said that under the receiver the shrivelled fruit swells and turns plump, that the body of the frog is strikingly inflated, that its turgid eyes grow prominent in its head, and that thin phials corked full of air are broke by its expansion; fill there are facts which do not admit of the like equivocal interpretation. All living bodies will die in the air which they have respired; and when ice covers the whole of the water, many of the fishes are known to perish: or if an opening be made in the ice, to hallow to the air, and rather than retire, quietly suffer themselves to be caught.

To this general dependence of life upon respiration, there occur but few things like an exception: there are some serpents and worms and crustaceous animals found alive in the hearts of the stones, some insects that were found in wood, and a number of toads which in different places have been taken from the hearts of trees and of rocks, where they left an impression, and where they were suppos’d in some caves to have lived for centuries without air. These facts, real or pretended, have been the cause of much speculation. Some philosophers, who imagine that nature is always obliged to act agreeably to those ideas which they have already formed of her laws, are, notwithstanding the high authorities by which some of these facts are attested, disposed to doubt them. General analogy, which regularly opposes singular phenomena, is upon their side; and without her concurrence, they will grant existence to no living body that will not submit to the old established modes of respiration. Others again, who would not presume to dictate for nature, who have long experienced that she is not forward to obtrude her secrets, and who can believe that she may have fill’d some to communicate, consider these facts as something new which the means to impart; and as one of the instances where she seems to deviate from general analogy in adhering to her grand accommodating principle by which she fits every living body for a certain range of varying circumstances.

These facts, receiving the facts as sufficiently authenticated, have studied only how to account for them. When stones therefore were thought coeval with the world itself, they supposed their toads to have sprung from the ova that were scattered through the earth at its first formation; they did not recollect, that if the earth must have existed before those ova were formed, and that if the stones were coeval with the earth, the ova could not have entered their substance. When they afterwards learned that the condensation of stones is an operation fill’ carried on in the mineral kingdom, they acknowledged their ova to be less ancient, but did not perceive that all the ova involved suppositions that cannot be admitted by sound reason. For how was an ovum to grow without air and without food? and how particularly was it to grow with such a force as to make an impression in a solid rock? This would imply a power of expansion scarcely to be equalled by gunpowder, and which we ought not to be rash in ascribing to the nutritive effects of abstinence and nothing. Were it not for the toad, the expansion itself might have found a solution in a theory of the Earth, which has cast all its stones in a foundery under the water, where the moisture might have rendered them apt to be formed with numerous cavities.

Perhaps the way to remove these difficulties concerning the toad, would be to ascertain its mode of existence in the heart of the stone. Suspecting that the air communicated somehow with the follicular cell, we procured a toad that was crawling out from its den in the evening. It was put into a glass just large enough to hold it with safety. The mouth of the glass was filled with cork sufficiently close to retain water; the glass was then laid on its side, and the animal respired for several days without discovering signs of uneasiness: but supposing that air might still be admitted, the cork received a covering of wax, and the animal died ten hours after.

From this experiment, and the fate of toads when put under an exhausted receiver, from an air passage in the crust of chrysalids, from the porous texture of the white speck, or the opening which the final leaves in the membrane that is spread over the mouth of its shell, we were led to think on d’Aubenton’s remark, that the inclosed toads might have breathed, and that the wood has been always cleft, and the stone broken, before it was shown how the external air was excluded.

On further reflection, our own experiment appeared inconclusive; and d’Aubenton’s remark, after close examination, seemed not entitled to much attention. He would have it supposed that a toad is lurking in every block of stone and of wood; and on this supposition would have an inquiry to be regularly made, whether or not there be any communication between this suppos’d animal and air; because, when the stone or wood is in fragments, the attempt to disprove such communication is in his opinion impossible.

But are we certain that the admission of external air would remove the difficulty? We are not so positive now as we were upon this subject. In the summer months, we recollect to have drownded frogs which were living in the fields, by keeping them some hours under water: but if we allowed them to rise to the surface, and inspire at pleasure, they became at last so accustomed to that element, that if the temperature was not much above that of spring water, they lay in the bottom not only for days but for weeks together.

In the winter season, it is well known that frogs are sometimes discovered in clusters below stones and under water in the neighbourhood of springs; and often seen in the bottom of ponds, marshes, and ditches, where water is collected, and the whole surface covered with ice. In this situation, we have frequently examined their sides and their nostrils and can venture to assert, that they did not respire in the same manner that they did when on land; for the moment that this animal is put under water, the palpitating motions of its sides and its nostrils are observed to cease; and Chaptal has seen them suspending respiration as it were at pleasure even when in air.

While they move, however, and exhibit indications of active life, we would not say that air is excluded. In the roots of plants, in aquatic worms, in polyopes, and in the placenta itself, the same organs seem to perform the double office of lungs and absorbers. When under...
under water, what are the functions of these organs in frogs and in toads? It is not disputed that in moist places they can live length without food; and some phenomena which have been observed relating to this subject appeared to us not unworthy of attention. In the beginning of the summer 1793, while we were making a few experiments on the nervous influence with some metals, a frog was taken out of the water in the dusk of the evening, and put into a deep and wide-mouthed glass till next morning; but next morning a quantity of water was found in the glass, the animal was dead, its mouth full of foam, and the greater part of its body covered with froth. The following autumn a boy came with a couple of toads wrapt up in tow. Till we had leisure to make our experiments, they were allowed to remain as they were for three days, in the corner of a room. When taken out, their colour was pale, their bodies much swelled, and a quantity of water collected between the skin and the muscles. When held in the hand with their head upwards, the water was evacuated downwards by the anus. It was one of the toads that afterwards died when confined in the glass without air. Its body was put into a solution of madder for two days; and when the skin and muscles were removed, the bones, which are still preferred, were found red. A live frog in the same solution, though allowed to breathe, expired in a few hours. In three days its bones became of the red colour, but not so deep as that of the toad's. Another frog died in the solution; but the bones, from age or some other cause, did not receive the colour of the madder. In all cases the skins were found red.

As we know not how far the great accommodating principle of nature may be extended, perhaps the absorbents opening externally may in these animals sometimes supply the place of the lungs, as the lungs supplied the place of the gills which they used when tadpoles, and as the gills had formerly supplied the place of a placenta, or the primary absorbents, through which they derived their nourishment in ordinary life. These stones which incline animals to be such as have gradually assumed the solid form, and those animals which have been inclined are known to be such as in other cases have been subjected to the tropid flate: But this flate has not been examined with all the attention which it deserves. From this flate, Bonmatthe says, in his introduction to Treptology *, that it is impossible to rofe the animal by the lowest knife, the rudest shock, or the deepest wound; the internal motion is just sufficiently to preserve the life from that decomposition to which animal substances are exposed. It retains only the form of what it was. It appears neither to live nor to grow; and the whole mass, if what is exposed to the air be excepted, is not sufficiently altered while the torpor continues. All the fenes are shut up; all their functions are entirely suspended: digestion is no longer in the stomach; all respiration has apparently ceased; and it has been doubted whether or not this function be in some cases at all retained. When the general warmth, however, returns, in five, in eight, or in ten months, according to that variety of climates between the frigid poles and the tropics, the animal revives. But the question is, if the first circumstances in which the animal became torpid, had been artificially or naturally continued, how long in this way might the different functions of life have been suspended; and how far are we warranted by the analogy of seeds and of eggs to lengthen this period of their existence, without supposing a decomposition or destruction of organs?

Experiments must tell what are the limits which nature has here prescribed to herself. New eggs, when covered with varnish, or placed under the exhausted receiver, are secured against the attacks of corruption. Bomare, in his Dictionary, has mentioned three, which, protected from air, were found fresh in the wall of a church after a period of 300 years (d).--

And if it be true that a stone found in a block of marble died as soon as exposed to the air, or if the parts in contact with air be the only ones in torpid animals appear to be changed, it would seem probable that a total exclusion of this varying and active element would tend more to the preservation of torpid animals, in certain infinances, than a free admission, which, in those cases where all vital functions have ceased, is regularly found a principal agent in their dissolution.

M. Heriffant of the French Academy was the first philosopher who, by means of experiment, thought of interrogating nature herself upon this subject. On the 21st of February 1771, he with great accuracy shut up three toads from the air, two of which were taken out alive on the 8th of April 1774. D'Aubenton says,† Encycl. after a period of 18 months; but in this instance we have decided on the evidence of Fontana, who has mentioned the dates. The two toads were again enclosed, and Heriffant died before there was a second inspection. D'Aubenton says, that when taken out their bodies were hard and shrivelled, and their whole moflely. A fourth toad that held the Animaux inclosed was heard to croak whenever the box in which it was confined happened to be shaken. Since that period the practice is common of confining snails in a sealed phial, where they exist in torpor for years.

These phenomena still excite wonder, but to wonder less, and examine more, would sooner procure us that information which we are wanting. In these observations concerning toads, have no circumstances been overlooked? Has it been determined whether they lived in the heart of stones, or, existing merely in a torpid flate, had come alive when exposed to air? We have seen a toad that was dead for two days; its body was opened; its heart was seen motionless, but exposed to air in a few seconds it began to beat. Considering the complex function of absorbents, we perhaps might conceive how a toad could live in the cliffs of rocks, or the hearts of trees, where there is moisture; but has it yet been determined whether all stones in which toads have been found supplied them with moisture? We at least are certain that they did not absorb

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(a) See Bomare, under the article Ouf; and a fuller account of the same eggs in the Dictionaire de Merveilles d: la Nature, under Ouf.
Physiology.

Respiration.

One of the toads was heard to croak after being inclosed. In making their experiments, has it, therefore, been thought a matter of indifference by the French philosophers, whether the animal was immersed alive in the full exercise of all its functions, or exciting only in its torpid state? and with respect to this singular state, (might not the question be fairly put), have its several kinds, have the causes which induce it, or the degrees to which it may be carried in different animals, been yet ascertained? Is not our knowledge of the torpid state at this moment principally the result of casual observation? Has it not been oftener than once supposed that the torpor of all animals is similar, or takes place to a similar degree? Have not torpid animals been therefore spoken of as general terms? and has it not been ascertained that they retain a portion of heat and internal motion? though some have been found congealed in the ice, and many been dried to such a degree that they could be revived only by moisture.

"That snakes and fishes, after being frozen, have still retained so much of life as when thawed to resume their vital functions, is a fact," says Mr. Hunter, "so well attested, that we are bound to believe it." How came it, we would ask, that fishes which had been frozen by this truly ingenious physiologist never recovered? He recovered parts of different animals which had been frozen! Had the snakes and fishes of which he had heard been only partially congealed in the ice? or had the fishes which he selected for the experiments been properly chosen? or may all animals with equal facility be made the subject of such experiments? and may all transitions from heat to cold, and from cold to heat, whether slow or rapid, if not in the extremity, be viewed as nearly of the same consequence? Are all facts and conditions of body equally favourable to this state of torpor? and will these causes which induce torpor by operating externally in the months of autumn be able to continue it by the like action in the months of spring? We can answer, no.

It has been said that animals subside in their torpid state by the reabsorption of fat. Has it therefore been proved that all animals, not to say living bodies, are poised of fat? or if they be, has it been demonstrated that they have a superfluous quantity to be reabsorbed? Has it been shown that their waste of fat is always occasioned by this reabsorption; or has this reabsorption in all cases been of that kind to counteract the effects of abstinence? If it has not been proved that all animals contain fat, and that this fat is reabsorbed in their torpid state, ought not the general attention to be limited? Granting that in many respects it were true, have not philosophers been here amusing themselves with logic, where they could have been employed in making experiments? Have they not ventured to give us conclusions, where we had reason to expect facts? and on this account has not their conduct been somewhat similar to that of navigators who, sailing along the coast of Patagonia on one side, and observing a few men of an uncommon stature, have from thence peopled the whole of the country with a race of giants? or rather to that of some calculators, who, from seeing a few parts of a continent, have ventured to give a map of the whole, to describe kingdoms that are yet unexplored; and by their skill in addition and subtractions to exhibit the figure, the extent, and proportion of lands unknown?

Leaving therefore the torpid state as one of those subjects with which we at present are little acquainted, and of which we therefore cannot speak with certainty in the general abstract language of science; it will naturally be asked, in what respect is air so necessary to all living bodies in their active state, and how it contributes to the regular performance of the different functions?

The ancients, who were led by the heat of the blood to suppose a vital spark in the heart, who had noticed the appearance of smoke in the breath, and who had observed that fire was extinguished when deprived of the air, naturally inferred that the end of respiration was to support their imaginary flame, to ventilate the blood in the arteries and lungs, and to keep alive their vitifying spark. They were far, however, from being agreed as to the manner how this was effected. Some were of opinion that a certain principle of the air was absorbed, to which they gave the name of the "pulvis" of life; or the food of the spirit; while others were persuaded that the air acted as a refrigeratory, and was merely intended to moderate the fire, to assist in expelling the fuliginous vapour, and preserve the effluvium in an equal temperature.

The moderns, who, after all their researches, have been unable to discover this vital spark of the ancients, are more puzzled to assign an adequate cause for the heat than for any cold which they discover. To account for this singular phenomenon, they have been running nature for causes; and perceiving that putrefcence, mixture, and friction, are in many instances accompanied with heat, have thence conjectured that they sometimes operate in producing the warmth of the living body. But these are theories which have been imported from the laboured, the laboratory, and mechanical shop, and which have never yet been countenanced by physiological facts and observations. No one has been able to show that putrefcence exists in a healthy state, except in the faces; no one has proved that any mixture which regularly occurs in the alimentary canal or vessels, generates heat; and though friction has been a favourable hypothesis, yet those circumstances, in which it evidently produces heat, have not been discovered in the living body; and it is not determined whether it be there a friction of the fluids, a friction of the solids, or a friction of the fluids and solids together.

Of animal heat, the most rational theory, we think, is one which properly belongs to the last century; it is confirmed by modern discoveries, and has attributed this heat to respiration. Many had observed, that those animals which require most have the warmest blood (e).

Ref. of Verheyen.

(e) Quod autem animalia calidiora fortius respirent, non probat respirationem illis potius datum esse, sicut vanitas refrigerium, quam calorem illum intennum product a validiori respiratione: imo potius non tantum a que, et magis probable apparebat: quia secundum omnium sententiam calido vivimus, frigido extinguimus.
Lower demonstrated, that this blood received a new and a brighter colour in passing through the lungs (a). Verheyen and Borelli both proved, that the air left something by coming in contact with that organ (a). Mayow showed, that this something which the air loses is contained in nitre (a). Experience taught the workers in nitre, that this something was absorbed from the air (1); and Verheyen remarked, that it is also absorbed by the lungs; and is probably that which maintains combustion; which qualifies the air for giving support to animal life, and imparts to the blood the vermillion colour (k).

How well the whole of this reasoning was founded, is proved by the late discoveries of Priestley and other chemists. There is now obtained, in a separate state, an aerial fluid, which maintains both life and combustion, and gives a vermillion colour to the blood. It is extracted in a very large quantity from nitre; is one of the component parts of the atmosphere, and the vital principle of that element; without which, in most animals, life is extinguished. From some phenomena which happen in combustion, it has been termed principium fritte. It was called dephlogisticated air by Priestley the first discoverer; as the great acifying cause in nature, the French nomenclature has given it the name of oxygene gas; and, as one of the causes on which the existence both of fire and of life depends, it is named oxidum or vital air.

Late discoveries have shown farther, how this air may in respiration produce heat. From the most accurate investigations, it appears, that caloric, or the principle of heat, is a distinct substance in nature; that it combines with different bodies in different degrees; that it is the cause of fluidity in all; and that, in proportion to that capacity which they have for it, and to that distance at which they are removed from the fluid, the more or less caloric they contain.

Aciform bodies being all therefore exceedingly fluid, it must be evident, that when they are fixed or contained in the blood, and made to approach nearer fluidity, a quantity of heat must be evolved. A part of this is very plainly evolved in the lungs, where the air is absorbed, as appears by the breath; and a part evolved by the action of veins, as appears from nearly an equal heat over the fiadem, from the partial heat of a morbid part, and the sudden transition from heat to cold, and from cold to heat, over the surface, when the veins are affected by either internal or external friction. When the heat, thus evolved by the gradual fixation of that body with which it was combined, has been successively, in making its escape by the lungs and integuments, the blood returns in a dark and a sluggish fire by the veins, and mingles again with the penial fluid, which before gave it spring, activity, and life.

Of that oxygene which remains in the fiadem, part is employed in forming different saline combinations and supplying the waste occasioned by that constant re-absorption; which, from many experiments that have been made with solutions of matter, is known to take place in the solid bones. The use of that oxygeneous gas which returns with the breath, is best understood after knowing its affinities. Its basis oxygene, combining with hydrogen, which is the basis of inflammable air, forms water; and combining with carbon, the carbonic acid. It carries, therefore, back with the breath a part of the carbure produced by the flight combustion of the blood, and a quantity of hydrogene arising from the watery fluid decomposed.

But oxygeneous gas does not alone enter the lungs. Of Gases which compose the atmosphere which we breathe, these fall, though intended chiefly for other beings different from man, which are in immense numbers on the globe, but which, like him and the nobler animals are not formed of the air in respiration.

Ut proinde non videatur aliquid a natura datum esse, quo intendatur frigus vitae contrarium. Verheyen, Trad. 2. cap. 7. de Usu Respirationis.

Postquum circulatio fungini immutatur, diu creditum fuit fungini venenum colore illo coccineo ruribus indii in ventriculis cordis, et præcipe ubi calor, quem judicabant ilius coloris authorem, est intenfior: At negotium ilud peragii in pulmonibus, nempe respirationis beneficio, evidentior olendit cl. Lowerus experimenti. Ibid.

Inquiramus qualis fit ilud aerem adeo nobis et multis animalibus necessarium. Ut eis defecut vitæ extinguator scientiæ. Vulgari numeram aeris non poterit, cum illum per measus notabiliores fungini immittit conveniret, fitque experientia certissimum, animalia respirationis non tantum aere simpliciter: fed etiam recenti continuo indigere, unde consequendum est tantummodo aliquas partibus subtiliores ab aeris seceri, et maese fungini immittit, quibus spoliatus ad ulterior respirationem fit indigenus.

Et quidem veritatem, inquit Mayow, particulis quidam indolis nitrocinus, eique valde subtiles, agiles, fummeque fermentatissimi ab aeris pulmonum minisfero seceri, inque oris multum transitum. Adeo enim ad vitam quamvisque id solo aeris respirationem eft, ut ne tale quidem, in terra, ad quam aeris accensus praeclauritus vegetari possit; fin autem terra alta aeri expolita, fase loco secundane denuo impregnatur, ea demum plantis alendis iterum idonea evadet.

In aerem autem quid nitrosum contineri non enti vulgari nitri confeciores, quia terram aut laterum fragmenta ex quibus nitrum elisivire intendunt, aestie liberi diu mutumque exponunt; utque ab eodem unique in tangente ac perfluente umerius impregnatur, capitis vertunt, atque ita furorum tumfuntum et laborum amplissimorum mecum mercedemque referunt.

Infus, si poti confecionem nitri terra aut laterum fragmenta exponantur libero aeri, ea demum poti aliquam temporis spatium, quodam fale nitrosum abundabant. Eft igitur veritatem, aerem gratia ejusdem materiae et vice ab omnibus continuationi et ignis accensioni necessarium esse: præcipue cum rurias experientia detect ruborem funginis e corpore edunt, per additionem falsi nitri intentioni iri in eodem profundus modo secutus, per respirationem in corpore vivente. Ibid.

These are nearly the proportions.
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ed to breathe the empyreal air, must notwithstanding be of some important and essential use to all living bodies. It has accordingly been found by experiment, that pure and unmixed oxygeous gas cannot be breathed for any very considerable time without danger; that some azote is contained in the blood, and has been extracted from the muscular fibre, when properly treated with the nitric acid. According to Berthollet, five of its parts with one of hydrogen forms ammonia or volatile alkali; which dispels the glandular tumours of the body, and prevents the coagulation of blood and the thickening of mucus which arise from acids (m).

The azotic gas may therefore in part unite with the carbonic acid, which is ⅓ of carbon and ⅔ of oxygen, may also be necessary in regulating the effects of the other two. In aerated water, its uses are very generally known: it allays the pain of the urinary bladder when excited by calculi; it has been employed in the cure of wounds, and been thought useful in the pulmonary phthisis. It is generated in the lungs of those animals which respire oxygene. In small proportions it favours the growth of the vegetable tribes. These tribes readily decompose it; and, with the addition of other prepared oxygen and water, restore what is pure to the general mafs of the vital fluid, that plants and animals might thus live by the mutual performance of kind offices.

We return again to animal heat. Every theory that pretends to account for animal heat, ought also to account for that singular equality of heat which the sytem prefers, or endeavours to preserve, in different temperatures. The above theory explains it simply in the following manner.

Venous blood, if exposed to the air, is known to absorb a portion of oxygen, and assume that colour which it has in the pulmonary veins and aorta. Suppose an absorption of a similar kind taking place in the lungs, a fact which may be proved by decticive experiments; it is plain that the oxygen by this absorption must recede from its gaseous or fluid state; that a quantity of heat must be therefore evolved, which, along with the heat of the refulent blood, is carried away by that vapour which issues from the lungs. In the course of circulation the oxygen will naturally incline with hydrogen to form water; it will tend likewise to the formation of many other compounds; and, as it enters into new m accusation, and becomes further removed from gaseous fluidity, it must still be giving off a portion of heat. If the surrounding temperature be cold, this separation will be easily effected. The caloric will, in that case, be greatly absorbed from the interior surface of the lungs and exterior surface of the whole body. The oxygene, meeting with the necessary temperature, will readily pass into new forms; and the venous blood returning to the lungs, will demand a supply which

(m) Weak volatile alkali dissolves mucus, whose morbid viscidity Fourcroy has ascribed to too great absorption of oxygene.
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69 How the natural heat of living bodies is to be effimated.

The temperature of plants is still lower. The heat of a tree which the very ingenious Hunter examined, though several degrees above that of the atmosphere when below the 56th division of Fahrenheit, was always several degrees below it when the weather was warm. When taken out, the sap was observed to freeze at 32°; while in the tree, it would not freeze below 47°. The very profuse periphrasis of vegetables greatly moderates the heat in their surface; and as air which absorbs moisture expands, and becomes thereby specifically lighter, there is a regular current produced, and evaporation rapidly promoted by the dense air displacing the rarefied.

To adopt here a general language with respect to the heat which is developed in all living bodies, it is proportioned to the quantity of matter which is by means of the vital powers reduced to a state more nearly approaching solidity; to the kind of the substances which are reduced, and to the degrees and kinds of the reduction.

In all living bodies there appear to be certain degrees of heat, peculiarly fitted for carrying on their various economical operations. What these are, in the different kinds of plants and animals, is not known. The bear, the hedge-hog, the dormouse, and the bat, may probably not digest when reduced to 73°, 70° or certain 80°. The frog, however, will digest at 60° (x); and the birch before it arrives at 47° (o). It would seem that respiration, besides imparting aerial food, was intended to preserve and regulate these different degrees of heat. It raises the heat after a meal; it suffers it to fall in the time of sleep; it withdraws the supply when the atmosphere is warm, and increases it again when the atmosphere is cold. It should therefore be remembered, that heat merely is not the object which is solely aimed at in respiration. All living bodies have their congenial degrees of heat. The regulation of these is important: on the one side, it prevents the dissipation, on the other the coagulation, of their fluids; it preserves the living power of their organs; and, by a natural and proper temperature, affords their action a mixing, compacting, in decomposing, and in variously preparing the different parts for secretion, excretion, absorption, reabsorption, and assimilation (p).

As various fixations of the vasciulat fluid are regularly taking place in the different parts of the living body, and as air is not the only fluid concerned, it should almost be unnecessary again to observe, that the whole of the heat is not evolved in the lungs, nor the whole that is evolved diffused from air.

(n) See observations on certain parts of the animal economy by Mr Hunter. We allude here to his experiments and observations on animals, with respect to the power of producing heat.

(o) See Dr Walker's excellent Paper on the motion of the sap in trees, 1st volume Philosophical Transactions, Edinburgh.

(p) The ingenious Dr Crawford has published a theory of animal heat different from that which we have here presented to our readers. Assuming as a fact, that heat and phlogiston are two opposite principles in nature, he goes on as follows.

"Animal heat seems to depend upon a process similar to a chemical elective attraction. The air is received into the lungs containing a great quantity of absolute heat; the blood is returned from the extremities highly impregnated with phlogiston; the attraction of the air to that of the phlogiston is greater than that of the blood. This principle will therefore leave the blood to combine with the air: by the addition of the phlogiston the air is obliged to deposit a part of its absolute heat; and, as the capacity of the blood is at the same moment increased by the separation of the phlogiston, it will instantly unite with that portion of heat which had been detached from the air.

"We learn from Dr Priestley's experiments with respect to respiration, that arterial blood has a strong attraction to phlogiston (become a vague word with different meanings in different authors). It will consequently, during the circulation, imbibe this principle from those parts which retain it with the least force, or from the putrefactive parts of the system: and hence the venous blood, when it returns to the lungs, is found to be highly impregnated with phlogiston. By this impregnation its capacity for containing heat is diminished. In proportion, therefore, as the blood which had been dephlogisticated by the process of respiration becomes again combined with phlogiston in the course of circulation, it will gradually give out that heat which it had received in the lungs, and diffuse it over the whole system.

"To account for the stablity of animal heat, he observes, that as animals are continually absorbing heat from the air, if there were not a quantity of heat carried off equal to that which is absorbed, there would be an accumulation of it in the animal body. The evaporation from the surface, and the cooling power of the air are the great causes which prevent this accumulation: and these are alternately increased and diminished in such a manner as to produce an equal effect. When the cooling power of the air is diminished by the summer heat, the evaporation from the surface is increased: and when, on the contrary, the cooling power of the air is increased by the winter colds, the evaporation from the surface is proportionally diminished." See Crawford on Animal Heat, p. 73—84.

Besides, supposing that the principles of fire and inflammability are opposites in nature: this theory supposes that the blood, while in the lungs, gives out phlogiston and takes in heat; but that, during the remaining course of circulation, it gives out heat and takes in phlogiston: it supposes, that this phlogiston is collected from parts that retain it with little force, or from the putrefactive parts of the system; it is not said where it supposes
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It may further be remarked, that the whole of the
air does not enter by the lungs; much is contained in
the liquid and solid parts of the food. It is
extracted often in the process of digestion; and when the
organs are vigorous and healthy, is made subfervient to the
general economy. If the organs, however, should happen
to be languid, it corneus their authority, which
cannot be enforced; from being friendly, it soon becomes
incommode to the system, and threatening danger
accumulates, not only in the flamoch and intestines,
but in other cavities. It has been found in the cellular
membrane; in certain vessels formed for itself; in the
uterus; in an abces; and in gun-shot wounds; It has
sometimes burst from the vagina with a fort of
noise*. And in a nephritic complaint of a horse, we
have observed it flowing in a stream from what the
farriers denominate the **breath.**

In some kinds of aquatic plants, in e.g., and in a
variety of fishes, there are certain vessels containing
air, which seem to have certain necessary functions.
Allotted them by nature. In the plants and in fishes they
were once supposed to have been wholly intended
for swimming (q.). It was remarked, that fishes
which remain constantly at the bottom of the water
have no air vessels; and that a fish whose vessels was
burst by means of the tarcellian vacuum, though it
lived for a whole month after in a pond, was never
able to rise to the surface. The pravice, however,
which some fishes have of ascending at times to inhale
air, and defending after their vessel is filled†; the
communication which, in some fishes, this air vessel
has with the stomach; that power in the pigeon and
some other birds of introducing air into the crop‡;
and lastly, the air which is uniformly found in
egg-eggs—would tempt us to believe that these
natural collections of air, with their other uses, may per-
form some essential service in nutrition.

Having explained the general intention of respiration,
we are now to inquire, what are the kinds of
respiratory organs, and in what manner their functions
are performed? The preceding table has in some mea-
ure made us acquainted with the subjedt. Some ani-
mais breathe by a trachea and lungs; insects, by either
fluniglata or trachea, open g into air vessels; plants,
by air vessels and leaves; fishes, and numbers of the
watery element, if they do not breathe, at least receive
air by their gills; the fetus in ovo, the polypus tribe,
and many more organized bodies, by the same organs
which convey their food.

The absorbents appear to be the first and most ge-
neral way by which living bodies are supplied with
air: the mouths of these vessels are like small tubeicles,
scattered over the body of the infect while weapt in
its membrane. In the horse and the bird they are
blood-veessels spreading on a membrane, and deriving
nourishment from the uterus or ovum, that had been it-
self nourished by absorbents: in a cow, they are vessels
which, spreading on a membrane, terminate in glands;
these glands being opposite to others which adhere to
the uterus; and the membranous and uterine glands,
when in contact, inflating a third gland like a kernel.
In man, they are vessels spreading on a membrane, and
entering a large glandular body called the **placenta.**
In the mouse and the hare, they are likewise vessels
branching on a membrane and entering a placenta;
this placenta, when it appears to be fixed, receives
large veins from the parent, and which may be either
inflated or injected from the cavity of the uterus.

These which are properly respiratory organs, exer-
cise not their function till circulation and nutrition are
tory organs begun: though, if the observation of Garman be just, that the air may become a real food for the class of
eating spiders, or if it be true that the larve of ants are
as of several insects of prey, increase in bulk, and un-
dergo their metamorphoses without any other nourish-
ment than air §, this law is not universal. It may, f Chaptal's
however, be doubted, whether some moisture be not elec-
trons absorbed. With regard to the ant, we have reason to
believe that the observations on such a conclusion
was founded on have not been accurate.

Not only are the respiratory organs thus late in ex-
ercising their functions; in many vegetables a great
part of them is annually renewed and laid aside in the
torpid state. In those insects which undergo the most
remarkable kinds of transformation they suffer a change;
and in all those animals which spend their earlier days
in the water, and afterwards come to live in the air, they
are altered in kind.

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* See observations on Digestion, by the late Mr. Hunter, 
† Borelli de Motu Animalium, cap. 23. De Natu.
‡ Chaptal’s Elements of Chemistry, vol. i. § 5. chap. 2. 
§ Anatomy and Description, of the De-molluske of Namidia, by the French Academy.

**Respiration.**

Supposes that the blood, in passing through the lungs, receives heat only: that the whole of this heat is evolved
in the lungs by precipitation; and is thence diffused over the system as from a centre or focus: in which case, we
must also suppose that the lungs are the warmest part of the body; and that the heat of the other parts will
be in proportion to their distance from the lungs, or the length of the vessels through which it has passed.

As for the liability of animal heat, this theory ascribes it entirely to foreign causes; to the different degrees
of evaporation; or to the varying states of the air.

The singular meaning which this theory gives to the word **phlogiston,** must strike everyone who knows the
eymology of that word. The celebrated Stahl found it in the Greek; and applied it naturally to signify
pure elementary fire, or the most pure and simple inflammable principle in a state of combination. Mr. Kirwan
has since used it to express hydrogen: Dr. Priestley has called the azotic phlogisticat air: and Dr. Crawford,
who seems to take phlogiston in the sense of Mr. Kirwan, speaks likewise as if he understood it in the sense of
Dr. Priestley. Mr. Kirwan's phlogisticat air, however, will not kindle without oxygen: Dr. Priestley's will
exinct with fire: and Dr. Crawford's is directly opposed to that principle. These are not the ancient doctrines
of Stahl: they are new ideas expressed in one of his antiquated words: the meaning of that great man is neglected.
The sounds which he uttered, like the dead language of an old ritual, are among a few still in veneration.

(a.) Borelli has shown how, by contradicting the air vessel or allowing it to expand, the fish can rise, sink, or
remain stationary in the water. Borelli de Natu.
In all living bodies the proper function of one part of the respiratory organs is, to secrete from the water or air that particular aeriform fluid which mingles with their juices, and which is necessary to life and nutrition. In many cases these organs are placed externally, and are always in contact with the air or water from which they secrete. In other cases they are lodged internally; and air or water are then alternately admitted and expelled by varieties of organs which serve as auxiliaries.

The plants secrete their aeriform fluid from water and air. They receive air along with the liquids of their abscissae, which open on the roots, the trunk, and the branches, and upon the inferior surfaces of leaves; or, if nature has plunged these leaves under water, the abscissae open and imbibe their fluids on both sides. In many, however, the upper surface of the leaf is intended to inhale air. Bonnet observed, that when this surface was applied to the water the leaf died soon; but when the lower surface was applied, it lived for months. It has also been remarked, that the upper surfaces of some leaves will repel water; and that the death of the leaf will ensue when its breathing pores are obstructed with oil. We hence learn why aquatic plants rise up to the surface of the water and spread their leaves in the open air; and as it is proved by Ingenhoust and others, that the respiration of many leaves is quickened by light, we see a reason why plants growing in a dark room turn to the place where light is admitted; why the flowers and the leaves of many plants follow the diurnal course of the sun; why moonshine in the open air: and as it is proved by Hunter And opium constricting the pulmonary appendages in birds, that they are to the oifich and not in the bat, he supposed that they were appendages to the lungs. In &c. amphibious animals, in the snake, viper, and many others, he observed, that “the lungs are continued down through the whole belly in form of two bags, of which the upper part only can perform the office of respiration with any degree of effect, the lower having comparatively but few air vesels.” In these animals, the use of such a formation of the lungs was to him evident. “It is in consequence of this structure,” said he, “that they require to breathe less frequently than others.” From this reasoning he naturally

(a) See the spiral rings in the pulmonary tubes of a bee, Plate XVII. fig. 10. Smamerdam’s Book of Nature, or History of Insects.

(b) The name observations were long ago made by the immortal Harvey. After observing that both the transverse and longitudinal membranous diaphragms of birds contributed to respiration, he adds, “Et alia, ut nunc taceam. Avic predaeque amphibiae non modo facilitum respirant, sed vocem etiam in cantu diversi modo modulatur: cum tamen ejus pulmones lateribus et colitis adeo affixi sunt, ut parum admodum dilatari, affligere, et contrahere possint.”

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It is generally inferred, that the motion of flying might render the frequency of respiration inconvenient: and that a reservoir for air might therefore become singularly useful. The bat and the ostrich, however, are here as formidable objections as before. The bird respires frequently when at rest, and when it flies to its bottom from the hawk; that frequency seems to have been increased by what is a general and a common cause, an increased degree of muscular exertion. Had air cells been intended merely to prevent the effects of a rapid motion on respiration, we might expect to see them in greyhounds and a number of quadrupeds, much more readily than in fome birds whose flights are neither rapid nor long.

This great physiologist was not aware that the circumstance most peculiar to birds was not their art of flying, but their feathers, which contain a large quantity of air, and which require a regular supply, whether they soar on the wings of the eagle, or remain on the ground, attending the ostrich (r).

Both in amphibious animals and birds, the air of the vessels has passed the respiratory surface of the lungs. In the trachea of plants and the pulmonary tubes and vessels of plants, it is only proceeding on its way to be respired. Would it be worth while to inquire whether vegetable substances, and those which are called corneous in animals, require a different preparation of air from what is the common preparation of lungs? whether hair grows beft, or the cuticle thickfled over soft parts that are cellular and spongy (v)? and whether the animals that bear horns have larger sinuses in the frontal bone of their cranium than others? From the general diffusion of air through the birds, and the situation of their vessels beyond the lungs, it would appear that the pulmonary viscus in these animals does not respire or secrete air for the whole system; and we are certain, that in plants and insects most parts re- - spir the air for themselves, and that there is no particular part appointed to secrete air for the whole.

Air serves respiratory organs as those which which called the organs in which an aeriform fluid is absorbed by their liquid contents, as thefie fly by either wholly or in part, in their course through the system. It was long denied that any absorption of the air took place from the pulmonary surface; and speculative reasoners had attempted to prove that no air could pass to the blood through the membranes of the lungs, because air had refuted upon some occasions to pass through pieces of wet leather that had been exposed to it for that purpose. Borelli, however, endeavoured to show how air in the lungs might mingle with the blood, and how some always disappeared in respiration. There are few doubts now entertained on this subject. Venous blood inclosd in a bladder by the celebrated Priestley discovered such an attraction for oxygen, that it absorbed the aeriform fluid through all the coats of the refilling medium, exhibiting an infallible and beautiful illustration of the chemical affinities which take place in this function.

The reader will observe, that the two words respiration organs are here employed in what may be called respiration arteries a particular fenece. The truth is, there are two or kinds of respiratory organs, which, though sometimes included in the general expression, should always be considered as perfectly distinct. The firft kind comprehend those in which the water and air is decomposed; the second, thofe by which these fluids are properly applied to the respiring surfaces of the former. We observe these ftaf in the fluttering motion of the leaf itself, or in that tendril which turns the surface of the

(r) "The use of this retention (of the air in the vessels of birds) is not well known to us, at least in respect of the upper pouches; so in regard of the lower ones. The use of this retention has been explained in the description of the ostrich; where it was shown that there is a probability that the air contained in the lower pouches serves to compress the viscus, and make them rise upwards. Some do think that this retention of air serves birds to render them lighter in flying, like as the bladder which is in fsh helps them to swim. And this conjecture would have some foundation, if the air contained in the bladders of birds were as light in proportion to the air in which they fly, as the air contained in the bladders of fsh is in proportion to the water in which they do swim. But to lay something which hath at leaft a little more probability, waiting till we have a more certain knowledge of the truth and use of this retention of air, we consider that the birds commonly rise very high, and even to the place where the air is a great deal lighter than it is near the earth, might be deprive of the principal advantages of respiration for want of an air whose weight might make on the heart and arteries the compression necessary to the distribution and circulation of the blood: If they had not the faculty of containing a long or a portion of air, which being rarefied by the heat which this retention produces therein, might, by enlarging itself, supply the defect of the weight of which the air that they do breathe in the middle region is destitute. For if there be a great many birds which do never rise very high into the air, whose lungs have notwithstanding these bladders in which the air is retained; there are also a great many that have wings which they ufe not for flying. And it may be observed, that there are found some parts in animals which have not any ufe in certain fpecies, and which are given to the whole genus, by reason that they have an important ufe in some of the fpecies. It is thus that in feveral kinds of animals the males have teats like the females; that moles have eyes; ostriches and caffowars wings; and that land tortoises have a particular formation of the vessels of the heart which agrees only with water tortoises, as it is explained in the description of the Tortoise."

The Anatomical Description of a Caffowar, by the Royal Academy of Sciences at Paris. We can hardly anfwer for the juftnefs of this reafonung, which maintain that the genus has ufeles parts merely in compliance to the species.

(v) Nails and hair grow after death, and a quantity of air is evolved in putrefaction.
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82 Auxiliary organs of respiration, the leaf to the sun. We see them producing these oscillatory motions in the branching gills of the pulm arboriformis. When the breathing surface is within the body, we discover them again in the trachea of plants, whose cavity is formed by a spiral fibre that is seemingly intended for some kind of peristaltic motion. We detect them likewise in the pulmonary tubes, in the spiral rings, and in the abdominal movements of insects. We see them in fillets swallowing the water and propelling it onward through the fringes of the gills. In the frog, we note them by the motions of the pouch between the sternum and the lower jaw. After this animal is divided transversely behind the fore legs, this pouch continues to fill and to empty the pouch between the jaw-bone and sternum, and propelling it forward. When the fore legs, this pouch continues to fill and to empty the pouch between the jaw-bone and sternum, and propelling it forward. We note them by the motions of the pouch between the sternum and the lower jaw. After this animal is divided transversely behind the fore legs, this pouch continues to fill and to empty itself downwards by the trachea where the lungs were. When the whole integuments and some of the muscles between the jaw-bone and sternum are removed, we see how the pouch was dilated and contracted by a broad cartilage connected with the trachea, and attached by muscles to the inside of the sternum and the neighbouring parts. When the pouch is enlarged, the air rushes in through the two nostrils at that time expanded; and when it is contracting, the glottis flares up with an open mouth to the middle of the pouch, and the air is pressed down through the trachea to the lungs. This amusing sight will sometimes continue for a whole hour. In man and all the warm-blooded quadrupeds, the thorax or cavity where the lungs are placed is dilated and contracted by the diaphragm and muscles attached to the ribs. In the time of dilatation the glottis opens, as we see in birds: the air rushes in, supports the incumbent weight of the atmosphere, and enables the thorax to expand wider. The expanding powers having made an effort, their antagonists succeed, exert their force, and the air is expelled.

In applying either the water or air to the breathing surface, all these auxiliary organs are afliffed by the circumambient fluid which presses equally on all sides. When a Florentine flask is applied to the mouth, and all communication between the larynx and external air entirely cut off, it requires an effort to bring the air of the flask into the lungs. The weight of the atmosphere is therefore afflizing in respiration; and the air, whether in the lungs or the thorax (x), must not be so dense as that which is without. When Verheyen perforated the thorax of a dog, and restored the equilibrium between the external and internal air, the respiration of the lungs ceased, though for some time the alternate admission and expulsion of air was continued through canals introduced into the wounds.

It cannot forely be asked here, how the pressure of the atmosphere should be afflizing in raising the thorax and thus seemingly counteracted? The heat of the lungs expands the air as soon as it enters. The air rapidly absorbs moisture; and though not usually noticed by philosophers, yet the sudden expansion, which is always the consequence of that absorption, is a very general phenomenon in nature. By this heat, or by this absorption, the air would occasion greater dilatation, were it not for the lungs, which seek to collapse the cartilages of the sternum, which seek to recoil; and the stretched-out muscles, which either spontaneously, or directed by the will, endeavour to contract and produce expiration.

Having seen how the air will rush in on the opening of the glottis, we may also conceive how the fluttering of the glottis will refleet the force of internal expansion, and support a weight laid upon the breast. The confined air will expand equally on all sides, and the pressure must be great before the space which falls to the glottis can exceed its own muscular force and the weight of the atmosphere. It is this distended pressure of fluids that produces such startling wonders in hydraulics; and which explains how the droppings of the ureters should expand the bladder even to a palsy, and overcome the abdominal muscles.

To account for the action of these organs which serve as auxiliaries in respiration, there have been supposed an appetite for air which prompts as a stimulus an influence of the will, though we breathe while asleep; and a natural instinct, which indeed may exist, but explains nothing. In specifying the several organs concerned, we have heard of an expansive power of the lungs, of a certain pressure of the phrenic nerve, of a muscular diaphragm, and of the action of oblique intercostals. But these explanations are from a limited view of the subject. The expirations used may indeed be general; but their meaning is particular, narrow, and confined; and their allusion is only to man, or perhaps to a few of the warm-blooded quadrupeds: for where are the intercostals of the frog? where is the muscular diaphragm of birds? where the pressure of the phrenic nerve? and where the expansive power of their lungs?

It is fortunate for man that these assisting respiratory organs are in some measure subject to his will. By this subjection he produces vocal sounds when he pleases, divides it into parts, varies it by tones, forms it into words, and enjoys the distinguished and numerous advantages that may be derived from a spoken language.

Sect. II. Digestion.

88 As respiration succeeded the placenta in one of its offices by maintaining life, the function of digestion succeeds it in another by either continuing or supporting the growth of the living body. It depends on respiration for a portion of heat, and is that function on which the liquid and solid food undergoes its first preparation in the system.

Though gaseous fluids, including the principles of heat and light, may be proved to nourish and compose the substance of all living bodies, yet part only can enter the system in a gaseous state. This part is changed by the lungs, or by those fluids which they contain. The organs of digestion, before they can die, and act on aerial bodies, must have them reduced to some new form. For the food of vegetables, this form requires to be water, whose 100 parts are found to consist of 84 per cent of oxygen and 15% of hydrogen. See Water.

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When the gaseous have passed through both the watery and vegetable flates, they, as juices or solids, become the food of a great many animals. These animals produce new changes, and by their preparation the gaseous become the food of others which are called carnivorous; and then the carnivorous and all living bodies, when the vivifying principle has ceased within them, and when they are hastening to a state of dissolution, are devoured by others who feed on corruption, are partly converted into water and gas, and become in their turn the food of the kinds on which they had fed.

As these effects of the digesting and assimilating powers are more surprising than any chemical processes of air, it may not be unpleasing to take a more particular view of them. It has long been observed, that those animals which are not carnivorous feed upon plants; and, since the days of Van Helmont and Boyle, it has been suspected that plants live upon water and air. This supposition has now been confirmed by numerous experiments. Plants have been raised from distilled water without earth, and, instead of requiring a vegetable mould, have spread their roots in moss, in paper, in cotton, in pieces of cloth, in pounded glass, and powder of quartz. From these facts, the ingenious Chaptal has been led to suppose that foils act but as so many sponges, affording water in different proportions, and in different ways; and that all that the plant wants from the soil is a firm support, a permission to extend its roots where it chooses, and that proportioned supply of humidity which will secure it against the alterations of being inundated or dried up. To answer, however, these several conditions, he allows it to be necessary in many cases to make a proper mixture of the primitive elements, as no one in particular possesses them. Siliceous and calcareous earths (he says) may be considered as hot and drying, the argillaceous as moist and cold, and the magnetian as possessing intermediate properties. Each, in particular, has its faults, which render it unfit for culture. Clay absorbs water but does not communicate it; calcareous earth receives and gives it too quickly; but the properties of these earths are so happily opposed that they correct each other by mixture. Accordingly we find, that by adding lime to an argillaceous earth, this last is divided, and the drying property of the lime mitigated, at the same time that the stiffness of the clay is diminished. On these accounts it is that a single earth cannot constitute manure, and that the character of the earth intended to be meliorated ought to be studied before the choice of any addition is decided on. The best proportions of a fertile earth for corn are three eighths of clay, two eighths of sand, and three eighths of the fragments of hard stone.

The advantages of labour consist in dividing the earth, aerating it, destroying useless ornoxious plants, and converting them into manure by facilitating their decomposition."

So far is vegetable mould from communicating any thing new to plants, that it rather owes its formation to them*, and if sea salt should at times be requisite to marine vegetation, it is to be remembered that salts, sulphur, and lime, are all products of organized bodies; that iron (v) itself has been discovered in plants and animals; and that even diamonds, quartz, crystals, firs, gypsium, &c. are found only in those earths that are partly composed of an impoverished vegetable residue, which provident nature seems to have reserved for the reproduction or preparation of the earthly metallic substances of the globe; while the vegetable mould on these organic parts that remain are made to serve as nourishment for the growth of succeeding plants (z).

If those earths in which plants are reared, and which contain no vegetable mould, should ever be sensibly diminished in weight, a circumstance, we believe, which seldom takes place if proper precaution be used to prevent it; yet if it should happen, it should not in that case be forgotten that gaseous are the general elements in nature; that they mix intimately with the hardest bodies; and that this sensible diminution of weight

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*(v) Whether iron exists formally in organized bodies, or is the result of decomposition, it derives its origin ultimately from gaseous. Blood gradually decomposed by putrefaction yielded not only mere salts and lime, but much more iron than blood, suddenly decomposed by lime. Though the greater part of an animal or vegetable, therefore, be without such substances as salt, lime, iron; yet when decomposed its parts may recombine, and thus produce them. See Surgical and Physical Effects, by Mr John Abernethy.

(z) "Vegetables in their analysis present us with certain metals, such as iron, gold, and manganese. The forms are near one-twelfth of the weight of the ashes of hard wood, such as oak. It may be extracted by the magnet. We read in the Journaux de Physique an observation, in which it is affirmed that it was found in metallic grains in fruits. Vegetables watered with distilled water afford it as well as others.

"Beechler and Kunckel ascertained the presence of gold in plants. M. Sage was invited to repeat the process by way of ascertaining the fact. He found gold in the ashes of vine twigs, and announced it to the public. After this chemist, most persons who have attended to this object have found gold, but in much less quantity than M. Sage announced. The most accurate analyses have shown no more than two grains, whereas M. Sage had spoken of several ounces in the quintal. The process for extracting gold from the ashes consists in fusing them with black flux and minium.

"Scheele obtained manganese in the analysis of vegetable ashes.

"Lime confluently enough forms seven-tenths of the fixed residue of vegetable incineration. Next to lime, alumine is the most abundant earth in vegetables, and next magnesia. Siliceous earth likewise exists, but less abundantly; the least common of all is the barytes. Chaptal's Elements of Chemistry, Part iv. § 3. art. 15.

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**Digestion.** Weight may be owing entirely to some diffusion of the fluid parts, and the consequent extrication of the gaseous fluids (a).

"Before we had acquired a knowledge of the constituent principles of water," remarks Chaptal, "it was impossible to explain or even to conceive the growth of plants by this single aliment. In fact, if the water were an element, or indecomposable principle, it would afford nothing but water in entering into the nutrition of the plant, and the vegetable would of course exhibit that fluid only; but when we consider water as formed by the combination of the oxygenous and hydrogeaneous gases, it is easily understood that this compound is reduced to its principles, and that the hydrogenous gas becomes a principle of the vegetable, while the oxygen is thrown off by the vital forces. Accordingly we see the vegetable almost entirely formed of hydrogene. Oils, resins, and mucilage, consist of scarcely anything but this substance; and we perceive the oxygenous gas escape by the pores where the action of light causes its disengagement."

But though water constitute the aliment of plants, we must not suppose that it is the aliment of thefe alone: the leech and the tadpole* are nourished by water, and many animals have no other food. *Rondelet* cites a great number of examples of marine animals which cannot subsist but by means of water by the very constitution of their organs. He affirms, that he kept during three years a fish in a vessel constantly maintained full of very pure water. It grew to such a size, that at the end of that time the vessel could no longer contain it. He relates this as a very common fact. We likewise observe the red fishes which are kept in glass vessels, are nourished, and grow, without any other subsistence than that of water properly renewed."

The ingenious Borelli, who knew that plants and several animals subsisted wholly by water and air, was likewise of opinion that some animals lived upon sand. He could discover nothing but sand in the stomachs of many tectaceous animals that live in the water, and particularly in the stomachs of the smaller kinds that live buried in the sand of the sea. He could not conceive what else could be the food of those small fishes or worms which penetrate the substance of the hardest rocks, and form excavations that always bear a proportion to their bulk. He had regularly found that the stomachs of fishes which he had examined were full of sand; and, recollecting the pebbles in the gizzards of fowls, he was led to infer that these substances were somehow dissolved in a gastric juice, and served to nourish the harder parts, as the shells, the feathers, and the bones (b). These sentiments, on a flight view, might not be unnatural. From observing children of depraved appetites swallowing sand, ashes, and cinders; from having sometimes met with sand in the stomachs of wild ducks; from the usual faces of the earth-worm; and from the dissection of several toads dug up in a garden, in whose stomachs we could see nothing but a quantity of earth, with pieces of coal, stone, and of flate, that had accidentally happened to be mixed with it (c), we long entertained a similar opinion with this celebrated author: but on recollecting

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(a) What follows is from the 33d additional note of Dr Darwin's Botanic Garden.

"Dr Priestley obtained air of greater or less purity, both vital and azotic, from almost all the fossil substances he subjected to experiment. Four ounce weight of lava from Iceland, heated in an earthen retort, yielded twenty ounce measures of air.

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<th>4 ounce weight of</th>
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<td>7</td>
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<td>Toadstone</td>
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<td>1</td>
<td>Elvain</td>
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<td>2</td>
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<td>3</td>
<td>Coal</td>
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"In this account the fixed air was previously extracted from the limestone by acids, and the heat applied was much less than was necessary to extract all the air from the bodies employed."

(b) A similar inference was made by Mr Burt upon opening the stomach of the pangolin of Hindostan. See Pangolin.

(c) The third ventricle had a strange food fastened to its interior membrane. This body was composed of a hard membrane, in which there was gravel inclosed. Gefler says the chamois is accustomed to swallow gravel to clear his tongue and throat from the phlegm, which is apt to cover them, and destroy the appetite. *Anat. Description of the Chamois or Gemy*, by the French Academy.
Physiology.

These fluids are observed to move between the different ligneous circles, and the more copiously as the wood is younger or the nearer the circles are to the bark. In the circles themselves, it has been remarked that the sap vessels, from being empty during a great part of the growing season, have been called air vessels; that they are formed of fibrous fibres, adapted to some phlegmatic motion (a); and it is plain, that by this structure they are well fitted to propel their contents, whether water or air, upwards or downwards, backwards or forwards, according to the different positions of the plant.

Besides the particular action of the vessels, a general concussion is received from the movement of the waters or winds, which serves as an exercise; a general dilatation is occasioned by both moisture and heat; and a general contraction by dryness and cold, which produce a motion something similar to that of the thorax.

In the springing season the sap ascends through the empty vessels before the leaves begin to appear. When the vessels are filled through their whole extent, the buds swell, the leaves spread, and the flowers blow; the evaporation from the surface is increased; the sap is diminished by the absorption; the succiferous vessels now cease to bleed (r); and the roots being unable to supple the waists, the rains and the dew enter by the trunk, the branches, the leaves, and the petals of the flowers. When the evacuations are immoderately increased by excessive heat, or preternaturally obstructed by the plucking of the leaves, by too much humidity, or other causes which prevent perspiration, the plant soon either sickens or dies. The chyle, which is formed in the sap vessels, has generally something of a facchinian taint.

Considering the forms of animal food, we may naturally expect in the animal kingdom a greater variety of those organs employed in digestion. Most animals have indeed, like the vegetable, both inhaling and exhalting vessels, by which some of their fluids are absorbed, and evacuations regularly carried on. Except, however, in those animals which subsist by liquids, these vessels are of little importance in receiving food or ejecting what is fecal from the system. In these animals the absorbents terminate in a hollow vixus, which is called the alimentary canal, where the fluids undergo a preparatory change, and are partly reabsorbed for assimilation. In all others the food enters by a proboscis (a), or by an aperture which is called the

(a) Bartholin, quoted by the French Academy, thought that these balls were composed of the hair which the cows lick from their skin, or of the wool which the sheep eat. But the horse does not lick himself, and many of these balls seem to be composed of ligneous fibres. The balls which are found in the chamois are called by Velchius German bewar. See Anat. Description of Chamois or Gump, by the French Academy.

(b) "The superior part of the intestine, which contained about thirteen inches, had a very particular structure; for, instead of the ordinary convolutions of the intestines, the cavity of this was transversely interrupted with several separations, composed of the membranes of the intestine folded inwards. These separations were near half an inch distant from each other, and turned round like the shell of a snail or of a slater or with an open navel." Anat. Description of the Stiles, ibid. These membranous folds running spirally, are not uncommon in the alimentary canals of animals.

(c) This happens in a great many plants.

(d) Every person may have an opportunity of seeing a proboscis in a number of those winged insects which extract juices from plants. It is very easily discernible in the butterfly. In this insect it is a fine moveable tube.
Digestion.

Food triturated in the mouth or stomach.

104 Tongue: this mouth is properly the entrance of the alimentary duct. It is very generally furnished with a tongue, which is usually affilling in deglutition; and if the food be of that nature to require cutting, tearing, or grinding, it is likewise furnished with the proper instruments for these operations. When the food is tallowaceous or some hard vegetable substance, and these instruments not in the mouth, something similar may generally be expected in a more remote part of the canal. The cat and the loxodont have accordingly grinding teeth in their stomachs; and graminivorous fowls have a powerful gizzard lined with a thick corneous substance. It poises the compreffing force of the jaws; and small pebbles which the animals swallow serve it for teeth.

Besides mere trituratation or grinding, the solid food will often require to be mixed with some additional liquid. In those carnivorous animals which chew, this liquid during the time of mastication flows into the mouth from certain glands placed in the neighbourhood. In some species of the ape kind a previous dilution takes place in two pouches situated on the sides of the lower jaw. In graminivorous birds this dilution is very usually performed in a sac, which is a dilatation of the canal; and the food being macerated there by the glands or exhaling vessels, gradually passes down, as is needed, to be triturated and further prepared in the stomach. In the ruminating kind the dilution is performed in a similar manner; but these having no muscular stomach fitted for grinding instead of defending the food is brought up again into the mouth, and is then acted on by the proper mastication sent to the stomach. If the food require no mastication, it is sent directly that way at first; a circumstance which shows a curious disarrangement with respect to foods, and proves that their alimentary canal is subject to the action of voluntary muscles as far as the stomach. Some of those birds which have a diluting sac or ingluvies seem likewise to ruminate.

This in the parrot was observed by the gentlemen of the French academy. It has since been observed in rooks, macaws, cockatoos, and others; and Mr Hunter, to whom physiology is so much indebted, discovered, that the male and the female pigeon secrete in their ingluvies a certain liquor for feeding their young; and that most kinds of what have been thought ruminating birds do very often in expressing their food regurgitate their food. Yet both this and another species of regurgitation which is very common with those animals that swallow indigestible substances with their food, should be carefully distinguished from rumination.

To the ruminating kinds the diluting sac is by no means peculiar. The porpoise has one, though it does not ruminate; and many of those animals which have none, as the rat, the hog, and the horse, have a part of the stomach covered with a cuticle, and which must therefore principally serve as a reservoir.

Applying stomach as a general word to the different number of ventricles of the canal, we may here observe that every species of animals which ruminate have two stomachs, or at least two divisions in one; that some have three, as the gazelle; and some four, as the cow, the dromedary, and the sheep; but it must not be supposed that the number of stomachs is any proof of a ruminating power. It was said already that the porpoise has two; the porcupine has three divisions in one; and the singular cassowar, although it be found to have four stomachs, does not ruminate.
PHYSIOLOGY.

Digestion.

108
The gaftric juice.

Although granivorous, is any one of the four a gizzard.

Somewhat different from these expansions which we have been mentioning as existing in the first part of the alimentary canal, is a fort of pouch (1) which hangs from the neck and the lower mandible of several birds, and which, like the two pouches of apeg, may be used either to macerate the food or to carry provisions from a distance to their young. The pelican, a native of the warm countries, employs this pouch sometimes to carry a quantity of water; and another native of the same countries, we mean the dromedary, was observed to have at the top of the second of the four ventricles a number of square holes, which being the orifices of as many cavities between the membranes which compose the ventricle, reminded the gentlemen of the French academy of those large reservoirs of water which Pliny mentions to be in camels; and for which, according to his story, their guides have opened them sometimes in cases of extreme thirst.

We come now to one of the principal agents in digestion. Independent of the fluids which mingle with the food in the mouth, the gullet, or macerating faces, there is one denominated the gaftric juice, and which, either by itself or along with others from the aliment or syrum, acts in some measure as a solvent. It is secreted from large glands at the entrance of the gizzard, from vesels or glands in the coats of the stomach, and perhaps most plentifully near the pylorus; it powerfully refills the putrefactive fermentation; it coagulates milk and the white of an egg; it dilolves food even when inclosed in metallic tubes; and when life ceases, it acts frequently on the very stomach from which it was secreted. Its taft, its colour, and its solvent powers, are different in different classes of animals. It seems to be modified according to the age, the health, the habit, and the different aliment on which they live. The sick and the child are incapable of digesting the food that is proper for a healthy man.

The hawk kind, after loathing bread and throwing it up without any change, can be gradually brought to take it for food; and Gaffendi has mentioned a certain lamb which, being fed on bread, cheese, and on flesh, refounded afterwards to taste grafs *. But what is most surprizing in the gaftric juice is, that it spares all living bodies, as those worms which exil in the stomach, and the stomach itself while it is alive; and it differs otherwife from a chemical solvent, in that it has an affimilating power, and reduces all substances, whether animal or vegetable, on which it acts, to a certain fluid of determinate properties, which is called style.

Besides the gaftric, there is another, after passing through the stomach, is mingled with a greenish sapo-naceous liquor, which is called bile, and which flows either immediately from the liver or from a vesicle into to which it had regurgitated as into a blind gut; at the same time nearly it is mingled with another refembling the falkiva from the pancreas or sweet-bread; a gland or glands whose place is supplied in a great ma-

ny fishes by a number of vermicular appendages to the stomach.

In short, from one extremity of the alimentary canal to the other, fluids are perpetually flowing into its cavity from glands. vesels, or organic pores; and the membranes constantly secreting a mucus to protect themselves from the acrimony of their contents. This acrimony must often be considerable near to that end of the canal where the faces are discharged; for as the first part of the canal has generally one or more dilatations which are called stomachs, and secretes at least one fluid which is strongly antifeptic, fo the last part has generally appendages which are called ceca, where the food always remains for some time, and where, from the quantity of animal matter that happens to be mixed with it, it becomes putrefact. The office of the ceca is sometimes supplied by the largenes and convolutions of the colon (o); to which gut the ileum cannot, when it enters laterally, so easily communicate its perifaltic motion. As the stomachs were the receptacles of the food when it entered, the ceca are receptacles of the fecal matter before it be discharged. They are of various forms and capacities; they are often larger than the stomach itself; are often composed of proportionally thin and transparent membranes; and from their contents have often a colour somewhat refembling that of the gall-bladder. Their number is different in different animals. Some have but one. The birds which have them have generally two; the bulbard has three; and Swammerdam has diffected insects which had four. As some stomachs have a number of folds which hang pendulous within their cavity, and increase their surface, fo have often the ceca as well as some portions of the canal. The cecum of both the rabbit and the hare is curiously formed. It is large and beautiful; it is rolled up like a cornu ammonis; it has the like outward appearance; and a fold running spirally is observed within. The animals which live on vegetable food have usually the greatest length of the canal, and the greatest number of stomachs and of ceca; yet the cafwar, which has no gizzard, has no cecum; and the polype, which is said to be all stomach, is properly speaking rather all cecum.

To see more fully the process of digestion, we must not overlook that general and organic action which takes place through the whole alimentary canal. The power of mastication exerted in the mouth is obvious to all. But the force of some stomachs has till very lately been known to few; we allude here to that of the mucular or gizzard kind: for Abbé Spallanzani has divided stomachs into three forts; the mucular, the membranous, and intermediate. The immortal Borelli, who was probably the first that tried the force of the mucular stomachs by throwing into them several of fiblers, hollow spheres of glass, hollow cubes of lead, small pyramids of wood, and several other very hard substances, supposed that the power exerted by the stomach of the Indian cock (r) was equal to 1350 pounds.

* Lorelli de Nutritione Animal. prop. 194.

† Gyllius Indicus, which in the writings of Longalius, Gefner, and Aldrovandus, means a bird.


**PHYSIOLOGY.**

Motions of the alimentary canal.

The force of an intermediate stomach cannot be so great, and that of a membranous one must be still less. Each seems to have more of the solvent as it has less of the muscular power. The most membranous are afflicted by the action of the surrounding parts, and expel their contents as readily as the strongest. The muscular fort is either wholly or principally confined to certain kinds of birds and of fishes, as nature has meant that the grain or the shells which they use as food should first be triturated before it be subjected to the gastric juice. This comminution takes place in their stomach, because it is plain that had bones or muscles, fully equal to all these effects, been placed in the head, the form of the animal must have been altered, or that equilibrium which it preserves in the stomach when that viscus is morbidly affected (q?).

The masticatory power is not always the same with the whole alimentary canal; for one portion of it is more or less gradually triturated or reduced to a pulp, not all at once, but by degrees; and this rancidity is the cause of that it is found in the milk, and sometimes in the urine from diseased persons. The acid prevails sometimes to so great a degree as to become a disease; attended with much of the history of living bodies. See the anatomical description of two Indian cock by the French Academy. *Gallina Indica* is Ainsworth's Latin for the Guinea hen. See Bozzi de Nutrit. Animal. Prop. 189, 190, 191.

(q.) It may be admitted as an axiom (says Mr Hunter), that two processes cannot go on at the same time in the same part of any substance; therefore neither vegetable nor animal substances can undergo their spontaneous changes while digestion is going on in them; a process superior in power to that of fermentation. But if the digestive power is not perfect, then the vinous and acetous fermentation will take place in the vegetable and the putrefactive in the food of those animals which live wholly on flesh. The gastric juice therefore preserves vegetables from running into fermentation and animal substances from putrefaction; not from any antiseptic quality in the juice, but by making them go through another process, prevents the spontaneous change from taking place.

In moist stomachs there is an acid, even although the animal has lived upon meat for many weeks: this, however, is not always the case; therefore we must suppose it is only formed occasionally. Whether the stomach has a power of immediately secreting this acid, or first secretes a fugar which afterwards becomes acid, is not easily ascertained: but we should be inclined to suppose from analogy the left to be the first: for animals in health seem to have the power of secreting fugar, as I find in the milk, and sometimes in the urine from disease. The acid prevails sometimes to so great a degree as to become a disease, attended with very disagreeable symptoms: the stomach converting all substances which have a tendency to become acid into that form: the fugar of vegetables, and even sometimes vinous spirits turning directly into acid.

To ascertain whether there is an acid naturally in the stomach, it will be proper to examine the contents before the birth when the digestive organs are perfect, and when no acid can have been produced by disease or any thing that has been swallowed. In the flink calf, near the full time, there is acid found in the stomach, although the contents have the same coagulating powers with those of animals who have forked. Spallanzani gives the opinion of authors respecting digestion; and so anxious is he to combat the idea of its being fermentation, that he will hardly allow that fermentation ever takes place in the stomach. That fermentation can go on in the stomach, there is no doubt. It is often found that milk, vegetables of all kinds, wine, and whatever has fugar in its composition, become much sooner in some stomachs than they would if left to undergo a spontaneous change out of the body; and even spirits in certain stomachs almost immediately degenerate into a very strong acid. All oily substances, particularly butter, very soon become rancid after being taken into the stomach; and this rancidity is the effect of the first process of the fermentation of oil. Mr Sieffert has been able to restore rancid oils to their original sweetness, by adding to them their due quantity of fixed air; the loss of which I consider as the first process in this fermentation, similar to what happens in the fermentation of animal and vegetable substances.
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One intention of the locomotive power in living bodies to procure food. Bouring Toock, or cling to the body of some of the living mollusk, they climb the face of a neighboring rock, or cling to the body of some of the flatlander children of the forest. Their range for food is extremely limited: it is chiefly confined to the small space which happens to be occupied by their roots and branches; yet if any uncommon exertion be necessary, the branches will bend, and the leaves turn to drink of the water that is palling by. If the roots be laid bare they will again plunge into the earth; if a stone or a pitch be thrown in the way, they will move round or will dip downwards, and find food on the other side; if there they arrive at one that is unfriendly they will not enter; but if a favourite earth should be near, though not in their direction, they will twist about, advance as they grow, and at last meet it. In all these cafes the prop, the water, and soil, must be necessary; they must also be within a very small distance, otherwise the plants cannot perceive them, or will fail in their languid attempts to approach them.

It may be considered as a general fact, that wherever food is liberally supplied for a whole lifetime in one place, the creatures which use it have seldom much locomotive power, or much inclination to exercise it in a long continued and progressive line. The curious insect is therefore observed to deposit its offspring in those places where the prospect of genial warmth and of plenty seem to preclude the future necessity of wandering or reparation; and when this offspring is about to pass into a new state, and the organs foretell that a change or perhaps a variety of food will soon be required, the appearance either of wings or of legs do likewise foreshow that the power of locomotion is to be increased. Even nobler animals in their feral state, where they live upon one species of food, and where that is afforded in regular plenty do spread out their roots, adhere to their soil, and become as stationary as the plant itself; and even when that supply is withdrawn, and they are perplexed, yet if the state into which they emerge be helpless and feeble, if their organs of digestion have a weak solvent or nutritive power, particularly adapted to some easily assimilated food, and if that food be preferred either by their parent or nature without their exertion, their power of locomotion is not great, nor is it exercised in wandering afar. It is when the organs of digestion are strong, and the appetite inclines to variety of aliment, and they are disposed and feel themselves able to wander in search of it; and that then they may be ready to move at intervals from place to place, when the enemy comes or the spirit prompts them, nature has directed them to solid food, and has given them a large alimentary canal with stomachs, with convolutions, and ceca, where they may lay up provisions for a journey; but afraid to entrust them with too much freedom, left in their excursions they might wander from the places where subsistence is found, there are two appetites, hunger and thirst, which never fall in a state of health to remind them of their duty.

This variety of food, and the manner in which it is affected by climate are the cause of the many and indar migrations from spot to spot, from country to country, and from sea to sea: they are the cause of a state of torpor in the hedgehog and the bear, and they partly explain the provident foresight of the ant and of the bee. Animals of great locomotive power, in order to provide for themselves and their offspring, remove to a distant country or climate when they see the signs of approaching famine. Those of less locomotive power, and who are incapable of migrating far, as if warned by heaven, lay up a store for the scarcity to come; or should their food be of that kind as not to be easily preferred for a season, they require no secret warning to hoard it at the time when it fails, their system becomes susceptible of torpor, and they are enabled to sleep through the storm of trouble and of want. The force of this want is in most instances to be traced to the nature of the plant and insect. The plant which has little heat of its own depends on the sun or some other agent for one of the great causes of digestion. When this agent refuses the necessary heat, the plant must decline; its leaves, its juices, and its fruits must fail. The insect tribe, which had no other food, or which like the plant could not maintain their vivifying warmth, must likewise submit to the same fate. The various animals which live on either the one or the other, according to their several dispositions and characters, retire to their stores, to their dens of torpor, or migrate to a country to which they are led by unseen guides to share in its abundance. Of these last the rail (s) and the swallow are the only two which are sometimes arreled, and which, with the bear, the hedgehog, and the toad, are obliged to remain in the dwellings of torpor till the genial season of warmth and of plenty.

Sect. III. Absorption.

When the food has undergone the first preparation, which is called digestion, and the chyle (r) is formed in the

(r) Many of the fat plants live chiefly by the absorption of moisture from the air; and many sea-plants float through the ocean, and having plenty of food wherever they go, they send out no roots in order to search for it.

(s) All the birds on the lakes of Siberia are said by Professor Gmelin to retreat southward on the commencement of frost, except the rail, which sleeps buried in the snow. Account of Siberia quoted by Dr Darwin in his The Loves of the Plants.

(t) the chyle of different living bodies has not yet been analyzed; in man it is generally a whitish fluid-resembling milk, and yielding water, oil, sugar, and a coagulable lymph.
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Absorption. The alimentary canal or syp veins, it is hence taken by means of absorption in the us of the syplem. From the vesels it passes into the whole cellular tissue, composed of vesels, and chiefly woven with all the vascular parts of the plant. From the vesels or articles of the cellular tissue it enters the vasa propria and glands, which contain and prepare the fluids and secretions peculiar to the species.

In animals. Lympaha. In all living animals. In the animal system. In the living animals. In the living animals. The lymphatics. The lymphatics. Thoacic duct discovered in 1624. The lachrymal system discovered in 1622.

165 Lympaha. The thoracic duct discovered before 1633.

Then it was evident that they had been seen before by Absorption. Dr Higginson and others, who had mistaken them for lasseals, but (adds Dr Hunter) none of the anatomists of those times could make out the origin of the lymphatics and none of the physiologists could give a satisfactory account of their use. He had not seen the lymphatics discovered from the several cavities back into the blood; and that Frederic Hoffman has expressed the doctrine of their being absorptions very explicitly.

It was on the 19th of June 1664 that Swammerdam discovered the vesels of these vesels; and Ruyfch, who had seen them, perhaps very nearly about that time, first gave an account of them in a small treatise which he published at the Hague in 1665.

The best mode of demonstrating the lymphatics we probably owe to the celebrated Nuck, who, as a specimen of that complete syplem of Lympgraphy which he meant to publish, printed in 1691 his injected adenography, or description of the glands. In this treatise he not only tells us how he brought them into view, but in his plates represents many of them as filled with his new mercurial injections; a happy invention, which perhaps was suggested by remarking the extreme facility of mercury when employed in the cure of venereal infection.

A method by which he inflated these vesels led him to suppose that they took their origin from veins or arteries, either immediately or through the intervention of some follicles. The celebrity of his name procured credit to this mistake; and notwithstanding the

(5) We learn from Galen, that the lachrymal vesels in kids had long before been seen by Eraclitus, who called them the lachrymal vesels.

(x) This duct had been seen before by Enachlachus. See Enachlach. de Vena fune pari.

(v) The discoveries of Ludbeck and Bartholine were made in the years 1651 and 1652, about which time Jolyte an Englishman saw alfo the lymphatics.

(1) Drs Hunter and Monroe claim the merit of having found out the true us of the lymphatics. The former says that he taught it in his lectures so early as 1746, and appeals to his pupils for the truth of the assertion. The latter seems to have made the discovery in 1753; and in 1755 published an account of it in a thesib De Tegibus in variis Animalibus. Before the printing of this thesis, Dr Black told him that the same opinions concerning the valvular lymphatics had been long entertained by Dr Hunter. In 1756 Dr Monroe attended Dr Hunter's lectures in London; heard the whole doctrine of the lymphatics very fully explained; and in 1757 reprinted his opinion at Berlin without taking notice of Dr Hunter's, who charges him with plagiarising; and the charge is retorted by Dr Monroe.

(a) Lympgraphiae, quod offertur speciem, ubi lectori non ingrata percepero ad alias transfusurus tum partes, non minus quam he, lymphaticus ductibus superficientes. Prefatio ad Adenographiam.

Nuck had traced lymphatics on the exterior parts of the head and neck, on the membrane of the lungs, on the spaces between the ribs, in the loins, on the diaphragm, on the heart, the spleen, on the liver, the gall-bladder, on the stomach, on the mesentery, on the tunica albuginea of the testes, in the feet, and in the hands. Its (continues he), ut multiplices experientiae et variis partum preparationibus eo usque pervenerim ut integrum lymphaticorum sytema a capite ad calcem mihi composuerim, cujus delineationem libenter tecum communi nico, ubi partium nonnullarum haecorum nundum fatis examinaturum, Lymphographiam abolverimur. Anton. Nuck de Inventis novis Epistola Anatomica ad D. D. B. G. Mod. Dodi.

(b) Quidam nervos constitutum lymphaticum principalem; aliis glandulas minores; aliis membra nas: nec deficient qui a tendineis nutriturum parte eadem deductum. Sed milis aliorum sententias, dicam modo; varia me hanc circa speculationem molitum nullus, variis experimentis (irrito licet ordinarum causarum) varia tentativa, causaque tandem nonnulla detecti, que locum, hic adierit poffunt.

Ante triumnum, mundando leoni vitulino intentus, omnique fanquine, aque tcpidae ope, jam elto, copipsum in arteriam splencicam infundi ærem, et spiritus fortius adaequato, non tantum plurimas exiguis in superficie leonis vidit elevari vecculac, sed ex idem vecculac vaia proinde lymphatica, flata etiam tarditer et lienen percept tanta vidit, et quo duibus arteria fruct inflata, eo majore poti vaforum numerum, ita ut, hac arte per in
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Absoption, the founder opinion of Glison, of Hoffman, and some others, the old notion that the veins performed the office of absorbents came so far down as the great names of Haller and of Meckel. The arguments, however, by which it was supported are shown now, and particularly by those of the Hunterian school, to have been injections that were not skilful, observations that were not accurate, and conclusions that were not logical; while the boasted assertion that birds and fishes were without lacteals and without lymphatics, has been disproved by the fortunate discoveries of Mr. Hewson and Dr. Monro.

Excepting, therefore, in the penis and testes, and in those animals whose veins may be injected from the gravid uterus, the lymphatics seem to perform the whole business of absorption. They contain a fluid that is capable of the like of the lymph of the blood, and are called valvular to distinguish them from the arteries that do not admit the red globules. They derive their origin from the cellular membrane, from the different cavities, and from the surface. Some authors say that they have seen them in the brain, and these Macagna has ventured even to describe in prints. That some indeed may exist in the brain, has not been denied; but to believe that they have been found, and to forestall assertions which are not countenanced by the observations of skilful anatomists, requires a faith which for our part we do not pretend to. Both they and the lacteals derive their name from the colour of the fluids which they contain. They both empty themselves into the veins; but most of the lymphatics in the human subject, and all the lacteals, first unite in the thoracic duct, which near the heart leads into the course of the circulation.

Sect. IV. Circulation.

After part of the food is converted into chyle, and this chyle absorbed by the lacteals, and brought into the course of the circulation, it remains to be distributed to all the different parts of the system. On this account, Hippocrates speaks of the usual and constant motion of the blood, of the veins and arteries as the fountains of human nature, as the rivers that water the whole body; and which if they be dried up man dies. He says that the blood vessels are for this reason every where dispersed through the whole body; that they give spirits, moisture, and motion; that they all spring from one; and that this one has no beginning and no end, for where there is a circle there is no beginning (p).

In such language was the prince of physicians accustomed to express his vague ideas of a circulation; for so far was he from having acquired accurate conceptions on this subject, that when he saw the motions of the heart, he believed that the auricles were two bellows to draw in air, and to ventilate the blood.

When after his time anatomy came to be more firmly established, the notions of the ancients respecting the blood were better defined; and, however chimerical they may seem to us, they were partly derived from dissection and experiment. On opening dead bodies, they found that the arteries were almost empty (e), and that very nearly the whole of the blood was collected in the veins, and in the right auricle and ventricle of the heart. They therefore concluded that the right ventricle was a fort laboratorium; that it attracted the blood from the Cave; by some operation rendered it fit for the purpose of nutrition, and then returned it by the way it came. From the almost empty state of the arteries, they were led to suppose that the right ventricle prepared air, and that this air was conveyed by the arteries to temper the heat of the several parts to which the branches of the veins were distributed.

To this last notion entertained by Erasistratus, Galen added an important discovery. By certain experiments, he proved that the arteries contained blood as well as the veins. But this discovery was the occasion of

fictum vafta lymphaticcis vaer immittis membrana linealis fere tota lymphaticis ductibus obiellae fuerit vita.


(1) Hippocratis de Venis. - Plato, in his Timaeus, speaks of the heart as a watch-tower completely fortified, as the knot of the veins, and the fountain from whence the blood arises, and briskly circulates through all the members. The blood he calls the pature of the flesh; and adds, that so the fate of nourishing the remotest parts, the gods have opened the body into a number of rivulets like a garden well watered with plenty of canals, that the veins might by this means receive their supply of moisture from the heart as the common source, and convey it through all the fluids of the body." The rest of the passage cited by Longinus is as full of nonsense as it well can hold: and indeed Longinus seems chiefly to have admired it for something which had struck him as divine and unparalleled in its tropes, as making the head a citadel, the neck an ithmus, the vertebrae hinges, and the flesh a rampart. See Longinus on the Sublime, § 32.

On the other hand, the veins are delivered of all such nonsense by this simple and just statement of Galen, who, though he professed to have seen the same appearances, made no such marble images of the head and neck, and such fables concerning the formation of the veins; and thus laid the foundation of our real knowledge of the subject.
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How Galen supposed the blood to pass between the right and left ventricle of the heart.

Another opinion, supposed to be Galen’s, refuted by Velledius.

Velledius routed the attention of anatomists to discover the true passage of the blood between the ventricles.

The passage discovered, and Galen’s opinion revived, by Michael Servede and others.

In toto est muta anatomomosa atque ecologorum apertio arteriarum simil cum venis. De Ufis, part 6, cap. 10.

It was the opinion of Galen, that the motion of the lungs and the pulse of the arteries was to cool the blood, and to expel the fuliginous vapour. That he had just ideas of the lesser circulation through the lungs, and of the nature of the valves, is evident from the passages cited by Harvey, De Motu Cordis, Exercit. 1, cap. 7.

The words in which he mentions this discovery are these: “Non par paretinem cordis, uti vulgo creditur, sed magno artificio a dextra cordis ventriculo, longo per pulmones ductu agitat tur tur fluctuat sibilus.” Being born at Villa Nova, in the kingdom of Arragon, he sometimes called himself Michael Villanovanus, or simply Villanovanus. In the title of all his books he takes the name of Renus, which is formed from S.rune, by throwing out the and transposing the five letters that remain. The book in which his discovery was mentioned was printed clandestinely, and intitled Christianity Refuted. Being first imprisoned at Vienna in Duapont, and afterwards allowed to Geneva by the treachery of his correspondant and confidant John Calvin, he was, by a fervant of that reformer’s, accused of blasphemy, and condemned to the flames in 1553.

Almost the whole merit of his discovery is due to the Paduan school, of which Celsalinus as well as Columbus was once a professor.
than his master Fabricius; and explained their use in a treatise which he published some time after. It is uncertain when he first conceived his celebrated doctrine of the circulation; but about the 1616 he taught it in his lectures, and printed it in 1628. He was the first author who spoke consistently of the motion of the blood, and who, unbiassed by the doctrine of the ancients, drew rational conclusions from his experiments and observations. His books present us with many indications of a great mind, acute discernment, unwearyed application, original remark, bold inquiry, and a clear, forcible, and manly reasoning; and every one who considers the surprise which his doctrine occasioned among the anatomists of those days, the strong opposition that it met with from some, and those numerous and powerful prejudices which it had to encounter from the fanction of time and of great names, must allow it was new, and that the author has from its importance a title to rank in the first clasps of eminent discoverers ancient or modern.

His discovery showed, that in most animals the blood circulates in arteries and veins, and through the medium of one, two, or of more hearts; that in arteries it moves from the trunk to the branches; and that, meeting there with the branches of veins, it returns in a languid stream to the heart; that the heart communicates a new impulsion; that it drives it on to the trunk of the arteries; and that the arteries, by the thickness of their coats, exerts a force, do push it onwards again into the veins.

In every part of this circulating course, there are valves situated where it is necessary; they are meant to prevent the return of the blood; they are at the beginning of the great arteries, and are found in different places of the veins where their feeble action requires to be assisted.

The veins, before they enter the heart, generally expand into a thin muscular sac, which is called the auricle. It receives the blood while the heart is contracting; and when the heart admits of dilatation, contracts itself, and throws the blood into the ventricle.

We have here called the ventricle a heart; though what is usually meant by the heart be a ventricle and auricle; or sometimes a ventricle and two auricles, where the veins approach in different directions, and, without bending to meet one another, expand at two different places. Two hearts are sometimes united, so as in appearance to form but one.

From our having mentioned more than one heart, it will be supposed that the modes of circulation are various. In some animals the heart throws its blood to the remotest parts of the system (t); in other animals it throws its blood only into the respiratory organs: from these organs it is collected by the branches of veins; and these branches, uniting in a trunk, convey it to an artery, which renew the impulse, and acts as a heart. In a third set of animals, the blood from the respiratory organs is carried by the veins to another heart; and this second heart, united in the same capsule with the first distributes the blood by the channel of its arteries to the several parts. In the human fetus, and the fetus of those animals which have two hearts, a part of the blood, without taking the passage through the lungs, proceeds directly from auricle to auricle. In amphibious animals, the auricular passage continues open during their life, and is employed, when the breathing ceases, under the water. In many insects, a number of hearts, or expansions which answer the purpose of hearts, are placed at intervals on the circulating course; and each renews the impulse of the former, where the momentum of the blood fails. In the Sepia the two separate parts of the gills are each supplied by a heart of its own: the blood from both is collected into one; which, by two arteries opening at two different parts, send it to the opposite extremities. In numbers of animals, the heart, like the stomach, is in the extremity opposite to the head.

After the discovery of the circulation, the most ingenuous and strong application of anatomy was to demonstrate it in a clear, satisfactory, and easy manner. Harvey, to do it with every advantage that he could think of, was obliged to open animals alive: but whether the animals were dead or alive, the larger branches of the veins and arteries were only to be seen, and even these but in certain cases, when they happened occasionally to be full of blood. That admirable method, which is now observed in demonstrating the course of the circulation, we owe to the great anatomists of Holland who flourished in the last century. About 1664, Regnier de Graaf invented the syringe, which is now used of all sorts of dead bodies, and, accompanied with a print, published an account of it in 1669. His injection was usually a thin fluid of a blue green or some other colour; this injection transmuted through the vessels, allowed them to collapse by its general diffusion, and broke out through the fourth opening that happened in its way. A fluid which hardened after being injected, and which preferred the vessels dilated, was a happier contrivance. This at first was either melted tallow or wax, of a colour foiling the taste of the anatomist. So early as the year 1667, the celebrated Swammerdam injected the vessels running on the uterus with ceraceous matter; and,

\[(x)\] Dr Hunter says, that "none of his writings show him to have been a man of uncommon abilities. It were easy to quote (he says) many passages which bring him nearly to a level with the rest of mankind. He lived almost 30 years after Vesalius published the lectures, yet to the last seemed most inclined to think that no such vessel existed. Thirty hours at any time should have been sufficient to remove all his doubts; but this subject taken up in self-defence (continues the Doctor) grows unpleasant." Dr Hunter was here thinking of his own discovery when brought in comparison with that of Harvey's. When this comparison was less immediately in view, he says that "Dr Harvey, as appears by his writings, was certainly a first rate genius for sagacity and application; and his name is deservedly immortal on account of the many observations and improvements he made in anatomy and physiology." Dr Hunter's First Introductory Lecture.

\[(y)\] We never exclude the action of the arteries.
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148 Of Ray:ch.
jealous left another should claim the merit of such an invention, he transmitted preparations, accompanied with plates, and with a full account of his method, to the Royal Society of London in 1672. Soon after, his friend Ray:ch acquired such skill in the art of injecting, that he has not been surpassed by any since his time. He discovered vessels in many parts where they were not supposed to have had an existence; and, contrary to the opinion of the great Malpighi, he showed that even many of the glands were entirely vascular; and that what had been supposed excretory ducts, derive their origin from some follicle, were but terminations of arteries continued; yet even Ray:ch could not exhibit in all cases the course of the vessels so well as we do now. Another discovery was yet to be made for demonstrating their small capillary branches running through a part. This was referred for the very ingenious Dr Nichols of London; who invented the method of corrugating the flatly with a menilium, and leaving the wax, as it was moulded by the vessels, entire. From these researches, which evince circulation to be a function so general among animals, some are disposed to think it takes place in all living bodies. But notwithstanding the fashionable language of circulating fluids, veins, arteries, and even of valves in the vegetable structure; yet nothing performing the office of a heart, and nothing that seems to convey fluids in a circular course, has been found in plants. In the vegetable kingdom, the chyle is distributed to all the parts from the numerous vessels which convey the sap: and these vessels, being fitted by their structure to convey the sap either downwards or upwards, from the branches to the roots, or from roots to the branches; is the reason why plants inverted in the ground will send forth roots from the place of their branches, and send forth branches from the place of their roots. Even a similar distribution of the chyle takes place in some animals. In the human tibia, in the faciula hepatica of sheep, and in moit polypes, the chyle, without a circulating system, is conveyed directly to the different parts from the alimentary canal. The taste for circulation may at last subside. Till the business of absorption from the intestines was, of late, fully secured to the facts, we were wont to have also learned dissertations upon a circular motion of the bile. The jant which it took was not very cleanly; but it was solid: it went with the fluxes down the intestines, and returned with the blood in the mesentric veins.

150 Circulation not universal in living bodies.

151 None in plants nor in some animals.

152 A supposed circulation of the bile.

153 Opinions concerning the red colour of the blood.

154 Respiration changes the colour of the blood.

155 None in plants nor in some animals.

Before we can expect to arrive at a proper knowledge of the spleen, we must first examine its form, its proportion, its situation, its numbers, and its different circumstances in different animals; and as yet this has been done only in a few cases. The gentlemen of the French Academy found, that in the demonelle it was like the liver, in the buffard like the kidney of a quadruped, in the chamouc round and flat, in the lynx narrow and long, in some animals proportionally large, in others proportionally small; that in the gazella it was joined immediately to the stomach, without a vast brevie; that in the caflor, again, it was attached to the left side of the stomach by eight veins and arteries, and as many vaia brevia; that in the otter it was fastened to the epiploon, in the Canada flag to the great ventricle; and they found that in the porcine and sea-fowl it was double. Since their time Dr Monro has observed two large spleens, one attached to the small and the other to the large curvature of the stomach of the fquatus fquatina or angel-fish, whose blood contains few red particles; and the same eminent physiologist found in a flurgeon no fewer than seven, one of the size of a dried horse-bean, and the rest about the bulk of a dried garden-pea.

(n) Interim non diffiterat vaia illa lymphatica lympham subinde vehere rubiculo colore tinctorum, with castra ad infortum se habentem. Hoc autem nunquam contingit in flatum naturali, verum pot nibium et irregularum fanguinis motum. Vel in quibus humidum (ob defecum alimenti) deficient, quas occasione plerique humores viviuntur, et colore preternaturali tinguntur. Quid mirum itaque hicare in calibus et lympham reddi fanguinem. Adenographia, cap. 5.

(o) Chaptal's Chemistry on the Properties of the Blood. The physiologists of late century accounted for the red colour in another way. Rubedo fanguinis (says Verheyen) pro magna parte procedere videtur ab alimentorum particulas salinis ac sulphures seu oleolis exaltatis. Cujus non lege indicum est, quod lexium ex eis erubuit vulgari modo paratum notabiliter rubet, in quo, pretor aquam, viviat quum sial et sulphur reperibili cft:—et lac...
by the mere action of the vessels; and this discovery has enabled us to conjecture with more certainty than we did formerly, why in insects, the phlegmatic parts of the blood is paler, in the choleratic more yellow, and in the sanguine of vermilion red. It explains likewise, in some measure, why the blood varies in the same individual, not only with regard to the state of health, but likewise at the same instant; and why the blood which circulates through the veins has not the same intensity of colour, nor the same consistence, as that of the arteries; and why the blood which flies through the organs of the breast differs from that which passes languidly through the vena of the lower belly. This power of the vessels over the blood will bring us also to the true cause why the vessels vary in the density of their coals and in their diameters; why they are sometimes convoluted in a gland; why they sometimes deposit their contents in a follicle; why they are sometimes of a spiral form; why the branches strike oft at various angles; why they are variously accommodated; why they sometimes carry the blood with dispatch and at times slowly through a thousand windings. By these means their action is varied, and the blood prepared in numerous ways to answer the ends of nutrition and secretion.

**Sect. V. Nutrition.**

**Nutrition** is the function which assimilates the food in the several parts, and which finishes the process already begun in the stomach, in the lungs, and the vascular systems. In perfect animals some of the flages of this process are distinctly marked. The chyle, which has some resemblance to milk, is the work of the alimentary canal: it undergoes some new changes by the action of the lacteals and of their glands, when they exit. In the course of circulation it passes along the respiratory organs, and is mixed with oxygen or some other gas; by this mixture, the consequent heat, and the action of the vessels, it is turned into blood. The blood, when examined, spontaneously separates into three parts: an albuminous part or a serum, a coagulable lymph, and red globules. The two first are analogous to the white parts of an egg, by which the chick in ovo is nourished; the globules have some resemblance to the yolk, which serves afterwards as food to the chick in the more advanced period of life. The three parts contain each a variety of principles which are originally composed of gases: these principles, conveyed through vessels of various forms, of various diagonals, and with various degrees of motion and of heat, and all along varying as they pass, arrive at last on the confines of Nutrition, the parts which are wrap up in a cellular tissue or other membrane. The tissue or membrane gives a new change; the parts nourished perform the office of secreting organs; and as the action of the vessels is varied according to the place to which they are tending and the parts which they enter, we partly see the manner in which bone, muscle, cartilage, and nerve, are all secreted from a common mafs.

In worms and polypes, the function of nutrition is assimilated by the cellular tissue; and in plants by a tissue cellular and vescular. In all living bodies the cellular tissue, besides giving a form to the parts, and besides preventing friction and cohesion, certainly performs some important nourished office. Many have thought it the organ of nutrition; and it is surely one of the organs employed in affilating to assimilate the nutritious fluid. But it should be remembered, that all the parts of the living body are assimilating organs; that each part assimilates for itself; and that the stomach, the respiratory organs, the vessels, and nerves where they exist, are allant to the whole and to one another.

It is singular how any should have imagined that the nerves are peculiarly the organs of nutrition, or that growth should be owing to the addition of some organic and vivifying particles pre-existing in the food. These physiologists have not demonstrated the existence of nerves in all living bodies; and these organic and vivifying particles have as yet been discovered but in their fancy. Dr Monro has condescended to prove, that the limb of a frog can live and be nourished, and its wounds heal, without any nerves: and Mr Hunter has given many curious instances of a living and nutritious power in the blood.

In plants and animals, the assimilating power has always certain limits prescribed to it: its influence is very generally confined to the part of food congenial to the species; and its strength is varied according to circumstances; as the age, the habits, and the state of health. Those which are young assimilate faster than those which are old; and one species, which may partly be owing to the nature of their food, will assimilate flows of much faster than another. Certain worms that feed assimilation on animal and vegetable substances will, in 24 hours after their escape from the egg, become not only double their former size, but will grow, according to Redi, from 155 to 210 times more than before. Most oils are of very difficult assimilation; and those which are essential will often refit the long continued and the varied action of the living organs; will mingle oils diffusely with crudely assimilated,
Physiology.

Secrætion.

162. An assimilating power is not peculiar to living bodies; it is observed in ferment and contiugation, and is obvious with respect to flame which is neither living nor organized, that whole nations who have seen it feeding on inflammable substances, have been disposed to think it was animated, to call it the principle of life itself, and to pay it a kind of religious homage as the proper emblem of that Being by whom the whole universe is upheld.

In living bodies nutrition is only a species of secretion.

Sect. VI. Secrætion.

Is a function in which a part is separated from the whole, and generally with some change of its qualities. In the case of nutrition it was observed, that all parts secrete for themselves; and that some few, as the lungs, the stomach, the vessels, and the nerves, secrete besides for the general use of the whole system. If all the ingesta were to remain and to be assimilated, the body would go on continually increasing. But living bodies are constantly in a state of waste and repair. In most animals part of the ingesta is carried off by evacuation, without having entered the mouths of the abscorbents: part, which enters the absorbing and veins, is thrown off by exhalings arteries or the urinary passage: and experiments with madder prove that the lymphatics, besides originating from the cavities and carrying back the lubricating fluids, do enter the substance of the hardest bones, and convey particles that had been assimilated back into the blood.

This office has not been generally ascribed to the abscorbents; nor has it been very generally supposèd that the blood receives the excrementitious matters of the system, and that one intention of the circulation was either to return them for resublimation or to discharge them by exhalings vesicles or by the kidneys. Decayed parts, however, are discovered in the feces evacuated by the intestines in the clouds, the sediments, and colour of the urine, and by the smell of the perspirable matter. The two last, on certain occasions, and for a time, have often supplied the place of one another; and all the three, the feces, the urine, and the perspirable matter, we have reason to believe are remarkably distinguished by two kinds of odour; the one peculiar to the whole species, the other peculiar to the individual. By the perspirable matter which adheres to the ground, and of which the odour is diffused by moisture, the dog not only distinguishes a man from any other animal, but is able to trace his matter through a crowd.

The natural evacuations of plants, and of some few animals which feed by abscorbents, are all by perpiration or exhalings vesicles. The urine in quadrupeds is before emission collected in a vesicle, and thence carried off by the genital organ. In birds, and in a number of fishes, the ureters empty themselves into the rectum, and their contents are evacuated along with the feces.

Besides being used to denote the function, the word secretation is sometimes employed for the matters secrete. In this sense there are various secretions. Besides the feces, the urine, and the sweat, and the vapour from the lungs, which are excretitious, there are secretions which answer useful purposes in the system. Of these the most important and general are the bile, the salivary, the gastric juice, and the pancreatic, which assist in digestion; the lymph and the fat, which lubricate the parts; the mucus, which protects them from acidic substances; the nervous fluid, which forms a very conspicuous link between body and mind; the seminal fluid employed in generation to propagate the species; and the leste intended for some while to support the young after they emerge from the fetal state.

The salivary is a fluid that mixes with the food in the mouth, and is secreted from the parotids, the submaxillary, and sublingual glands. It is watery and somewhat viscid; it is found to retard and moderate fermentation; it has sometimes a tendency to form calculi like the urine. By these concrètions it incrusts the teeth and sometimes obstructs the formation of the salivary ducts. It is the fluid of the labes caninae.

Upon first examination the gastric liquor seems to possess a solvent power upon animal and vegetable substances without any great preference of affinity. The reason is, it varies according to the nature of the aliment; it is sometimes acid, sometimes insipid. Brugnatelli has found (says Chaptal) in the gastric juice of carnivorous birds and some others a digested acid, a reft, and an animal substance, united with a small quantity of common salt. The gastric juice of ruminating animals contains ammoniac, an extractive animal substance, and common salt. In our time the phosphoric acid has been found digested in the gastric juice of the graminiferous kinds.

The bile secreted by the liver is glutinous or im-perfectly fluid like oil; it a very bitter taste, a green colour inclining to yellow, and froths by agitation like the solution of soap. Its constituent principles are water, a spiritus rector, a coagulable lymph, a refrinous oil,

(q.) These glands are very rarely met with in birds. It is mentioned as a singular circumstance in the demollis of Numidia, that "in the lower beak, on both sides of the tongue, under the inward tunicle of the mouth, there were found two glandulose bodies, from whence proceeded several lymphedules which opened into the mouth, and there discharged, being fqueezed, a white and viscid humour. There were two of them towards the upper part a great deal bigger than the others. The tongue was fleshy at top and cartilaginous underneath, as in hens.

"The tunicle of the palate was rough, with a great number of little nipples and of hard and membranous points. It likewise included a glandulose body, which shot forth two great ducts opening into the mouth. There was discovered a great quantity of other little glands at the sides of the larynx, which had also some lymphedules."—Anat. Descript. of the Demollis of Num. by the French Academy.
oil, and soda. The resinous part differs from vegetable refining; because these do not form a soap with fixed alkalies; because they are more acrid and inflammable; and because the animal resin melts at the temperature of 40 degrees, and acquires a fluidity similar to that of fat. From fat it differs in not being soluble in cold alcohol, in which respect it approaches to spermacer, which alcohol cannot dissolve without heat.

Bile, like other soaps, removes spots of oil from these substances to which they are adherent; when its passages are obstructed the motion of the intestines becomes languid. It is neither alkaline nor highly putrefacient. In putrefaction it yields something of a muddy colour; the foil alkali precipitates from it a green sediment; and with distilled vinegar it produces a mixture rather acrid or sweet. Like saliva and urine, it has a tendency to form concretions which are called bile calculi or gall-stones. They are sometimes found of an irregular texture, of a brown, black, yellowish, or greenish colour. They sometimes consist of transparent chrysaline lamina, like mica or tale, and are sometimes radiated from the centre to the circumference. They are always inflammable, of a more solid consistence than the generality of animal oils, and resemble spermacer both in their solidity and chrysalization; they are soluble in ardent spirit when filtered by a moderate heat; the warm solution, when filtered, deposits by cooling a number of laminated white brilliant crystals, such as Poulletier de la Salle found in the bile, and which have been compared to the salt of benzoin, the concrete acid of borax, and to spermacer. Many of their characters indicate that they are a substance of the same nature with the latex mentioned. Fourcroy found that the substance of these crystals are composed of not only in the crystallized gall-tones or bile; he observed it to be a very considerable, degree in a human liver which had been exposed to the air for several years, and had lost its volatile parts by putrefaction. He detected it also in a faponaceous form in bodies which had been many years buried under ground; and lately Dr. Pearson of London has artificially converted the muscular fibre into a substance of a similar kind, highly inflammable, resembling spermacer (a).

The pancreatic juice resembles the saliva, and was examined in the latest century, with a good deal of care, by De Graaf and Swammerdam. It has often been observed forming flaky concretions (b). The lymph consists chiefly of water, but, like the fœrous part of the blood, contains a substance which is coagulable by heat, by acids, and by spirit of wine. It is found in the cellular membrane, in the vesicles of the brain, in the pericardium, on the surface of the plura, in the abdomen, in the burse musco, and in the joints under the name of forswis, where it has more than an ordinary degree of viscosity and of the lubricating quality. Sometimes, when it stagnates in the sheathes of the tendons and burse musco, it acquires a thickness and forms indolent transparent tumors, which become at last gelatinous. Its secreted chiefly by arteries. Animal fat is a substance of a nature similar to those fats which are called fæt in the vegetable kingdom. Its colour is usually white, sometimes yellow, and its taste anisipid. Its consistence is various in different animals. In cetaceous animals and fishes it is nearly fluid: in carnivorous animals more fluid than in the frugivorous: in birds, finer, sweeter, and more unctionous, and generally less solid, than in quadrupeds. In the same animal it is more solid near the kidneys and under the skin different than in the vicinity of the moveable vifera. As the animal grows old it becomes yellower and more solid; and in most animals is more copious in winter than in summer. In man and some other animals, it is collected in particular follicles of the cellular membrane, accumulated in great quantities in the groin, in the axilla, in the epiploon around the kidneys and around the blood vessels: it is likewise secreted on the surface of the skin which it protects from acid substances, and where it sometimes concretes, often from a want of cleanliness, in the form of small worms. In cetaceous animals and fishes it is generally deposited in certain receptacula, such as the cavity of the cranium and the vertebrae; in some it is chiefly confined to the liver; in others, in the serpents, insects, and worms, to the vifera of the lower belly, where it is deposited in small lumpes, and only a small quantity found on the muscles and under the skin: in frogs it is collected in certain bags which diverge, as it were, from a common trunk, and seem like appendages to the vessels and veins. In many places it seems to be secreted by organic pores, and under the surface of the skin by glands. It is accumulated from a diminution of perspiration, from the nature of the aliments, from morbid affection, and from idiofyn-ercy. It is of the same nature as the fixed oil of plants; and Lorry has found a striking analogy between the bile and the bile.

(a) The means which he uses is digestion in water; and the proceed supposes a previous acquaintance with what is common and what peculiar to the fibre and the fat. He maintains that the fibre is entirely composed of carbone, oxygen, hydrogen, and azote. In a high temperature these are decomposed, or at least separated, without producing fat. But when the fibre is kept in water in a low temperature, the carbone unites with the hydrogene of the water, and forms a fat resembling spermacer, and highly inflammable. Part of the oxygen, too, uniting with azote, forms the nitric acid; and part of the azote uniting with the hydrogene constitutes ammonia; so that these substances are thus formed.

(b) De Graaf was of opinion, that calcui might be formed in all glands. He had seen them above twenty times in the pinéal gland, that was long thought the residence of the soul—He says, too, that they occur more frequently in the pinéal gland of Frenchmen than of Dutchmen; and very pleasantly affirms this reason, that the volatile spirit of a Frenchman requires more ballast than that of a Hollander. De Succo Pancræatico, cap. 7.
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It would be impossible here to enumerate or to tell the uses of all the different kinds of secretions in living bodies. We cannot enumerate all that we know with running into tedious detail. The essential oils, which are peculiar secretions, the camphor, the gums, the balsams, the resins, and many others, are various secretions of the vegetable kingdom. Each species of plant and animal has generally some peculiar secretion; and this secretion in the individual has often some distinguishing quality, discoverable by taste, by colour, or by smell. These different secretions have likewise each their particular uses. We know the intention of the oily juice with which the bird dresses its feathers, of the glutinous fluid of the fish, of the viscous mucilage of the snail; we see the purpose for which the viper sometimes employs its virulent humour, and for which the scuttlefish ejects its ink: but yet we know only in part.

The difference among the various secretions of the same system from principally owing to a difference of stimulants, and to some difference in the action, the form and the irritable power of the secretory organ. It is therefore probable that the organs of secretion, and the smallest fibre is an organ of this kind: we may, it is probable that the organs of secretion, like the eye, the ear, and all the different organs of sense, are each affected in some measure by peculiar stimulants; as the stomach by hunger, by fæces the thirst, and the genital organs by venereal orgasmus.

Fermentative mixture, and some original impregnation. To what fermentation the organs, have also been brought to explain by the several phenomena of secretion. We conclude with observing, that however much the various fluids of living bodies may differ in appearance, chemical analysis has generally reduced them to a water, a gluten, a fatty impregnation, and an oil.

SECT. VII. Integumentation.

All living bodies are furnished with one, two, or integuments with more integuments, which are prepared by secretory organs, and which are a defence against those injuries to which their situation is commonly exposed. Of these integuments, some prevent the diffusion of the fluids, some again reflect acid and corrosive substan-}

ties, some are indigestible in the stomach, and some are seemingly incorruptible in the earth. By these properties they preserve feed and the ova of insects, in which are indigestible for a number of years, waiting the change of reptiles in seed or of season. They protect both from the action of the earth, of weak membranous frauchmach, and make those animals which choose to swallow them contribute likewise to their propagation. The gelatinous substanee ejected by birds, and called the tremella-nosea or starfall, we have lately found, by numerous experiments, to be a substance of this kind. It is nothing else than the oviducts of frogs, which, as the egg moves along their winding canal, are intended by nature to secrete that transparent and vitreous glass which

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185. The navous fluid.

So little are we acquainted with the nervous fluid, that some have doubted of its existence. The discovery, however, of Galvani, and the numerous experiments that have since been made on animal electricity, leave us not without all hope that something yet may be known of its properties that will greatly illustrate several phenomena in the animal economy.

The lacteal secretion is generally confined to one sex, and is peculiar to the class of mammalia, though something similar may perhaps be secreted in the crops of pigeons.

186. The milk fluid.

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{(r) The efficient cause may be diminished by respiration.
which constitutes the albuminous part of the ovum, and feeds and protects the embryo in water (v).

Some integuments are chiefly useful by their strength and hardness. The shells of the beetle are an excellent defence for the membranous wings which the creature is seen to pack up in folds when it inclines to creep into the earth. The shell of the snail lodges the intestines (x) when the animal comes forth to search for its food, and it furnishes a safe retreat for the body when any danger is threatened from without. Some animals, confined to their shells, can open and close them by a muscular power; and some shells, like the scales observed on fishes and insects, are disposed into plates, so as to be no hindrance to motion. Several insects which spend a part of their time in the water always compose a shell for themselves where it is needful. The usual materials are sand, straw, or mud, which they cement by a viscid secretion. The shells of molluscs are corneous. Swammerdamm found earth worms the colour of the earth which they inhale, when occasioned by the imbibition of vapours, that produce a suffocating vapour, that feels hot, steamy, and unpleasant, to the sensation that creepaceous shells are composed of layers of indurated membranes, and that they are sometimes covered with a cuticle.

Some integuments are covered with feathers, some with hair or a thick down. Besides many other obvious uses of these coverings, they serve in general to repel insects; and being bad conductors of heat, maintain a genial and necessary warmth.

When the integuments are covered with prickles, they repel attacks by the strength of their points, or by the venom which they infuse, as the fangs of nettles and the down of some insects and plants.

When they are moistened with a viscid secretion, they prefer the necessary softness of the parts, prevent evaporation, reft their memory, enable plants to destroy their enemies, and adjust the fluid in performing its motions.

Both plants and animals, but particularly the former, are often protected by an odorous effluvia from their integuments. This effluvia is the finer part of their volatile oil, always inflammable, and so subtle, that the continued emission of it from wood or flowers does not sensibly diminish their weight. To this fragrance it is owing, that the deadly nightshade, the henbane, hounds-tongue, and many others, are seen on almost every high road untouched by animals. The manielle-tree of the West Indies emits so very dangerous vapours, that the natives poison their arrows with its juice, and those have died who have ventured to sleep under its shade. The lobelia longiflora of America produces a suffocating apprele in the breath of those who breathe in its vicinity. The return of a periodical disease has been attributed to the exhalation of the rhoea to the dendra. Every one knows, says Chaptal, the effects of mule- and oriental saffron on certain persons. Ingenhousz mentions a young lady whose death was occasioned by the smell of lilies; and Tillier reports an instance of another who died in consequence of the smell of violets. The flection of grapples by different animals seems to be owing to the manner in which the volatile aroma affects their senses. But of all the vegetable exhalations known, those emitted by the bohun-upas, or poison-tree of Java, are the most remarkable. For many miles round no animal can breathe the air, no plant dares to peep from the soil, the flies die in the poisoned stream, and the birds that venture athwart the atmosphere with despairing flincks sink down lifeless. Such often is the use of the fragrant oils in the vegetable economy. The shrubs and trees that are covered with thorns are in general a grateful food to animals. They generously avow their manner of attack, and incur the dark affiance of poison.

The various colours of the integuments, as well as by their aroma, is a species of defence. "Caterpillars which feed on leaves (says Darwin) are generally green; and earth worms the colour of the earth which they inhabit. Butterflies which frequent flowers are coloured like them. Small birds which frequent hedges have greenish backs like the leaves, and light coloured belies like the sky, and are hence less visible to the hawk who passes under them or over them. Those birds which are much amongst flowers as the goldfinch are furnished with vivid colours. The lark, partridge, hare, are the colour of dry vegetables or earth on which they rest; and frogs vary their colour with the mud of the streams which they frequent (y), and those which live on trees are green. Fitch which are generally suspended in the water, and swallows which are generally suspended in the air, have their backs the colour of the distant ground, and their bellies the sky."

The sphinx-convolvuli, or unicorn-moth, resembles in colour the flower on which it rests; and among plants, the nectarine and petals of the ophrys, and of some kinds of the delphinium, resemble both in form and colour the insects which plunder them, and thus sometimes escape from their enemies by having the appearance of being pre-occupied. From colour being thus employed as a defence, many animals vary their change of colours with the seasons and circumstances; and those which are of different colours in summer according to the places which they inhabit, do all in winter assume in common the colour of the snow.

But a change of colour is not the only change of the integuments. As the outflow are often insensible to stimulants, and for obvious reasons possess little of the vital principle, in all cases where they cannot be enlarged to admit an additional increase of growth, or where they are not furnished with necessary organs to repair those injuries which they may suffer from disease or accident, the body is endowed by nature with power to throw them off, and to produce others in their stead (z).

For this reason we see the tree calling annually its exterior bark, the lobster his shell, the

(v) We have often inhaled the odour of frogs, and dried them; and afterwards putting small pieces of them into water, have seen them swim in a few hours to a large size, and forming the tremella-nothoc, or thalamus.

(x) This snail is found in our gardens, and carries its shell, including the intestines, upon its back.

(y) The fame is the case with many fishes that live in lakes.

(z) Several small animals, in changing their integuments, change likewise the interior coat of the alimentary canal, which they void with the faces.
Irritability.

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Bird his feathers, the quaduped his hair, and sometimes his horns, the serpent his skin, and man himself renewing the scales of the epidermis. These changes usually take place once a-year; twice frequently with respect to serpents, and oftener in toads, who have been observed to devour the skin which they throw off. All the integuments of ova and seeds, being wholly the production of parental organs, neither are nor can be repaired.

Sect. VIII. Irritability.

Is that property of the living fibre by which it acts in consequence of stimulants. Being one of the great causes of motion in living bodies, no propery has excited more wonder, been the cause of more error, or exhibits such a number of striking phenomena to the senses. These effects, however, have arisen rather from the nature of the stimulants than from any thing mysterious in irritability. Many of the stimulants by which this property in bodies is displayed are often invisible, unknown, or not thought of, and men being conscious that a number of their motions proceed from a stimulant, that is, under the direction of a mental power, they readily conclude from a sort of analogy, that every motion in plant and insect that seems to answer a useful purpose, and is caused by some invisible stimulant, is the consequence of mind directing from within. They further suppose that irritability is in all cases the consequence of nerves, which are those organs which nature has employed in the animal kingdom to convey stimuli between body and mind. These singular conclusions have led to others that are less admissible even than themselves. It has been imagined that creatures the most stupid poisses within them a principle of mind that is incapable of further improvement, but which notwithstanding is in many respects superior to reason, and a surer guide in whatever relates to self-preservation or that of the species; it enables the animal to predict without foresight, and to act rationally without intelligence. This wondrous principle has been called instinct: in order to account for some of the singular phenomena of vegetables, a share of it has graciously been allowed to plants; which having become favourites of late, have been also presented with the privilege of fe!usion, permitted to fall in love, and to marry, and on some occasions to exercise the faculty of volition.

At these concessions the metaphysician will naturally smile. He knows how many impose on themselves by the mere sound of their own words, as if by calling the snow black they were to discover a new property, which curious discovery would turn out at last to be only a gross ignorance of language, and the foolish misapplication of a syllable. He who has studied the philosophy of mind, and been accustomed to view objects through another medium than the magic colourings of paffion and of fancy, readily perceives something of absurdity in ascribing such wisdom to plants and insects. With respect to animals, these gentlemen do not recollect that voluntary actions are of two kinds, as they proceed from design or propensity; that in performing one of these kinds the mind itself has an object in view, and is properly the source whence they originate; but that in the other the mind is merely a secondary agent, is acting under the influence of stimulants, is often not aware of the consequences, or, although aware is often so infatuated as not to regard them, however fatal. It is generally well known that protoplasm is a system of matter, that not a few of these protoplasms rise from the form and structure of the body, from the manner in which the optic nerve is affected by colours, the olfactory by imcels, the gustatory by tastes and auditory by sounds; from different ways in which the tastes are affected by thirst, the stomach by hunger, and the genital parts by venereal organs.

Besides these and other properties which operate as stimulants in the system itself, the naturalist has found that light, heat, and moisture, in various degrees, from absolute darkness, coldness, and dryness, act as stimulants upon living bodies: he has experienced that electricity is a general agent, that several plants emit flashes, and that some animals even give shocks resembling the electric. He has made it probable that

\[(a)\] In Sweden, (says the author of the Loves of the Plants) a very curious phenomenon has been observed on certain flowers by M. Haggeren, lefurer on natural philosophy. One evening he perceived a faint flash of light dart from a marigold: surprised at such an uncommon appearance, he resolved to examine it with attention; and to be assured that it was no deception of the eye, he placed a man near them in order to make a signal at the moment when he observed the light. They both saw it conveniently at the same moment; the light was most brilliant on marigolds of an orange or flame colour, but scarcely visible on pale ones: the flash was frequently seen on the same flower two or three times in quick succession, but more commonly at intervals of several minutes; and when several flowers in the same place emitted their light together, it could be observed at a considerable distance. This phenomenon was remarked in the months of July and August at fun-set, and for half an hour after when the atmosphere was clear, but after a rainy day or when the atmosphere was loaded with vapours nothing of it was seen. The following flowers emitted flashes more or less vivid in this order: the marigold, garden nafluration, orange lily, African marigold; sometimes it was observed on the sun-flowers; but bright, yellow, or flame colour, seemed in general necessary for the production of this light, for it was never seen on the flowers of any other colour. The flowers were carefully examined with a microscope without any insects or phalophorous worms being found. M. Haggeren, after having observed the flash from the orange-lily, the author of which are a considerable space distant from the petals, found that the light proceeded from the petals only; whence he concludes, that this electric light is caused by the pollen which, in flying off, is scattered upon the petals (Obere. Physique par M. Rozier, vol. xxxiii. p. 111.) Add. to the note on Tropaeolum, the Loves of the Plants. The author of this beautiful poem supposes, that the time of the twilight is sometimes extended by different bodies, emitting the light which they had absorbed during the day.
Irritability. It produces all the wonders of crystallization; and that the cause of chemical affinity, and of all the phenomena displayed by the magnet, if not simply a modification, is at least akin to it. In the male parts of plant and animal, he has seen both the fluid and the pollen that give the stimulus in generation, and are accompanied with so extraordinary changes in the system. He has found that much of the vegetable economy, and that even the function of generation itself, as the development of the fecundating powder, and its application to the female organ, is partly carried on by wind, heat, and other such agents. He has reason to conjecture that many general agents in nature are yet unknown. By the help of chemistry, he has found out lately a considerable number which are called gases, which are of the highest importance in both the animal and vegetable economy, and which, like the aromas of plants, or the causes of contagion, produce their effects without being visible. It is only, too, of a late date that the celebrated professor Galvani of Bologna has excited so much curiosity through Europe, by the discovery of a certain stimulus that refides in other animal; but many an animal has a much greater acuteness of the different senses and circumstancies, though it answer a useful purpose, proceeds from a cause that does not seem to be very well known. Even many animals which are not invisible, nor yet unknown, exert their influence in a secret manner, so as not be obvious to the senses. It is generally known that many singular movements of plants are owing to heat, many to light, and several to moisture. The barley-corn is often observed to creep on the ground by means of its awn, which dilates and contracts according to the different degrees of moisture. The wild oat, employed as a hay-gemeter, moves through the barn, travels through the fields, nor ceases to be changed by its natural motion till its beard fall off, or till it meet with a soil where it conveniently may strike root. Upon a similar principle of motion, the ingenious Edgeworth constructed an automaton which moved through a room which it inhabited. It is easily conceived how these singular effects, arising from causes that are unknown, invisible, or unthought of, should give birth to the notions of witchcraft and of infinid, and impress the fancy with an idea of something resembling sensation and volition in the vegetable kingdom. These agents, whether visible, unknown, or unthought of, directed by regular and uniform laws under the great Author of nature, produce effects that indicate prescience, wilddom, and design, and causing a transient or permanent propensity in the mental part, frequently contrived by refiluils they the finite minds that reside in matter. These minds, in a living body, have generally been found accompanied with some system of nerves; and these nerves happening with equal facility and promptness to convey stimuli from the mind to the body and the body to the mind, the great difficulty has been to determine with respect to others when the action proceeds solely from design, solely from propensity, or from design and propensity together. The uniform conduct of the brute creation would seem to imply that their minds has little of inventive power; that it generally acts from the impulse of propensity; and that its manners are varied, not in consequence of a change of sentiments, but from the induction of new habits, and the application of new stimuli.

It has been observed, that in all animals the vividness of mind has some relation to the quantity of brain, and mind depends on the brain, the acuteness of the different senses is generally proportioned to the quantity of nerve bestowed on their organs. Man has a greater proportion of brain than any other animal; but man has a greater vividness of mind than any other animal on this globe.

The brain of quadrupeds is somewhat similar to that of man, but proportionally smaller, and not perhaps of its organization well organized. Willis has observed, that among animals the structure of the cerebrum is more variable than that of the cerebellum; that the former generally furnishes nerves to the voluntary muscles, and the latter with the medulla oblongata to the involuntary. He has likewise remarked, that the round prominences commonly called the nates and telfes are large in the quadrupeds, which are active and vigorous, and in some measure able to procure their own subsistence at birth; that the taber annulare is large in the quadrupeds that are distinguished for their sagacity; that wherever the taber annulare is small, the prominences are large, and wherever it is large the prominences are small. From these observations he has concluded that the taber annulare is the seat of genius, and the round prominences the seat of what has been called intellect. The brain of birds is seemingly the reverse of the human brain; the cortical substance the interior, and the ventricles are situated in the white part on the outside. In the brain of the bird there are no circulations like the intestines, no fornix, corpus callosum, nor corpora striata.

The brain of fishes is in many respects similar to that of birds. It is very small in fishes, proportion to their body, and is generally surrounded with an oily matter. In one genus of fishes, the gudus, Dr Monro found spheroidal bodies between the dura mater.

(2) The acuteness of the senses depends upon the readiness with which their organs are affected by stimuli. The readiness depends on irritability. It is not necessarily connected with mind, nor should it ever be confounded with perception, which in classical language signifies a property of the mental principle.

(c) Few perhaps who have dissected different animals, and who, besides a number of structures have seen a variety of tubercles and lobes existing in the brain, will be rash in ascribing to any one of them one particular office. The pineal gland was for some time thought the seat of the soul. It was afterwards found to be of
Irritability. Dura et pia mater, and covering the greater part of
the nerves like a coat of mail. The two senses, seeing
and hearing, in many fishes are often acute. By lay-
ing one ear on the water, and striking the surface at
some distance, this element is found to be a better con-
ductor of sound than even the air.

Of reptiles.

Of insects.

Most insects have no brain at all, but a nervous cord
that is full of ganglions, that runs from one extremity
to the other, and is denominated the spinal marrow.
This knotty cord, however, is not marrow; the insect
has nothing resembling a spine; and the formation of
the cord in the animal is often not along the back but
the breast. In the silkworm, and most other insects,
this cord is in contact with the alimentary canal; and
the first ganglion, which is sometimes called the brain,
though not in the head, divides, in order to give a pas-
tage to the stomach, and again unites in a second
ganglion. Swammerdam found in a species of snail
a brain with two lobes, in contact with the stomach,
moveable by muscles, and without a fixed place in the
body.

The polypes exhibit no appearance of brain or of
nerve, as in other animals. Their skin, however, is
observed to be full of a number of small granulary
bodies, which are connected by a glistening matter that
resembles a thread. Like rods of head-flings, they
extend from one extremity to the other, and along the
arms. Trembley learned from a number of experi-
ments that they received their colour from the food,
and therefore supposed them to be vesseles or glands.
If not like the tuberous nerves of the insects, they at
least are not very different in appearance from the
nerves of the gadus that are covered with a number of irritant.

Polypes.

A move-
able brain
in a species
of snail.

The great
influence
of the
nerves.

In the animal kingdom all muscles in the time of
action
ten filled with stony concretions; and the celebrated Nuck, instead of affixing to it any prerogative, con-
tented himself with writing its epitaph.

VIATOR

Gradum. Sitae.
Omnique Conatu. CONARIUM.
Repite. Sepultum.
Amice. Sedem.
GLANDULAM. PINEALEM.
Cujus. magnatatem. Splendoremque.
Pamina. Firmarat.
Opinio. Confirmaret.
Tandem. Vixit.
Avaluerat. Tota.
LYMPHAEC. Limpida.
Locum. Supplerat.
Abi Sine. GLANDE. Viator.
Lymphamque. Ut aliis. CONARIO. Concede
Ne tuam positeri
Mirentur Ignorantiam.

(p) In many instances the prompt motions of animals seem more owing to the irritability of their fibres
than to what has been called the sensibility of their nerves. The poet was mistaken when he supposed that the
mangled insect would feel as sensibly as a mangled giant. When the gad-fly fixed on the hand, you may
cut off its wings, its legs, its antennae, and a part of the lower division of its body, without disturbing its gra-
tification, or apparently occasioning to it much trouble.
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Irritability, action are observed to discharge a quantity of their blood and those muscles which are naturally white are the most irritable. In all living bodies, the irritable power will cease to obey the action of a stimulant if either long or violently applied. After exercise, therefore, the irritible fibre requires rest, after heat cold, after waking sleep, before it again becomes subservient to the action of the stimulant that overwhelmed it. This is the reason that in plants and animals there are certain exertions and functions of the system that can only be continued at intervals and seances. The natural stimuli of involuntary muscles continue to act, and the muscles continue to obey through life.

The organs of sense were formed to mark the difference of stimuli; yet living bodies are affected by light without having eyes, by sounds without having ears, by odorous effluvia without having smell, and by rapid bodies without having taste. It is easily confessed how these objects, by their inherent properties or motion, may produce a confused fort of excitement in every highly irritable fibre. But the organs of sense are peculiarly fitted to receive accurate and distinct impressions from each of those objects; and these different impressions seem not to arise from any difference in the kind of nerves by which they are received. All the difference that has been observed arises from the structure of the organ itself, and from the manner in which the nerve is distributed through it. Other parts of the animal body, as the stomach, the fauces, and genital organs, are thus affected by particular stimuli; and many animals, and even vegetables, may be affected in various manners, and by various stimulants, of which neither our feelings nor our senses can give an intimation of any thing analogous.

With respect to the several organs of sense, some animals have many eyes without any motion, and some animals have few eyes with varieties of motion. The entrance to the car in some animals is from the mouth, as happens in the frog; and the bones of the car are without the cranium, as in some fishes. The sense of smell is found in the nose: this sense is attending in dogs; and even sheep, in distilling the lamb's milk, to it more than seeing or hearing. The sense of taste is far from being general; and the sense of touch can hardly be said to reside peculiarly in any one organ.

Sect. IX. Motion.

Motion is one of the great sources of motion in all living bodies; and this power is brought into action immediately by nerves or some other stimulants. Locomotion here is principally considered; for although the kinds of internal motion employed in secretion and the other functions be as remarkable, in the eye of the philosopher they have not so generally attracted the attention. Most animals are capable by nature of changing the place which their body occupies; for this reason the irritible fibres being formed into bundles, which are called muscles, are in most animals attached to bones, cartilages, or hard integuments; which they move as levers: these levers, with their muscles attached, are in most cases formed into wings, fins, and legs of various kinds, and are employed in performing the motions of flying, swimming, walking, leaping, and creeping. So very necessary, in the opinion of some of the ancients, was one or other of these instruments to progressive motion, that the movement of the ferpent was often ascribed to a preternatural cause, was supposed to resemble the insensius durum, and procured to the animal one of the highest and most honourable ranks among the emblematic kinds of divinities. Even Moses himself, who was unwilling to allow it the character of an athanademon or good genius, was yet so puzzled at its being able to move without feet, that he pronounces it a tool of the devil; and says that it was deprived of its feet by a curse from heaven for producing mankind into idolatry. Notwithstanding, however, the surprise that has been occasioned by the singular motion, the motion of snails, though not so rapid, is in many respects as extraordinary: they adhere by a certain viscid secretion; on dry ground this secretion forms a pavement over which they glide; and they proceed by the action of muscles without bone, cartilage, or shell, to which these motions can be attached.

No animal walks without legs or flies without wings: but there are many that swim without fins, and that leap and creep without any legs. The rapidity of movement is not proportioned to the number of instruments that are employed: if the spout of a fish be observed to move slowly with one leg, the sea urchin moves its flower with many thousands; the octopus moves by squirting out water; the scallop by the jerk of its shell, and when in the water it rises to the surface and falls before the wind.

Many animals are formed by nature to fly, walk, leap, and swim: the fate of this is rather uncommon; whose muscles or feet are by nature attached to their integuments; the lobster is obliged to throw off its shell, and the caterpillar its flower, and the worm situation to remain stationary till it receive new instruments of motion.

Whoever has read the celebrated work De Motu Animalium, needs not to be told that, besides the organs which are here mentioned, the form, the structure, and even the specific gravity of the body, depend on the nature of the bones and muscles, or as varied by air, vessels, and bubbles, with a great variety of other circumstances, are necessary to explain the different phenomena of locomotion.

As to vegetable motions, they evidently depend on external agents: The motion of the wild oat has been mentioned; the wings of insects only fit them to be carried by the wind, their specific gravity to float in the water, and their legs or tentacula to adhere to bodies that are in motion: the singular motions which have been ascribed to sleeping, to waking, to senation, and volition, in the vegetable kingdom, seem only the consequence of light, heat, moisture, and such stimulants, acting invisibly or without secret influence; the opening and closing of the meteoric flowers are at times correspondant to the states of the atmosphere; and the opening and closing of the equinoctial and tropic flowers, to the light, the length, or shortness of the day.

The fins of the flying fish enable it rather to spring than to fly.
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Habit.

The principal intentions of locomotion are to get food, to shun danger, to promote intercourse, and diffuse the species.

Sect. X. Habit.

Habit here deviates a little from its usual meaning. We employ it to signify that principle in living bodies by which they accommodate themselves to circumstancies, assume as it were a different nature, and in many respects undergo a species of transformation. So very much do some individuals of the vegetable tribe accommodate themselves to different situations, to soil, to climate, and the state of cultivation, that those naturalists who have not been accustomed to nice and accurate discriminations, have frequently mistaken the variations of the same plant for so many species. These variations may be daily seen by examining the plant as it grows on the mountains, in the valleys, in the garden, or in the fields; or by bringing it from a rude uncultivated state, when it sometimes lays aside its formidable prickles, and changes the colour and structure of its flowers.

In the plant and animal, the delicacy and vigour of the constitution are often the effects of habit and circumstance than original constitution. We have mentioned already the varying colour of the integuments, and the purpose which it serves in changing with the seasons. We may here add, that animals covered with a down or hair have it thick or thin, long or short, according to the different exigencies of climate.

Those changes produced on their body are accompanied with others which are the causes of new tales, of new propensities, and new manners. At the Cape of Good Hope the ostrich inclines to sit on her eggs day and night like any other bird; but in Senegal, where the heat is great, she is somehow disposed to leave them to the sun during the day. In those countries where provisions can be found during the greatest part of the year, the bee gradually loses the propensity of laying up stores for the feaason of winter; and in "those countries infested with monkeys, many birds (says an amusing and instructive writer) which in other climates build in bushes and the clefts of trees, suspend their nests upon slender twigs, and by this ingenious device elude the rapacity of their enemies." Man, from imitation, is exposed to a great number of habits peculiar to himself; and physical causes have ingeniously been assigned for the variety of his features and complexion.

Few experiments have yet been instituted with a view to show how far this accommodating principle in nature may be extended in the different species of plants and animals. It is known, however, that the lamb and the dove can be made carnivorous; and that the hawk, laying aside its ferocity, can be brought by art to live upon grain.

Of all the effects of this singular principle, the most wonderful are those which are seen to take place with respect to generation. The fact is far from being new to the naturalists, that certain animals, oviparous at one season, are viviparous at another. This indicated much how far it is possible to accommodate, though far inferior to what has been since witnessed and displayed: for who from all this could suspect, that any animal which usually propagates by an intercourse of sexes, could in any circumference accommodate so far as to multiply its species another way. Bonnet of Geneva, however, has discovered, that the puceron or vine fretter, which generally propagates by an intercourse of sexes, is not only oviparous at one period and viviparous at another, but in all cases where the union of the sexes is not to be obtained, can easily accomplish all the purposes of generation without it.

Similar experiments have likewise proved, that many plants can bring to maturity a productive seed, though the male parts of the flower be destroyed before they can in the usual way have any impregnating effect on the female. In this case the conclusions drawn have been somewhat new. From these experiments it has been inferred, that the sexual system is ill-founded, and that most of the learned naturalists of Europe are on this subject labouring at present under a mistake. This reasoning, however, is not satisfactory: for why, it might be asked, in the vegetable kingdom more than in the animal, should the mode of generation be necessarily uniform? Those plants may, like some animals, propagate without sexual distinctions, the conclusion is not logical that these distinctions are useless in all; and though some few may, in particular instances, propagate without that impregnation to which they were accustomed, will any one demonstrate, that accommodating nature does not here as in the puceron adopt a new method to accomplish her designs?

In all living bodies, it frequently happens that feveral characteristic distinctions, as the colour, the features, and a number of diseases that are originally the effects of circumstance, do at last become so fixed in the system, that they are afterwards transmitted to posterity through some generations (r). With regard to animals these facts are well known; and as to vegetables, it has been observed by a pupil of Linnaeus, that the apple trees which are sent from Britain to New England blossom at first too early for the climate, and

(r) Might not these facts reasonably claim the attention of those who mean to form matrimonial connections? How many might easily entice on their pohterity hale constitutions, regular features, beautiful forms, found minds, and tempers at once uniform and cheerful, who yet, from their fordid desire of wealth or their fond admiration of high rank, bequeath to them only scorbutic habits, deformed persons, disagreeable features, mean understandings, and forbidding tempers? Excepting the more extraordinary properties of body and mind, there are few that may not in some measure be transmitted to posterity: but nature seems unwilling that what is very eminent should ever be extended to a genus or a species; and therefore the sons of Cicero and Cromwell are only two of a thousand instances that might serve to prove, that neither extensive nor eccentric genealogies can be made hereditary. In the second generation they often degenerate into minds that are weak, fatuous, or deranged; or into minds that are chiefly remarkable by their oddities and whims.
that induce habits, and to that general accommodating principle in living bodies, many medical prescriptions are found to be not only useless but mischievous; and many parents, by studying the health and comfort of their children, bring on habits that prove the forcers of perpetual sickness or the certain prelages of an early death.

The accommodating principle is one of the consequences of irritability. Its various effects arise from the actions of different stimulants on the irritable fibre, and the after-duration of these effects, from the modifications of the irritable fibre, become habitual from the frequently repeated action of the stimulants.

The design of this accommodating principle is to fit both the plant and the animal for a more extensive and a more varied range of existence.

More remarkably striking than any of those changes to which the plant and animal are exposed, from the variations of habit or the change of integuments, are those alterations which they undergo from metamorphosis or transformation. It has indeed been asserted, that these alterations consist in throwing off certain temporary coverings or envelopes: but there is here a want of precision in the ideas, and consequently a want of accuracy in the expression. The fame persons who make this assertion inform us, that caterpillars change their skin, and many of them even several times, previous to the period of their transformation. Transformation, therefore, and a change of integuments, by their own concedeions, are different things. The truth is, transformation frequently takes place independent of any change of integuments; and there is often a change of the integuments without transformation or any appearance of a new form; but a new form or change of appearance is always implied in metamorphosis or transformation. This new form is sometimes occasioned by a change of shape, consistency, and colour; as when the lobes of a leaf are converted into feiminal leaves. It is sometimes occasioned by a change of proportions among the parts: the proportions of a fruit, every one feeds, are different from those of a full grown man; and the painter, merely by observing the proportions, represents a child, a dwarf, and a giant, on the same scale. It is sometimes occasioned by the addition of new organs; as when the emmet receives wings, and the plume of the feed is fed by new roots striking into the ground; or it is occasioned by a change of both the form and the organs, and their mode of operation, as happens remarkably in some insects; for though all living bodies, plants and animals without exception, undergo partial or general transformations, yet those changes are chiefly observable among insects. Many insects appear to consist of two distinct animal bodies one within the other: the exterior, a creature of an ugly form, reposing in the water or under the earth, breathing by gills or sometimes by trachea projections from the tail, possessing a voracious and groveling appetite, and having a system of fanguiniferous veins that circulates the blood towards the head. When all its parts decay and fall off, the creature included succeeds in its stead: this often is an animal of a different form, generally lives in a different element, feeds on a different species of food, has different instruments of motion, different organs of sense, different organs of respiration, and differently situated; and being endowed with the parts of generation, inclines to gratify the sexual propensity, and produces an embryo which becomes like the firft, and from which afterwards in process of time a creature is evolved similar to itself.

If the embryo or egg be deposited on a leaf, the leaf frequently is observed to bend, to wrap it in folds intended for the purpose, and to protect it from injuries and danger. If deposited in the body of an animal or plant, they accommodate themselves to its wants and necessities, and furnish a tumour which serves it for a nidus, and besides, like an uterus, supplies it with nourishment; and if deposited in the body of an insect, the creature provides for the future deposition of its young charge with all the tender care of a parent, and then dies.

These circumstances, added to the great variety of forms which insects assume, render it sometimes difficult, even to the parents of insects, to know who is the parent. We cannot, for instance, pronounce with certainty who is the true parent of the girdas, known by the name of the feta equina, or hair eel. A few experiments, which we once began with a view to throw some light on the subject, were interrupted unfortunately by an accident, and we have not since had leisure to resume them. We learned only, from a number of observations, that certain black beetles about the end of the summer months have the {tongue} propensity to run into the water, where they soon die; and that one or two, and sometimes three or more, of these eels gradually drop from the beetle by the anus. Whether other insects provide for the girdas in this manner we have not yet been able to determine.

The transformation of some animals is most observable in the uterus and egg. Some early transformations of the chick may be seen in the plate belonging to this article; and anatomy has often witnessed the change which happens at birth with respect to circulation, respiration, digestion, and the other functions.

If the reader will be much acquainted with the manners and transformations of insects, he will derive information and pleasure from consulting the plates and memoirs of Reaumur. If he wish to know their intimate structure, the laborious Swammerdamer can introduce him to a new and amusing species of anatomy. This last author had before Reaumur defined and described
Reflected the kinds of transmutations among insects and some other animals. He has shown similar transmutations in plants; and in plate 46 of his Book of Nature, has compared the frog and the clove July-flower under their fix different forms.

In all living bodies poised of mind, the changes of form, as well as the change of habit and of age, are usually accompanied with new properties, appetites, and passions. It may therefore be inferred, that we ought not to look for the cause of temper in either the brain or the nervous system; or to imagine, that the present passions, appetites, and passions, are properties of mind: they seem only affections happening to mind in consequence of stimuli and organic structure.

Microscopic observations having demonstrated, that all the forms of the plant and animal existed previously in the seed or embryo, transformation must be owing entirely to the evolution of the different parts by means of nutrition.

What nature intends by transformation, we pretend not to say; but by means of transformation different elements are produced, the different species are variegated, and animated nature wonderfully diversified without a multiplication of beings.

Sect. XII. Generation.

Many of the causes which contribute to the formation of a living body have hitherto eluded human research; may in all probability never be discovered; and perhaps are beyond human comprehension. Some philosophers, considering the extreme divisibility of matter, and learning from the microscope that transformation is but the development of certain parts that previously existed, have thence imagined that generation is somewhat analogous; that all regularly organized bodies received their form at the beginning; that the first of every genus and species contained by involution the numerous millions of succeeding generations; and that the union of the two sexes gives only a stimulus, and brings into view forms that had existed since the world began.

This hypothesis has attempted to explain a thing that is unknown by what must fore ever remain incomprehensible to the human mind in its present state. It appeals abundantly from observation to conjecture; and supposes that bodies which are originally brought into view, which are daily augmented, frequently repaired, and sometimes renewed by organic action, do nevertheless in their first formation require an effect superior to what omnipotent power is able to perform by secondary agents.

Had the supporters of this hypothesis considered that many herbaceous plants produce new flowers when the first set are entirely cut off, that lobsters and many species of insect renew their limbs, and that certain polypyes can raise so perfect vegetable forms as to puzzle the naturalist whether or not he should class them under plants; they would not have prefixed such bounds to omnipotent wisdom and almighty power, or declared with such confidence what the Author of Nature, to speak with the vulgar, must necessarily perform by his own hands, or what he may intrust to secondary causes regulated by his laws.

These philosophers will find it difficult to account in a very satisfactory manner for monerous productions, and for those changes of structure and of form which for a while continue hereditary from the influence of habit. They object to others, that all the parts of a living body are mutually dependent. Nor the most on one another, so that they must necessarily have been caused or produced at once. But though every attempt has not yet been made to ascertain which of the vital organs are prior, and which posterior, in a living body has proved unsuccessful, it has not been demonstrated that either themselves or their functions are coeval. It may, on the contrary, be plainly demonstrated from observation, that the lungs and the stomach do not begin to perform their functions so early as the heart and the vascular system; that the heart and its system perform their functions, even with some considerable changes, immediately after birth; that the vegetable tribes are without nerves; and that brain and nerves in the animal kingdom perform more and more of their functions as the system approaches towards maturity. It has been shown that bones will unite, and the limbs of an animal continue to be nourished without nerves; or that there is a principle of life in the blood; that the heart will last under other stimuli besides that of nerves; and that sound logic does by no means require us to suppose that the first actions of the vital heart, or the punctum saliens, are owing to the influence of stimuli from the brain, or that the brain must have existed when the heart first moved.

Although the minuteness and transparency of the parts may prevent us from seeing the first gradual formation of the embryo, yet every observation corroborates the rate of opinion that it is formed by secondary causes, and through the medium of organic powers.

It has been asked, whether or not is the embryo by one of the joint operation of the two sexes? or is the female formed entirely by one, and brought into action by another? The former of these questions supposes that each of the sexes has a seminal fluid; that some mixture takes place in the uterus, and produces an embryo, in the same manner that a neutral salt assumes a certain and determinate form. The notion implies some general and concealed idea of chemical combination; but does not bespeak a very clear head, profound reflection, or much acquaintance with the nature and properties of living bodies.

For a long time past the most rational physiologists have generally agreed that the embryo is formed gradually and slowly in one or other of the two sexes, not by chemical combination and mixture, but a system of organs, directed by laws and prompted by their stimuli, with many of which we are yet unacquainted.

From the great Hippocrates downwards to Aquavendens and Harvey, the credit of furnishing the facts of the embryo was almost universally given to the females of those animals which are named oviparous. Among the viviparous, appearances were such, that the female was left to content itself with the male. At last the clat of Leeuwenhoek's discoveries seemed to put an end to all doubts entertained upon the subject. He very plainly saw through his microscope that very great and their profusion of particles that move too and fro with amazing rapidity in the male semen. Upon this he embraced the doctrine of Hamme, who had seen them before, and supported from their motions that these particles were not only animalcules, but the principles of
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...rudiments of that animal in whom they were formed, and that they were deposited in the uterus of the female only to be nourished and augmented in size.

What raised speculations against this theory were the numerous animalcules discoverable by the microscope in other fluids, and that vast profusion of young embryos in those cases where never more than one or two arrive at maturity. It was an objection to it, that some females had been impregnated where the hymen remained unbroken, and where the vulva had been shut so closely as to leave only a passage for the urine.

The male female in these instances could have reached only the mouth of the uterus. It was another, that in all birds which have no intract penis the male female is never sent farther than the mouth of the vulva, and that a single act of the male impregnates the whole eggs of the ovarium. A third objection is the pollen of flowers, which is not applied immediately to the seed, but often to a distant part of the vein in which it is contained. A fourth may be taken from frogs and fishes, and all those animals whose eggs are impregnated after emission. And, lastly, Haller had observed the pullet completely formed in those eggs that were not fecundated.

Supporting animalcules in every kind of prolific female, yet it frequently happens that this female undergoes a change before it can be applied to the embryo. The semen of the frog is dissolved in water; and that, which is injected disappearing suddenly after coition, would seem to intimate, that in those animals which have been examined it had met with a solvent somewhere in the uterus, and produced its effect after the change. It is now, we believe, pretty generally known, that the embryo does not commence its existence in the cavity of the uterus. De Graaf observed it on its passage down the Fallopian tube; he saw the place where it first began in the teficle of the female; and cafes have occurred where it has missed the Fallopian tube, where it has fallen into the abdomen, where the placenta has been formed, and the fetus has grown among the viscera of the lower belly.

From these facts it has been concluded, notwithstanding some feeble objections, that the female teficles are real ovaries containing eggs; that these eggs are brought into action by the stimulating power of the male semen, which is sometimes thrown into the cavity of the uterus, sometimes applied only to its mouth, and sometimes sprinkled over the egg after emission.

The principal difference, therefore, that occurs between oviparous and viviparous animals, confidered as such, appears to be this: the former are accustomed to eject their embryo before it escapes from the membranes of the egg; the latter retain it long in the uterus until it acquires a confiderable size, until the membranes can hold it no longer, and then eject it when the membranes are burst. A plant is oviparous when it yields seed; viviparous when it produces a gem, a bud, or an embryo root. The membranes of the seed being removed, an incipient embryo is seen through the microscope.

Some animals, according to the featon, eject the embryo enclosed in its membranes, or retain it in the uterus till the membranes are broken. These are the animals which are said to be oviparous at one period and viviparous at another. The spider-flies retain their young till they be as large as the natural size of their own bodies, and have undergone all their transformations within the expandible membranes of the egg, and an uterus as expandable as the stomach of a serpent.

In most cases generation requires a temporary union Union of of two sexes: but it has been said, that in Senegal the sexes...

...there is a species of shell-fish among whom this operation is the joint work of three individuals. In our own country, too, three frogs are frequently observed adhering together, though the labours of the third have generally been thought more officious than necessary.

In some animals the sexual union is almost inanimate. It constitutes nearly the business of life in the last stage of the ephemeron; and the male both of the frog and toad often continues on the back of the female not for hours and for days only but for some weeks. Upon examination it has been found, that with his fore-feet he affixes the female to protrude her eggs through the windings of the oviduct; and when they at last arrive at the anus, a species of the toad has been observed to draw them out with his hind legs. These animals were probably the first of the masculine gender who practised this art. But due honour has not been ascribed to the discoverers. In former days, the generous and grateful spirit of the ancients made them ready to acknowledge their obligations to different animals for the arts of bleeding, clystering, and purging; but such is the degeneracy of modern times, that many write only to claim the discoveries of others. On this account we ought not to wonder that many accumulators, in publishing encomiums on their own merit, have invidiously concealed the superior pretensions of the obbligational road.

Among all living bodies the two sexes are generally similar, and the male sex generally distinguished by the appearance of the female.

(c) Such glowing beauty allures enemies as well as lovers. "In Jamaica, in some feasons of the year, (by Dr Darwin), the fire-flies are seen in the evenings in great abundance. When they settle on the ground, the bull-frog greedily devours them; which seems to have given origin to a curious, though cruel, method of destroying these animals: if red-hot pieces of charcoal be thrown towards them in the dusk of the evening, they leap at them, and, haftily swallowing them, are burnt to death." Botanic Garden. From this fact the romantic moralist and spiritualizer might derive some hints for amusing declamation; and in their diffusives might plausibly demonstrate, that in most cafes beauty is fatal to the object beloved, to the lover, and destroyer.
fertation to be well founded, that certain bulls are very apt to beget males and others females, and that certain cows which have females always when they are young bring forth males when they grow old. The different proportion of males and females in different climates and ages might also serve to illustrate this doctrine. It is not perhaps objection to it that the order of male and female births in the same family is often irregular. The proportional force of the two stimuli will naturally be different at different times. It may depend on the quantity or quality of the fluid secreted, on the difference of armour in the parties, on the fancy, the passions, the particular state of the system at the time, and a thousand circumstances, besides the age, and the usual or general habit of the body. We mean only to infer at present, that wherever a male or female is produced, the stimulus of that particular sex, whatever was the cause, had during the time of coition and conception acquired the ascendancy over the parts that were to become sexual in the future. We cannot therefore answer the question, Why the offspring should possess the form and dispositions of one parent, and the sex of the other? In this case the different stimuli may have acted differently on different parts; in the case of hermaphrodites, which are very common in the horse, the ass, the cow, and the sheep, the two parents seem to divide the form, the sex, and the dispositions, equally between them.

The particular cause which excites the orgasmus in the female organs is not ascertained. That viscous fluid which young lascivious females eject when fond of the male, is chiefly a secretion from the glands of the vagina, the mouth of the uterus, and the neighbouring parts. In some respects it appears to be similar to those periodic discharges of females which frequently assume the erect posture; and these discharges being usually discontinued during the times of pregnancy and suckling, we must suppose that it is a portion of that fluid which nature has prepared for the use of the fetus. These discharges are always made that the female has arrived at the age of puberty; that her ovary is now performing its office; and that she is disposed to propagate her kind. Whatever be the cause of the female orgasmus, it is often so strong as to counteract the natural effects of the seminal fluid, and prevent impregnation. For this reason, new young and lascivious females conceive immediately after their marriage; and after coition, therefore, in cattle, it is sometimes a practice to beat the female, to plunge her in water, to weary her with running, and to use other means, to prevent the return of the sexual desire.

In man, and some of the noble animals, the influence of fancy over the organs of generation is unanswerably great; but the extent and mode of its agency is not defined. Those who allow it so much power in impelling marks, and altering the form and colour of the fetus, support their opinion rather by the number than the strength of their arguments. Many of the stories which they adduce as a fort of proofs are evidently fabulous, and have brought the truth of the whole into question. The reports, however, of the French commissaries who were appointed to examine the nature of animal magnetism, ought to deter the careful
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The queries of Fienus (a) concerning the powers of this mental faculty are important and curious, and might be of use in directing our researches; but they ought to be answered by accurate experiments, and not by acute metaphysical reasoning and historical anecdotes that are ill authenticated.

To prevent a confusion of genera and species, animals are generally restricted by propensity to their own kind; and the seminal fluids, besides, being various in various animals, they cannot indifferently act as a stimulus on all female organs of generation. The changes of form induced by habit, which is owing itself to the influence of stimuli, will partly explain the manner in which the progeny is made to resemble the male. As the irritability of different parts is of different kinds, the stimulus will have a different effect on different organs; and in these cases where either genera or species are mixed, the parts which are molt least affected by the stimulus of the male will be obvious in the shape and form of the offspring.

We have hitherto spoken of generation as being performed by the temporary intercourse of two sexes; but the puerulus is an infancy where sexual distinctions are not always necessary. Even where they exist they are daily dispensed with in the vegetable kingdom. Plants grow from the germ, the bulb, the leaf, or the root. They propagate by slips, by suckers, and by layers, and some of them multiply by spontaneous separation (1). In many animals the distinctions of sex are totally unknown. It has been observed, that infusory animals multiply their species by continual divisions and subdivisions of their own body; that some polypes, by spontaneous separation, split transversely, some longitudinally, and that some send off shoots. When experiments have been made upon these animals, it has been discovered that the numerous and artificial divisions of their body or their head produce entire animals. Trembley learned that they might be engraved upon one another, and produce monsters as wild and extravagant as poet or fabulist has ever dreamed of.

It was noticed already that the alimentary canal of some animals distributed nourishment through the whole body without the intervention of circulating vessels, and that the vital organs of vegetables were generally diffused through the whole system. The case is the same in polypes as in plants. Every part is a miniature of the whole. It is found to have similar organs of digestion, of respiration, of circulation, and of generation. In perfect animals all the parts are more dependent on one another; the vital organs have distinct situations, and their powers are concentrated in distinct places. The arm of a man has no heart; it has no lungs; it has no stomach, and no organs of generation; but the branch of a tree has as a system of organs as the trunk itself, and is as independent of that body from which it grew as the graft is independent of the stock.

The several parts of perfect animals all contribute to make one whole; the several parts of a plant or polype, when united together, form only a congeries of living bodies. These facts contribute to explain the principal phenomena in this mode of propagation.

Sect. XIII. Sleep.

Sleep is rather an affection of mind than a property of body, and is therefore more naturally a subject of metaphysics.

(a) The small work of Fienus to which we allude is intitled De Viribus Imaginatisationis Traditatus. The following questions serve to give an idea of its contents, and are named Index Questionum hujus Libri.

Quest. I. An anima habeat vim agendi in ulbo corpus?
II. In que corpora agere polsit, et qua actione?
III. Per quas potentias illos motus et actiones exerceat?
IV. An anima agat a liquid per potentiam imaginativa?
V. An phantasia polsit illoom corpus movere loculator?
VI. An polsit alterare?
VII. An phantasia polsit vim nullam acqueire ab influxu colorum?
VIII. An ergo phantasia nullam habeat vim agendi?
IX. Per quas potentias phantasia corpora immutet?
X. Quid polsit in corpus proprium, et specialiter, an polsit in eo creare morbos?
XI. An polsit morbos creare?
XII. Quid polsit in alienum externum?
XIII. Quod polsit in alienum propinquum feu feum?
XIV. Quomodo et qua ratione feum immutet?
XV. Quomodo polsit co-formiatricem dirigere?
XVI. Quamam imaginatio habeat illam fignandi poftfatum? qua non?
XVII. Cur non omnis imaginatio quam animi patientes sequuntur fignat?
XVIII. An omnes animi patientes fignant?
XIX. Quamam imaginatio fignet, an tantum matris an etiam patris?
XX. An etiam brutorum imaginatio fignet?
XXI. Quo tempore fignet, an tantum graviditatis, an etiam conceptus?
XXII. Quam quantum permutationem polsit in fectum inducere, et quas fignaturas polsit canfare?
XXIII. Cur phantasia non semper imprimit in fectum res imaginatas eodem modo, sed fepe tam diversa?
XXIV. Cur non eadem semper partis sed diversis notis inducitur?

(1) As the house leek and some grasses.
metaphysics than of physiology. This affection is often induced by fatigue and exercise; and several persons, when they are weary and no longer able to move their limbs, say they are exhausted. Though the word *exhausted*, in this expression, has seldom any precise meaning, it seems, however, to have been the means of suggesting a theory with regard to sleep. This theory supposes that sleep is occasioned by the exhaustion of irritability in the living system; but it seems to be founded on very limited and partial observations, or rather has been formed, like a great many others, prior to any observations at all, and afterwards tortured to account for facts which it does not comprehend. It does not account for the periodical returns of sleep, for the almost unremitting drowsiness of infants, and for that little lethargic inaction so often attendant on old age. When no exhaustion of irritability can well be supposed to have taken place, the propensity to sleep on many occasions becomes irresistible, from the effects of moderate exertion, from illness, darkness, or from the fumblous of scenery around us; and when one stimulus, after long application, can rouse no more (a plain proof that the irritable principle is by no means exhausted) another stimulus that is less powerful in ordinary cases is accompanied with excitement.

Of these phenomena, we frankly confess that we can assign no physical cause that is satisfactory. It is easy, however, to see the intention which nature has in view by inducing sleep. It has long been observed, that in all living bodies there is a continual waste and repair; or, to speak with more precision and accuracy, one process of assimilation and another of disintegration constantly taking place in all the different parts of the system. It is also true that this assimilation, when the body is healthy, predominates in youth; that disintegration predominates in old age; and that the two are nearly on a par during the vigour and meridian of life. Another fact which admits of demonstration is, that a gentle and moderate exertion of mind and body will promote both. And lastly, it is certain that immediate exertion in either respect, or any exertion that is not suited to our strength, habits, or period of life, prevents assimilation, hinders disintegration; and that the means which nature employs to restore the balance is usually by inducing a state of sleep.

When the balance is restored, and all the parts are again repaired for discharging their office, man awakes; but his waking period is of short duration. If appetite or passion do not engage him in some pursuit, if his mind be not occupied with some object, or if no stimuli be applied from without. This period seems chiefly intended for collecting food, and for being employed in those exertions which promote respiration, digestion, absorption, circulation, and secretion; while sleep after the food is collected, affords nutrition, and promotes assimilation throughout the system. If what is the natural food of the species cannot be collected by the plant or animal in a short time, the period of sleep is proportionally extended. If the food received be difficultly assimilated, the period of sleep is proportionally extended. If the food be not prepared for assimilation, the sleep is disturbed. If it be difficultly prepared by the organs, the active exertions are more vigorous; if easily prepared, they are more feeble. If it be collected during the day, the sleep is in the night; if collected in the night, the sleep takes place during the day; and all living bodies are directed by nature to select that time and species of food which is most suited to their nature, their habits, their circumstances, and age.

To favour nutrition, not only the body, but even the mind, must be allowed to indulge in rest. The child and his mental faculties are under restraint; these functions employed in nutrition may not be disturbed. The mental faculties are still feeble in a more advanced period of life; and the moderate exertions of mind and body which are natural to youth are chiefly such as favour the preparatory organs of the system, and promote growth: but the active and vigorous exertions of manhood, considered with respect to mind or to body, soon cause disintegration to proceed in the scale, and old age becomes liable to inactivity, and sleep, and the mind returns to childhood or stagnation, because living bodies are known to accommodate themselves to circumstances, and become the prevailing disintegration is retarded by the frequent returns of rest and of sleep, which favour so much the assimilating powers, counteracting absorption, and oppose decay.

During sleep the irritisable principle is more languid, and all the senses are more obtuse. The mind then is withdrawn to its rest, and does not attend to stimuli from without. The same happens when the mind is absorbed in profound thought: but profound thought is hurtful to the system. The mind then is engaged in pursuits peculiarly its own, and is less attentive to the calls of nature. In the time of sleep it withdraws seemingly, not so much for its own false as that of the body, which then being freed from the interruption of voluntary motions, all those organs which act spontaneously can more easily discharge their functions.

For the best of reasons, the mind is not allowed to judge for itself when it is proper to eat, to drink, to sleep, to wake, and to propagate the species. These and the like are offices too important to be wholly intrusted with a being so very limited intelligence. In all these cases, it is therefore directed by certain propensities resulting from the body in consequence of stimuli or organic structure. Being often amased with thoughts and ideas on those objects which are purely intellectual, the system as the notes of memory, the forms of fancy, and its own operations in the way of reasoning; being involuntarily guided the passions, the desires, and appetites; and having the command of all the voluntary movements of the body; it sometimes neglects its charge of the system, destroys it sometimes by excessive indulgence, and sometimes employs it in accomplishing ends peculiarly its own. One should imagine that the mental principle in the lower animals should occasion but little disturbance to the system; yet it has been observed that in the fatten sooner in the dark than they do in light, where the mind is entertained with varieties of objects; and this circumstance will partly explain why man does not feed so regularly as the brute, and why caution, which prevents for much anxiety and passion and exhausting efforts, affists growth and the organs of nutrition. The seminal stimulus, for this reason, is not strongly felt at a very early period of youth, nor is very troublesome in old age. In the former case it would
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Sleep. would prevent the growth of the system; in the latter it would halt its dissolution.

The natural returns of waking and sleeping may be altered by the presence or absence of stimuli, and are curiously affected by the influence of habit. Although the commencement of one of these periods happens to be changed, the commencement of the other will continue as before. If a person be accustomed to sleep precisely at nine in the evening, and to rise again at six in the morning, though his sleep in the evening may now and then be kept off till twelve, he will waken at six; and though continued by darkness, quietness, or such like causes, till the day be advanced, it will recommence in the evening at nine. The state of physiology is such at present that we cannot assign any precise physical cause for the natural kinds of sleeping and waking, or for their regular periods of return. As for the causes which occasion morbid sleeping and waking, we refer our readers to books on pathology.

Plants too have been said to sleep. At the approach of night, many of them are observed to change their appearances very considerably, and sometimes even to such a degree as scarcely to be known for what they were before. These changes happen principally to the leaves and the flowers. During the night, many leaves, according to the nature and genus of the plant, are seen to rise up, to hang down, or to fold themselves in various ways for the protection of the flowers, the buds, the fruits, or young stems; and many flowers, to escape a superabundance of moisture, to hang down their mouths towards the earth, or wrap themselves up in their calyxes. It was mentioned already, that these phenomena are owing to stimuli acting from without: we may add here, that most of the motions are performed at the joints where the leaves and petals articulate with the stem. A period of rest is as necessary to plants as sleep is to animals. The irritable principle cannot exist long under the influence of the same stimulant, except at intervals; and the rapid growth observable in plants during the night, is a strong proof that the organs employed in assimilation had been disturbed in discharging their functions during the day, when exposed to the actions of heat and light: and of other stimuli.

Sect. XIV. Death.

Death is the cessation and total absence of the living principle in organized bodies. It is sometimes imitated by sleep and swoons; and a state of torpor in many instances can hardly be distinguished from it. Several moles and a few animals, as the ears of blight-ed wheat, the feta equina, the wheel polype, and some fishes as we learn from the Philosophical Transactions, may be safely preserved as dried preparations, not for months only but for years; and after insensibility and fenation have been totally suspended, will return to life upon the proper application of moisture. A wheel polype was put by Fontana upon a bit of glass, and exposed during the whole summer to the sunlight; another was exposed in a similar manner for a year and a half; and after they were like a piece of hardened glue, were reposed to the use of all their functions by a few drops of water (k). Wherever there is death, there must therefore be likewise a partial or general decomposition of one or more of the vital organs. This decomposition takes place naturally in some living bodies after a few hours, in some after a few days; the life of others is extended to weeks; some are vigorous for months or a season. Man has often seen more than four score; and the hardy oak survives the shock of two or three centuries. These observations conspire to show that there is a certain period of existence allotted by nature to every species of living bodies. In the individual this period is sometimes abridged, and may be sometimes extended by circumstances: but yet there is a bound to which it cannot pass, when the vital organs must be decomposed, and the system return to moulder with the dust. The time of incubation and the time of gestation are pretty much defined in every species, because the circumstances of the individual in these cases are generally similar; but after emerging from the foetal state, the individuals are partly entrusted to their own organs and the chances of life, which are much varied; and hence we account for the difference of their age.

Life in general seems to be proportioned to the Life pro-space occupied by that series of functions which the portioned species is evidently defined to perform: and here sometimes the accommodating principle is singularly remarkable. As the period of decay is never seen to commence in the species till that of propagation be nearly elapsed, and as propagation in the lower tribes of plants and of animals is often the immediate harbinger of death; so many animals which have not propagated, indulged the propensity, nor became uneasy from the languor of desire, continue vigorous longer than ordinary, as if it were waiting for an opportunity to multiply their kind. And in the vegetable kingdom, where no individual is ever the victim of desire or passion, annually, if prevented from flowering and feeding in their proper season, will live double, and sometimes triple, the usual time, till these functions be

(f) Father Gumilla a Jesuit, and the Indians of Peru, says Dr Fowler, are quoted by Fontana, on the authority of Bouguer, as speaking of a large and venomous snake, which being dead and dried in the open air or in the smoke of a chimney, has the property of coming again to life on its being exposed for some days to the sun in flagrante and corrupted water. But, adds the Doctor, it would almost require the credulity of an Indian to credit the testimony of the Jesuit. Experiments and Observations relative to Animal Electricity, by Richard Fowler.—With regard to this report, we shall only observe, that the snake would not readily return to life after it was dead: but if the Jesuit meant only that it recovered after it was dried, and its several functions had been suspended, we must say, that if his report be not sufficiently authenticated, neither has it been sufficiently disproved.
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be somehow performed, and then die. But when all the organs are fully evolved and have discharged, or have continued for the usual time capable of discharging, those offices for which they were intended; dissolution commences, the assimilating organs begin gradually to lose their tone, and the reab sorbents carry on all the functions, and discharges of living bodies are so frequently regulated, and which periods may sometimes be varied but not evaded, the most prudent language that, signed for perhaps, can be adopted in the present state of physiological science is this of the Divine, That the God who formed us hath numbered our days, determined our times, and prescribed the limits of our existence.

The following Table may be considered as in some respect a summary view of the foregoing Sections, and as a Supplement to the Table of D’Azyr.

1. Respiration.
   - Diffused through the system.
   - Confined to one place.
   - Situated externally.
   - Situated internally.
   - Situated in the course of circulation.
   - Situated not in the course of circulation.
   - Situated without the course of circulation.
   - Situated partially ramified through the system.
   - Situated wholly ramified through the system.
   - Situated partly projecting from the body.
   - Situated opening at the head.
   - Situated at the opposite extremity.
   - Situated upon one side.
   - Situated upon both sides.

2. Digestion.
   - Without teeth.
   - With teeth in the mouth.
   - In the stomach.
   - Bones or artificial teeth in the stomach.
   - Glands in the mouth for secreting a liquor to be mixed with the food.
   - Pouches in the mouth where the food is kept and moistened.
   - A sac or bag where the food is kept and moistened.
   - A membranous stomach.
   - A mucular stomach.
   - An intermediate stomach.
   - Without a cæcum or blind gut.
   - With a cæcum.
     - These parts, as well as
     - Two cæca.
     - Three cæca.
     - Four cæca.
     - One entrance or mouth.
     - Many entrances by abiorbents.

Plants

\[ (n) \] Where the respiratory organs are situated externally.
Plants have many alimentary canals (a).

Some polypes have alimentary canals that branch through the body.

The alimentary canals of plants, of some polypes, and worms, distribute the fluids without the aid of a circulating system.

By vessels beginning from the alimentary canal.

- from the cavities.
- from the surface.
- in the penis and placenta.
- originating from all the parts of the system.

No circulating system.

A circulating system with one heart.

- a heart for distributing the blood through the respiratory organs, and an artery for distributing it through the system.
- one heart for the respiratory organs, and one for the system, both in one capule.
- two hearts for the respiratory organs, and one for the system.
- a pulmonary heart, or a heart for the respiratory organs in the course of circulation.
- a pulmonary heart within or without the course of circulation at pleasure.
- a heart situated in the breast.
- near to the head.
- in the opposite extremity.

By the alimentary canal.

- the ladeals.
- the respiratory organs.
- the circulating system.
- the cellular membrane.
- glands.

And by the several parts in which it becomes finally assimilated.

By vessels.

- exhaling vessels.
- excretory organs.
- organic parts.
- glands.

And by all the parts of which the system is composed.

Which are scaly.

- shelly.
- membranous.
- corneous.
- cretaceous.
- ligneous.

- covered with down.
- hair.
- prickles.
- feathers.
- a viscid matter.

- change their colour.
- their covering.
- are changed themselves.

8. Irri-

(a) The subterranean bulbs, the fwole fleshy parts of the root, and certain cups and vessels which contain water, serve often as reservoirs of food to the plants, although for various reasons we have not ventured to call them stomachs. Stemach would be a vague and unmeaning word were it applied even to all those reservoirs of water or secreted fluids which we find in fishes, and by which some of these animals are preserved alive on the dry shore till the tide return.

(o) There seems to be a want of precision in classing bones with integuments, or integuments with bones, as...
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**3. Irritability.**
- The irritable principle affected.
- By stimulants invisible.
- By heat.
- By moisture.
- By electricity.
- By light.
- By gases.
- By fluids.
- By the nervous influence.
- By light.
- By the嘴
- By gases.
- By the nervous influence.

**4. Motion**
- Locomotion performed.
- By legs.
- By wings.
- By fins.
- By the tail.
- Organs which fall not properly under these descriptions.
- Constructions which fit living bodies for being moved by foreign agents.

**9. Habit.**
- By legs.
- By wings.
- By fins.
- By the tail.
- Organs which fall not properly under these descriptions.
- Constructions which fit living bodies for being moved by foreign agents.

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is done in D'Azyr's table. Comparatively speaking, bones are confined to a few genera of living bodies, and are never subject to periodical changes like the integuments or cuticular coat of the alimentary canal in some animals.

For the sake of perspicuity, it could have been wished that either anatomists or physiologists had defined bones in a manner different from what they have done, and as far as possible avoided those loose and inaccurate expressions which disgrace science; for some speak of animals having their bones, by which they mean shells, on their outside, and the muscles within them. Some speak of solid and compact bones, that were once cartilages, membranes, or a mere jelly; and some speak of bones in general as the hardest, most solid, and most inflexible parts of the organized body. From all this we are led to infer, that integuments, if hard, solid, and inflexible, may be called bones; that the heart and blood-vessels, if converted into a hard, solid, and inflexible substance, may be called bones; and that a jelly, a membrane, or a cartilage, if it can be supposed that in the course of nature they will become hard, solid, and inflexible, may likewise be called bones. But certainly if hardness, solidity, and inflexibility, be to constitute the characteristics of bones in a living body, however often we may be necessitated to include shells, wood, horns, and flaky concretions, under that denomination, we can never with propriety speak of bones that are cartilaginous, membranous, or even a mere jelly. These expressions might be proper enough were ossification considered merely as a natural or accidental circumstance, and were bones defined to be those internal parts of an animal which are intended by nature to form what is meant by the skeleton in its usual sense. These parts, we know, after passing through the forms of jellies, membranes, and cartilages, often become hard, solid, and inflexible, from ossification; a species of induration which is natural to the parts which form the skeleton of some animals, an induration which occasionally is extended to other parts, which sometimes exhibits the appearance of crystallization, and in many respects is different from the manner in which the wood of vegetables and the shells of animals become hard.

Ossification does not interfere so much as may be commonly imagined with the structure of bones; the structure of bodies may often be similar, and yet their mode of induration be different. Bones have been observed to consist of laminæ, or plates like shells, and cylindric bones of concentric circles like wood. The concentric circles of wood have been found to consist of indurated membranes, which they receive successively from the bark; and Swammerdam discovered that the shells of some fishes were composed of laminae that consisted likewise of indurated membranes or hardened cuticles, that had been successively furnished by the body. It has thence been supposed that bones, though hardened in a different manner, are of a structure nearly similar to that of some ligneous bodies and shells, and that their laminae in many instances consist also of indurated membranes, supplied successively by the periosteum when it is present. When it is absent, nature, which accommodates itself to circumstances, can form the bone in another way, and afterwards cover her new productions with a periosteum. For many excellent physiological observations on bones, we refer our readers to the Osteology of the late Dr Monro, and particularly to the volume already published of Mr Bell's System of Anatomy.

(*) The pulp which surrounds seeds is often the means of their propagation. Animals swallow the seeds for the sake of the pulp; and the seeds remaining indigestible, are carried to a distance, and discharged with the feces.
All living bodies are much exhausted after performing the act of generation, and many of the inferior plants and animals begin immediately to sicken and decay.
We conclude by confessing, that concerning many uses of the parts, and concerning different species of variety in the form, structure, and position of the organs, much, after all, is still reserved for farther reading, for farther observation, and for future physiological arrangement.

PHYTOLACCA, POISONWEEED, or American Nightshade, in botany, is of the decandria icofandria class of plants. It grows naturally in the United States of America. It hath a thick, fleshy, perennial root, divided into several parts as large as middling parsnips. From this root many purplish, herbaceous stalks, about an inch thick, and five or six feet long, which break into many branches, irregularly set with large, oval, sharp-pointed leaves, supported on short footstalks. These at first are of a fresh green colour, but as they grow old they turn reddish. As the joint and divisions of the branches come forth long bunches of small bluish-coloured flowers, consisting of five concave petals each, surrounding ten stamina and ten styles. These are succeeded by round depressed berries, having ten cells, each of which contains a single sweet seed.

In Virginia and other parts of America the inhabitants boil the young leaves, and eat them in the manner of spinach. They are said to have an anodyne quality, and the juice of the root is emetic and cathartic. The young stems when boiled are as good as asparagus; but when old they are to be used with great caution, being violently cathartic. The Portuguese had formerly a custom of mixing the juice of the berries with their red wines, in order to give them a deeper colour; but as it was found to deface the flavour and to make the wine deleterious, the matter was represented to his Portuguese Majesty, who ordered all the items to be cut down yearly before they produced flowers, thereby to prevent any further adulteration. The same practice was followed in France till it was prohibited by an edict of Louis XVI. and his predecessor under pain of death. This plant has been said to cure cancers; but the truth of this assertion requires to be proved by a greater number of experiments.

Dr Shultz in his ingenious dissertation on this subject observes that in the cases, a solution of the extract in water is generally sublimated, where the expressed juice cannot be had. In rheumatism the whole substance of this plant has at different times been of essential service; although the berries have generally been preferred. In these rheumatic affections which sometimes occur to syphilitic patients, its virtue far exceeds that of opium.

For medical purposes the leaves should be gathered about July, (when the root-turms begin to assume a reddish colour), dried in the shade and powdered for use. An extract may easily be obtained from the leaves when gathered at this period, by gently evaporating their expressed juice to a proper consistence. An infusion may be made by dissolving either the extract, or the leaves, in their green or dry flake in common brandy; or in the spirit distilled from the berries.

An ointment is also made by powdering the dried leaves, and mixing them well with hogs-lard, or simple cerate; or by boiling some hogs-lard and bees-wax with fresh leaves, and straining the mass. The proper time for gathering the berries in this climate, will be in October, when they become soft and ripe, and are of a blackish colour. They are generally used in tincture, made by infusing them in Brandy. An extract may easily be made by evaporating their expressed juice.

The root is to be gathered about November or December, when the stalks of the plant are perfectly dead. It may be prepared in the same manner as the leaves are; but to facilitate drying, it should be perfectly divided into small pieces. It has also been used in impounds as an article in dyeing.

PHYTOLACCA, a discourse concerning the kinds and virtues of plants. See Botany, and Materia Medica.

PHYTON, a general of the people of Rhagium against Dionysius, the tyrant of Sicily. He was taken by the enemy, and tortured, and his son was thrown into the sea.

PIA MATER. See Anatomy, p. 756, &c.

PIABA, in ichthyology, is a small fresh-water fish, caught in all the rivers and brooks in the Brusilis, and in some other parts in America. It is about the bigness of the common minnow; is well taffed, and much esteemed by the natives.

PIABUCU, in ichthyology, is an American fish eaten in many places by the natives. It is ravenous, and fo greedy of blood, that if a person goes into the water with a wound in any part of his body, the pia-bucu will make up to it to suck the blood. It seldom exceeds four inches in length.

PIACENZA, a city of Italy, in the duchy of Parma, in E. Long. 10°. 25'. N. Lat. 45°. It is a large handsome city, whose name is derived from some from its pleasant situation, in a fruitful plain, on the Via Arniata, about half a mile from the Po. It is the see of a bishop suffragan of Bolgna, and has a university, but of no great fame. It is defended by a wall and a strong citadel, and is reckoned about three miles in circumference, so that it is somewhat bigger than Parma.

PIASTUS, a native of Poland, was originally a wheelwright and the son of Cosiico, a citizen of Crutzitz. He flourished in the year 830, when on the extinction of the family of Popiel great disputes arose about his succession, and Cracow was afflicted with a severe famine. During this extremity, when the people were dropping down in the streets, two angels in human forms, as the story is told, took up their residence with Piaiatus, who was celebrated for his piety and extensive charity. He had nothing left but a small cask of the common liquor of the country, and this he presented to his new guests, who charged with his hospitality, promised him the crown of Poland. The faith of Piaiatus was equal to his other virtues: he implicitly believed the word of his guests, and purely followed their directions in every particular. He was ordered to distribute the liquor out of his little cask to the multitude: he did so, and found that it was inexhaustible. The people were astonished; all cried out, A Piacenza.
"A miracle!" and the electors determined to choose a person in whose favour Heaven had so visibly declared: Piafius was accordingly taken from his shop, and raised to the ducal dignity.

Such is the relation of the canon of Cracow, which differs in many particulars from the account given by Guagnini, and several other historians. According to them, Piafius had prepared a small collation, to entertain some friends who were assembled at the birth of a child. Two pilgrims, Paul and John, afterwards murdered at Rome, came about this time to Cracow. They begged charity at the door of the election-hall, and were rudely repulsed; upon which they stumbled on the house of Piafius, and were kindly received. The miracle we have mentioned was wrought by them; and the two pilgrims, and not angels, were the instruments of the elevation of the hospitable wheelwright. Tho' we pay but little regard to the marvellous means by which Piafius ascended the ducal throne of Poland, it would be presumptuous entirely to omit a fact attested by all the writers upon this subject: it was proper, therefore, to take notice of it, and we leave the refit to the reader's judgment.

Being now raised to the supreme dignity, he was not intoxicated with his prosperity. His natural charity, benevolence, and sweetness of disposition, remained: nothing was altered but his power of doing good. He was truly called the father of his people: the injured never returned unredressed, nor merit unrewarded. Piafius wiped the tear from the eyes of the widow: and himself the guardian of the orphan, and the general patron of the poor and distressed. His excellent inclinations served him in the room of great abilities; and the miracles that his people enjoyed made them forget that their prince was not born a statesman and a warrior. Several illustrious commotions arose during his administration, all which he quelled by the mildness and clemency of his nature: his nobility were ascribed to rebellious against a sovereign who devoted his whole life to render his people happy. He removed the court from Cufchwitz, a city which he detested, because it was the scene of Popp's crimes and tragic end, and fixed his residence at Gnefna, where he died beloved, adored, and even adored by his subjects.

It is in memory of this excellent prince, that all the natives of Poland, who have been since promoted to the ducal or regal dignity, were called Piafues, in contradiction to the foreigners.

Piafius associated his son Ziemovitzi with him in the government before his death; a circumstance of much benefit to the people.

PIAZZA, in building, popularly called piace, an Italian name for a portico, or covered walk, supported by arches.

The word literally signifies a broad open place or square; whence it also became applied to the walks or porticoes around them.

PIBROCH, says Dr Beattie *, is a species of tune peculiar, I think, to the Highlands and Western Isles of Scotland. It is performed on a bag-pipe, and differs totally from all other music. Its rhythm is so irregular, and its notes, especially in the quick movement, so mixed and confused together, that a stranger finds it almost impossible to reconcile his ear to it, so as to perceive its modulation. Some of these pibrochs, being intended to represent a battle, begin with a grave motion resembling a march; then gradually quicken into the onset; run off with noisy confusion and turbulent rapidity, to imitate the conflict and pursuit; then swell into a few surbursts of triumphant joy; and perhaps close with the wild and flow wailings of a funeral procession.

PICA, in ornithology. See CORVINUS, sp. 9.

PICA, in medicine, a deprivation of appetite, which makes the patient long for what is unfit for food, or incapable of nourishing; as chalk, ashes, coals, flattering, &c. See MEDICINE, n° 371.

PICA, or πηγας, had formerly the same sense as ordin-, meaning a table or directory, pointing out the order in which the devotional services appointed for different occasions were to be performed. Accordingly we are told it is derived from πηγας, a contraction of περιγας, a table: and by others from littera pica, a great black letter at the beginning of some new order in the prayer. The term was used in a similar sense by officers of civil courts, who called their calendars or alphabetical catalogues directing to the names and things contained in the rolls and records of their courts the πηγας.

PICARD, a native of the Netherlands, who founded an academy of which were called Picards. See Pica.

PICARD (John), an able mathematician, and one of the most learned astronomers of the 17th century, was born at Fleche, and became prior of the college of Saint-Pierre in Angers. Going to Paris, he was in 1666 received into the Academy of Sciences in quality of astronomer. In 1677, he was made, by order of the king, to the college of Uraniborg, built by Tycho Brahe in Denmark, to make astronomical observations there; and from thence he brought the original manuscripts wrote by Tycho Brahe, which are the more valuable as they differ in many places from the printed copies, and contain a book more than has yet appeared. He made important discoveries in astronomy; and was the first who travelled through several parts of France, to measure a degree of the meridian. His works are, 1. A treatise on levelling. 2. Fragments of optics. 3. Experimenta circa aquas effluent. 4. De mensuris. 5. De mensura terminorum & aliorum. 6. A voyage to Uraniborg, or astronomical observations made in Denmark. 7. Astronomical observations made in several parts of France, &c. These, and some other of his works, which are much adored, are in the sixth and seventh volumes of the Memoirs of the Academy of Sciences.

PICARDS, a religious sect which arose in Bohemia in the 12th century.

Picard, the author of this sect, from whom it derived its name, drew after him, as has been generally said, a number of men and women, pretending he would restore them to the primitive state of innocence wherein man was created: and accordingly he assumed the title of the New Adam. With this pretence he taught his followers to give themselves up to all impunity; saying that therein confided the liberty of the sons of God; and that all those not of their sect were in bondage.
He first published his notions in Germany and the low countries, and persuaded many people to go naked, and gave them the name of Adamites. After this he feized on an island in the river Lauenze, some leagues from Thabor, the head quarters of Zifca, where he fixed himself and his followers. His women were common, but none were allowed to enjoy them without his permission: so that when any man defired a particular woman, he carried her to Picard, who gave her leave in these words, Go, increase, multiply, and fill the earth.

At length, however, Zifca, general of the Hussites, (famous for his victories over the emperor Sigismund,) hurt at their abominations, marched against them, made himself master of their island, and put them all to death except two; whom he spared, that he might learn their doctrine.

Such is the account which various writers, relying on the authorities of Anastasius Sylvius and Varillas, have given of the Picards, who appear to have been a party of the Vaudois, that fled from persecution in their own country, and fought refuge in Bohemia. It is indeed doubtful whether a feat of this denomination, chargeable with such wild principles and such licentious conduct, ever existed; and it is certainly aborning that Mr Bayle, in his art, Picards, should adopt the reproachful representations of the writers just mentioned: for it appears probable at least that the whole is a calumny invented and propagated in order to disgrace the Picards, merely because they deferted the communion and protected against the errors of the church of Rome. Laditius informs us, that Picard, together with 40 other perfons, besides women and children, settled in Bohemia in the year 1418. Balbinus the librarian, in his Epitome Rerum Bohemicarum, lib. ii., gives a similar account, and charges on the Picards none of the extravagancies or crimes ascribed to them by Sylvius. Schieib, secretary of Laditius, king of Bohemia, in his letters to Erasmus in which he gives a particular account of the Picards, says that they considered the pope, cardinals, and bishops of Rome, as the true Antichrists, and the adorers of the consecrated elements in the eucharist as worshippers of idols; that they denied the corporal presence of Christ in this ordinance; that they condemned the worship of saints, prayers for the dead, auricular confession, the penance imposed by priests, the feasts and vigils observed in the Romish church; and that they confined themselves to the observance of the fabbath, and of the two great feasts of Christmas and Pentecost. From this account it would appear that they were no other than the Vaudois; and M. de Beaumcez has shewn that they were both of the same sect, though under different denominations. Besides, it is certain that the Vaudois were settled in Bohemia in the year 1418, where some of them adopted the rites of the Greek, and others those of the Latin church. The former were pretty generally adhered to till the middle of the 14th century, when the establishment of the Latin rites caused great disturbance. On the commencement of the national troubles in Bohemia, on account of the opposition to the papal power (see Moravians), the Picards more publicly avowed and defended their religious opinions; and they formed a considerable body in an island by the river Lauenitz or Lauenze, in the district of Bechin, and recurring to arms, were defeated by Zifca. Enzylop. art. Picards.

PICARDY, a province in France, is bounded on the north by Hainault, Artois, and the Straits of Calais; on the east by Champagne; on the south by Geographical Island of France; and on the west by Normandy (A). This province is long and narrow, being usually compared to a bent arm; and in this figure is nearly 150 miles in length, but not above 40 in breadth, and in many places not above 20. It is generally a level country; and produces wine, fruit of all kinds, plenty of corn, and great quantities of hay: but wood being scarce, most of the inhabitants burn turf. They have, however, some pit-coal, but it is not so good as that of England. It was united to the crown of France in the year 1643; and is supposed to contain 533,000 inhabitants.

Its principal rivers are the Somme, the Oise, the Canche, the Lanthie, the Lys, the Aa, the Scarpe, and the Deule.

The situation of this province on the sea, its many navigable rivers and canals, with the industry of the inhabitants, render it the seat of a flourishing trade. In it are made beautiful silk flufs, woollen stuffs, coarfe linen, lawn, and soap: it also carries on a large trade in corn and pit-coal. In the government of Calais and Boulogne are annually bred 5000 or 6000 colts, which are afterwards turned loose in the pastures of Normandy, are sold for Norman horses. The fisheries on this coast are also very advantageous. This province is divided into Upper, Middle, and Lower Picardy; and is again subdivided into four deputy-governments. The principal town is Amiens.

PICART (Bernard), a celebrated engraver, son of Stephen Picart, also a famous engraver, was born at Paris in 1673. He learned the elements of his art from his father, and studied architecture and perspective under Sebastian le Clerc. As he embraced the reformed religion, he settled in Holland to enjoy the free exercise of it; where his genius produced those masterpieces which made him esteemed the most ingenious artist of his age. A multitude of books are embellished with plates of his engraving. He died in 1753.

PICCOLOMINI (Alexander), archbishop of Patras, and a native of Sienna, where he was born about the year 1508, was of an illustrious and ancient family, which came originally from Rome, but afterwards settled at Sienna. He composed with facility for the theatre; but he was not more distinguished by his genius, than by the purity of his manners, and his regard to virtue. His charity was very great; and was chiefly exerted.

(A) The origin of the name of this province does not date earlier than A.D. 1200. It was an academical joke; an epithet first applied to the quarrelsome humour of those students in the university of Paris who came from the frontier of France and Flanders, and hence to their country.

Valki Notitia Galliarum, p. 447.
Largueras, Description de la France, p. 52.
Piccolomini, (Francis), of the same family with the foregoing, was born in 1520, and taught philosophy with success, for the space of 22 years, in the most celebrated universities of Italy, and afterwards retired to Sienna, where he died, in 1604, at the age of 84. The city went into mourning on his death. His works are, 1. Some Commentaries upon Aristotle, printed at Mayence, 1608, in 4to. 2. Universa Philosofia de Moribus, printed at Venice, 1583, in folio. He laboured to revive the doctrine of Plato, and endeavoured also to imitate the manners of that philosopher. He had for his rival the famous James Zabarella, whom he excelled in facility of expression and neats of discourse; but to whom he was much inferior in point of argument, because he did not examine matters to the bottom as the other did; but pressed too rapidly from one preposition to another.

Piccolomini (James), whose proper name was Am-
ed, when finely polished, like a rich scarlet tabby; which colour it has in great perfection. The longer it is kept, the more beautiful it grows; hence it is, that the teixo tree is felled only for the king's use or by his order; and is prohibited from being exported as a common article of trade.

Pico Marins, a fish-ship common at Kongo in Africa, derives its name from the resemblance of its mouth to the beak of a wood-pecker. It is of a large size, and prodigious strength, has four fins on its back, three under its belly, and one on each side of its head; its tail is large and forked, by which it cuts the waves with surprising force and velocity. It is at war with every fish that swims, and with every thing it meets in its way, without being intimidated by the largest vessels; a surprising instance of which intrepidity, we are told by some missionaries, whose ship was attacked by one of them, near these coasts, in the dead of night. The violence of the shock which it gave to the vessel quickly awakened the captain and the rest of the people; who immediately ran to the ship's side, where they perceived, by moon light, this huge monster fastened by its forehead to the vessel, and making the strongest efforts to disengage itself; upon which some of them tried to pierce him with their pikes, but he got off before they could accomplish their aim. On the next morning, upon visiting that side of the vessel, they found, about a foot below the surface of the water, a piece of its bony front flank faft into the wood, and two or three inches of it projecting outward. They went presently after to visit the inside of the ship, and discovered about five or six inches more of the point of the horn which had penetrated through the plank.

PICQUERING, a flying war, or skirmish, made by soldiers detached from two armies for pillage, or before a main battle begins.

PICKET, or PICK. See PICKET.

PICRANIA, in botany: A genus of the pentandria order, belonging to the diocese class of plants; and in the natural method ranking with those that are doubtful. The calyx is tripartite; the corolla has three petals; the stamens, small and white: the berries are numerous; at first red, then of a jet black colour; the pulp is soft, and of a purple complexion.—The whole plant is bitter, and especially the berry. The negroes make a decoction of them, and use it in weakness of the stomach and in venerable cases.

PICRANIA AMARA, or Bitter Wood, is a tall and beautiful timber tree, common in the woods of Jamaica. It is a new genus, belonging to the pentandria monogynia of Linnaeus. The name is expressive of its sensible qualities. Every part of this tree is intensely bitter; and even after the tree has been laid for floors many years, who-
ever rubs or stages the wood, feels a great degree of bitterness in their mouth or throat. Cabinet-work made of this wood is very useful, as no insect will live near it.

This tree has a great affinity to the Quassia Amara of Linnæus; in lieu of which it is used as an antifeptic in putrid fevers. When used, lefs of it will do than of the Quassia Amara of Surinam. See Quassia.

Picros, Ox-tongue: a genus of the polygama equis alia order, belonging to the fyrigeneia class of plants. There are four species, of which the only remarkable one is the echicides, or common ox-tongue, growing spontaneously in corn-fields in Britain. It has undivided leaves embracing the stem, with yellow blossoms, which sometimes close foon after noon, at other times remain open till nine at night. It is an agreeable pot-herb while young. The juice is milky, but not too acid.

Picrosium, in botany: A genus of the monogynia order, belonging to the tetandra class of plants; and in the natural method ranking with those that are doubtful. The calyx is monophylous and quinquefid; the corolla monopetalous, and its tube short; the filaments are four in number, and hooded at the place of their infection; the style long and thick; the stigma bilamellated; the capsule is round, bivalved, and contains a number of small feeds.—There are two species, viz. the picros, and ranosa; both natives of Guiana. Both species are bitter, and employed in dyep韧性, to promote the menses: they are also recommend in medical obfervations.

Pictet (Benedict), born at Geneva, in 1655, of a distingufhing family, profefied his studies with great success. After having traveled into Holland and England, he taught theology in his own country with an extraordinary reputation. The university of Leyden, after the death of Span treina, solicited him to come and fill his place; but he thought that his own country had the right to his services: and for that generosity he received its thanks by the mouth of the members of council. A languishing disorder, occafioned by too much fatigue, halteened his death; which happened on the 9th of June 1724, at the age of 69 years. This minister had much sweetness and affability in his manner. The poor found in him a comforter and a father. He published a great number of works in Latin and French, which are much esteemed in Protestant countries. The principal of these are, 1. A Syflem of Chriftian Theology in Latin, 3 vols. in 4to; the fekn edition of which is that of 1721. 2. Chriftian Morality, printed at Geneva, 1710, 8 vols. in 12mo. 3. The Hiftory of the 11th and 12th centuries; intended as a sequel to that of Suer, printed in 1713, 2 vols. in 4to. The Continuator is held in higher estimation than the first author. 4. Several Controversial Treatises. 5. A great number of tracts on morality and piety; among which we muft fufficiently "The Art of Living and Dying well," published at Geneva, 1705, in 12mo. 6. Some Letters. 7. Some Sermons, from 1697 to 1721; 4 vols. in 8vo. With a variet number of other books, the names of which it would be tedious to mention; but which, as Mr Sennelier fays, "all show evident marks of picy and good fense."

Pictet (John-Louis), a counsellor of Geneva, born in 1739, was of the fame family. He was member of the Council of Two Hundred; Counsellor of State and Syndic; and died in 1781. He applied himself to the study of astronomy, and made several voyages into France and England for his improvement. Few men were ever bleffed with a clearer or more enlightened understanding. He has left in manuscript the "Journal of a Voyage which he made to Ruflia and Siberia in 1768 and 1769, in order to obvife the tranfit of Venus over the fun's disk." A work very inte resting, from the lively descriptions which it gives both of men and of nature.

Pictetland. See Pictetland.

Picts, the name of one of those nations who anciently poifoned the north of Britain. It is generally believed that they were called from their custom of painting their bodies; an opinion which Camden supports with great erudition. (See Gough's edition, Vol. I. p. xxi, of the preface). It is certainly, however, to considerable objections; for as this custom prevailed among the other ancient inhabitants of Britain, who called the placium of Pliny and the corium of Mela for the like purpose, it may be asked, Why the name of Picts was confined by the Romans to only one tribe, when it was equally applicable to many others? Why should they defign them only by an epithet without ever annexing their proper name? Or why should they impose a new name on this people only, when they give their proper name to every other tribe which they have occasion to speak of? As these quefions cannot be anfwered in any satisfactory manner, it is plain we must look for some other derivation of the name.

The Highlanders of Scotland, who speak the ancient language of Caledonia, express the name of this once famous nation by the term Pictich; a name familiar to the ears of the moft illiterate, who could never have derived it from the Roman authors. The word Pictich means pilfers or plunderers. The appellation was probably imposed upon this people by their neighbours, or assumed by themselves, some time after the reign of Caracalla, when the unguarded state of the Roman province, on which this people bordered, gave them frequent opportunities of making incursions whether, and committing depredations. Accordingly this name seems to have been unknown till the end of the 3d century. Eumenus the panegyrit is the first Roman author who mentions this people under their new name of Pictich, or, with a Latin termination, Picti. When we fay that this name may have been probably assumed for the reason just now mentioned, we must obvife, that, in those days of violence, the character of a robber was attended with no disgrace. If he had the address to form his schemes well, and to execute them feccefuly, he was rather praised than blamed for his conduct; providing he made no encroachments on the property of his own tribe or any of its allies. We mean this as no peculiar stigma upon the Picts; for other nations of antiquity, in the like rude state, thought and acted as they did. See Theognides, lib. 3. p. 3. and Virg. Æn. 7. 745 et 749.

Concerning the origin of the Picts, authors are much divided. Boethius derives them from the Agathyrsi,
As there has been much dispute about the origin of the Picts, so there has been much dispute about their language. There are many reasons which make it plain that their tongue was the Gaelic or Celtic; and these reasons are a further confirmation of their having been of Caledonian extraction. Through the south and north-east coasts of Scotland (which were possessed by the Picts) we meet with an innumerable list of names of places, rivers, mountains, &c. which are manifestly Gaelic.

From a very old register of the priory of St Andrew's (Dairymple's Collections, p. 122.) it appears, that in the days of Hungrus, the last Pictish king of that name, St Andrew was called Makrof; and that the town now called Queenferry had the name of Ardchimeachon. Both these words are plain Gaelic. The first signifies "the heath or promontory of boars;" and the latter, "the height or peninsula of Kenneth." In the list of Pictish kings published by Father Innes, most of the names are obviously Gaelic, and in many instances the name with the names in the list of Scottish or Caledonian kings published by the same author. Had Innes understood any thing of this language, he would not have supposed with Camden that the Picts spoke the British tongue. It was unlucky that the two words on which they built their conjecture (Strath and Aber) areEventArgs in the Gaelics as they could not be in the British, and at this day make a part of the names of places in countries to which the Pictish empire never extended. The names of Strathflian and Lochaber may serve as instances.

The venerable Bede, as much a stranger to the Celt as either of the antiquaries just now mentioned, is equally unhappy in the specimen which he gives of the Pictish language in the word penuahal, "the head of the wall." Allowing the commutation of the initial p into c, as in some other cases, this word has still the same meaning in Gaelic which Bede gives it in the Pictish. It is true, there might have been, as well as now, a considerable difference between various dialects of the Celtic; and thus, perhaps, that pious author was led to discover five languages in Britain agreeably to the five books of Moses. A conceit from which the good man derived a great deal of harmless satisfaction.

The Picts of the earliest ages, as appears from the joint testimony of all writers who have examined the subject, possessed only the east and north-east coast of Scotland. On one side, the ancient Drumalbin, or that ridge of mountains reaching from Lochmond near Dumbarton to the frith of Taine, which separates the county of Sutherland from a part of Ross, was the boundary of the Pictish dominions. Accordingly we find in the life of Columba, that, in travelling to the palace of Brudius, king of the Picts, he travelled over Drumalbin, the Dorne Britnonis of Adamnan. On the other side, the territory of the Picts was bounded by the Roman province. After Britain was relinquished by the emperor Honorius, they and the Saxons by turns were masters of those countries which lie between the Frith of Edinburgh and the river Tweed. We learn from Bede, that the Saxons were masters of Galloway when he finished his ecclesiastical History. The Picts, however made a conquest of that country soon after; so that before the extinction of their monarchy, all the territories bounded on the one side by the Forth and Clyde, and on the other by the Tweed and Solway, fell into their hands.

The history of the Picts, as well as of all the other History, ancient inhabitants of Britain, is extremely dark. The Irish historians give us a long list of Pictish kings, who reigned over Pictavia for the space of eleven or thirteen centuries before the Christian era. After them Innes, in his Critical Essay, gives us a list of above fifty, of whom no less than five held the sceptre, each for a whole century. It is probable that these writers had confounded the history of the Picts with that of their ancestors the old Caledonians. In any other view, their accounts of them are highly fabulous; and have been long ago confuted by Dr Macpherson of Slate, an antiquary of much learning and research. The Picts, as has been already observed, were probably not known by that name before the 2d or 3d century. Adamnan, abbot of Iona, is the first author that expressly mentions any Pictish king; and the oldest after him is Bede. We are informed by these two writers, that St Columba converted Brudius king of the Picts to the Christian faith. Columba came into Britain in the year of the vulgar era 655. Before that period we have no general record to ascertain so much as the name of any Pictish king. The history of Driff or Driss, who is said to have reigned over the Picts in the beginning of the fifth century, when St Ninian first preached the gospel to that nation, has all the appearance of fiction (a); His having reigned a hundred years, and his putting an end to a hundred wars, are stories which exceed all the bounds of probability.

Brudius, the contemporary of Columba, is the first Pictish king mentioned by any writer of authority. What figure his ancestors made, or who were his successors on the throne of Pictavia, cannot be ascertained. Bede informs us, that during the reign of one of them, the Picts killed Egfred king of Northumberland in battle, and destroyed the greatest part of


(a) According to Camden, this conversion happened about the year 650, in the southern Pictish provinces; while the northern, which were separated by fruitful mountains, were converted by Columba.
The fame author mentions another of their kings called Niaimun, for whom he had a particular regard. It was to this Niaimun that Cæolfrith, abbot of Wirenemouth, wrote his famous letter concerning Eased and the Tonfur (c); a letter in which Bede himself is supposed to have had a principal hand. Roger Horner and Simon of Durham mention two other Pictish kings Omnuf and Kindath, the first of whom died in 761, and the latter flourished about the 774, and gave an asylum to Alfred of Northumberland, who was much about that time expelled his kingdom. The accounts given by the Scots historians, of several other Pictish kings cannot be depended on; nor are the stories told by the Britifh historians, Geoffry of Monmouth and the author of the Eulogium Britannie, worthy of much greater credit.

In the ninth century the Pictish nation was totally subdued by the Scots in the reign of Kenneth Macgulpin. Since that time their name has been lost in that of the conquerors, with whom they were incorporated after this conquest; however, they seem to have been treated by the Scotch kings with great leniency, so that for some ages after they commanded a great deal of respect. The Prior of Hulheid, an old English historian, relates, that they made a considerable figure in the army of David the Saint, in his disputes with Stephen king of England. In a battle fought in the year 1136, by the English on one side, and the Scots and Picts on the other, the latter insulcd on their hereditary right of leading the van of the Scots army, and were indulged in that request by the king.

The principal seat of the Pictish kings was at Abernethy. Brudius, however, as appears from the accounts given by Adamman, in his life of Columba, had a palace at Inverness, which was probably near the extremity of this territory in that quarter; for there is no great reason for believing, with Camden, that this king had any property in the Western Isles, or that he had made a gift of Iona to St Columba when he visited him in that place.

With respect to the manners and customs of the Picts, there is no reason to suppose they were any other than those of the Old Caledonians and Scots, of which many particulars are related in the Greek and Roman writers who have occasion to speak of those nations.

Upon the decline of the Roman empire, cohorts of barbarians were raised, and Picts were invited into the service, by Honorius, when peace was everywhere restored, and were named Honoriati. Those under Constantine opened the passes of the Pyrenean mountains, and let the barbarous nations into Spain. From this period we date the civilization of their manners, which happened after they had by themselves, and then with the Scots, ravaged this Roman province.

(c) We are told by some authors that Columba taught the Picts to celebrate Easter always on a Sunday between the 14th and 20th of March, and to observe a different method of tonsure from the Romans, leaving an imperfect appearance of a crown. This occasioned much dispute till Niaimun brought his subjects to length to the Roman rule. In that age many of the Picts went on a pilgrimage to Rome, according to the custom of the times; and amongst the rest we find two persons mentioned in the antiquities of St Peter's church: Afrasius count of the Picts, and Syria with his countrymen, performed their vow.
“Again why does an elegant piece of garden-ground make no figure on canvas? the shape is pleasing, the combination of the objects harmonious, and the winding of the walk in the very line of beauty. All this is true; but the smoothness of the whole, though right and as it should be in nature, offends in picture. Turn the lawn into a piece of broken ground plant rugged oaks instead of flowering shrubs, break the edges of the walk, give it the rudeness of a road, mark it with wheel-tracks, and scatter around a few stones and brulhwood; in a word, instead of making the whole smooth, make it rough, and you make it also picturesque. All the other ingredients of beauty it already possessed.” On the whole, picturesque composition consists in uniting in one whole, a variety of parts, and these parts can only be obtained from rough objects. It is possible therefore to find picturesque objects among works of art, and it is possible we may make objects — but the grand scene of picturesque beauty is nature in all its original variety, and in all its irregular grandeur. “We seek it (says our author) among all the ingredients of landscape, trees, rocks, broken grounds, woods, rivers, lakes, plains, valleys, mountains, and ditches. These objects in themselves produce infinite variety; no two rocks or trees are exactly the same; they are varied a second time by combination; and almost as much a third time by different lights and shades and other aerial effects. Sometimes we find among them the exhibition of a whole, but oftener we find only beautiful parts.”

Sublimity or grandeur alone cannot make an object picturesque: for, as our author remarks, “however grand the mountain or the rock may be, it has no claim to this epithet, unless its form, its colour, or its accompaniments, have some degree of beauty. Nothing can be more sublime than the ocean; but wholly unaccompanied, it has little of the picturesque. When we talk therefore of a sublime object, we always understand that it is also beautiful; and we call it sublime or beautiful only as the ideas of sublimity or simple beauty prevail. But it is not only the form and the composition of the objects of landscape which the picturesque eye examines, it connects them with the atmosphere, and seeks for all those various effects which are produced from that vast and wonderful storehouse of nature. Nor is there in travelling a greater pleasure than when a scene of grandeur bursts unexpectedly upon the eye, accompanied with some accidental circumstance of the atmosphere which harmonises with it, and gives it double value.”

There are few places so barren as to afford no picturesque scene.

———Believe the muse,
She does not know that insipid spot
Where beauty is thus niggard of her store.
Believe the muse, through this terrestrial waste
The seeds of grace are sown, profusely sown,
Even where we least may hope.—

Mr. Gilpin mentions the great military road between Newcastle and Carlisle as the most barren tract of country in England; and yet there, he says, there is “always something to amuse the eye. The inter-changeable patches of heath and green-sward make an agreeable variety. Often too on these vast tracks of intersecting grounds we see beautiful lights, setting off along the sides of hills; and often we see them adorned with cattle, flocks of sheep, heath-cocks, grouse, plover, and flights of other wild fowl. A group of cattle standing in the shade on the edge of a dark hill, and relieved by a lighter distance beyond them, will often make a complete picture without any other accompaniment. In many other situations also we find them wonderfully pleasing, and capable of making pictures amidst all the deficiencies of landscape. Even a winding road itself is an object of beauty; while the richness of the heath on each side, with the little hillocks and crumbling earth, give many an excellent lesson for a fore ground. When we have no opportunity of examining the great scenery of nature, we have everywhere the means of observing what a multiplicity of parts, and yet with what general simplicity, the covers every surface.”

“But if we let the imagination loose, even scenes like these administer great amusement. The imagination can plant hills; can form rivers and lakes in valleys; can build castles and abbeys; and if it find no other amusement, can dilate itself in vast ideas of space.”

Mr. Gilpin, after describing such objects as may be called picturesque, proceeds to consider their sources of amusement. We cannot follow our ingenious author through the whole of this consideration, and shall therefore finish our article with a short quotation from the beginning of it. “We might begin (says he) in moral style, and consider the objects of nature in a higher light than merely an amusement. We might observe, that a search after beauty should naturally lead the mind to the great origin of all beauty; to the

———first good, first perfect, and first fair.

But though in theory this seems a natural climax, we infilt the leaft upon it, as in fact we have scarce ground to hope that every admirer of picturesque beauty is an admirer also of the beauty of virtue; and that every lover of nature reflects, that,

Nature is but a name for an effect,
Whole cause is God.—

If, however, the admirer of nature can turn his amusements to a higher purpose; if its great scenes can inspire him with religious awe, or its tranquil scenes with that complacency of mind which is so nearly allied to benevolence, it is certainly the better. Apponat lure. It is so much into the bargain; for we dare not promise him more from picturesque travel than a rational and agreeable amusement. Yet even this may be of some use in an age teeming with licentious pleasure; and may in this light at least be considered as having a moral tendency.”

PICUIPINIMA in ornithology, is the name of a species of pigeon in Brazil. It is so very small as scarce to exceed the lark in size. Its head, neck, and wings, are of pale lead colour, with a black melanochor mark at the extremity of each wing; but its long wing-feathers, which are seen when the wings are expanded in flying, are of a reddish-brown on one side, and blackish on the other, with black ends or tips; the tail is long,
PICUS [ 732 ]

PICUS. 

Picus, long, and is variegated with black, white and brown; the belly is covered with white feathers every one of which has a brown mark of the shape of a half moon at the end.

Picumns and Rlumns, were two deities at Rome, who presided over the anuplices required before the celebration of suppillas. Pilumus was supposed to patronize children, as his name seems in some manner to indicate quod pollut nulla infantia. The meaning of land was first invented by Picumns, from which reason he is called Stagnalia. Pilumus is also invoked as the god of bakers and millers, as he is said to have first invented the art of grinding corn.

Picus, the Woodpecker, in ornithology, a genus belonging to the order of picae. The beak is straight and conical of many sides, and like a wedge at the point; the nostrils are covered with bristles; the tongue is round like a worm, very long, and sharp at the point, which is befeft with bristles bent backwards.

The grand characteristic, says Latham, of these birds is the tongue (which in no bird is similar, the wren- neck excepted, whole other characters, however, differ too widely to give it place in this class), the muscles necessary to the motions of which are singular and worthy of notice; affording the animal means of darting it forwards the whole length, or drawing it within the mouth at will. See Ray on the Creation, p. 143. Derham's Phys. Theol. p. 342. Note c, Will. Orn. p. 156. t. 21.

The same intelligent ornithologist enumerates no less than 50 different species of woodpeckers, besides varieties of some of which amount to nine more. Each of these species our readers cannot expect us to describe; we shall therefore content ourselves with such as appear to be most remarkable.

1. The picus martius, or greatest black woodpecker, is about the size of a jackdaw, being about 17 inches long; the bill is nearly two inches and a half in length, of a dark ash-colour, and white on the sides; the irises are pale yellow, and the eyelids are naked, according to Scopoli; the whole bird is black, except the crown of the head, which is vermillon; the first quill-feather is the shortest, and the two middle tail-feathers, which are longer than the others, make it appear a little rounded, the legs are of a lead colour, covered with feathers on the afterpart for half their length.

2. The female differs from the male in having the head bare only red, and not the whole crown of the head, and the general colour of the plumage is a strong cast of brown in it. It has likewise been observed, that the red on the head has been wholly wanting; and indeed both male and female are apt much to vary in different subjects; some having a much greater proportion of red on the head than others.

This species is found on the continent of Europe, but not in plenty except in Germany. It is not an inhabitant of Italy, and is very rarely seen in France. Frisch mentions it as a bird common to his parts; and it is found also in Sweden, Switzerland, and Denmark, but not in winter.

It is said to build in old ash and poplar trees, making large and deep nests; and Frisch observes, that they often go to excavate a tree, that it is soon after blown down with the wind; and that under the hole of this bird may often be found a bushel of dust and bits of wood. The female lays two or three white eggs, the colour of which, as Willoughby observes, is peculiar to the whole of the woodpecker genus, or at least all those which have come under his inspection.

2. The picus principalis, or white billed woodpecker, is somewhat bigger than the last, being equal in size to a crow. It is 16 inches long, and weighs about 20 ounces. The bill is white as ivory, three inches long and channelled; the irides are yellow, and on the hind head is an erect pointed crest, of a fine red colour some of the feathers of which are two inches long; the head itself, and the body in general are black; but the lower part of the back, rump, and upper tail-coverts, are white; from the eye there arise a stripe of white, which passes on each side of the neck down to the back; three or four of the prime quills are black, but the rest are white; the tail is cutiform, and of the same colour as the body; the legs and claws are also black.

"This species inhabits Carolina, Virginia, New Spain, and Brazil, and is called by the Spaniards carpenter, and not without reason, as this as well as most of the other species make a great noise with the bill against the trees in the woods, where they may be heard at a great distance, as if carpenters were at work, making, according to Cadby, in an hour or two a bushel of chips. He adds likewise, that the Canadian Indians make use of the bills of these birds for corcelets, setting them round in a wreath with the points outward; and that the northern Indians purchase them of the southerners at the rate of two and three buck skins per bill. Kalm says they are found in New Jersey, though very seldom, and only at certain seasons."
are not seen in such numbers in winter as in summer. During the winter they are very tame, and are frequently known to come into the houses in the same manner as the red-breast is wont to do in England. It is observed that this species is found chiefly in old trees; and the noise they make with their bills may be heard above a mile distant. It builds the earliest of all the woodpeckers, and generally pretty high from the ground. It is accounted for by many people very good eating. Buffon is of opinion, that it is necessity alone that compels these birds to feed on vegetables of any kind, as it is contrary to the nature of the genus.

4. The picus palpebrensis, or little woodpecker, according to Catesby, weighs only about an ounce and a half. Briffon says, it is larger than the smallest of the European species; being about five inches and a half long. The bill is about eight lines long, and of a horn colour; the top of the head is black, and on each side above the eye is a white line; the hind head is red; the hind part of the neck, the back, and lump, are black, which is divided into two parts by a line of white paling down the middle to the rump; the scapulars, upper wing and tail coverts are black; the greater wing coverts and quills are spotted with white; the under part of the body are pale, the breast black; the four middle feathers are plain, the feet bare with white and black; and the legs and claws are black.

The female has no red on the hind head. Linnaeus tells us, that the outer tail feather is white, marked with four black spots. This species inhabits Virginia and Carolina. According to Kalm, it abounds in New Jersey, where it is esteemed of all others the most dangerous to orchards, and the most daring. As soon as it has pecked one hole in a tree, it makes another close to the first, in an horizontal direction, proceeding till it has made a circle of holes quite round the tree; and the apple-trees in the orchards, have often several of these rings of holes round the stem, in such numbers, that the tree frequently dries up and decays.

5. The yellow woodpecker is about nine inches long. The bill is of a yellowish white, and more than an inch long; the hind head is red; the head itself, the neck, and whole body, are covered with dirty white feathers; from the lower jaw to the ears on each side, there is a red stripe; the wing coverts are brown and edged with yellowish, and some of the greater ones are mixed with russet on the inner web; the quills are brown or rufous; the tail is black; the legs and claws are grey.

"This species is common at Cayenne, and is called there charpentier jaune. It makes its nest in old trees which are rotten within; making with its bill a hole from without, at first horizontal, but declining downwards so soon as it has pierced through the round part, till it is at last a foot and a half below the first opening. The female lays three white and nearly round eggs, and the young are hatched about the beginning of April. The male bears his flaire in the work with the female, and in her absence keeps sentinel at the entrance of the hole. The note of this bird is a kind of whistle six times repeated, of which the two or three last are in a graver accent than the others. The female wants the red band on the side of the head which is seen in the male."

"Specimens vary; some are of that dirty white, as Briffon describes it; others of a light yellow; which last is the cafe in a specimen in the Leverian museum; this is 1½ inches in length.

"In the place referred to above, we find a bird imperfectly described by Mr Fermin: he merely says, that it is a large species; that it has a fine red crest on the head; the neck, breast, and belly, of a citron colour; and the wings blueish above. He only adds, that it may be distinguished from others by the strokes of the bill, which it gives to the trees, and may be heard at a great distance."

6. The picus auratus, or gold-winged woodpecker, is about 1½ inches long, and weighs about 5 ounces. The bill is an inch and a half long, and is somewhat bent; it is not square but roundish, rufous on the top, the point being sharp; the upper parts of the head and neck are ash-coloured; the hind head is red; the sides of the head, throat, and fore-part of the neck, are pale yellow; on each side of the head is a stripe of black, from the base of the lower jaw to the neck; the back, scapulars, and wing coverts, are of a grey brown colour, transversely striated with black lines; the rump is whitish; the breast, belly, and sides, are whitish yellow, and each feather is marked with a round black spot at the tip; on the middle of the breast there is a large crescent of black; the thighs, upper and under tail coverts, are black and white mixed; the quills are brown, with yellow shafts spotted with brown on the outer edge; the tail is blackish, being outwardly edged with grey; the outer feather is dotted with whiteness on the margins; the shafts of all but the two middle feathers are yellow; half way from the base; and the legs and claws are brown.

The female differs in having the crown and neck behind, grey brown; the hind head of a less vivid red; and the greater quills not spotted on the edges. She also wants the black lift on the throat, but otherwise like the male.

This species inhabits Carolina, Virginia, and Maryland, and is plenty in the middle states, where it is called by some hitstick or jine, and by others high-hole (a). Both the first names have some relation to its

(a) "I have lately seen (says Latham) in the Leverian museum a bird which appears to be a mere variety though brought from a far different country. This was much like the picus auratus in colour, but rather less in size. The bill made exactly like that bird, and brown; on each side of the jaw is a stripe of crimson like a whisker; the under part of the wings of a pale red colour, not unlike what is called red head; and the shafts of the quills and tail, which in the other bird are yellow, in this are red; the plumage on the upper parts of the body is brown, beneath vinaceous, marked with round black spots; tail black, pointed, and each feather bifurcated at the tip, exactly like the American one. This was brought from the Cape of Good Hope. I have seen two specimens of this bird."
its note; and perhaps the latter, from the situation of the nest. It is almost continually on the ground, and is not observed to climb on the trees, like others of the genus. It lives chiefly on insects (a), and is commonly very fat, so as to be thought very palatable for the table. It flies all the year; and as it cannot at all times get insects, it must perhaps eat some kind of grubs or plants in the fields. Its form and some of its qualities make it resemble the cuckow (c). Though it climbs not on trees, it flies to their tops and sits occasionally on the branches.

Forster, in the Philosophical Transactions, observes, that it is a bird of passage in the northern parts of America, visiting the neighbourhood of Albany Fort in April, and leaving it in September; that it lays from four to six eggs, in hollow trees, and feeds on worms and other insects. Called by the natives out-thee-quan-now.

The following species are pretty well known in Britain.

7. The viridis, or green woodpecker, weighs six ounces and a half; its length is 13 inches, the breadth 20 and a half; the bill is dully, triangular, and near two inches long; the crown of the head is crimson, spotted with black; the eyes are surrounded with black, and the males have a rich crimson mark beneath the blackness; the back, neck, and under coverts of the wings, are green; the rump of a pale yellow; the whole of the under part of the body is of a very pale green, and the thighs and vent are marked with dulky lines; the legs and feet are of a cinereus green; the tail consists of ten stiff feathers, whose ends are generally broken, as the bird rests on them in climbing; their tips are black; the rest of each is alternately barred with dulky and deep green. These birds feed entirely on insects; and their principal action is that of climbing up and down the bodies or boughs of trees; for the first purpose they are provided with a long slender tongue, armed with a sharp bony end barred on each side, which by the means of a curious apparatus of muscles, they can exert at pleasure, darting it to a great length into the cliffs of the bark, transfixing and drawing out the insects that lurk there. They make their nests in the hollows of trees; in order therefore to force their way to those cavities, their bills are formed strong, very hard, and wedge-like at the end; Dr Derham observes, that a neat ridge runs along the top, as if an artist had designed it for strength and beauty. Yet it has not power to penetrate a found tree; their perforation of any tree is a warning to the owner to throw it down. Their legs are short, but strong; their thighs very muscular; their toes disposed two backward, two forward; the feathers of the tail are very stiff, sharp-pointed, and bending downwards. The three first circumstances do admirably concur to enable them to run up and down the sides of the trees with great security; and the strength of the tail supports them firmly when they continue long in one place, either where they find plenty of food, or while they are forming an access to the interior part of the timber. This form of the tail makes their flight very awkward, as it inclines their body down, and forces them to fly with short and frequent jerks when they would ascend, or even keep in a line. This species feeds often on the ground than any other of the genus: all of them make their nests in the hollows of trees; and lay five or six eggs, of a beautiful semi-transparent white.

Willoughby says that the female lays five or six eggs; which Pennant (b) also observes; adding that they are of a beautiful semi-transparent white.

"These birds sometimes build in a hollow sap or other tree, 15 or 20 feet from the ground. The male and female take it by turns to bore through the living part of the wood, till they come to the rotten part, wherein, after being hollowed out to a proper depth, they lay their eggs (e), which are generally five and sometimes six (f) in number, greenish with small black spots." The young ones climb up and down the trees before they can fly. It is worthy of remark to observe with what nicety the holes of the woodpecker are made, as perfectly round as if made by the assistance of a pair of compasses. Nuthatches, starlings, and bats, frequently build in these holes when deserted.

"Both Frisch and Klein mistake in saying that the females have not the red crown, for even the young ones in the nest have the appearance of it; and I have had them brought to me when they could scarcely fly, when the red was mixed with brown; but they do not become of a full red till after the first moult. They are said to be fond of bees in winter, making great havoc among them. Salerne observeth, that they are found in the markets in Italy, at Bologna; but this is not extraordinary, for the Italians eat all small birds almost without exception."

"In Sir A. Lever's museum there is a variety of this bird, of a straw-colour throughout, except the crown, which is faintly marked with red."

8. The major, or great spotted woodpecker, weighs two ounces three quarters; the length is nine inches; the breadth is 16. The bill is one and a quarter long, of a black horn colour. The irides are red. The forehead

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(a) "In defect of insects I have been informed (says Mr Latham), that it feeds on the berries of the red cedar, and grows fat on them. This food has been both digorged by the mouth, after being shot, as well as found in the stomach on dissection."

(b) Linnaeus, in his tenth edition of the Systema Naturae, had ranked this with the cuckows; and Buffon, from its similarity to this genus, has placed it at the end of the wood peckers of its class.

(c) Br. Zool. p. 242. Where some pertinent observations on these birds may be found. Let the reader also consult Ray on the Creation, p. 143. and Derham's Physico-theol. p. 193; 339; 342.

(d) "This is sometimes so deep that they must feed their young quite in the dark; for I have been told by one, that he was obliged to thrust his whole arm to the shoulder down the hollow of a tree before he could reach the eggs."

(e) "I have seen six young ones together in one nest."

(f) "I have seen six young ones together in one nest."
Picus

Picus

Head is of a pale buff colour; the crown of the head a glossy black; the hind-part marked with a rich deep crimson spot. The cheeks are white; bounded beneath by a black line that passes from the corner of the mouth and surrounds the hind-part of the head. The neck is encircled with a black colour. The throat and breast are of a yellowish white; the vent feathers of a fine light crimson. The back, rump, and covert of the tail, and lesser covert of the wings, are black; the scapular feathers and covert adjoin to, them are white. The quill feathers are black, elegantly marked on each web with round white spots. The four middle feathers of the tail are black, the next tipped with dirty yellow; the bottoms of the two outermost black; the upper parts of a dirty white. The external feathers marked on each web with two black spots; the next with two on the inner web, and only one on the other. The legs are of a lead colour. The female wants that beautiful crimson spot on the head; in other respects the colours of both agree. This species is much more uncommon than the preceding; and keeps altogether in the woods. This bird is pretty common in England, France, Germany, and other parts of Europe, frequenting the woods like the rest of its genus, and is likewise met with in America. It is a very cunning bird; for when a person has seen one on a tree, he is almost sure to lose sight of it, if the tree is large, and the observer not very attentive; for the moment it spies any one it will creep behind a branch, and there lie secure till the danger is over. The extreme facility with which birds of the woodpecker kind descend as well as ascend the trees is wonderful. Buffon speaks of a woodpecker, found in an hollow of a tree, and often disputes the right of occupancy with the little colemeone, which, till, as it is much weaker of the two, most yield the victory. Willoughby says it is called in England by the name of kick-wall. Linnaeus, in his synonynmes of this bird, quotes Hafedid, for the fame; but whoever diligently read what this author says of the matter, will be convinced that the reference should be to the greater rather than the leaf of this genus. It is said by him to inhabit the higher parts of Asia.

Mr Sonnerat mentions a bird found by him at Antiqua, in the island of Paray, with the top of the head, and hind part of the neck, of a greyish black: on each side of the neck, two-thirds downwards, is a stripe of white, which begins just above the eye; and under this another of black from the eye to the shoulder. The upper part of the body is black and white. The under parts pale yellow, spotted with black. The tail is black above, and beneath barred with a dirty white and yellowish colour. The bill and legs blackish. The head had no red on it. Buffon supposes it to have been a female, and a very variety of our least spotted woodpecker.

Picus (f. b. h.), a king of Latium, son of Saturn. He married Venilia, also called Canens, by whom he had Faunus. He was tenderly loved by the goddess Pomona, and he returned her affection. As he was one day hunting in the woods, he was met by Circe, who became deeply enamoured of him, and who changed him into a woodpecker, called by the name of picus among the Latins. His wife Venilia was so discomfited when she was informed of his death, that she flew away. Some suppose that Picus was the son of Plutus, and that he gave out prophecies to his pupils by means of a favourite woodpecker; from which circumstance originated the fable of his being metamorphosed into a bird.

Picus (John), earl of Mirandola, a prodigy of parts and learning, was the youngest child of John Francis Picus earl of Mirandola and Concordia; and was born in the year 1463. The progress that he made in letters was so extremely rapid, that it was matter of astonishment to see even a boy one of the first poets and orators of his age. He was the scholar of R. Jochanan, a German Jew, who confirmed his natural fondness for the caballitical writings, informally that he is reported to have declared, that those who dived into them dived in the true head spring; whereas those rivulets that had flowed thence into Greece were no better than corrupt and stagnated waters. After visiting the most famous universities of France and Italy, he went to Rome; where, in 1486, before he was 24 years of age, he published 900 propositions in logic, mathematics, physics, divinity, caballitical learning, and magic, drawn not only from Greek and Latin, but even from Jewish and Arabian writers; subjoining to his advertisement, that, if any philosopher or divine would come to Rome to dispute with him, but is not so often met with. Salerne tells us that this bird is not found in France; but Buffon affirms that it inhabits most of the provinces there. It approaches near habitations in winter, and may be seen in orchards adjoining to houses, which no doubt it does for the sake of food, finding about the trunks of the trees both caterpillars and larvae of insects of all kinds. It builds in a hole of a tree, and often disputes the right of possession with the little colemeone, which, until, as it is much weaker of the two, most yield the victory. Willoughby says it is called in England by the name of kick-wall. Linnaeus, in his synonynmes of this bird, quotes Hafedid, for the same; but whoever diligently read what this author says of the matter, will be convinced that the reference should be to the greater rather than the leaf of this genus. It is said by him to inhabit the higher parts of Asia.
him upon any or all of them, he would destroy the
expenditures of his journey from the remotest corners of
India. He enjoyed, however, the honour of this dis
putations challenge quietly, without danger to his cre
dit; for envied procured some of his propositions to be
drawn with heresy, and he was forbid to dispute upon
them. As a proof of the ignorance of his oppo
sers, we are told that a theologian who had shown himself
very zealous in centering his book, being asked what
was the meaning of the word caballia? answered,
that he was a wicked man and a heretic, who had
written against Jesus Christ, and that those who followed his
opinion were called cabbalists. At the age of
28, he continued himself wholly to the study of the
Scripture; and undertook to combat the Jews and
Mahometans, as well as written
but in this intention
after
red; and
have
to the coast of Angola
The
ever,

Piedmont, a country of Italy, with the title
of a principality, is bounded on the north by Savoy
and Italy; on the west by France; on the south by the
Mediterranean and the republic of Genoa; and on
the east by the duchies of Montferrat and Milan; extending
about 150 miles from north to south, but much
leas from east to west. It is called Piedmont, and in
Latin Pismontium, from its situation at the foot of the
mountains, or Alps, which separate France from Italy.
This country is in some parts mountainous, but is
everywhere very fruitful. The plains produce fine corn,
and Montferrat and the Moline yield great quantities
of Turkey wheat, which commonly serves for bread,
and with which the people of the middle rank mix
rye; the pods are used for fuel, and the stalks being
thick serves to mend the roads. The hills produce
plenty of wine, which, like the Italian wines, is very
luscious when new, especially the white. There is also
a tartish red wine called vino brusco, said to be very
refreshing for fat people; and, on the other hand, the
sweet wine is recommended as a tonic.

The neighbourhood of Turin is famous for its fine fruits,
and many long walks of chestnut and mulberry trees,
which produce both pleat and profit. Marons, or
large chestnuts, are a favourite dainty among the
common people. These are put into an oven, and, when
thoroughly hot, and cooled in red wine, are dried
a second time in the oven, and afterwards eaten cold.

Truffles grow here in such abundance, that Piedmont
has obtained the name of the truffle country. Some are
black, others white marbled with red. Their price is
to be paid according to their fat. Sometimes they are found
of 14 or 15 pounds weight; and many country people
can earn from 60 to 70 dollars a-year merely by digging
for them. The trade in cattle is said to bring into
Piedmont no less than three millions of lives per an
num. The cultivation of flax is also a profitable article,
the Piedmontese flax being, on account of its fineness
and strength, esteemed the best in Italy. The
Piedmontese gentry breed vast numbers of fowl; in the care
of their tenants, who have the eggs and
mulberry leaves delivered to them, and in return they
give half the flax to their tenants. This principality
comprehends eleven small provinces: Piedmont proper,
the valleys between France and Italy, the valley of
Salza, the county of Nice, the Marquisate of Sufa,
the duchy of Aost, the Canavece, the lordship of Vet
ful, the county of Alt, and the Langes. It was
formerly a part of Lombardy, but now belongs to the
king of Sardinia, and lies at the foot of the Alps,
which separate France from Italy. It contains many
high mountains, among which there are rich and fruit
ful valleys, as pleasant and populous as any part of
Italy. In the mountains there are mines of several kinds,
and the forests afford a great deal of curious game,
among which the cuore is a useful animal. "The
mules (says Mr. Watkins) are very fine in this country;
but the inhabitants have other beasts, or rather mon
sters, which they find very serviceable, though vicious
and obstinate. These are produced by a cow and an
al, or mare and bull, and called jumares or gimeiri (a).
I cannot say that I have ever seen any of them, but I
am told they are very common."

(a) These equis vocal animals, however, if we may so term them, are so generally mentioned by travellers in
The Piedmontese have more sense than the Savoyards, but then they are not so sincere. Some authors represent them as lively, artful, and witty, the inhabitants of the mountain of Aosta excepted, who are farther distinguished by large wits, even their horses, dogs, and other animals. Mr. Baretty, however, in his Account of Italy, vol. ii. p. 116. gives the following account of them: “One of the chief qualities (says he,) which distinguish the Piedmonteuf from all other Italians, is their want of cheerfulness. Piedmont never produced a single good poet, as far as the records of the country go, whereas every province of Italy but what can boast of some poet ancient or modern; and yet the Piedmontese are not deficient in several branches of learning, and some of them have succeeded tolerably well in civil law, phyic, and the mathematics. It is likewise observed of this people, that none of them ever attained to any degree of excellence in the polite arts, and it is but lately that they have been invaded by the French, Spaniards, and Germans, whenever they have been invaded by these nations. The skill of the Piedmontese in fortification is likewise very great, and their Bortolas and Pintos have shown as much genius as the Vaubans and Cochons, in rendering impregnable several places which inferior engineers would only have made secure.”

The chief trade of this principality consists in hemp and flax. Indeed, so great is their trade in raw flax, that the English alone have purchased to the value of 200,000 l. in a year. The flax worm thrives so well, that many peasants make above (a) 100 l. of flax annually; and it is not only abundant, but universally known to be stronger and finer than in any in Italy. The land owners divide the profit, with their tenants. The Piedmontese workmen, however, are said to want expertise, though they finish their work equally well with those of other nations. The high duty and landcarriage on mules likewise tend to lessen the value of this trade. They have besides corn, rice, wine, fruits, flax, and cattle.

In the valleys of Lucerne, Peyrouse, and St Martin, which have always belonged to Piedmont, live the celebrated Waldenses or Vaudois, a name which signifies people of the valleys. They have rendered themselves famous in history for their dissent from the Romish church long before the time of Luther and Calvin, and for the persecutions they have suffered on that account; but since the year 1730 they have not been openly molest for their religion, but, in order to suppress them by degrees, a papish church has been built in every parish. They are heavily taxed, and labour under great oppressions. The number of people in these valleys is at present exceed 10,000, of which 1000 are Catholics. The chief river of Piedmont is the Po, which flows out of Mount Viù. The river Sebha, the Doria, Baltea, the ancient Drutta, the Tenaro, and several others, run into it. The Var, anciently called the Varus, rises in the county of Nice, and after watering it empties itself into the Mediterranean. The language of the Piedmontese is a mixture of French and Italian. In this country are about 50 earldoms, 15 marquises, a multitude of lordships, and 20 abbeys. Though the country be entirely popish, except some valleys inhabited by the Waldenses, the king reserves to himself the greatest part of the power in church affairs, which in many other places is given up to the pope, and the constitution unigenitus is here universally opposed. Towards the end of the last century, the French king persuaded the duke of Savoy to drive them out of the country; in consequence of which 200,000 of them retired to Germany, England, and Holland, and yet they are not all expatriated, though, as we have observed, they are obliged to have a Roman Catholic church in every parish.

Turbir, the general residence of the king of Sardinia, to whom this principality belongs, is the chief city. See Turin. The number of inhabitants, Mr Watkins says, in Piedmont and Savoy, amount to 2,695,727 souls, of which Turin contains about 77,000.

PIENES, a small island of Japan, over against the harbour of Saccai, is famed not only for the beauty of its walk, to which crowds of people resort from the city, but for a deity worshipped there, to which vast numbers of persons devote themselves. They go from his temple to the sea side, where they enter into a boat provided for the purpose; then, launching into the deep, they throw themselves overboard, loaded with stones, and sink to the bottom. The temple of that deity, which is called Canon, is very large and lofty, and is many others in the city itself; one in particular, dedicated to the gods of other countries, is thought the finest in the whole empire.

PIEPOUDRE, Court of, the lowest, and at the same time the most expeditious, court of justice known to the law of England. It is called Piepoudre, curia pedis pulverisata, from the dusty feet of the suitors; or, according to Sir Edward Coke, because justice is there done as speedily as dust can fall from the foot: Upon the same principle that justice among the Jews was administered in the gate of the city, that the proceedings might be the more speedy, as well as public. But the etymology given us by a learned modern writer is much more ingenious and satisfactory; it being derived, according to him, from pied, paludræus.

* Each pound is valued in Piedmont at 18 s. Sterling. The little village of La Tour, in the valley of Lucerne, makes above 50,000 l. annually, and the exports every year to the single city of Lyons amount to more than 160,000 l. Sterling.*
PIER [738]

PIER

PIERIINO, "a pedlar," in old French, and therefore signifying the court of such petty chapmen as refer to fairs or markets. It is a court of record, incident to every fair and market; of which the steward of him who owns or has the toll of the market is the judge. It was instituted to administer justice for all commercial injuries done in that very fair or market, and not in any preceding one. So that the injury must be done, complained of, heard, and determined, within the compacts of one and the same day, unless the fair continues longer. The court hath cognizance of all precincts, except those of the rivers Ludias and Peneus; and lying next Cilicia to the north-west. From the mouth of the river Axios on the north, and on the south no river being only to be made at that season; but it may certainly be made equally at all times. The Chinese chemists refer the various parts of the body to the several seasons of the year, and thus they refer the lungs to autumn. This is evident in their writings, and thus the fume for diseases of the lungs came to be called autumnal fume. It is prepared as follows: They put 50 pints of the urine of a strong and healthy young man into a large iron pot, and let it over a gentle fire. When it begins to boil, they add to it, drop by drop, about a large tea-cup full of rape oil. They then leave it on the fire till the whole is evaporated to a thick substance like black mud. It is then taken out of the pot, and laid on a flat iron to dry, so that it may be powdered very fine. This powder is moistened with water and the mass is put into a double crucible, surrounded with charcoal, where it stands till it be thoroughly dried again. This is again powdered, and put into a china vessel, which being covered with silk cloth and a double paper, they pour it on boiling water, which makes its way, drop by drop, through these coverings, till so much is got in as is sufficient to reduce it to a paste. This paste is well mixed together in the vessel it is kept in, and this is put into a vessel of water, and the whole set over the fire. The matter thus becomes again dried in balsamo mariae, and is then finished. Observe, for the Cure of the Ate, p. 258.

PIERIS (anc. geog.), a mountain which is thought to have given name to Pieria of Macedonia; taking its name from Pierus a poet, who was the first that sacrificed to the Muses, whence called Pierides, if credit may be given to an ancient scholiast on Juvenal.

PIERRE D'AUTOMNE is a French name, translated from the Chinese, of a medicinal stone, celebrated in the east for curing all disordors of the lungs. Many imagine it had its name of the autumn stone from its being only to be made at that season of the year; but it may certainly be made equally at all times. The Chinese chemists refer the various parts of the body to the several seasons of the year, and thus they refer the lungs to autumn. This is evident in their writings, and thus the stone for diseases of the lungs came to be called autumnal stone. It is prepared as follows: They put 50 pints of the urine of a strong and healthy young man into a large iron pot, and let it over a gentle fire. When it begins to boil, they add to it, drop by drop, about a large tea-cup full of rape oil. They then leave it on the fire till the whole is evaporated to a thick substance like black mud. It is then taken out of the pot, and laid on a flat iron to dry, so that it may be powdered very fine. This powder is moistened with water, and the mass is put into a double crucible, surrounded with charcoal, where it stands till it be thoroughly dried again. This is again powdered, and put into a china vessel, which being covered with silk cloth and a double paper, they pour it on boiling water, which makes its way, drop by drop, through these coverings, till so much is got in as is sufficient to reduce it to a paste. This paste is well mixed together in the vessel it is kept in, and this is put into a vessel of water, and the whole set over the fire. The matter thus becomes again dried in balsamo mariae, and is then finished.

PIERUS (st), or St Peter's, the capital of Martini, was built in 1665, in order to ouerve the muti-
PIE

neers of the island who rebelled against its proprietors, the second West India company, who were at the same time the proprietors of all the French Antilles. It is situated on the western side of the island. The town extends along the shore, and a battery that commands the road is erected on the west side, which is washed by the river Royolan, or St Peter. The town is divided into three wards; the middle, which is properly St Peter's, begins at the fort, and runs westward to the battery of St Nicholas. Under the walls of the second ward ships at anchor ride more securely than under the fort, on which account this ward is called the Anchorage. The third ward, called the Gallery, extends along the sea side from Fort St Peter to the J-Suits' River, and is the most populous part of the city. The houses of St Peter's ward are neat, commodious, and elegant, particularly those of the governor of the island, the intendent, and the other officers. The parish church of St Peter is a magnificent stone building which belonged to the J-Suits, with a noble front of the Doric order. The church of the Anchorage, which belongs to the Jacobine friars, is likewise of stone. It is a place of considerable trade, and is built with tolerable regularity. The houses are mostly constructed of a grey pumice-flone or lava, which is found on the strand; and the high street is, according to Dr Isert, above an English mile in length. It is supposed to contain about 2000 houses, and 30,000 inhabitants, including negroes. St Pierre, with the whole of the flourishing island of Martinico, was taken from the French in the month of March 1794, by the British land and sea forces under the command of Sir Charles Grey and Sir John Jervis, and may perhaps continue annexed to the British crown: 125 vessels loaded with the produce of the island, and of great value, were captured, 71 of which were in the harbour of St Pierre.

PIETISTS, a religious sect sprung up among the Protestants of Germany, seeming to be a kind of mean between the Quakers of England and the Quietists of the Romish church. They dispirit all sorts of ecclesiastical polity, all school theology, and all forms and ceremonies, and give themselves up to contemplation and the mystic theology. Many gross errors are charged on the Pietists, in a book intitled Manipulus Observations Antiquitates, but they have much of the air of polemical exaggeration, and are certainly not at all just. Indeed there are Pietists of various kinds: Some running into gross affluations, and carrying their errors to the overturning of a great part of the Christian doctrine, while others are only visionaries; and others are very honest and good, though perhaps misguided, people. They have been ingulphed with the coldness and formality of other churches, and have hence become charmed with the fervent piety of the Pietists, and attached to their party, without giving into the grovelf of their errors. See Molyneux's Ann. History, vol. iv. p. 454.

PIETISTS, otherwise called the Brethren and Sisters of the Pious and Christian Schools, a society formed in the year 1678 by Nicholas Barre, and obliged by their engagements to devote themselves to the education of poor children of both sexes.

PIETOLA, anciently called Andes, is a place within two Italian miles of Mantua, famous for being the birth-place of Virgil.

PIETY, is a virtue which denotes veneration for the Deity, and love and tenderness to our friends. This distinguished virtue, like many others, received among the Romans divine honours, and was made one of their gods. Acilius Glabrio first erected a temple to this divinity, which he did upon the spot on which a woman had fed with her own milk her aged father, who had been imprisoned by order of the Senate, and deprived of all aliment. The story is well known, and is given at length in authors which are in the hand of every school-boy. See Cicero de dom. 1. and Paulus Magnetianus, s. c. 4. and our article Pietas Piety, p. 238. col. 2d.

If piety was thus practised and thus honoured in Heathen antiquity, it surely ought not to be lost among Christians to whom its nature is better defined, and to the practice of which they have motives of greater cogency. A learned and elegant writer has said that the want of piety arises from the want of sensibility; and his observations and arguments are so just and so well expressed, that we cannot do better than transcribe them.

"It appears to me (says Dr Knox), that the mind of man, when it is free from natural defects and acquired corruption, feels no lefs a tendency to the indulgence of devotion than to virtuous love, or to any other of the more refined and elevated affections. But debauchery and excess contribute greatly to destroy all the susceptible delicacy with which nature usually furnishes the heart; and, in the general extinction of our better qualities, it is no wonder that so pure a sentiment as that of piety should be one of the first to expire.

"It is certain that the understanding may be improved in a knowledge of the world, and in the arts of succeeding in it, while the heart, or whatever constitutes the fear of the moral and sentimental feelings, is gradually receding from its proper and original perfection. Indeed experience seems to evince, that it is hardly possible to arrive at the character of a complete man of the world, without losing many of the most valuable sentiments of uncorrupted nature. A complete man of the world is an artificial being; he has discarded many of the native and laudable tendencies of his mind, and adopted a new system of objects and propensities of his own creation. These are commonly gross, coarse, forbid, selfish, and sensuol. All, or either of these attributes, tend directly to blunt the sense of every thing liberal, enlarged, disinterested; of every thing which participates more of an intellectual than of a sensual nature. When the heart is tied down to the earth by lust and avarice, it is not extraordinary that the eye should be seldom lifted up to heaven. To the man who spends his Sunday (because he thinks the day fit for little else) in the counting house, in traveling, in the tavern, or in the brothel, those who go to church appear as fools, and the butcher, or go open as nomens. He is callous to the feelings of devotion; but he is tremblingly alive to all that gratifies his senses or promotes his interest.

"It has been remarked of those writers who have attacked Christianity, and represented all religions merely as diversified modes of superstition, that they were, indeed, for the most part men of a metaphysical and a disputatious turn of mind, but usually little distinguished for benignity and generosity. There was, amid
amidst their pretensions to logical sagacity, a cloudiness of ideas, and a coldness of heart, which rendered them very unfit judges on a question in which the heart is chiefly interested; in which the language of nature is more expressive and convincing, than all the dreary subtleties of the dismal metaphysicians. Even the reasoning faculty, on which we so greatly value ourselves, may be perverted by excessive refinement; and there is an abstruse, but vain and foolish philosophy, which philosophizes us out of the noblest parts of our nature. One of those parts of us is our insatiable sense of religion, of which not one of those brutes which the philosophers mock admire, and to whose rank they would assign us, is found in the slightest degree to participate.

"Such philosophers may be called, in a double sense, the enemies of mankind. They not only endeavour to entice man from his duty, but to rob him of a most exalted and natural pleasure. Such, surely, is the pleasure of devotion. For when the soul rises above this little orb, and pours its adorations at the throne of celestial Majesty, the holy fervour which it feels is itself a rapturous delight. Neither is this a declamatory representation, but a truth felt and acknowledged by all the sons of men; except those who have been defective in sensibility, or who hoped to gratify the pride or the malignity of their hearts by singular and pernicious speculation.

"Indeed all disputations, controversial and metaphysical writings on the subject of religion, are unfavourable to genuine piety. We do not find that the most renowned polemics in the church militant were at all more attentive than others to the common offices of religion, or that they were actuated by any peculiar degree of devotion. The truth is their religion centered in their heads, whereas its natural region is the heart. The heart! confined, alas! in coldness, and by pride on a defeat. With such habits, and so defective a system of feelings, can we expect that a doctor of the Sorbonne, or the disputing professors, will ever feel the pure flame of piety that glowed in the bosoms of Mrs Rowe, Mrs Talbot, or Mr Nelson?

"It is however certain that a devotional taste and habit are very desirable in themselves exclusive of their effects in mollifying the morals and disposition, and promoting present and future felicity. They add dignity, pleasure, and security to any age: but to old age they are the most becoming grace, the most substantial support, and the sweetest comfort. In order to preserve them, it will be necessary to preserve our sensibility; and nothing will contribute so much to this purpose as a life of temperance, innocence, and simplicity."

Of piety, as it denotes love and tenderness to our friends, there have been many distinguished instances both in ancient and modern times. See Filial Piety, Fraternal and Parental Affection, &c.

The following example of filial piety in China, taken from P. Du Halde's description of that country, will not we truf disagreeable to our readers. "In the commencement of the dynasty of the Tang, Lou-tao-tong, who was disaffected to the government, being accused of a fault, which touched his life, obtained leave from those who had him in custody, to perform the duties of the Tao to one of his deceased friends. He managed matters so well that giving his keepers the slip, he fled to the house of Lou Nan-kin, with whom he had a friendship, and there hid himself. Lou Nan-kin, notwithstanding the fierce search that was made, and the severity of the court against those who conceal prifoners that have escaped, would not betray his friend. However, the thing coming to be discovered, Lou Nan-kin was imprisoned; and they were jult on the point of proceeding against him, when his younger brother presenting himself before the judge, It is I, Sir, said he, who have hidden the prifoner; it is I who ought to die, and not my elder brother. The eldest maintained on the contrary, that his younger brother accufed himself wrongfully, and was not at all culpable. The judge, who was a perfon of great sagacity, lifted both parties to effeély, that he not only discovered that the younger brother was innocent, but even made him confess it himself: It is true, Sir, said the younger all in tears, I have accused myself falsely; but I have very strong reafons for so doing. My mother has been dead for some time, and her corps is not yet buried. I have a father also who is marriageable, but is not yet disposed of: these things which my brother is capable of managing. I am not, and therefore desire to die in his stead. Vouchsafe to admit my testimonies. The commiffioner gave an account of the whole affair to the court, and the emperor at his solicitation pardoned the criminal."

PIG, in zoology. See Sus.

Guinea Pig. See Mus.

Pig of head, the eighth part of a fother, amounting to 250 pounds weight.

Piganiol de la Force (John Aymar de), a native of Auegne, of a noble family, applied himself with ardour to the study of geography, and of the history of France. With the view of improving himself in this study he travelled, into different provinces; and, in the course of his travels, made some important observations on the natural history, the commerce, the civil and ecclesiastical government of each province. These observations were of great use to him in compiling the works he has left behind him, of which the chief are, 1. An Historical and Geographical Description of France; the largest edition of which is that of 1753, in 15 vol. 12mo. It is the best work which has hitherto appeared upon that subject, though it contains a great number of inaccuracies and even errors. 2 A description of Paris, in 10 vol. 12mo; a work equally entertaining and instructive, and much more complete than the description given by German Brice; besides, it is written with an elegant simplicity. He published an abridgement of it in 2 vol. 12mo. 3. A description of the Cattle and Park of Verfailles, Marly, &c. in 2 vol. 12mo: it is very amusing, and pretty well executed. Piganiol had also a concern with Abbé Naudal in the Journal of Trevoux. He died at Paris in February 1753, at the age of 80 years. This learned man was as much to be respected for his manners as for his talents. To a profound and varied knowledge
Pigeon. Knowledge he united great probity and honour, and all the politeness of a courtier.

Pigeon, in ornithology. See Columbia.

Pigeon-House is a house erected full of holes within for the keeping, breeding, &c. of pigeons, otherwise called a dove cot.

Any lord of manor in England, may build a pigeon-house on his land, but a tenant cannot do it without the lord's licence. When persons shoot at or kill pigeons within a certain distance of the pigeon house, they are liable to a forfeiture.

In order to erect a pigeon-house, to advantage, it will be necessary in the first place, to pigeon upon a convenient situation; of which none is more proper than the middle of a spacious court-yard, because pigeons are naturally of a timorous disposition, and the least noise they hear frightens them. With regard to the size of the pigeon-house, it must depend entirely upon the number of birds intended to be kept; but it is better to have it too large than too little; and as to its form, the round should be preferred to the square ones, because rats cannot so easily come at them in the former as in the latter. It is also much more commodious; because you may, by means of a ladder turning upon an axis, easily visit all the nests in the house without the least difficulty; which cannot so easily be done in a square house. In order to hinder rats from climbing up the outside of the pigeon-house, the wall should be covered with tin plates to a certain height, about a foot and a half will be sufficient; but they should project out three or four inches at the top, to prevent their clambering any higher.

The pigeon-house should be placed at no great distance from water, that the pigeons may carry it to their young ones; and their carrying it in their bills, will warm it, and render it more convenient for them to sit; of which none is better than an axis, easily visit all the nests in the house without the least difficulty; which cannot so easily be done in a square house. In order to hinder rats from climbing up the outside of the pigeon-house, the wall should be covered with tin plates to a certain height, about a foot and a half will be sufficient; but they should project out three or four inches at the top, to prevent their clambering any higher.

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PIGEON (Peter Charles Francis), curate of St Peter du Regard, in the diocese of Bayeux, was one of the priests lately belonging to the king's house at Winchester. He was born in Lower Normandy, of honest and virtuous parents, and of a decent fortune. His inclinations early led him to embrace the ecclesiastical state, from which neither the solicitations of his friends, nor the prospect of a more ample fortune on the death of his elder brother, could withdraw him. Several of his schoolfellows and masters, who are now resident in the king's house at Winchester, bear the most ample testimony to his fidelity, regularity, piety, and the sweetness of his disposition, during the whole course of his education. The sweetness of temper, in particular, was so remarkable, and so clearly depicted on his countenance, as to have gained him the esteem of the inhabitants of Winchester as by any means had become acquainted with him. He was seven years employed in quality of vicar, or, as we should call it curate, of a large parish in the diocese of Sees, where his virtues and talents had ample scope for exertion. His practice was to rise at five o'clock every morning, and to spend the whole time till noon (the usual time of dining for persons in his station) in prayer and study. The rest of the day, till evening, was devoted to visiting the sick, and other external duties of his function. In 1789, the year of the French Revolution, M. Pigeon was promoted to a curacy, or rather a rectory, in the diocese of Bayeux, called the paroiss of St Peter du Regard, near the town of Condé for Normandy. It was easy for him to gain the good-will and the protection of his parishioners; but a Jacobin club in the above-mentioned town seemed to have no other subject to deliberate upon than the various ways of harassing and persecuting M. Pigeon and certain other priests in the neighbourhood, who had from motives of confidence refused the famous civic oath. It would be tedious to relate the many cruelties which were at different times exercised upon him, and the imminent danger of losing his life to which he was exposed, by the blows that were inflicted on him, by his being thrown into water, and being obliged to wander in woods and other solitary places, without any food or place to lay his head, in order to avoid his persecutors. We may form some judgment of the spirit of his persecutors from the following circumstance. Being disappointed on a particular occasion in the search they were making after M. Pigeon, with the view of amusing themselves with his sufferings, they made themselves amends by seizing his mother, a respectable lady of 74 years of age, and his two sisters, whom they placed upon a cart with their faces turned backwards, obliging them in derision to hold the tails of these animals. Thus they were conducted in pain and ignominy throughout the whole town of Condé, for no other alleged crime except being the nearest relations of M. Pigeon. At length the decree for transporting all the ecclesiastics arrived; and this gentleman, with several others, after having been stripped of all their money, was shipped from Port Beaufin, and landed at Portsmouth, where he was shortly after received into the establishment at Foxton, and upon that being dissolved in order to make room, for prisoners of war, into the king's house at Winchester. Being of a studious turn, he was accustomed, as many of his brethren also were, to betake himself to the neighbouring lanes and thickets for the sake of greater solitude. With this view having about ten o'clock in the morning, Aug. 28, 1793, retired to a certain little valley, on the north-east side of a place called Orme's Arbours, the same place where the county elections for Hampshire are held, he was there found, between three and four o'clock in the afternoon, murdered, with the upper part of his skull absolutely broken from the lower-part, and a large hedge-flake, covered with blood, lying by him, as were the papers in which he had been transcribing a manuscript sermon, with the hearing of which he had been much edified, and the sermon itself which he was copying, together with his pen, imbrued in blood. His watch was carried away, though part of the chain, which had by some means been broken, was left behind. He was writing the word *paradise*, the last letters of which remained unwritten when the fatal blow was given him, which appears evidently to have been discharged upon him from a gap in a hedge which was immediately behind him. At first the information of this cruel murder fell upon the French democrats, who, to the number of 200, are prisoners of war, at the neighbouring town of Alresford, as one of that number, who had broken his parole, had about three weeks before, been taken up in Winchester, and both there and at Alresford had repeatedly threatened to murder his uncle, a priest, whom he understood to be then at Winchester, not without fervent wishes of having it in his power to murder the whole establishment, consisting of more than 600 persons. However, as no French prisoner was found that day in the neighbourhood of Winchester, as none of them were known to have left Alresford, it is evidently reasonable to acquit the verdict of the coroner; namely, that the murder was committed by a person or persons unknown. The most noble marquis of Buckingham, whose munificence and kindness to those conscientious exiles, the emigrant French clergy, can only, be conceived by those who have been witnesses of the fame, with the truly respectable corps of the Buckinghamshire militia, then quartered at Winchester, joined in paying the last mark of respect to the unfortunate deceased, by attending his funeral, which was performed at the Roman Catholic burying-ground, called St James's near the said city, on Saturday August 29. He was just 38 years of age when he was murdered.

PIGMENTS, preparations used by painters, dyers, &c. to impart colours to bodies, or to imitate particular colours. See COLOUR MAKING, and DYEING.

PIGNER, or Earlibnut. See BUNIUM.

PIGUS, in ichthyology, is the name of a species of leather-mouthed fish, very much resembling the nature of the common carp; being of the same shape and size, and its eyes, fins, and fishy palate, exactly the same from the gills to the tail there is a crooked dotted line.
PIK

PI-hahiroth, the back and sides are bluish, and the belly reddish.

It is covered with large scales; from the middle of each of which their rizes a fine, pellucid, prickle, which is very sharp. It is an excellent fish for the table, being perhaps preferable to the carp: and it is in feaf in the months of March and April. It is caught in lakes in some parts of Italy, and is mentioned by Pliny, tho' without a name. Artedi says it is a species of cyprinus, and he calls it the cyprinus, called pike and pggeus.

PI-MAHIROTH, (Moles;) understood to be a mouth or narrow pas between two mountains, called Chiroth, or Eiroth, and lying not far from the bottom of the western coast of the Arabian gulf; before which mouth the children of Israel encamped, just before their entering the Red Sea, (Wells.)

PIISSKER, in ichthyology, is a fish of the mufelia kind, commonly called the fufile mustia, or fusile fish. They are generally found as long as an ordinary man's hand is broad, and as thick as one's finger; but they sometimes grow much longer: the back is of grey with a number of spots and transverse stripes, partly black and partly blue; the belly is yellow, and spotted with red, white, and black; the white are the larger, the others look as if they were made with the point of a needle; and there is on each of the sides a longitudinal black and white line. There are some fishy excrescences at the mouth, which are expanded in swimming; and when out of the water, they are contractible. These fishes run into caverns of the earth, in the sides of rivers, in marshy places, and penetrate a great way, and are often dug up at a distance from waters. Often, when the waters of brooks and rivers stand beyond their banks, and again cover them, they make their way out of the earth into the water; and when it deferts them, they are often left in vault numbers upon the ground and become a prey to fowes. It is thought to be much of the same kind with the figurn fish; and it is indeed possible that the peculiarity of Schonefeld is the same.

PIKE, in ichthyology. See Esox.

The pike never swims in fows as most other fish do, but always lies alone; and so bold and ravenous, that he will seize upon almost any thing less than himself. Of the ravenous nature of this fish we shall give the following instances. At Ryckett in Oxfordshire, in the year 1749, in a moat surrounding the earl of Abingdon's seat, there was a Jack or pike of such a monstrous size, that it had destroyed young swans feathers and all. An old cob swan having hatched five young, ones after another was lost till four were gone. At length an under gardener faw the fifth seize the fifth. The old one fought him with her beak, and with the affiilation of the gardener; releafed it although he had got it under water. In the year 1765 a large pike was caught in the river Ouze, which weighed upwards of 29 pounds, and was fold for a guinea. On gutting the fish, a watch with a black ribbon and two feel feals were found in its flomach, which by the maker's name, &c. was found to belong to a perfon who had been drowned about six weeks before. This fish breeds but once in a year, which is in March. It is found in almost all fresh waters; but is very different in goodnefs, according to the nature of the places where it lives. The finest pike are those which feed in clear rivers; those in ponds and mere are inferior to these, and the worst of all are those of the fen ditches. They are very plentiful in these lat places, where the water is foul and coloured; and their food much as frogs and the like, very plentiful, but very coarse; so that they grow large, but are yellowish and high belied, and differ greatly from those which live in the clearer waters.

The fihermen have two principal ways of catching the pike: by the ledger, and by the walking-bait.

The ledger-bait is fixed in one certain place, and may continue while the angler is absent. This must be a live bait, a fish or frog: and among fih, the dace, roach, and gudgeon, are the falt, of frogs, the only caution is to choose the largest and yellowest that can be met with. If the bait be a fish, the hook is to be fluck through the upper lip, and the line must be 14 yards at lealf in length; the other end of this is to be tied to a bough of a tree, or to a fick driven into the ground near the fikes's haunt and all the line wound round a forked fick, except about half a yard. The bait will by this means keep playing so much under water, and the pike will soon lay hold of it.

If the bait be a frog then the arming wire of the hook fould be put in at the mouth, and out at the fide; and with a needle and some strong filk, the hinder-leg of one fide is to be faftened by one ftrick to the wire-arming of the hook. The pike will then seize this, and mutt have line enough to give him leave to get to his haunt and poach the bait.

The walking-bait is a plaent method also of taking them: in this a dead bait ferves, and none is fo proper as a gudgeon.

This is to be pulled about in the water till the pike feizes it; and then it is to have line enough, and time to iwallow it: the hook is small for this fport, and has a smooth piece of lead fixed at its end to fink the bait; and the line is very long, and runs through a ring at the end of the rod, which muft not be too flender at top.

The art of feeding pike, so as to make them very fat, is the giving them eels; and without this it is not to be done under a very long time; otherwise perch, while small and their prickly fins tender, are the best food for them. Breem put into a pike pond are a very proper food: they will breed freely, and their young ones make excellent food for the pike, who will take care that they shall not increase too much. The numerous shoals of roaches and ruds, which are continually changing place, and often in floods get into the pikes quarters, are food for them for a long time.

Pike, when used to be fed by hand, will come up to the very fhore, and take the food that is given them out of the fingers of the feeder. It is wonderful to fee what courage they will do this, after a while praditing; and it is a very diverting fight when there are several of them neariy of the fame fize, to fee what firving and fighting there will be for the beet bits when they are thrown in. The moft convenient place is near the mouth of the pond, and where there is about half a yard depth of water; for, by that means, the offal of the feedings will alll lie in one place, and the deep water will serve for a place to retire into and refi in, and will be always clean and in order.

Carp will be fed in the fame manner as pike; and though by nature a fish as remarkably fly and timo-
PI 5 4]

PILATE, or Pontius Pilate, was governor of Judea when our Lord was crucified. Of his family or country we know but little, though it is believed that he was of Rome, or at least of Italy. He was sent to govern Judea in the room of Gratus, in the year 26 or 27 of the vulgar era, and governed this province for ten years, from the 12th or 13th year of Tiberius to the 22d or 23d. He is represented both by Philo and Josephus as a man of an impetuous and obdurate temper, and as a judge who used to fell justice, and to pronounce any sentence that was desired, provided he was paid for it. The same authors make mention of his rapines, his injuries, his murders, the tortures that he inflicted upon the innocent, and the persons he put to death without any form of process. Philo, in particular, describes him as a man that exercised an excessive cruelty during the whole time of his government, who disturbed the repose of Judea, and gave occasion to the troubles and revolts that followed after. St Luke (xxii. 1, 2, &c.) acquaints us, that Pilate had mingled the blood of the Galileans with their sacricides; and that the matter having been related to Jesus Christ, he said, "Think you that these Galileans were greater sinners than other Galileans because they suffered this calamity. I tell you nay; and if you do not repent, you shall all perish in like manner. It is unknown what occasion Pilate caused these Galileans to be slain in the temple while they were sacrificing; for this is the meaning of that expression of mingling their blood with their sacricides. Some think they were disciples of Judas the Gaulonite, who taught that the Jews ought not to pay tribute to foreign princes; and that Pilate had put some of them to death even in the temple; but there is no proof of this fact. Others think that these Galileans were Samaritans, whom Pilate cut to pieces in the village of Tiratbabs, as they were preparing to go up to mount Gerizim, where a certain impostor had promised to discover treasures to them; but this event did not happen before the year 35 of the common era, and consequently two years after the death of Jesus Christ. At the time of our Saviour's passion, Pilate made some endeavours to deliver him out of the hands of the Jews. He knew they had delivered him up, and pursued his life with so much violence, only out of malice and envy (Matt. xxvii. 18.) His wife also, who had been disturbed the night before with frightful dreams, sent to tell him she desired him not to meddle in the affair of that just person (ib. 19.) He attempted to appease the wrath of the Jews, and to give them some satisfaction, by whipping Jesus Christ (John xix. 1. Matth. xxvii. 25.) He tried to take him out of their hands, by proposing to deliver him or Barabbas, on the day of the festival of the passover. Lastly, he had a mind to discharge himself from pronouncing judgment against him, by sending him to Herod king of Galilee (Luke xxii. 7, 8.) When he saw all this would not satisfy the Jews, and that they even threatened him in some manner, saying he could be no friend to the emperor if he let him go (John xix. 12, 15.) he caused water to be brought, washed his hands before all

PI 5 4]

PI 5 4]

PI

PILA, or the sea-ball, in natural history, is the name of a substance very common on the shores of the Mediterranean, and elsewhere. It is generally found in the form of a ball about the size of the balls of horse-dung, and composed of a variety of fibrilbs irregularly complicated. Various conjectures have been given of its origin by different authors. John Bau­line tells us, that it consists of small hairy fibres and fibrils, such as are found about the sea plant called alga utriculariorum; but he does not ascertain what plant gives its origin to Imperatius imagined it consisted of the exuviae of both vegetable and animal bodies. Mercatus is doubtful whether it be a congeries of the fibres of plants, wound up into a ball by the motion of the sea water, or whether it be the workman­ship of some sort of beetle living about the sea shore, and analogous to our common dung beetle's ball, which it elaborates from dung for the reception of its progeny. Schreckius says it is composed of the filaments of some plant of the reed kind; and Wulchers sup­poses it is composed of the pappus part of the flowers of the reed. Maurice Hoffman thinks it the excrement of the hippocampus; and others think it that of the phoca or sea calf. Klein, who had thoroughly and minutely examined the bodies themselves, and also what authors had conjectured concerning them, thinks that they are wholly owing to, and entirely composed of the capillilaments which the leaves, growing to the woody stalk of the alga utriculariorum, have when they wither and decay. These leaves, in their natural state, are as thick as a wheat straw, and they are placed so thick about the tops and extremities of the stalks, that they enfold, embrace, and lie one over another; and from the middle of these clusters of leaves, and indeed from the woody substance of the plant itself, there arise several other very long, flat, smooth, and brittle leaves. These are usually four from each tuft of the other leaves; and they have ever a common vagina, which is membranaceous and very thin. This is the style of the plant, and the pila marina, appears to be a cluster of the fibres of the leaves this plant, which cover the whole stalk, divided into their constituent fibres; and by the motion of the waves first broken and worn into short fillets, and afterwards wound up together into a roundish or longish ball.

PI. was a ball made in a different manner according to the different games in which it was to be used. Playing at ball was very common amongst the Romans of the first diltribution, and was looked upon as a man­ly exercise, which contributed both to amusement and health. The pila was of four sorts: 1st, Follis or halcon; 2d, Pila Trigomalis; 3d, Pila Pagasica; 4th, Harpophorum. All these come under the general name of pila. For the manner of playing with each of them, see the articles Follis, Trigomalis.

PI LASTER, in architecture. See there, no 50. &c.
Pilate. all the people, and publicly declared himself innocent of the blood of that just person (Matt. xxvii. 23, 24.; yet at the same time he delivered him up to his soldiers, that they might crucify him. This was enough to justify Jesus Christ, as Calmet observes, and to show that he held him as innocent; but it was not enough to vindicate the conscience and integrity of a judge, whose duty it was as well to avert the cause of oppressed innocence as to punish the guilty and criminal. He ordered to be put over our Saviour's crosses, as it were, an abridgment of his sentence, and the motive of his condemnation (John xix. 19.), Jesus of Nazareth, king of the Jews, which was written in Latin, Greek, and Hebrew. Some of the Jews found fault with it, and remonstrated to Pilate that he ought to have written Jesus of Nazareth, who pretended to be king of the Jews. But Pilate could not be prevailed with to alter it, and gave them this peremptory answer, That what he had written he had written.

Towards evening, he was applied to for leave to take down the bodies from the crosses, that they might not continue there the following day, which was the passover and the sabbath-day (John xix. 31.) This he allowed, and granted the body of Jesus to Joseph of Arimathea, that he might pay his debts to it, (ib. 53.) Lastly, when the priests, who had solicited the death of our Saviour, came to desire him to set a watch about the sepulchre, for fear his disciples might place them there themselves (Matt. xxvii. 65.) This is the substance of what the gospel tells us concerning Pilate.

Justin Martyr, Tertullian, Eusebius, and after them several others both ancient and modern, assure us, that it was formerly the custom for Roman magistrates to prepare copies of all verbal proceedings and judicial acts which they passed in their several provinces, and to send them to the emperor. And Pilate, in compliance with this custom, having lent word to Tiberius of what he had related to Jesus Christ, the emperor wrote an account of it to the senate, in a manner that gave reason to judge that he thought favourably of the religion of Jesus Christ, and showed that he would be willing they should decree divine honours to him. But the senate was not of the same opinion, and the matter was dropped. It appears by what Justin says of these acts, that the miracles of Jesus Christ were mentioned there, and even that the soldiers had divided his garments among them. Eusebius intimates that they spoke of his resurrection and ascension. Tertullian and Justin refer to these acts with so much confidence as would make one believe they had them in their hands. However, neither Eusebius nor St Jerome, who were both inquisitive, understanding persons, nor any other author that wrote afterwards, seem to have seen them, at least not the true and original acts; for as to what we have now in great number, they are not authentic, being neither ancient nor uniform. There are also some pretended letters of Pilate to Tiberius, giving a history of our Saviour, but they are universally allowed to be forgeries.

Pilate being a man that, by his excessive cruelties and rapine, had disturbed the peace of Judea during the whole time of his government, was at length deposed by Vitellius the proconsul of Syria, in the 36th year of Jesus Christ, and sent to Rome to give an account of his conduct to the emperor. But though Tiberius died before Pilate arrived at Rome, yet his successor Caligula banished him to Vienne in Gaul, where he was reduced to such extremity that he killed himself with his own hands. The evangelists call him governor, though in reality he was no more than procurator of Judea, not only because governor was a name of general use, but because Pilate in effect acted as one, by taking upon him to judge in criminal matters; as his predecessors had done, and other procurators in the small provinces of the empire where there was no proconsul, constably did. See Calmet's Dictionary, Echard's Ecclesiastical History, and Beaufroy's Annals.

With regard to Pilate's wife, the general tradition is, that she was named Claudia Procula or Procula; and in relation to her dream, some are of opinion that as she had intelligence of our Lord's apprehension, and knew by his character that he was a righteous person, her imagination, being struck with these ideas, did naturally produce the dream we read of; but others think that this dream was sent providentially upon her, for the clearer manifestation of our Lord's innocence.

PILATRE DU ROSIER (Francis), was born at Metz the 30th of March 1756. He was first apprentice to an apothecary there, and afterwards went to Paris in quest of farther improvement. He applied himself to the study of natural history and of natural philosophy, and had already acquired some reputation, when the discovery of M. de Montgolfier had just astonished the learned world. On the 25th of October 1783, he attempted an aerial voyage with the Marquis of Arlande. He performed several other excursions in this way with brilliant success, in the presence of the royal family of France, of the king of Sweden, and of Prince Henry of Prussia. He then resolved to pass into England by means of his aerial vehicle, and for that purpose he repaired to Boulogne, whence he roe about 7 o'clock in the morning of the 15th June. He was cruised by the fall of that machine, which was more ingenious, perhaps, than useful. * See Aeronauts.

Pilate's social virtues and courage, which were very distinguished, heightened the regret of his friends at his death. His merit as a chemist, and his experiments as an aeronaut, procured him some precarious reward, and some public appointments. He had a pension from the King, was intendant of Monfieur's cabinets of natural philosophy, chemistry, and natural history, professor of natural philosophy, a member of several academies, and principal director of Monfieur's museum.

PILCHARD, in ichthyology, a fish which has a general likeness to the herring, but differs in many particulars very essential. The body of the pilchard is less compressed than that of the herring, being thicker and rounder: the nose is shorter in proportion, and turned up; the under jaw is shorter. The back is more elevated; the belly less sharp. The dorsal fin of the pilchard is placed exactly in the center of gravity, so that when taken up by it, the body preserves an equilibrium, whereas that of the herring dips at the head. The scales of the pilchard adhere very closely, whereas those of the herring very easily drop off. The pilchard

5 B
The pilchard appears in vaft shoals off the Cornish coasts about the middle of July, disappearing beginning of winter, yet sometimes a few return again after Christmas. Their winter retreat is the same with that of the herring, and their motives for migrating the same. They affect, during summer, a warmer latitude; for they are not found in any quantities on any of the English coasts except those of Cornwall, that is to say, from Fowey harbour to the Scilly isles, between which places the shoals keep shifting for some weeks. The approach of the pilchard is known by much the same signs as those that indicate the arrival of the herring. Persons, called in Cornwall butts, are placed on the cliffs, to point to the boats stationed off the land the course of the fish. By the 1st of James I. e. 23, fishermen are empowered to go on the grounds of others to hue, without being liable to actions of trepass, which before occasioned frequent law-suits.

The emoluments that accrue to the inhabitants of that country are great, and are best expressed in the words of Dr W. Borlafe, in his Account of the Pilchard Fishery. "It employs a very great number of men on the sea, training them thereby to naval affairs; employs men, women, and children, at land, in salting, preserving, washing, and cleaning, in making boats, nets, ropes, cafsks, and all the trades depending on their constitution and sale. The poor are fed with the offals of the fish, and all the trades depending on their business, the fisherman, the gains of the fish. Ships are often freighted bither with salt, and into foreign countries with the fish, carrying off at the same time part of our tin. The usual number of hogheads of fish exported each year, for ten years, from 1747 to 1757 inclusive, from the four ports of Fowey, Falmouth, Penzance, and St Ives, in all amounts to 39,794; since it appears that Fowey has exported yearly 1732 hogheads; Falmouth, 14,651 hogheads and two-thirds; Penzance and Mounts-Bay, 12,149 hogheads and one-third; St Ives, 1282 hogheads. Every hoghead for ten years last past, together with the bounty allowed for each when exported, and the oil made out of each, has amounted, one year with another at an average, to the price of L. 10. 13s. 6d so that the cafsk paid for pilchards exported has, at a medium, annually amounted to the sum of L. 49,532, 10s." The numbers that are taken at one shooting out of the nets is amazingly great. Mr Pennant says, that Dr Borlafe affurred him, that on the 5th of October 1767, there were at one time incafled in St Ives's Bay 7000 hogheads, each hoghead containing 35,000 fish, in all 245,000,000.

PILE, in heraldry, an ordinary of a wedge, contrary from the chief, and terminating in a point towards the bottom of the shield.

PILE, among the Greeks and Romans, was a pyramid built of wood, whereon were laid the bodies of the deceas'd to be burnt. It was partly in the form of an altar, and differed in height according to the quality of the person to be consumed. Probably it might originally be considered as an altar, on which the dead were consumed as a burnt-offering to the infernal deities. The trees made use of in the erection of a funeral pile were such as abounded in pitch or rosin, as being most combustible; if they used any other wood, it was split that it might the more easily catch fire. Round the pile were placed cyepres boughs to hinder the noifome smell. See Funeral.

PILE, in building, is used for a large flake ramm'd into the ground in the bottom of rivers, or in marshy land, for a foundation to build upon.

PILE is also used among architects for a mass of building.

PILE, in coinage, denotes a kind of puncheon, which, in the old way of coining with the hammer, contained the arms or other figure and inscription to be struck on the coin. See Coinage.

Accordingly we shall call the arms fide of a piece of money the pile, and the head the cross; because in ancient coin, a cross usually took the place of the head in ours.

PILE-Engine, a very curious machine invented by Mr Vauloue for driving the piles of Westminster-bridge. It is represented Plate CCCXIII. A is a great upright shaft or axle, on which are the great wheel B, and the drum C, turned by horses joined to the bars S, S. The wheel B turns the trundile X, on the top of whose axis is the fly O, which serves to regulate the motion, and also to act against the horses, and to keep them from falling when the heavy ram Q is discharged to drive the pile P down into the mud in the bottom of the river. The drum C is loose upon the shaft A, but is locked to the wheel B by the bolt Y. On this drum the great rope HH is wound; one end of the rope being fixed to the drum, and the other to the follower G, to which it is conveyed over the pulleys I and K. In the follower G is contained the tongs F, that take hold of the ram Q by the treble R, for drawing it up. D is a spiral or fully fixed to the drum, on which is wound the small rope T that goes over the pulley block V. To the pulley-block V is hung the counterpoise W, which hinders the follower T from accelerating as it goes down to take hold of the ram; for as the follower tends to acquire velocity in its descent, the line T winds downwards upon the fully, on a larger and larger radius, by means which means the counterpoise W adds stronger and stronger against it; and so allows it to come down with only a moderate and uniform velocity. The bolt Y locks the drum to the great wheel, being pulled upward by the small lever 2, which goes through a mortise in the shaft A, turns upon a pin in the bar 3, fixed to the great wheel B, and has a weight 4, which always tends to push up the bolt Y through the wheel into the drum. L is the great lever turning on the axis m, and resting upon the forcing bar 5, 5, which goes through a hollow in the shaft A, and bears up the little lever 2.

By the horses going round, the great rope H is wound about the drum C, and the ram Q is drawn up by the tongs F in the follower G, and the tongs come between the inclined planes E; which, by slitting the tongs at the top, opens it at the foot, and discharges the ram which falls down between the guides bb upon the pile P, and drives it by a few strokes as far into the mud as it will go; after which, the top part is fawed off close to the mud by an engine for that purpose. Immediately
Immediately after the ram is discharged, the piece 6 upon the follower G takes hold of the ropes aa, which raise the end of the lever L, and cause its end N to descend and press down the forcing bar 5 upon the little lever 2, which, by pulling down the bolt Y, unlocks the drum C from the great wheel B; and then the follower being at liberty, comes down by its own weight to the staple R, and the weight of their heads causes them to fall outward, and shut upon it. Then the weight 4 pushes up the bolt Y into the drum, which locks it to the great wheel, and so the ram is drawn up as before.

As the follower comes down, it causes the drum to turn backward, and unwinds the rope from it, whilist the horces, great wheel, trundle, and fly, go on with an uninterrupted motion; and as the drum is turning backward, the counterpoise W is drawn up, and its rope T wound upon the spiral fusey D.

There are several holes in the under side of the drum, and the bolt Y always takes the first one that it finds when the drum stops by the falling of the follower upon the ram; until which stoppage the bolt has not time to flip into any of the holes.

This engine was placed upon a barge on the water, and so easily conveyed to any place desired. The ram was a ton weight; and the guides bb, by which it was let fall, were 30 feet high.

A new machine for driving piles has been invented lately by Mr. S. Bunce of Kirby street, Hatten street, London. It will drive a greater number of piles in a given time than any other; and can be constructed more simply to work by horses than Mr. Vauloie's engine above described.

Fig. 1 and 2 represent a side and front section of the machine. The chief parts are A, fig. 1, which are two endless ropes, or chains connected by cross pieces of iron B (see fig. 2) corresponding with two crofs grooves cut diametrically opposite in the wheel C (fig. 1.), into which they are received, and by which means the rope or chain A is carried round. FHK is a side-view of a strong wooden frame moveable on the axis H. D is a wheel, over which the chain passes and turns within at the top of the frame. It moves occasionally from F to G upon the centre H, and is kept in the position F by the weight I fixed to the end K. Fig. 3. L is the iron ram, which is connected with the cross pieces by the hook M. N is a cylindrical piece of wood suspended at the hook at O, by which freely upon the bar that connects the hook to the ram, always brings the hook upright upon the chain when at the bottom of the machine, in the position of GP. See fig. 1.

When the man at S turns the usual crane-work, the ram being connected to the chain, and passing between the guides, is drawn up in a perpendicular direction; and when it is near the top of the machine, the projecting bar Q of the hook strikes against a crofs piece of wood at R (fig. 1.); and consequently discharges the ram, whilist the weight I of the moveable frame instantly draws the upper wheel into the position shown at F, and keeps the chain free of the ram in its descent. The hook, while defending, is prevented from catching the chain by the wooden piece N. For that piece is specifically lighter than the iron weight below, and moving with a less degree of velocity cannot come in contact with the iron till it is at the bottom and the ram stops. It then falls and again connects the hook with the chain, which draws up the ram, as before.

Mr. Bunce has made a model of this machine, which performs perfectly well, and he observes, that, as the motion of the wheel C is uninterrupted, there appears to be the least possible time lost in the operation.

Pile-Worms, are a kind of worms found in the piles of the sea-dikes in Holland. They are of very various sizes; for some of the young ones are not above an inch or two in length, while others have been found thirteen or fourteen inches long. The heads of these creatures are covered with two hard shells or hemispheres; which together form a figure resembling an augre; and with which they bore the wood. The best remedy against them is, to perforate the pile with many small holes about an inch aunder; then it must be done over with a varnish in the hottest sun; and, while the varnish is hot, brick-dust must be fired over it; and this being several times repeated, the pile will be covered with a strong crust absolutely impenetrable to all insects.

PILES, in medicine, the same with hemorrhoids. See MEDICINE, n° 240, &c.

PILEUS, in Roman antiquity, was the ordinary cap or hat worn at public shows and sacrifices, and by the freedmen. It was one of the common rewards assigned to such gladiators as were slaves, in token of their obtaining freedom.

PILEWORT ('Ranunculus ficaria, Lin.'), the root. This is a very small plant, found in moist meadows and by hedge sides. The roots consist of slender fibres with some little tubercles among them, which are supputed to resemble the hemorrhoids. From thence it has been concluded, that this root must needs be of wonderful efficacy for the cure of that distemper: to the tale, it is little other than mucilaginous; and although still retained in several of the foreign pharmacopoeias, it is hardly in use in this country.

PILGRIMAGE, one who travels through foreign countries to visit holy places, and to pay his devotion to the relics of dead saints. See PILGRIMAGE.

The word is formed from the Flemifh pêlgrim, or Italian pellegrino, which signifies the same; and those originally from the Latin peregrinus, a "stranger or traveller."

PILGRIMAGE, a kind of religious discipline, which consists in taking a journey to some holy place in order to adore the relics of some deceased saint. Pilgrimages began to be made about the middle ages of the church; but they were most in vogue after the end of the 11th century, when every one was for visiting places of devotion, not excepting kings and princes themselves; and even bishops made no difficulty of being absent from their churches on the same account. The places most visited were Jerusalem, Rome, Compostella (a), and Tours; but the greatest numbers now resort to Loretto, in order to visit the chamber of the blessed

(a) It deserves to be remarked here, that in the year 1428, under the reign of Henry VI. abundance of licences
blest virgin, in which she was born, and brought up her son Jesus till he was 12 years of age. For the
pilgrimage of the followers of Mahomet, see MAHO-
METANISM, p. 455.

In every country where povery was established, pil-
griimages were common; and in those countries which
are still poffid, they continue. In England, the shrine
of St Thomas à Becket was the chief reftort of the
pious; and in Scotland, St Andrew's; where, as tradi-
tion informs us, was deposited a leg of the holy apo⚫
ite. In Ireland they ffill continue; for, from the beginning
of May till the middle of August every year, crowds
of poffid penitents from all parts of that country re-
port to an illand near the centre of Lough Gill, or White-
Lakes, in the county of Donegal, to the amount of
3000 or 4000. These are moftly of the poorer fort,
and many of them are proxies for thofe who are richer;
fo me of which, however, together with fome of the
priests and bishops on occasion, make their appearance
there. When the pilgrim comes within fight of the
holy lake, he muff uncover his hands and feet, and thus
walk to the water-fide, and is taken to the illand for
fifpence. Here there are two chapels, and 15 other
houses; to which are added confeffionals, fo contrived,
that the pilgrim cannot fee the perfon confessing. The
penance varies according to the circumftances of the
penitent; during the continuance of which (which is
fometimes three, fix, or nine days) he fubfifts on oat-
meal, fometimes made into bread. He traverses sharp
flones on his bare knees or feet, and goes through a va-
tity of other forms, paying fipence at every different
confeflion. When all is over, the prieft bores a gimblet-
hole through the pilgrim's ftab near the top, in which
he fatts a crofs peg; gives him as many holy pebbles
out of the lake as he cares to carry away, for amulets
to be prefented to his friends, and fo difmisses him, an
object of veneration to all other papifts not thus initiat-
ed; who no fooner fees the pilgrim's crofs in his hands,
than they kneel down to get his bleffing.

There are, however, other parts of Ireland facred to
extraordinary worship and pilgrimage; and the num-
ber of holy wells, and miraculous cures, &c. produced
by them is very great. That fuch things fould exift in
this enlightened age, and in a Pofladent country, is
indeed strange; but our wonder ceafes, when we re-
feft that it is among the lowest, and perhaps the
worft of the people. They who carry external reli-
gion to an extreme, and place that confidence in cer-
emony which belongs only to the spirit of it, are
feldom delighted either for their wisdom or their
virtue. We do not deny, however, that they who
carry matters to the other extreme, may be equally
deficient of real knowledge and genuine morality.

Dr Johnfon, in his Reflexions, gives us fome obser-
pressions on pilgrimage, which are fo much to the purpoسط
that we think we cannot do better than lay them be-
fore our readers. "Pilgrimage (faid Imlac, into whöfe
mouth the observations are put), like many other acts
of piety, may be reasonable or fuperflitious according
to the principles upon which it is performed. Long
journeys in search of truth are not commanded. Truth,
such as is neceffary to the regulation of life, is alwaYS
found where it is honestly fough; change of place is
no natural caufe of the increafe of piety, for it inevi-
tibly produces dilputation of mind. Yet fheen men go
every day to view the fields where great actions have
been performed, and return with stronger impressions
of the event, curiosity of the fame kind may naturally
disper us to view that country whence our religion
had its beginning; and I believe no man surveys those
awful cenfes without fome confirmation of holy re-
solutions. That the Supreme Being may be more
eafily propitious in one place than in another, is
the dream of idle fuperftition; but that fomeplaces
may operate upon our own minds in an uncommon
manner, is an opinion which hourly experience will
justify. He who fuppofes that his vices may be more
fuccefsfully combating in Palestine, will, perhaps, find
himfelf miftaken; yet he may go thither without fully:
he who thinks they will be more freely pardoned, difhonnour at once his reafon and religion."

PILKINGTON (Laetitia), a famous poetical ge-
nius, the daughter of Dr Van Lewin, a phyfician of
Dublin, where she was born in 1712. She was mar-
ried very young to the Rev. Matthew Pilkington, a phy-
ffician of no inconsiderable merit; and these two wits, as
is often the cafe, lived very unhappily together. They
were at length totally feparated, on the husband acci-
dently discovering a gentleman in her bed chamber
at two o'clock in the morning; a circumstance which she
accounted for in a very unfatisfactory manner. The
flory is told at large in her Memoirs; where fhe fays,
"Lovers of learning, I am fure, will pardin me, as I
folemnly declare it was the attractive charms of a new
book, which the gentleman would not lend me, but
confented to fay till I read it through, that was the
fcel motive of my detaining him." As there are
not wanting fome who form objections to marrying
learned wives, the chance of fuch literary affigna-
tions may perhaps be added to the list of them. Af-
ther unfortunate adventure, Mrs Pilkington came to
London; and having recourse to her pen for fubbil-
ence, through the means of Colley Cibber, fhe lived
fome time on the contributions of the great. She was
however thrown into the Marthellea for debt; and be-
ing fet at liberty, opened a pamphlet fhop. She raised
at length a handfome subscription for her Memoirs;
which are written with great fpightliness and wit,
containing feveral entertaining anecdotes of dean Swift,
with whom fhe was intimate, as well as many pretty
little

ences were granted from the crown of England to captains of English ships, for carrying numbers of devout
perfon to the shrine of St James of Compostella in Spain; provided, however, that those pilgrims fhou.d first
take an oath not to take any thing prejudicial to England, nor to reveal any of its secrets, nor to carry out
with them any more gold or fiver than what would be fufficient for their neceffary expences. In this year
there went out thirteen from England, on the fald pilgrimage, the following number of perfon: From Lon-
don 280, Briftol 200, Weymouth 122, Dartmouth 90, Yarmouth 60, Jersey 60, Plymouth 40, Exeter 30,
Poole 24, Ipswich 20, in all 926 perfon.
PILLARS, in antiquarian topography, are large fingle stones set up perpendicularly. Those of them which are found in Britain have been the work of the Druids; but as they are the most fimple of all monuments, they are unquestionably more ancient than druidism itself. They were placed as memorials of God's mercies, contracts, singular victories, boundaries, and sometimes sepulchres. Various instances of these monuments erected by the patriarchs occur in the Old Testament: such was that raised by Jacob at Luz, afterwards by him named Bethel; such also was the pillar placed by him over the grave of Rachel. They were likewise marks of executions and magical talismans.

Thefe stones, from having long been considered as objects of veneration, at length were by the ignorant and superflitious idolatrously worshipped; wherefore, after the introduction of Christianity, some had crosses cut on them, which was considered as flattering them from the service of the devil. Vulgar superflition of a later date has led the common people to consider them as perils transformed into stone for the punishment of some crime, generally that of Sabbath-breaking; but this tale is not confined to fingle stones, but is told also of whole circles; witness the monuments called the burhers in Cornwall, and Rollright stones in Warwickshire. The firk are by the vulgar supposed to have been once men, and thus transformed as a punishment for playing on the Lord's day at a game called hurling; the latter, a pagan king and his army.

At Wilton, where the earl of Pembroke has a very magnificent house, there is a pillar of one piece of white Egyptian granite, which was brought from the temple of Venus Genetrix at Rome, near 14 feet high and 22 inches diameter, with an inscription to Alcide or Venus.

PILLORY, from the French pillaire, i.e. deprecator, or pillor; derived from the Greek protos, a "door," because one standing on the pillory puts his head as it were through a door, and quam, video), is an engine made of wood to punish offenders, by exposing them to public view, and rendering them infamous. There is a figure of the pillory, 51 Hen. III. And by statute it is appointed for bakers, forefellers, and those who use false weights, perjury, forgery, &c. 3 L. & B. 219. Lords of lords are to have a pillory and tumbrel, or it will be the cause of forfeiture of the leet; and a village may be bound by prescription to provide a pillory, &c. 2 Hawk. P. C. 73.

PILOT, the officer who superintends the navigation, either upon the sea-coast or on the main ocean. It is, however, more particularly applied to our mariners to the person charged with the direction of a ship's course on or near the sea-coast, and into the roads, bays, rivers, havens, &c. within his respective district.

Pilots of ships, taking upon them to conduct any ship from Dover, &c. to any place up the River Thames, are to be first examined and approved by the master and wardens of the society of Trinity House, &c. or shall forfeit 10 l. for the first offence; 20 l. for the second, and 40 l. for every other offence; one moiety to the informer, the other to the master and wardens; but any master or mate of a ship may pilot his own vessel up the river; and if any ship be lost through the negligence of any pilot, he shall be for ever disabled to act as a pilot. 3 Geo. I. c. 13. Also the lord-warden of the cinque ports may make rules for the government of pilots, and order a sufficient number to stay at sea to conduct ships up to the Thames; 7 Geo. I. c. 21. No person shall act as a pilot on the Thames, &c. (except in collier ships) without a licence from the master and wardens of Trinity House at Deptford, on pain of forfeiting 20 l. And pilots are to be subject to the government of that corporation; and pay ancient dues, not exceeding 1 s. in the pound, out of wages, for the use of the poor thereof. Stat. 5 Geo. II. c. 20.

By the former laws of France, no perfon could be received as pilot till he had made several voyages and passed a strict examination; and after that, on his return in long voyages, he was obliged to lodge a copy of his journal in the admirality; and if a pilot occasioned the loss of a ship, he had to pay 100 livres fine, and to be for ever deprived of the exercise of pilotage; and if he did it designedly, be punished with death. Lex Mercat. 70. 71.

The laws of Oleron ordain, That if any pilot designedly misguide a ship, that it may be cast away, he shall be put to a rigorous death, and hung in chains: and if the lord of a place, where a ship be thus lost, abet such villains in order to have a share of the wreck, he shall be apprehended, and all his goods forfeited for the satisfaction of the perils suffering; and his person shall be fastened to a stake in the midst of his own manion, which, being fired on the four corners, shall be burnt to the ground, and lie with it. Leg. Ol. c. 25. And if the fault of a pilot be so notorious, that the ship's crew see an apparent wreck, they may lead him to the hatches, and strike off his head; but the common law denies this halty executio: an ignorant pilot.
pilot is sentenced to pass thrice under the ship's keel by the laws of Denmark. *Lex Mercat.* 70.

The regulations with regard to pilots in the British navy are as follow: "The commanders of the king's ships, in order to give all reasonable encouragement to so useful a body of men as pilots, and to remove all their objections to his majesty's service, are strictly charged to treat them with good usage, and an equal respect with warrant-officers.

"The purser of the ship is always to have a set of bedding provided on board for the pilots; and the captain is to order the boatswain to supply them with hammocks, and a convenient place to lie in, near their duty, and apart from the common men; which bedding and hammocks are to be returned when the pilots leave the ship.

"A pilot, when conducting one of his majesty's ships in pilot water, shall have the sole charge and command of the ship, and may give orders for steering, setting, trimming, or furling the sails; tacking the ship, or whatever concerns the navigation; and the captain is to take care that all the officers and crew obey his orders. But the captain is diligently to observe the conduct of the pilot; and if he judges him to behave so ill as to bring the ship into danger, he may remove him from the command and charge of the ship, and take such methods for his preservation as shall be judged necessary; remarking upon the log-book, the exact hour and time when the pilot was removed from his office, and the reasons assigned for it.

"Captains of the king's ships, employing pilots in foreign parts of his majesty's dominions, shall, after performance of the service, give a certificate thereof to the pilot, which being produced to the proper naval officer, he shall cause the same to be immediately paid; but if there be no naval officer there, the captain of his majesty's ship shall pay him, and send the proper vouchers, with his bill, to the navy-board, in order to be paid as bills of exchange.

"Captains of his majesty's ships, employing foreign pilots to carry the ships they command into or out of foreign ports, shall pay them the rates due by the establishment or custom of the country, before they discharge them; whose receipts being duly vouch'd, and sent, with a certificate of the service performed, to the navy-board, they shall cause them to be paid with the same exactness as they do bills of exchange."

**Regulations and Injunctions of the Seafervice, &c.**

*Pilot-Fish,* or *Gafferhus Dellor,* in ichthyology, is a species of the gadofolius, and is found in the Mediterranean and in the Atlantic ocean, chiefly towards the equator. Catfish, who gives a figure of it in its natural size, together with a short description, calls it *Perca marina Sciera,* or rudder-fish. One of them, which Gronovius describes, was about four inches in length, and its greatest breadth little more than an inch: the head is about the third of the body, and covered, excepting the space between the snout and the eye, with scales scarcely perceptible, and covering one another like tiles; the iris of the eye is a silver grey; the jaws are of equal size, and furnished as well as the palate with small teeth disposed in groups; there is also a longitudinal row of teeth on the tongue. The trunk of the pilot-fish is oblong, a little rounded, but it appears quadrangular towards the tail, because at this place the lines are thicker, and form a kind of membranous projection. The back fin is long, and furnished with seven spines; on the fore-part of this fin are three moveable prickles very short; the fins on the breast have each of them 20 spines, forked at their extremity; the abdominal fins have six; that of the anus has 17 branches, of which the first is longest; this fin is preceded by a small moveable prickle; that of the tail is thick, large, and fork'd. The body is brownish colour, changing into gold; a transversal black belt crosses the head; a second passes over the body at the place of the breast; a third near the moveable prickles of the back; three others near the region of the anus; and a seventh at the tail.

Seafaring people observe, that this fish frequently accompanies their vessels; and as they see it generally towards the fore part of the ship, they imagined that it was guiding and tracing out the course of the vessel, and hence it received the name of the *pilot-fish.*

Obsec tells us, that they are shaped like those mackerels which have a transversal line across the body. "Sailors (continues he) give them the name of *pilots,* because they closely follow the dog-fish, swimming in great flocks round it on all sides. It is thought that they point out some prey to the dog-fish; and indeed that fish is very unsightly. They are not only not touched, but also preferred by them all their enemies. Psalm cxi. ver. 2. "Who can utter the mighty acts of the Lord? Who can show forth all his praise?"

This scarce and remarkable fish I had an opportunity of describing: it is *Scopem corvus albus cingulustransversus nigros finis, dorso monopterygius.* See the *Memoirs of the Swedish Academy of Sciences for the year 1755*, vol. xvi. p. 71. of the Swedish edition."

It likewise follows the shark, apparently for the purpose of devouring the remains of its prey. It is pretended that it acts as its pilot. The manner in which it attends the shark, according to M. Daubenton, may have given rise to this name. It is said to swim at the height of a foot and a half from the fin of this voracious animal, to follow and imitate all its movements, and to seize with address every part of its prey which the shark allows to escape, and which is light enough to buoy up towards the surface of the water. When the shark, which has its mouth below, turns to seize any fish, the pilot-fish starts away; but as soon as the shark recovers its ordinary situation, it returns to its former place. Barbot informs us, that these fishes propagate their species like the shark. He adds, that in the gulf of Guinea those fishes follow ships for the sake of the offals and human excrements; and hence the Dutch give them the name of *dung-fish.* It is remarkable, that though so small they can keep pace with ships in their swiftest course.

**PIL TEN,** a division of Courland, which lies in Courland properly so called, derives its name from the ancient castle or palace of Pilten, built by Valdemar II. king of Denmark about the year 1220, when he founded a bishop's see in this country for the more effectual conversion of its Pagan inhabitants. This district afterwards successively belonged to the Germans, then again to the king of Denmark, the duke of Courland, and to Poland; and by virtue of the instrument of regency drawn up for this district in the year 1717, the government is lodged in seven Polish senators or coun-
There are seven species; the Pimento.

The most remarkable part of this district is the promontory of Domaefies, which projects northward into the gulf of Livonia. From this cape a sand-bank runs four German miles farther into the sea, half of which lies under water, and cannot be discerned. To the east of this promontory is an unfathomable abyss, which is never observed to be agitated. For the safety of vessels bound to Livonia, two square beacons have been erected on the coast, near Domaefies church, opposite to the sand-bank, and facing each other. One of these is twelve fathoms high, and the other eight; and a large fire is kept burning on them from the first of August to the first of January. When the mariners see these fires appear as one in a direct line, they may conclude that they are clear of the extremity of the sand-bank, and consequently out of danger; but if they see both beacons, they are in danger of running upon it. The district of Pilten contains seven parishes, but no town worthy of notice. The inhabitants are chiefly of the Lutheran persuasion.

PILUM, a military weapon used by the Roman soldiers, and in a charge darted upon the enemy. Its point, we are told by Polybius, was so long and small, that after the first discharge it was generally so bent as to be rendered useless. The legionary soldiers made use of the pilum, and each man carried two. The pilum underwent many alterations and improvements, and much of it is impossible to describe it. Julius Scaliger laboured much to give an accurate account of it, and would have esteemed successes on this head among the greatest blessings of his life. This weapon appears, however, to have been sometimes round, but most commonly square, to have been two cubits long in the staff, and to have had an iron point of the same length hooked and jagged at the end. Marius made a material improvement in it; for during the Cimbrian war, he so contrived it, that when it stuck in the enemies' field it should bend down, in an angle in the part where the wood was connected with the iron, and thus become useless to the person who received it.

PIMENTO, or, as Mr. Edward writes, Pimento, in botany, or Jamaica pepper, or Allspice, a species of the myrtus. See Myrtus.

The pimento trees grow spontaneously, and in great abundance, in many parts of Jamaica, but more particularly on hilly situations near the sea, on the northern side of that island; where they form the most delicious groves that can possibly be imagined; filling the air with fragrance, and giving reality, tho' in a very distant part of the globe, to a great poet's description of those balmy gales which convey to the delighted voyager.

'Sabean odours from the spicy shore
Of Arabia the blest.'

'Cher'ed with the grateful smell, old ocean's miles.'

'This tree is purely a child of nature, and seems to mock all the labours of man in his endeavours to extend or improve its growth; not one attempt in fifty to propagate the young plants, or to raise them from the seeds, in parts of the country where it is not found growing spontaneously, having succeeded. The usual method of forming a new pimento plantation (in Jamaica it is called a walk) is nothing more than to appropriate a piece of woodland, in the neighbourhood of a plantation already existing, or in a country where the scattered trees are found in a native state, the woods of which being fallen, the trees are suffered to remain on the ground till they become rotten and perished. In the course of twelve months after the first season, abundance of young pimento plants will be found growing vigorously in all parts of the land, being without doubt, produced from ripe berries scattered here by the birds, while the fallen trees, &c. afford them both shelter and shade. At the end of two years it will be proper to give the land a thorough cleansing, leaving such only of the pimento trees as have a good appearance, which will then form such groves as those I have described, and, except perhaps for the first four or five years, require very little attention afterwards.

'Soon after the trees are in blossom, the berries become fit for gathering; the fruit not being suffered to ripen on the tree, as the pulp in that state, being moist and glutinous, is difficult to cure, and when dry becomes black and tasteless. It is impossible, however, to prevent some of the ripe berries from mixing with the rest; but if the proportion of them be great, the price of the commodity is considerably injured.

'If it is gathered by the hand; one labourer on the tree, employed in gathering the small branches, will give employment to three below (who are generally women and children) in picking the berries; and an industrious picker will fill a bag of 70lbs. in the day.

'The returns from a pimento walk in a favourable season are prodigious. A single tree has been known to yield 150lbs. of the raw fruit, or one cwt. of the dried spice; there being commonly a loaf in weight of one third in curing; but this, like many other of the minor productions, is exceedingly uncertain, and perhaps a very plentiful crop occurs but once in five years.'

PIMPINELLA, Burnet Saxifrage; a genus of the digynia order, belonging to the pentandria class of plants. There are seven species; the most remarkable of which are, 1. The major, or greater burnet saxifrage, growing naturally in chalky woods, and on the sides of the banks near hedges, in several parts of England. The lower leaves of this form are winged; the lobes are deeply sawed on their edges, and fit close to the midrib, of a dark green. The flalks are more than a foot high, dividing into four or five branches. The lower part of the flalk is garnished with winged leaves, shaped like those at the bottom, but smaller; those upon the branches are short and trifid; the branches are terminated by small umbels of white flowers, which are composed of smaller umbels or rays. The flowers have five heart-shaped petals, which turn inward, and are succeeded by two narrow, oblong, channelled seeds. 2. The anium, or common anife, is an annual plant, which grows naturally in Egypt; but is cultivated in Malta and Spain, from whence the seeds are annually imported into Britain. The lower leaves of this plant are divided into three lobes, which are deeply cut on their edges; the flalks rise a foot and a half high, dividing into several slender branches, garnished with narrow
PIN

Pimpinella

narrow leaves, cut into three or four narrow segments, terminated by pretty large loose umbels, composed of smaller umbels or rays, which stand on pretty long footstalks. The flowers are small, and of a yellowish white; the seeds are oblong and swelling. — The former species requires no culture; the latter is too tender to be cultivated for profit in this country. However, the seeds will come up if sown in the beginning of April upon a warm border. When they come up, they should be thinned, and kept clear of weeds, which is all the culture they require.

Uses. Both these species are used in medicine. The roots of pimpinella have a grateful, warm, very pungent taste, which is entirely extracted by rectified spirit; in distillation the menstruum artifices, leaving all that it had taken up from the root united into a pungent aromatic resin. This root promises, from its tenable qualities, to be a medicine of considerable utility, though little regarded in common practice: the only official composition in which it is an ingredient is the pulvis aridocompositus. Stahl, Hoffman, and other German physicians, are extremely fond of it; and recommend it as an excellent stomachic, resolvent, detergent, diuretic, diaphoretic, and aperient. They frequently gave it, and not without success, in scabrous and cutaneous disorders, foment of the body and juices, tumors, swellings, and dilatations of the glands, and diseases proceeding from a deficiency of the fluid secretions in general. Boerhaave directs the use of this medicine in athermic and hydropic cases, where the strongest resolvents are indicated: the form he prefers is a watery infusion, but the spirituous tincture poises the virtues of the root in much greater perfection.

Aniseeds have an aromatic smell, and a pleasant warm taste, accompanied with a degree of sweetness. Water extracts very little of their flavour; rectified spirit the whole. These seeds are in the number of the four greater hot seeds: their principal use is in cold flatulent disorders, where tenacious phlegm abounds, and in the gripes to which young children are subject. Frederic Hoffman strongly recommends them in weakness of the stomach, diarrhea, and for strengthening the tone of the vasa in general; and thinks they will well deserve the appellation given them by Helmont, intellinorum folium. The smaller kind of aniseeds brought from Spain are preferred.

PIMPLE, in medicine, a small pustule arising on the face. By mixing equal quantities of the juice of house-leek, sedum minus, polished through paper, and of spirit of wine rectified by itself, a white conglomeration of a very volatile nature is formed, which Dr. Bughart recommends for curing pimples of the face; and says, that the thin liquor separated from it with fugar-candy is an excellent remedy for thick viscid phlegm in the breast.

PIN, in commerce, a little necessary instrument made of brass wire, chiefly used by women in adorning their drefs.

In the year 1543, by statute 34 and 35 of Henry VIII. cap. vi. it was enacted, "That no perfon shall put to sale any pinses but only such as shall be double headed, and have the heads folded to the shank of the pins, well-smoothed, the shank well-fla-
pin being complete, nothing remains but to separate it from the bran, which is performed by a mode exactly similar to the winnowing of corn; the bran flying off and leaving the pin behind fit for immediate sale. I was the more pleased with this manufacturer, as it appeared to afford employment to a number of children of both sexes, who are thus not only prevented from acquiring the habits of idleness and vice, but are on the contrary initiated in their early years in those of a beneficial and virtuous industry." See NEEDLES.

PINACIA, among the Athenians, were tablets of brags inscribed with the names of all those citizens in each tribe who were duly qualified and willing to be judges of the court of Areopagus. These tablets were cast into a vessel provided for the purpose, and the fame number of beans, an hundred being white and all the red black, were thrown into another. Then the names of the candidates and the beans were drawn out one by one, and they whose names were drawn out together with the white beans were elected judges or senators. In Solon's time there were only four tribes, each of which chose 100 senators; but the number of tribes afterwards increased, the number of senators or judges increased to so many hundreds more.

PINANG, the Chiefe name of the Areca Catechu.

Lin. See Areca.

PINCHBECK. See Zinc.

PINDAR, the prince of lyric poets, was born at Thebes, about 520 years B.C. He received his first musical instructions from his father, who was a flute-player by profession; after which, according to Suidas, he was placed under Myrtis, a lady of distinguished abilities in lyric poetry. It was during this period that he became acquainted with the poetess Corinna, who was likewise fluent under Myrtis. Plutarch tells us, that Pindar profited from the leflions which Corinna, more advanced in her studies, gave him at this school. It is very natural to suppose, that the first poetical effusions of a genius so full of fire and imagination as that of Pindar would be wild and luxuriant; and Lucian has preferred the verses, said to have been the exordium of his first essay; in which he crowded almost all the subjects for song which ancient history and mythology then furnished. Upon communicating this attempt to Corinna, she told him smiling, that he should sow with the hand, and not empty his whole sack at once. Pindar, however, soon quitted the leading firings of these ladies, his poetical nursery, and became the disciple of Simonides, now arrived at extreme old age: after which he soon surpassed all his masters, and acquired great reputation over all Greece, but, like a true prophet, he was less honoured in his own country than elsewhere; for at Thebes he was frequently pronounced to be vanquished, in the musical and poetical contests, by candidates of inferior merit.

The custom of having these public trials of skill in all the great cities of Greece was now so prevalent,

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(1) Pausanias says, that Corinna was one of the most beautiful women of her time, as he judged by a picture of her which he saw at Tanagra at the place where the public exercises were performed. She was represented with her head ornamented by a riband as a memorial of the victories she had obtained over Pindar at Thebes.
PIN

There is no great poet in antiquity whose moral character has been less cen­fured than that of Pindar. Plutarch has preferred a single verse of his Epicedium or Dirge that was sung at his funeral; which short and simple as it is, implies great praise: This man was pleasing to strangers, and dear to his fellow-citizens. His works abound with precepts of the purest morality: and it does not appear that he ever traduced even his enemies; comforting himself, for their malignity, by a maxim which he inferred in his first Pythic, and which afterwards became proverbial, That it is better to be en­cited than pitied.

Pausanias says, that the character of poet was truly consecrated, in the person of Pindar, by the god of verse himself; who was pleased, by an express oracle, to order the inhabitants of Delphos to set apart for Pindar one half of the first-fruit offerings brought by the religious to his shrine, and to allow him a consecru­ous place in his temple, where in an iron chair he used to sit and sing his hymns in honour of that god. This chair was remaining in the time of Pausanias, several centuries after, and thown to him as a relic not unworthy of the sanctity and magnificence of that place.

But though Pindar's muse was pensioned at Delphos, and well paid by princes and potentates else-where, the deeds, however, sometimes to have sung the sponta­neous strains of pure friendship. Of this kind were, probably, the verses beffowed upon the musician Midas, of Agrigentum in Sicily, who had twice obtained the palm of victory by his performance on the flute at the Pythic games (a). It is in his 12th Pythic ode that Pindar celebrates the victory of Midas over all Greece, upon that instrument which Minerva herself had in­sented (c).

Fabricius tells us, that Pindar lived to the age of 90; and according to the chronology of Dr Blair, he died 435 years B.C, aged 86. His fellow-citizens erected a monument to him in the Hippodrome at Thebes, which was still fulfil­ling in the time of Pausanias; and his renown was so great after his death, that his posterity derived very consider­able honours from it.

The Lacedemonians had done the fame before this pe­riod; for when they ravaged Boeotia and burned the capital, the following words were written upon the door of the poet: Forbear to burn this house, it was the dwelling of Pindar. Respect for the memory of this great poet continued so long, that, even in Plutarch's time, the best part of the sacred victim at the Theocenian festival was appropriated to his descend­ants.

PINDARIC one, in poetry, an ode, in imitation of the manner of Pindar. See POETRY, no 136, &c.

PINDUS (anc. geog.), not a single mountain, but a chain of mountains, inhabited by different people of Epirus and Thessaly; separating Macedonia from Thessaly and Epirus: An extensive chain, having Macedonia to the north, the Perchebi to the west, the Dolopes to the south, and the mountain itself of Thessaly (Strabo).

PINDUS, a Doric city of Aetolia, situated on the cognominal river, which falls into the Cephilus (Strabo).

PINE, in botany. See PINUS.

PINE-Apple. See Bromelia.

PINEA, or PIONS, in commerce; is a term used in Peru and Chili, for a kind of light, porous maffes, or lumps, formed of a mixture of mercury and silver-duft from the mines. The ore, or mineral, of silver, when dug out of the veins of the mine, is first broken and then ground in mills for the purpose, driven by water with iron-pellets, each of 200 pounds weight. The mineral, when thus pulverized, is next fitted, and then worked, up with water into a paste; which, when half dry, is cut into pieces, called cuerpos, a foot long, weighing each about two thousand five hundred pounds. Each piece or cuerpo is again kneaded up with sea­salt, which, dissolving, incorporates with it. They then add mercury, from 10 to 20 pounds for each cuerpo, kneading the paste afresh until the mercury be incorporated therewith. This office, which is exceedingly dangerous, on account of the noxious qual­i­ties of the mercury, is always made the lot of the poor Indians. This amalgamation is continued for eight or nine days; and some add lime, lead, or tin ore, &c. to forward it; and in some mines, they are obliged to use fire. To try whether or no the mixture and a­malgamation be sufficient, they wash a piece in water; and if the mercury be white, it is a proof that it has had its effect; if black, it must be still farther work­ed. When finis­hed, it is sent to the lavatories, which are large basons that empty successively into one another. The paste, &c. being laid in the uppermost of these, the earth is then washed from it into the rest by a rivulet turned upon it; an Indian, all the while, fill­ing it with his feet, and two other Indians doing the like in the other basons. When the water runs quite clear, out of the basons, the mercury and silver are found at bottom incorporated. This matter they call per­las, and of this they form the pinesas, by expressing as much of the mercury as they can; first, by putting it in woolen bags, and pressing and beating it strongly; then, by stamping it in a kind of wooden mould, of an octagonal form, at bottom whereof is a brass plate pierced

(a) This Midas is a very different personage from his long-cared majesty of Phrygia, whose decision in favour of Pan had given such offence to Apollo; as is manifest, indeed, from his having been co­tem­porary with Pindar.

(c) The most extraordinary part of this musician's performance that can be gathered from the scholiast upon Pindar, was his finis­hing the solo, without a reed or mouth-piece, which broke accidentally while he was playing. The legendary account given by the poet in this ode, of the occasion upon which the flute was invented by Minerva, is diverting: It was (says he) to imitate the howling of the Gorgons, and the hissing of their snakes, which the gods had heard when the head of Medusa (one of these three anti-graces), was cut off by Perseus.
PIN

PINEAU (Severin du), who died at Paris in 1619, was a native of Chartres, and first surgeon to the king of France. He was very skilful in lithotomy; and has left behind him, 1. A discourse concerning the Extraction of the Stone in the Bladder, published in 1610 in 8vo. 2. A treatise De Virginitatis Noto, printed at Leyden 1641, in 12mo. This last performance, however useful it may be to men of science, we would not venture to recommend to the perusal of young people, on account of some particulars which it was perhaps unnecessary to expose to the eyes of the public.

PINEAU (Gabriel du), was born at Angers in 1573, where he followed the profession of a lawyer with a reputation above his years. He went afterwards to Paris, and lived with care at the parliament and great council. Upon his return to Angers, he became a councilor in the prefidal court. He was consulted by all the neighboring provinces, and had an active hand in all the great affairs of his time. Mary de Medicis conferred upon him the office of master of requests, and in her disgrace wished to support herself by his credit and counsel; but Du Pineau, always attentive to what he owed on the one hand to the mother of his king, and on the other to the king himself, never ceased to inspire that prince with sentiments of peace.

In 1632 Louis XIII. by way of reward, appointed him mayor and captain-general of the city of Angers; a situation in which he merited the flattering title of Father of the People. He had no respect of persons; for he was equally accessible to the poor and the great. This worthy citizen died the 15th of October 1644, at the age of 71. His house was a kind of academy, where regular conferences were held, and attended by young officers, advocates, and other literary characters. In those conferences every one freely stated the difficulties which occurred to him upon subjects either of law or history; and when Pineau spoke, all was made clear; but he was always the last to bring his sentiments, because he perceived that too much deference was paid to his opinion. His writings are, 1. Latin notes, in addition to those of Du Moulin, upon the canons law, and printed along with the works of that eminent lawyer by the care of Francis Pinon. 2. Commentaries, observations, and consultations, upon several important questions respecting the laws both of Anjou and of France, with some dissertations upon different subjects, &c. reprinted in 1725 in 2 vols. fol. by the care of Livoniere, who has enriched them with very useful remarks. The editor says, that "Du Pineau is a little inferior to the celebrated Du Moulin on the civil law, but that he is more accurate than the other upon the canon law."—Menage made those two verses upon his death.

PINEDA (John) who was born at Seville of a noble family, entered into the society of Jesuits in 1572. He taught philosophy and divinity in several colleges; and devoted his time to the study of the Holy Scriptures. That he might render that study easier, he made himself master of the oriental languages. We have of his writings, 1. Two volumes of Commentaries upon the book of Job, in folio. 2. Two upon Ecclesiastes. 3. A General History of the Church, in Spanish, 4 vols. in folio. 4. A History of Ferdinand III, in the same language, in folio. He died in 1637, much regretted by the members of his society, and by the public in general.

PINELLI (John Vincent), born at Naples, was son of Count Pinelli, a noble Genoese, who had settled in that city, and had acquired a handsome fortune in the way of trade. After receiving a liberal education he quitted the place of his nativity, and repaired to Padua, where he took up his residence at the age of 24. Being a great lover of science, he gave a preference to that city on account of its famous university, which brought to it a number of learned men. He had an excellent library, which consisted of a choice collection of books and manuscripts, and which he continued to enrich till the hour of his death. His literary correspondence, not only in Italy, but through the rest of Europe, procured him all the new works which were worthy of his place in his collection. The authors themselves were often forward to pay their respects to him. In many cities of Italy he had persons employed to search, at least once a month, the stalls of those artificers who make use of old parchments, such as lute-makers, diev-wrights, and others; and by this means he had the good fortune often to save from destruction some valuable fragments. His passion for knowledge embraced all the sciences; but history, medals, antiquities, natural history, and particularly botany, were his favourite studies. He was consulted from all quarters, and the extent of his acquaintance with the learned world was very great. He corresponded with Justice Lipius, Joseph Scaliger, Sigoius, Poffevin, Peter Pithou, and a great many others, who have all paid the highest compliments to his erudition. Inmitable to all the pleasures of life, and acquainted only with those of the mind, he had a great dislike to plays, entertainments, shows, and every thing which most excites the curiosity of other people. During the space of 43 years that he lived at Padua, he was never known to be out of the city but twice; once on occasion of a plague which infected it; and afterwards on a voyage to Naples, which he made at the earnest solicitation of his friends. In short, Pinelli was generous, sympathizing, and compassionate, particularly to men of letters, whose wants he often anticipated. His zeal
for the progress and advancement of science rendered
him very communicative of his knowledge and of his
books; but this was always done with judgment and
discipline. He died in 1601, aged 68, without hav-
ing published any work. Paul Gualdo, who has writ-
ten Pinelli's life, does not specify the number of vol-
umes of which his rich library consisted: he only in-
foms us, that when it was transported by sea to Na-
eples, it was packed up in 150 chests, of which 14 con-
tained manuscripts; but did not go wholly to his
heirs. The senate of Venice caused their seal to be set
upon the manuscripts, and took away whatever con-
cerned the affairs of the republic, to the number of
200 pieces.—I compare (says presidet de Thou)
Pinelli to Titus Pomponius; for, as that illustrious Ro-
man was called Attid, Pinelli also bore the title of Fe-
netian, on account of the great affection which the
public of Venice entertained for him.

PINET (Antony du), lord of Noroy, lived in the
16th century, and was a native of Belfou. He was
strongly attached to the protestant religion, and a bit-
ter enemy to the church of Rome. His book, inti-
tled La Conformité des Églises Réformées du Fran-
ces, and de l'Église primitive, printed at Lyons, 1564, in 8vo;
and the notes which he added to the French transla-
tion of the Fees of the Popes's Chancery, which was
printed at Lyons, in 8vo, 1564, and reprinted at Am-
tterdam in 1570, in 12mo, plainly discover his senti-
ments. He published the last mentioned perform-
ance under this title: Taxe des parties cachetées de la bonne
du Pape, in Latin and French, with some notes taken
from decrees, councils, and canons, in order to ascer-
tain the discipline anciently observed in the church.
In the epistle dedicatory, he assumes the tone of a de-
clared enemy to the court of Rome. He apologizes
for having presented this book "to a society so holy
as yours (the protestants), in which are heard only
hymns, psalms, and praises to the Lord one God:
but it is proper to shew to the villain his villainy, and
the fool his folly, left one should be thought to re-
semble them." We see by this specimen, that Pinet
had no more politeness in his style than in his man-
ners. His translation of Pliny's Natural History,
printed at Lyons, in 2 vol. folio, 1566, and at Paris,
1608, was formerly much read. Though there are
a good many errors in it, it is yet very useful at pre-
sent, especially for those who understand Pliny's La-
itin, on account of the translator's researches, and a
great number of marginal notes. Pinet also publish-
ed Plans of the principal fortresses in the world, at
Lyons, 1564, in folio.

PING-LANG-FOU, a city of China in the Pro-
vince of Chefoo. It is one of the most considerable
cities of the western part of the province, and is situ-
ated on the river Kin-fou. The air here is mild; and
the agreeable views which the surrounding mountains
present, added to the streams which water the coun-
try, render it a very delightful residence. It has un-
der its jurisdiction three cities of the second class and
seven of the third. In this district is a valley so deep
and narrow, that it is almost impervious to the light:
a large highway, paved with square stones, runs
through it.

PINGUIcula, BUTTERWORT; a genus of the
monogynia order, belonging to the diandria class of
plants. There are four species; of which the most re-
markable is the vulgaris, or common butterwort, Pingo-
cula vulgariis, growing commonly on bogs or low moist
grounds in England and Scotland. Its leaves are covered
with soft, upright phyllis prickle, secreting a glutinous
 liquor. The flowers are pale red, purple, or deep vi-
iolet colour, and hairy within. If the fresh gathered
leaves of this plant are put into the strainer through
which warm milk from the cow is poured, and the
milk set by for a day or two to become acident, it ac-
quires a consistency and tenacity, and neither whey
nor cream separate from it. In this state it is an ex-
tremely grateful food, and as such is used by the in-
habits of the north of Sweden. There is no fur-
ter occasion to have recourse to the leaves; for
half a spoonful of this prepared milk, mixed with
fresh warm milk, will convert it to its own nature, and
this again will change another quantity of fresh milk,
and so on without end. The juice of the leaves kills
lice; and the common people use it to cure the cramps
or chaps in cows udders. The plant is generally sup-
poused injurious to sheep, by occasioning in them that
disease called the rot. But from experiments made on
purpose, and conducted with accuracy, it appears,
that neither sheep, cows, goats, horses, or swine will
feed upon this plant.

Wherever this plant, called also Yorkshite fanics, is
found, it is a certain indication of a boggy soil. From
the idea that the country people have of its nosous
operation on sheep, this plant has been called the white rot;
from as they imagine it gives them the rot whenever
they eat it, which they will not do but from great
necessity.

The Laplanders, like the Swedes with the milk of
cows, receive that of the rein-deer upon the fresh
leaves of this plant, which they immediately strain off
and set aside till it becomes somewhat acceitent; and
the whole acquires in a day or two the confinence of
cream without separating the serum, and thus becomes
an agreeable food. When thus prepared a small quan-
tity of the same has the property of remnet in produc-
ing the like change on fresh milk.

PINGUIN, or PENGUIN, in ornithology, a genus
of birds of the order of palmpedes; distingiuished by Mr
Latham by the following characters. The bill is strong,
straight, more or less bending towards the point, and fur-
wed on the sides; the nostrils are linear, and placed in
the furrows; the tongue is covered with strong spines,
pointing backwards; the wings are small, very
like fins, and covered with no longer feathers than the
rest of the body, and are useless in flight; the body is
clothed with thick short feathers, having broad shafts,
and placed as compactly as the scales of fishes; the
legs are short, thick, and placed very near the vent;
the toes are four, and are all placed forwards, the in-
terior are loose, and the rest are webbed; the tail is
ever stiff, confining of broad shafts rarely webbed.

It is agreed that Pinguins are inhabitants of southern
latitudes only; being, as far as is yet known, found
only on the coasts of South America from Port Defere
to the Straits of Magellan; and Frezier says they are
found on the western shore as high as Conception. In
Africa they seem to be unknown, except on a small isle
near the Cape of Good Hope, which takes its name
from them. They are found in vast numbers on land
during the breeding season; for they seldom come on
shore but at that time: they form burrows under
ground.
PI
t

**Penguin**

ground like rabbits; and the islands they frequent are
perfectly undermined by them.

Their attitude on land is quite erect, and on that
account they have been compared by some to pygmies,
by others to children with white bibs. They are very
tame, and may be driven like a flock of sheep in
water; they are remarkably active, and swim with vast
strength, assisted by their wings, which serve instead
of fins. Their food in general is fish; but not that
they will eat grass like geese.

Mr. Latham remarks, that this genus appears to hold
the same place in the southern division of the earth
that the awks do in the northern; and that, however
authors may differ in opinion on this head, they ought
not to be confounded with one another. The penguin
is never seen but in the temperate and frigid zones
where it is never seen but in the temperate and frigid zones
nor are they often met with in great numbers on the outer
shores, where they have been bred. They are frequently
so regardled as to suffer themselves to be taken by
the hand. The females of this species lay their eggs
in burrows, which they easily form of themselves with
their bills, throwing out the dirt with their feet. In
two holes the eggs are deposited on the bare earth.
The general time of hatching is in October; but some
of the species, especially in the colder parts, do not fit
until December, or even January. How long they fit
is not known.

1. The second species mentioned by Latham is the
fiagionian. It is distinguished by this name not only
because it is found on that coast, but also because it
exceeds in bulk the common penguins as much as the
natives are said to do the common race of men. It
was first discovered by Captain Macbride, who brought
one of them from Falkland Islands off the Straits of
Magellan. The length of the flattened skin of this
particular bird measured four feet three inches, and the
bulk of the body seemed to exceed that of a swan. The
bill was four inches and a half long, slender, straight,
bounding on the end of the upper mandible, with no
nails on the joint of the bill; and singularly armed with
strong sharp spines pointing backwards. The plumage is most
remarkable, the feathers lying upon one another with the compactness
of the scales of a fish; their texture equally extraordinary;
the shafts broad and very thin; the vanes unwebbed;
the head, throat, and hind part of the neck,
are of a deep brown colour; from each side of the head
to the middle of the fore part of the neck are two lines
of bright yellow, broad above, narrow beneath, and
uniting half way down; from thence the same colour
winds towards the breast fading away till it is lost
in pure white, of which colour is the whole under side
of the body, a dusky line dividing it from the colour
of the upper part. The whole back is of a very deep
blue colour almost dusky; but the end of each feather
is marked with a blue spot, those about the junction of
the wings larger and paler than the others. The wings are
in this species, as in all the others, extremely short in
respect to the size of the bird; hang down and have the
appearance of fins, whose whole they perform; their length
is only 14 inches; on the outside they are dusky, and
covered
the perron who had care of it: it fed on the name of towns.-Penrose observes, that they come entirely of fish; the larger, or forne very short webs. The tail vered to lay and sit in the ele-ment wherein it is so converfant. sea-wolves woodpecker is when it ascends; it is a pretty numerous species. This species, which is very numerous inhabits the Straits of Magellan, Staten Land, Terra del Fuego, and Falkland islands. Far from being timid, these birds will often attack a man and peck his legs. As food they are not at all unpalatable. They often mix with fow-wolves among the rushes, burrowing in holes like a fox. They swim with prodigious swiftness. They lay their eggs in collective bodies, reftoring, in incred-ible numbers to certain spots, which their long re-fixe has freed from grafs, and to which were given the name of towns.—Penrose observes, that they com-posed their nests of mud, a foot in height, and placed as near one another as may be. It is poifible that they may have different ways of nesting, according to the places they inhabit; or perhaps the manners of this may be blended with those of another. “Here, (says he, i.e. in the places they frequent), during the breed-ing season, we were prefented with a flight which con-veyed a moft dreary, and I may fay awful idea of the defertion of thefe islands by the human species: a general fllines prevailed in these towns; and whence we took our walks among them in order to pro-vide ourselves with eggs, we were regarded indeed with fide-long glances, but we carried no terror with us. The eggs are rather larger than thofe of a goofe, and laid in pairs. When we took them once, and sometimes twice in a fean, they were as often replaced by the bird; but prudence would not permit us to plunder too far, left a future fupply in the next year's brood might be prevented.” They lay fome time in November driving away the albatrofies, which have hatched their young in turn before them. The eggs were thought palatable food, and were preferred good for three or four months.

7. The collared pinguin is a very little less than the papuan, being 18 inches long. The bill, which is black, is similar to that of the patagonian pinguin; the irides are black; the eye is surrounded with a bare skin of a blood colour, of an oval shape, and three times as large as the eye itsel; the head, throat, hind part of the neck, and sides, back, wings, and tail, are all black; the fore part of the neck, breast, belly, and thighs, are white extending round the neck, where the white begins like a collar, except that it does not quite meet at the back part; the legs are black. This species inhabits New Guinea. It was also seen by Dr Forfier near Kerguelen's Land; and again on two isles adjoining to the island of South Georgi.

8. For...
PIN

1. For the red-footed penguin, or phaeton dermferus, see Phaeton.

9. The small, or, as Latham calls it, the little penguin, is about the size of a teal, being 1½ inches long. The bill, which is of a dusky colour, is about 1½ long, and shaped like that of the phaeton dermferus: the upper parts of the bird from the head to the tail appear to be of a cinereous blue colour, of which colour are the ends of the feathers; the base of them, however, is brown black, and the shafts of each of the same colour; the under parts from chin to vent are white; the hide itself is about the size of a teal, being 5 inches long. The legs are of a dark red colour; the webs are dusky, and the claws are black.

This species is pretty commonly found among the rocks on the southern parts of New Zealand, but they are most frequent at Dusky Bay. They make deep burrows on the sides of the hills, in which they lay their eggs: these holes are so thick in some parts, that a person is scarcely able to walk three or four steps without falling into one of them up to the knees. The inhabitants of Queen Charlotte's Sound kill them with flacks, and, after skinning them, esteem the flesh as good food. They are known at New Zealand by the name of korora.—"These birds (says Latham), I have found to vary both in size and colour: some are much smaller than others, quite black above, and measure only 1½ inches in length; others are rather larger, and of a plain lead-colour on the upper parts, and the wings black, though all are white, or nearly so, beneath.

The legs of these two last are marked with black at the ends of the toes, and the claws are black.

PINION, in mechanics, an arbor, or spindle, in the body whereof are several notches, which catch the teeth of a wheel that serves to turn it round, or it is a lever wheel that plays in the teeth of a larger.

PINK, a name given to a ship with a very narrow stern; whence all vessels, however small, whose sterns are fashioned in this manner, are called pink bårded. Pink, in botany. See DIANTHEUS.

PINNA, in zoology; a genus belonging to the order of vermes teetaceae. See MULLUS, n° 6. The animal is a flag. The shell is bivalve, fragile, and furnished with a beard; gapes at one end; the valves hinge without a tooth. They inhabit the coasts of Provence, Italy, and the Indian Ocean. The largest and most remarkable species inhabits the Mediterranean. It is blind, as are all of the genus; but furnished with very strong calcareous valves. The fittle-fish (sepiia), an inhabitant of the same sea, is a deadly foe to this animal: as soon as the pinnus opens its shell, he rushes upon her like a lion; and would always devour her, but for another animal whom the protect is within her shell, and from whom in return the receives very important services. It is an animal of the crab kind (see Cancer, n° 15.), naked like the hermit and very quick-fisted. This crab or crab the pinnus receives into her covering; and when she opens her valves in quest of food, lets him out to look for prey. During this the fittle-fish approaches; the crab returns with the utmost speed and anxiety to his holiefs, who being thus warned of the danger shuts her doors, and keeps out the enemy. Thus the sagacious observer Dr Hasselquist, in his voyage towards Paleline, beheld this curious phenomenon, which the well known to the ancients had escaped the moderns. Ariobite (Hist. lib. 5. c. 15.) relates, that the pinna kept a guard to watch for her: That there grew to the mouth of the pinnus a small animal, having claws, and serving as a caterer, which was like a crab, and was called the pinophylax. Pliny (lib. 9. 51.) says, the smallest of all the kinds is called the pinnotcres, and therefore liable to injury; this has the prudence to hide itself in the shells of oysters. Again, lib. 9. 66. he says, the pinna is of the genus of shell-fish; it is produced in muddy waters, always erect, nor ever without a companion, which some call the pinnotcres, others the pinophylax. This sometimes is a small mollusck, sometimes a crab, that follows the pinna for the sake of food. The pinna upon opening its shell, exposes itself as a prey to the smallest kind of fishes; for they immediately assault her, and, growing bolder upon finding no resistance, venture in. The guard watching its time gives notice by a bite; upon which the pinna, closing its shell, swells its, kills, and gives part of whatever happens to be there to its companion.

The pinna and the crab together dwell,
For mutual succour, in one common shell.
They both to gain a livelihood combine;
That takes the prey, when this has given the sign.
From hence this crab, above his fellows fam'd,
By ancient Greeks was pinnotcres nam'd.—OPPLAN.

The pinna marine differ left from muscles in the size of their shells than in the finefib and number of certain brown threads which attach them to the rocks, hold them in a fixed situation, secure them from the rolling of the waves, especially in tempests, and assist them in laying hold of lime. See MULLUS, p. 611. note (3). Theses threads, says Rondelet, are as fine, compared with those of muscles, as the finest flax is compared with tow. M. de Reaumur says, that these threads are nearly as fine and beautiful as silk from the silk-worm, and hence he calls them the silk-worms of the sea. Stuffs, and several kinds of beautiful manufacture, are made of these threads at Palermo; in many places they are the chief object of fishing, and become a silk proper for many purposes. It requires a considerable number of the pinna marine for one pair of stockings. Nothing can equal the delicacy of this singular thread. It is so fine, that a pair of stockings made of it can be easily contained in a snuff-box of an ordinary size. In 1734, a pair of gloves or stockings made of these materials was presented to Pope Benedict XIV. which, notwithstanding their extreme fineness, secured the leg both from cold and heat. A robe of the finest of these materials was the gift of the Roman emperor to the Satraps of Armenia. See Prospcrius de Edif. lib. 3. c. 1. A great many manufacturers are employed in manufacturing these threads into various stuffs at Palermo and other places.

The men who are employed in fishing up the pinna marine, inform us, that it is necessary to break the tuft of threads. They are fished up at Toulon, from the depth of 15, 20, and sometimes more than 30, feet, with an instrument called a cramp. This is a kind of fork of iron, of which the prongs are perpendicular with respect to the handle. Each of them is about
PINACE, a small vessel navigated with oars and sails, and having generally two masts, which are rigged like those of a schooner. See PINNA.

PINNACLE, in architecture, the top or roof of an house, terminating in a point. This kind of roof among the ancients was appropriated to temples; their ordinary roofs were all flat, or made in the platform way.


PINNATIFID, do. p. 442 n° 103.

PINNATERUS, or PINNOMYX, is a kind of crab-fish, furnished with very good eyes. It is said to be the companion of the pinna marina. They live and lodge together in the same shell, which belongs to the latter. When it has occasion to eat, it opens its valves, and sends out its faithful purveyor to procure food. If during their labour the pinnatirus perceives the polypus, it immediately sets to warn its blind friend of the danger, when, by shutting its valves, it escapes the rage of its enemy; but when the pinnatatus loads itself with booty without molestation, it makes a gentle noise at the opening of the shell, and when admitted the two friends feast on the fruits of its industry. See PINNA, &c.

PINT (pinta), a vessel, or measure, used in eliciting the quantity of liquids, and even sometimres of dry things. - Budæus derives the word from the Greek potas; others from the German pint, a little measure of wine; Nicod from the Greek potas, "to drink."

The English pint is twofold; they one for wine measure, the other for beer and ale-measure. See MEASURE.

PINTADA, a species of PROCERULARIA.

PINTLES, certain pints or hooks fastened upon the back part of the rudder, with their points downwards, in order to enter into, and rest upon, the goings, fixed in the rernpoil, to hang the rudder. See HELM.

PINTOR (Peter), born at Valencia in Spain, in the year 1420, was physician to Alexander VI. whom he followed to Rome, where he practised with great success. He has left behind him two performances of considerable merit, 1. Aggregator Samentarium Bellorum de Caratione in Pefiinentia, printed at Rome 1499, in folio. 2. De Morbo Fades & Oculeto bi Temporis Afflctus, &c. printed at Rome, 1520. in 4to, black letter, a book extremely scarce, unknown to Lusiis and Auruc, and which traces the venereal disease to the year 1460. Pintor died at Rome in 1509, aged 83 years.

PINTURICCHIO (Bernardino), a celebrated Italian painter, born at Perugia in 1454. He was the disciple of Peter Perugino, under whom he became so good an artist, that he employed him on many occasions as his assistant. He principally painted history and grotesque; but he also excelled in portraits, among which those of pope Pius II. and Innocent VIII., of Giulia Farnese, Cesar Borja, and queen Isabella of Spain, are particularly distinguished. The most memorable performance of Pinturicchio is the history of Pius II. painted in ten compartments in the history of Siena; in which undertaking, Raphael, then a young man and bred under the same master, assisted him so far as to sketch out cartoons of many parts of the composition. The story of his death is worth relating, especially as it illustrates his character. The last work he was engaged in was a Nativity for the monastery of St. Francis at Siena; the monks accommodated him with a chamber to work in, which they cleared of all the furniture, except one old trunk or chest that appeared too rotten to move; but Pinturicchio, naturally positive and persevering, inflicting on its being taken away, the monks willing to gratify him, complied. It was no sooner flared than one of the planks bulging, out tumbling 500 pieces of gold, which had been secreted there for many years. The monks were overjoyed at finding this treausre, and the painter proportionably mortified at losing his chance of the discovery by his indifferet obstinacy; it affected his spirits so much he survived but a few months, and it was that generally considered as the cause of his death.

PINUS, the PINE-TREE; a genus of the monodelphus order, belonging to the monerecia class of plants. The pine-tree was well known to the ancients, and has been described and celebrated both by their philosophers and poets. Pliny enumerates no less than six species of trees of this genus; and it is mentioned by Virgil both in his Eclogues, his Georgics, and his Aeneid; by Horace in his Odes; by Ovid in his Metamorphoses; by Statius; and by Catullus, &c. Macrobius relates a pleasant anecdote concerning the cons
of pine-trees, which in common language were called *Pinus pines*, "pine apples." There lived in the Augustan age one Vatinius, who by some means had induced the Roman people to much that they perceived with stones. When he entertained them with gladiators, to save himself from such treatment for the future he procured an edict from the ediles, that no person should throw any thing but apples in the amphitheatre. It accidentally happened that at this time Cæcilius, eminently for his wit as well as knowledge of the law was consulted on the question, whether a pineapple (the cone of the pine) was legally included in the term *pinus*, "an apple?" It is an apple (said he) if you intend to fling it at Vatinius*. A decision by which the edict in his favour did not much mend his situation: for Martial represents it dangerous to come under this tree, because the cones in his time were of so great a size and weight, probably enlarged by cultivation for ages.

*Nucif Pinae.*

*Pomum Cybeleae: procul hinc Pinae fawer petes Cybelae:*  // vandalism.

There are generally reckoned 14 species of this genus; of which the most remarkable are these following:

1. The *pinea*, *pineaster*, or wild pine, grows naturally on the mountains in Italy and the south of France. It grows to the size of a large tree; the branches extend to a considerable distance; and while the trees are young, they are fully garnished with leaves, especially where they are not so close as to exclude the air from thence; but as they advance in age, the branches appear naked, and all those which are situated below become unfightly in a few years; for which reason they are now much less in esteem than formerly.

2. The *pinus pinea*, or stone pine, is a tall evergreen tree, native of Italy and Spain. It delights in a sandy loam, though like most others it will grow well in almost any land. Respecting the uses of this species, Hanbury tells us that "the kernels are edible, and by many preferred to almonds. In Italy they are served up at table in their deserts. —They are exceeding wholesome, being good for coughs, colds, consumptions, &c., on which account only this tree deserves to be propagated." Hanbury continues: "It may be very proper here to take notice of a very great and dangerous mistake Mr Miller has committed, by laying, under this article of stone-pine, that seeds kept in the cones will be good and grow if they are sown ten or twelve years after the cones have been gathered from the tree; whereas the seeds of this fort, whether kept in the cones or taken out, are never good after the first year; and though sometimes a few plants will come up from the seeds that are kept in the cones from two years before, yet this is but seldom; neither must a tenth part of a crop be expected. This caution is the more necessary, as several gentlemen who had cones, upon reading Mr Miller's book, and finding the seeds would take no damage when kept there, deferred the work for a season or two, when they thought they should have more convenience either of men or ground for their purpose; and were afterwards wholly disappointed, no plants appearing, the seeds being by that time spoiled and worth nothing."

3. The *rubra*, commonly called the Scotch fir or pine. It is common throughout Scotland, whence its name; though it is also found in most of the other countries of Europe. M. du Hamel, of the Royal Academy of Sciences, mentions having received seeds of it from St Domingo in the West Indies; and therefore concludes, that it grows indifferently in the temperate, frigid, and torrid zones. The wood of this tree is the red or yellow deal, which is most durable of any of the kinds yet known. The leaves of this tree are much shorter and broader than those of the former, of a greyish colour, growing two out of one sheath; the cones are small, pyramidal, and end in narrow points; they are of a light colour, and the seeds are small.

4. The *pinus pinea*, or yew-leaved fir, is a tall evergreen and a native of Scotland, Sweden, and Germany. This species includes the silver fir and the balm of Gilead fir. The first of these is a noble upright tree. Mr Martyn says, "The tallest trees I have seen were yew and silver firs in the valleys in Switzerland. I saw several firs in the dockyards in Venice 40 yards long; and one of 39 yards was 18 inches diameter at the small end. I was told they came from Switzerland."

The branches are not very numerous, and the bark is smooth and delicate. The leaves grow finely on the branches, and their ends are slightly indented. Their upper surface is of a fine strong green colour, and their under has an ornament of two white lines running lengthwise on each file the midrib: on account of which silver look this fort is called the *silver fir*. The cones are large, and grow erect; and, when the warm weather comes on, they soon shed their seeds; which should be a caution to all who wish to raise this plant, to gather the cones before that happens.

The balm of Gilead fir has of all the farts been most coveted, on account of the great fragrance of its leaves; though this is not only its good property: for it is a very beautiful tree, naturally of an upright growth, and the branches are so ornamented with their balmy leaves, as to exceed any of the other farts in beauty. The leaves, which are very closely set on the branches, are broad; and their ends are indented. Their upper surface, when healthy, is of a fine dark-green colour, and their under has an ornament of two white lines running lengthwise on each file the midrib: on account of which silver look this fort is called the silver fir. The leaves when bruised are very finely incised; and the buds, which swell in the autumn for the next year's flowers, are very ornamental all winter, being sturg'd, and of a fine brown colour; and from these also exudes a kind of fine turpentine, of the same kind of (though heightened) fragrance. The tree being wounded in any part, emits plenty of this turpentine; and Hanbury says, "it is supposed by many to be the fort from whence the balm of Gilead is taken, which occasions this tree being so called. But this is a mistake; for the true balm of Gilead is taken from a kind of terebinth; though I am informed, that what has been collected from this tree has been sent over to England from America (where it grows naturally), and often sold in the shops for the true fort."

The silver fir is very hardy, and will grow in any soil or situation, but always makes the greatest progress in rich loamy earth. The balm of Gilead fir must be planted in deep, rich, good earth; nor will it live long
The foliage is esteemed for making mast for Pinus. It has room enough to in any other. The foliage may be black mould, or of a sandy nature, if it be deep enough, and if the roots have room enough to strike freely.

5. The *Pinus abies*, or European spruce fir, a native of the northern parts of Europe and of Asia, includes the Norway spruce and long-coned Cornish fir. The former of these is a tree of as much beauty while growing, and its timber is valuable when propagated on that account. Its growth is naturally like the silver, upright; and the height it will aspire to may be easily conceived, when we say that the white deal, or European spruce fir, a native of the hill tribe; though, being ev."...

6. The *Pinus Canadensis*, American or Newfoundland spruce fir, a native of Canada, Pennsylvania, and other parts of North America, includes three varieties. The white Newfoundland spruce, the red Newfoundland spruce, and the black Newfoundland spruce. These, however, differ so little, that one description is common to them all. They are of a gentled upright growth, though they do not shoot so freely or grow so fast in Britain as the Norway spruce. The leaves are of the same green, and garnished the branches in the same beautiful manner as those of that species; only they are narrower, shorter, and flatter. The greatest difference is observable in the cones; for these are no more than about an inch in length, and the scales are closely placed. In the cones, indeed, confits the difference of these three sorts: those of the white species are of a very light brown colour; those of the red species more of a nut brown or reddish colour; and those of the black species of a dark or blackish colour. Besides this, there is scarcely any material difference; though it is observable, that this trifling variation seems to be pretty constant in the plants raised from the like seeds. These sorts will often flower, and produce cones when only about five or six feet high; and indeed look then very beautiful: but this is a sign of weakness in the plant, which it does not often fairly get over.

7. The *Pinus balsamea*, or hemlock fir, a native of Virginia and Canada, possesses as little beauty as any of the fir tribe; though, being rather scarce in proportion, it is deemed valuable. It is called by some the "hemst" fir, from the resemblance of the leaves to those of the yew-tree. It is a tree of low growth, with but few branches; and these are long and slender, and spread abroad without order. The leaves do not garnish the branches so plentifully as those of any other sort of fir. The cones are very small and round ed; they are about half an inch long; and the scales are loosely arranged. They are sent from America to Europe, by which plants are raised; though this caution should be given to the planter, that this tree is fond of moist rich ground, and in such a kind of soil will make the greatest progress.

8. The *Pinus orientalis*, or oriental fir, a native of the Earth, is a low but elegant tree. The leaves are very short and nearly square. The fruit is exceeding small, and hangs downward; and the whole tree makes an agreeable variety with the other kinds.

9. The *ficus*, Lord Weymouth's pine, or North American white pine. This grows sometimes to the height of 100 feet and upwards, and is highly valued on account of its beauty. The bark of the tree is very smooth and delicate, especially when young; the leaves are long and flender, five growing out of one sheath; the branches are pretty closely garnished with them, and thus make a fine appearance. The cones are long, slender and very loofe, opening with the first warmth of the spring; so that if they are not gathered in winter, the scales open and let out the seeds. The wood of this sort is esteemed for making masts for ships. In Queen Anne's time there was a law made for the preservation of these trees, and for the encouragement of their growth in America. Within these last 50 years they have been propagated in Britain in considerable plenty.

With respect to the culture of this species, Mr Hanbury, after some more general directions, continues thus, "I have known gentlemen, who, in attempting to raise these trees, have seen the young plants go off without perceiving the cause; and the more watering and pains they have taken, have found the plants perish in this way more and more, to their great mortification and alitonishment. In the spring following these plants should be pricked out in beds half a foot asunder each way; and here they may stand two years, when they may be either finally planted out, or removed into the nursery, at the distance of one foot asunder, and two feet in the rows. If care has been taken of them in the nursery, they may be removed at a considerable height with great assurance of success: for it is much easier to make this pine grow than any of the other sorts; so that where they are wanted for ornament in parks, open places, &c. a show of them may be made in a short time.

"The foliage the Weymouth pine delights in moist, is a sandy loam; but it likes other soils of an inferior nature: and although it is not generally to be planted on all lands like the Scotch fir, yet I have seen it luxuriant and healthy, making strong shoots, on blue and red clays, and other clods of strong ground. On stony and clayey ground, likewise, I have seen some very fine trees; so that I believe whoever is defirous of having plantations of this pine, need not be curious in the choice of his ground."
PINE

The dwarf pine.

There are many (continues our author) other sorts of American pines, which we receive from hence with the like cant names of those of the above, which I have chosen to retain, as they will probably be continued to be sent over; and that the gardener receiving them as such may bethink what to do with them. In many of these sorts I fear present no material difference; so am induced to think they are the same, sent over with different names. Some of the sorts above-mentioned differ in very few respects; but I have chosen to mention them, as a perfon may be supplied with the seeds from Pennsylvania, Jeryey, Virginia, Carolina, &c. where they all grow naturally:

and having once obtained the seeds, and from them plants, they will become pleasing objects of his nicest observations.

The pinus cedrus, ranked by Tournefort and others under laris, famous for its duration, is that popularly called by us the cedar of Lebanon, by the ancients cedrus magna or the great cedar; also cedrelate, cedrelata, and sometimes the Phenician or Syrian cedar, from the country where it grows in its greatest perfection. It is a coniferous evergreen, of the bigger sorts, bearing large roundish cones of smooth scales, flanding erect, the leaves being small, narrow, and thick fret.—They sometimes counterfeit cedar, by dying wood of a reddish hue: but the same discovers itself by its bitter incorruptible; a prerogative which it owes chiefly to this reason it was that the ancients used cedar tablets to write upon, especially for things of importance, as appears from that expression of Periplus, Et cedra digna locutus. A juice was also drawn from cedar, with which they smeared their books and writings, or other matters, to preserve them from rotting; which is alluded to by Horace: by means of which it was that Numia’s books, written on papyrus, were preserved entire to the year 535, as we are informed by Pliny.

Solomon’s temple, as well as his palace, were both of this wood. That prince gave king Hiram several cities for the cedars he had furnished him on these occasions. Cortes is said to have erected a palace at Mexico, in which were 7000 beams of cedar, most of them 120 feet long, and twelve in circumference, as we are informed by Herrera. Some tell us of a cedar felled in Cyprus 150 feet long, and 18 in diameter. It was used for the main-mast in the galley of king Demetrius. Le Bruyn affures us, that the two biggest he saw on mount Lebanon, measured, one of them 47 palms, and the other 47, in circumference. In the temple of Apollo at Utica, there were cedar trees near 2000 years old; which yet were nothing to that beard in an oratory of Diana at Seguntum in Spain, said to have been brought thither 200 years before the destruction of Troy. Cedar is of so dry a nature, that it will not endure to be fastened with iron nails, from which it usually shrinks; so that they commonly fasten it with pins of the same wood.

The statue (says Hanbury) of the great goddess at Ephesus was made of this material; and, if this tree abounded with us in great plenty, it might have a principal share in our mott superb edifice. The effluvia constantly emitted from its wood are said to purify the air, and make rooms wholesome. Chapels and places set apart for religious duties, being wainscotted with this wood, inspire the worshippers with a more solemn awe. It is not poisonous to worms; and emits an oil which will preserve cloth or books from worms or corruption. The saw-dust will preserve human bodies from putrefaction; and is therefore said to be plentifully used in the rites of embalming, where practiced.

It is remarkable that this tree is not to be found as a native in any other part of the world than mount Libanus, as far as hath yet been discovered. What we find mentioned in Scripture of the lofty cedars can be nowhere applicable to the common growth of this tree; since, from the experience we have of those now growing in England, as also from the testimony of several travellers who have visited those few remaining trees on mount Libanus, they are not inclined to grow very lofty, but on the contrary extend their branches very far; to which the allusion made by the Psalms agrees very well, when he is describing the flourishing state of a people, and says, “They shall spread their branches like the cedar-tree.”

Rauwolf, in his Travels, says, there were not at that time (i.e. anno 1574) upon mount Libanus more than 26 trees remaining, 24 of which stood in a circle; and the other two, which stood at a small distance, had their branches almost consumed with age; nor could he find any younger tree coming up to succeed them, though he looked about diligently for some. These trees (he says) were growing at the foot of a small hill, on the top of the mountains, and amongst the snow. These having very large branches, commonly bend the tree to one side, but are extended to a great length, and in so delicate and pleasant order, as if they were trimmed and made even with great diligence, by which they are easily distinguished, at a great distance, from fir-trees. The leaves (continues he) are very like to those of the larch-tree, growing close together in little branches upon small brown foughs.

Maundrel, in his Travels, says, there were but 16 large trees remaining when he visited the mountain, some of which were of a prodigious bulk, but that there were many more young ones of a smaller size: he measured one of the largest, and found it to be 12 yards six inches in girth, and yet found, and 37 yards in the spread of its boughs. At about five or six yards from the ground it was divided into five limbs, each of which was equal to a great tree. What Maundrel hath related was confirmed by a gentleman who was there in the year 1730, with this difference only, viz. in the dimensions of the branches of the largest tree, which he measured, and found to be 22 yards diameter. Now, whether Mr Maundrel meant 37 yards in circumference of the spreading branches, or the diameter of them, cannot be determined by his
words; yet either of them well agrees with this last account.

12. There is another species, viz. the larch-tree, which the old botanists ranked under larix, with deciduous leaves, and oval obtuse cones. It grows naturally upon the Alps and Apennines, and of late has been very much propagated in Britain. It is of quick growth, and the trunk rises to 50 feet or more; the branches are slender, their ends generally hanging downward, and are garnished with long narrow leaves which arise in clusters from one point, spreading open above like the hairs of a painter's brush: they are of a light green, and fall away in autumn. In the month of April the male flowers, appearing pear, which are disposed in form of small cones; the female flowers are collected into oval obtuse cones, which in some species have bright purple tops, and in others they are white: these differences are accidental; the cones are about an inch long, obtuse at their points; the scales are smooth, and lie over each other: under the manner of their growth, the cones are about an inch long, obtuse at their points; the scales are smooth, and lie over each other: under the manner of their growth,

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The nuts of the pinus cembra, the same author afferts, are eat as luxuries in Russia, and are even exported with the same view. The unripe cones give a very fragrant oil, termed balsamic. The inhabitants of Siberia use the tender tops, and even the bark rubbed off in the spring, a-an antiscorbutic. The kernels of the nuts of the amygdales nana give a very pleasing flavour to brandy; and, when pressed, afford a bitter oil in large quantities. The way of destroying the bitter is by digesting it in sun with spirit of wine, and it then becomes sweet and extremely agreeable.

From the larch-tree is extracted what we erroneously call Venice turpentine. This substance, or natural balsam, flows at first without incision; when it has done dropping, the poor people who wait in the fir woods make incisions at about two or three feet from the ground into the trunks of the trees, in which they fix narrow troughs about 20 inches long. The end of these troughs is hollowed like a ladle; and in the middle is a small hole bored for the turpentine to run into the receiver which is placed below it. As the gummy substance runs from the trees, it passes along the sloping gutter or trough to the ladle, and from thence runs through the holes into the receiver. The people who gather it visit the trees morning and evening from the end of May to September, to collect the turpentine out of the receivers. When it flows out of the tree, Venice turpentine is clear like water, and of a yellowish white; but, as it grows older, it thickens and becomes of a citron colour. It is procured in the greatest abundance in the neighbourhood of Lyons, and in the valley of St Martin near St Lucern in Switzerland.

Though we have already noticed the manner of cultivating some of the particular species of this genus, and have also remarked the uses of some of them, we shall finish the article with a few general observations on the culture and uses of the whole.

Culture. All the sorts of pines are propagated by seeds produced in hard woody cones. The way to get the seeds out of these cones is to lay them before a gentle fire, which will cause the cells to open, and then the seeds may be easily taken out. If the cones are kept entire, the seeds will remain good for some years; so that the fairest way of preserving them is to let them remain in the cones till the time for fowing the seeds. If the cones are kept in a warm place in summer, they will open and emit the seeds; but if they are not exposed to the heat, they will remain close for a long time. The best season for fowing the pines is about the end of March. When the seeds are sown, the place should be covered with the nets to keep off the birds; otherwise, when the plants begin to appear with the husk of the seed on the top of them, the birds will peck off the tops, and thus destroy them.

Uses. From the first species is extracted the common turpentine, much used by farriers, and from which is drawn the oil of that name. The processes of making pitch, tar, resin, and turpentine, from these trees is very familiar. In the spring season, when the sap is most free running, they pare off the bark of the pine tree, to make the sap run down into a hole which they cut at the bottom to receive it. In the way, as it runs down, it leaves a white matter like cream, but a little thicker. This is very different from all the kinds of resin and turpentine in use, and it is generally sold to be used in the making of flambeaux instead of white bees wax. The matter that is received in the hole at the bottom is taken up with ladles, and put in a large basket. A great part of this immediately runs through, and this is the common turpentine. This is received into stone or earthen pots, and is ready for sale. The thicker matter, which remains in the basket, they put into a common alembic, adding a large quantity of water. They distil this as long as any oil is seen swimming upon the water. This oil they separate from the surface in large quantities, and this is the common oil or spirit of turpentine. The remaining matter at the bottom of the hill is common yellow resin. When they have thus obtained all that they can from the sap of the tree, they cut it down, and, hewing the wood into billets, they fill a pit dug in the earth with these billets, and, letting them on fire, there runs from them, while they are burning, a black thick matter. This naturally falls to the bottom of the pit, and this is tar. The top of the pit is covered with tiles, to keep in the heat; and there is at the bottom a little hole, out of which the tar runs like oil. If this hole be made too large, it fets the whole quantity of the tar on fire; but, if small enough, it runs quietly out.

The tar, being thus made, is put up in barrels; and if it be to be made into pitch, they put it into large haling vessels, without adding any thing to it. It is then suffered to boil a while, and being then let out, is found when cold to be what we call pitch.

A decoction of the nuts or seeds of the first species in milk, or of the extremities of the branches pulled in spring, is said, with a proper regimen, to cure the most inveterate scurvy. The wood of this species is not valued; but that of the Scots pine is superior to any of the rest. It is observed of the Scots pine, that when planted in boggs, or in a moist foil, though the plants make great progress, yet the wood is white, soft, and little esteemed; but when planted in a dry foil, though the growth of the trees is there very slow, yet the wood is proportionally better. Few trees have been applied to more uses than this. The tall and straightest are formed by nature for masts to the navy. The timber is refined, durable, and applicable to warehouses, domestic purp·ses, such as flooring and wainscotting of rooms, making of beds, chests, tables, boxes, &c. From the trunk and branches of this, as well as most others of the pine tribe, tar and pitch is obtained. By incision, bars, Burgundy pitch, and turpentine, are acquired and prepared. The resinous roots are dug out of the ground in many parts of the Highlands, and, being divided into small splinters, are used by the inhabitants to burn instead of candles. At Loch-Broom, in Ross-shire, the fishermen make ropes of the inner bark; but hard necessity has taught the inhabitants of Sweden, Lapland, and Kamtschatka, to convert the same into bread. To effect this, they, in the spring season, make choice of the tall and fairest trees; then stripping off carefully the outer bark, they collect the soft, white, succulent interior bark, and dry it in the shade. When they have occasion to use it, they first Toast it at the fire, then grind, and after
pipe-

Pioneers, in the art of war, are such as are commanded in from the country, to march with an army for mending the ways, for working on intrenchments and fortifications, and for making mines and approaches. The English folders are likewise employed for all these purposes. Most of the foreign regiments of artillery have half a company of pioneers, well instructed in that important branch of duty. Some regiments of infantry and cavalry have three or four pioneers each, provided with aprons, hatchets, faws, spades, and pick-axes. Each pioneer must have an ax, a saw, and an apron; a cap with a leather crown, and a black bearskin front, on which is to be the king's crest in white, on a red ground; and the number of the regiment is to be on the back part of it.

Pipe, or PIP, a disease among poultry, consisting of a white thin skin, or film, that grows under the tip of the tongue, and hinders their feeding. It usually arises from want of water, or from the drinking puddle-water, or eating filthy meat. It is cured by pulling off the film with the fingers, and rubbing the tongue with salt. Hawks are particularly liable to this disease, especially from feeding on tinking flesh.

Pipe, in building, &c. a canal, or conduit, for the conveyance of water and other liquids. Pipes for water, water-engines, &c. are usually of lead, iron, earth, or wood: the latter are usually made of oak or elder. Those of iron are called in forges; their usual length is about two feet and a half; several of these are commonly fastened together by means of four screws at each end, with leather or old hat between them, to stop the water. Those of earth are made by the potters: these are fitted into one another, one end being always made wider than the other. To join them the clofer, and prevent their breaking, they are covered with tow and pitch: their length is usually about that of the iron pipes. The wooden pipes are trees bored with large iron augers, of different sizes, beginning with a less, and then proceeding with a larger successively; the first being pointed, the rest being formed like spoons, increasing in diameter, from one to six inches or more: they are fitted into the extremities of each other (as represented fig. 2.), and are fold by the foot.

Wooden pipes are bored as follows. The machine represented fig. 1. is put in motion by the wheel A, which is moved by a current of water; upon the axle of this wheel is a cog-wheel B, which causes the lanterns C, D, to turn horizontally, whose common axis is consequently in a perpendicular direction. The lantern D turns at the same time two cog-wheels, E and F: the first, E, which is vertical, turns the auger which bores the wood; and the second, F, which is horizontal, causes the carriage bearing the piece to advance by means of the arms H, I, which takes hold of the notches in the wheel K. The first, H, by means of the notches, draws the wheel towards F, and consequently causes the auger to pierce the wood. The auger being from 9 to 12 feet in length, and of a proportionable bigness, it will be necessary to have two pieces, as L, M, to support its weight, and cause it to enter the piece to be bored with the same uniformity.

For the construction of leaden pipes, see the article Plumberry.

Pipe, in mining, is where the ore runs forwards endwise in a hole, and doth not sink downwards or in a vein.

Pipe, PIP, in law, is a roll in the exchequer, called also the great roll. See the next article.

Pipe-Office, in England, is an office wherein a person called the clerk of the pipe, makes out leaves of crown-lands, by warrant from the lord-treasurer, or commissurers of the treasury, or chancellor of the exchequer. The clerk of the pipe makes out also all accounts of sheriffs, &c. and gives the accountants their quietus off. To this office are brought all accounts which pertain to the remembrancer's office, and remain there, that if any stated debt be due from any person, the same may be drawn down into the great roll of the pipe; upon which the comptroller passes out a writ, called the summons of the pipe, for recovery thereof; and if there be no goods or chattels, the clerk then draws down the debts to the lord treasurer's remembrancer, to write eilents against their lands. All tidles which vouch the
the payment of any sum contained in such accounts are examined and allowed by the chief secondary of the pipe. Besides the chief clerk in this office, there are eight attorneys or sworn clerks, and a comptroller.

Piper, in ichthyology. See Synagnathus.

Sea-Pipes, in zoology, are univalve shells, of an oblong figure, terminating in a point, sometimes a little bending, and sometimes straight. Sea ears, figures of which we have given along with the sea-pipes, are also univalve flat shells, resembling in shape the ear of a man. In sea ears it is not uncommon to find small pearls, the feeds of which are often found in the middle of their cavities, which are of the finest maker or mother-of-pearl colour. There are ridges on both sides; these without form a kind of volute or spire, terminating in an eye. In these shells there is a row of round holes, fix of which generally go quite through.

There is a shell of this kind, which is longer in proportion to its width, and much less common. There is yet another, very fine and thin, of a dirty grey colour, neither nakered nor perforated as the others are; the inner rim is spiral, and at some distance from the outer.

The sea-pipes are distinguished from sea-worms by having their pipes fingle; whereas the others form an assemblage of pipes joined together. The sea worms, from the number and junction of their parts, are multivalve. The shells of pipes called dentales and antales are distinguished from each other only by their size, the antales being much the least. The sea pencil, or watering spout, is the most remarkable shell of this tribe, and must be considered as having a specific character either by its form, which is straight, or the singularity of its superior extremity, which is perforated like the spout of a watering pot.

In Plate CCCXCI, the shell, fig. 1, pierced with many holes, is found with its natural covering. It is finely nakered within, and in the middle of its hollow or cavity contains many small pearls. Fig. 2. is placed on its upper side to show its spots, which are red upon a ground of the purest white; the ridges are prominent; the rim and the eye are irregular and notched. Fig. 4. the singularity of this shell consists in its being neither nakered nor perforated, and in turning very much up near the eye of its spire or contour. Fig. 5. is a pencil or watering spout; at the head is a kind of ruff, and within it is formed like the end of a watering spout, perforated with many holes, which, when the fih is alive, are filled with very fine threads, like the hairs of a painter’s pencil. Fig. 6. are called dentals from their resemblance of elephants teeth; the point or apex is white, and the other extremity green. They are both ribbed and nakered, and are distinguished from each other only by some excellences which appear on the uppermost. Fig. 7. are two small shells of the dental figure, called for distinction antales. They are perfectly smooth; one is white, and the other reddish.

PIPER, in ichthyology. See Trigla.

Piper, Piper; a genus of the trigyna order, belonging to the diandria class of plants. There are 20 species, of which the most remarkable is the fibboa, with oval, heart-shaped, nerved leaves, and reflexed spikes. This is the plant which produces the pepper so much used in food. It is a shrub whose root is small, thorny, and flexible; it rics into a stem, which requires a tree or a prop to support it. Its wood has the fame fome of knots as the vine; and when it is dry, it exactly resembles the vine-branch. The leaves, which have a ftrong smell and a pungent taste, are of an oval shape; but they diminish towards the extremity, and terminate in a point. From the flower-buds, which are white, and are sometimes placed in the middle and sometimes at the extremity of the branches, are produced small berries resembling those of the currant-tree. Each of these contains between 20 and 30 corns of pepper; they are commonly gathered in October, and exposed to the sun seven or eight days. The fruit, which was green at first, and afterwards red, when stripped of its covering assumes the appearance it has when we see it. The largest, heaviest, and leaf shivered, is the bell.

The pepper plant flourishes in the islands of Java, Sumatra (a), and Ceylon, and more particularly on the Malabar coast. It is not fown, but planted; and great nicety is required in the choice of the roots. It produces no fruit till the end of three years; but bears so plentifully the three succeeding years, that some plants yield between six and seven pounds of pepper. The bark then begins to shrink; and the shrub declines so fast, that in 12 years it ceases bearing.

The culture of pepper is not difficult: it is sufficient to plant it in a rich soil, and carefully to pull up the weeds that grow in great abundance round its roots, especially the three first years. As the sun is highly necessary to the growth of the pepper plant, when it is ready to bear, the trees that support it must be lopped to prevent their shade from injuring the fruit. When the season is over, it is proper to crop the head of the plant. With ut this precaution, there would be too much wood, and little fruit.

The pepper exported from Malabar, which was formerly entirely in the hands of the Portuguese, and is at present divided between the Dutch, British, and French, amounts to about 10,000,000 weight. Betel, or betle, is a species of this genus. See Betel. It is a creeping and climbing plant like the ivy; and its leaves a good deal resemble those of the citron, though they are longer and narrower at the extremity. It grows in all parts of India, but thrives best in moist places. The natives cultivate it as we do the vine, placing props for it to run and climb upon; and it is a common practice to plant it against the tree which bears the areca nut.

At all times of the day, and even in the night, the Indians chew the leaves of the betel, the bitterness of which is corrected by the areca that is wrapped up in them. There is constantly mixed with it the chinam, a kind of burnt lime made of shells. The rich frequently

(a) See a copious account of the mode of cultivating pepper in Sumatra, in Mr. Marshen’s History of Sumatra, or in the New Annual Register for 1793, p. 147.
Piper, or black pepper, and the *piper amalago*, or long pepper of Jamaica, with some other species, are indigenous, and known by the names of *joint wood*, or *pepper elders*. The first bears a small spike, on which are attached a number of small seeds of the size of mustard. The whole of the plant has the exact taste of the East India black pepper. The long pepper bulb grows taller than the amalago. The leaves are broad, smooth, and shining. The fruit is similar to the long pepper of the flowers, but smaller. The common people in Jamaica eat the leaves of the *piper amalago* with the black pepper. To preserve both, the fruit may be slightly scalded when green, then dried, and wrapped half of the ten black peppers. Of this the Middle and South America are the strong and slighty incurvated, and the nostrils are naked. The middle toe is connected to the outer as far as the third joint; this character, however, is not altogether universal, some of the species differing in this particular. The tail is short. This genus has a considerable resemblance to the genus *pa-rus*, or titmouse. They are supposed to inhabit South America only; but this is not true, for Mr Latham affures us that he has seen many of those species which he has described which came from other parts, but which nevertheless certainly belong to this genus. Buffon differs widely in his arrangement from Mr Latham, and only enumerates six distinct species. Without particularizing those differences, however, we shall give from Buffon the following elegant account of the genus in general: "The natural habits common to them all were not known, and the observations which have been made are still insufficient to admit an exact detail. We shall only relate the remarks communicated to us by Sonini of Manouch, who saw many of these birds in their native climates. They inhabit the immense forests in the warm parts of America, and never emerge from their recesses to visit the cleared grounds or the vicinity of the plantations. They fly with considerable swiftness, but always at a small height, and to short distances; they never perch on the summits of trees, but on the middle branches; they feed upon small wild fruits, and also eat insects. They generally occur in small bodies of eight or ten of the same species, and sometimes mingled with other flocks of the same genus, or even of a different genus, such as the Cayenne warblers, &c. It is commonly in the morning that they are found thus assembled, and then seem to be joyous, and warble their delicate little notes. The freshness of the air seems to inspire the song, for they are silent during the burning heat of the day, and disperse and retire to the shade of the thickest parts of the forest. This habit is observed, indeed, in many kinds of birds, and even in those of the woods of France, where they collect to sing in the morning and evening; but the manakins never assemble in the evening, and continue together only from five to nine or ten o'clock in the forenoon, and remain separate during the rest of the day and the succeeding night. In general they prefer a cool humid situation, though they never frequent marshes or the margins of lakes."

1. The *piper rupicola*, or crested manakin, is about the size of a small pigeon, being about 10 or 11 inches long. The bill is about an inch and a quarter long, and of a yellowish colour. The head is furnished with a double round crest; the general colour of the plumage is orange, inclining to saffron; the wing coverts are loofe and fringed; the quills are partly white and partly brown; the tail feathers are in number 12; the base half of the ten middle ones is of an orange colour, from thence to the ends they are brown; the outer feathers are brown, and the base half of the inner web is orange; all of them are similarly fringed; the upper tail coverts are very long, loosely webbed, and square at the ends; the legs and claws are yellow. The female is altogether brown, except the under wing coverts, which are of a rufous orange; the crest is neither so complete nor rounded as that of the male. Both males and females are at first grey, or of a very pale yellow, inclining to brown. The males do not acquire the orange colour until the second year, neither does the female the full brown.

"This beautiful species (says Latham), inhabits various parts of Surinam, Cayenne, and Guiana, in rocky situations; but is nowhere so frequent as in the mountain Luca, near the river Oyapoc, and in the mountain Courouaye, near the river Aproack, where they build in the cavernous hollows, and the darkest recesses. They lay two round white eggs, the size of those of a pigeon, and make the nest of a few dry bits of sticks. They are in general very shy, but have been frequently tamed, and make fine pets. They are of a pale grey, and the nest is made of the frets of the creeper. (See Pavo, &c.) A most complete pair is in the Leverian Museum." Our author describes a variety of this species, which he calls the *Peruvian manakin*. It is longer than the preceding, especially in the tail, and the upper coverts of it are not truncated at the ends; the wing coverts are not fringed, as in the rock manakin, and the crest is not so well defined as in that bird; the general colour of the plumage inclines much to red; the second
cond coverts and rumps are of an ash colour; the wings and tail are black; the bill and legs are as in the last described. It is an inhabitant of Peru, from whence its name.

2. The next and laft species which we shall describe (for it would be impossible to enumerate them all), Mr Latham calls the tuneful ma a kin. Its length is four inches; the bill is dusky, the forehead yellow, and the crown and nape blue; the chin, sides of the head below the eye, and the throat, are black; the upper part of the back, the wings, and the tail, are dusky black; the tail is very short; the lower par of the back and rump, the breast, belly, vent, and thighs, are orange coloured; the legs are dusky. It is a native of St Domingo, where it has gained the name of organ fle from its note, forming the complete clavet in the most agreeable manner, one note sixtively after another. It is said not to be uncommon, but not easy to beat; as, like the creeper, it perpetually flits to the opposite part of the branch from the spectator’s eye, so as to elude his vigilance. It is most likely the very bird mentioned by Du Prats, above quoted, whose notes, he says, are so varied and sweet, and which was bables so tenderly, that those who have heard it value much less the song of the nightingale. It is said to sing for near two hours without cease taking breath, and after a repits of about the same time begins again. Du Prats, who himself has heard it, says that it sung perchcd on an oak, near the house he was then in.

PIQUET, or Piquer, a celebrated game at cards, much in use throughout the polite world.

It is played between two persons, with only 52 cards; all the aces, threes, fours, fives and sixes, being set aside.

In reckoning at this game, every card goes for the number it bears, as a ten for ten; only all court cards go for ten, and the ace for eleven: and the upial game is one hundred up. In playing, the ace wins the king, the king the queen, and so down.

Twelve cards are dealt round, usually by two and two; which done, the remainder are laid in the middle; if one of the gamesters finds he has not a court-card in his hand he is to declare he has carte blanche, and tell how many cards he will lay out, and desire the other to discard, that he may throw his game, and satisfy his antagonist that the carte-blanche is real; for which he reckons ten.

Each person discards, i.e., lays aside a certain number of his cards, and takes in a little number from the stock. The first of the eight cards may take three, four, or five; the dealer the remainder, if he pleases.

After discarding, the eldest hand examines what suit he has most cards of; and reckoning how many points he has in that suit, if the other have not so many in that or any other suit, he tells one for every ten of that suit. He who thus reckons most is said to win the point.

The point being over, each examines what sequences he has of the same suit, viz., how many tierces, or sequences of three, quarte or fours, quintes or fives, fixime, or fix’s, &c. For a tierce they reckon three points, for a quarte four; for a quinte five, for a fixieme six, &c. And the several sequences are distinguished in dignity by the cards they begin from: thus ace, king, and queen, are called tierces major; king, queen, and knave, tierces to a king; knave, ten, and nine, tierces to a knave, &c., and the bell tierce, quarte, or quinte, i.e., that which takes is descent from the bell card, prevails, so as to make all the others in that hand good, and destroy all thees in the other hand. In like manner, a quarte in one hand sets aside a tierce in the other.

The sequences over, they proceed to examine how many aces, kings, queens, knaves, and tens, each holds; reckoning for every three of any fort, three: but here too, as in sequences, he that with the name number of threes has one that is higher than any the other has; e.g., three aces, has all his others made good hereby, and his adversary’s all set aside. But four of any fort, which is called a quadrats, always sets aside three.

All the game in hand being thus reckoned, the eldest proceeds to play reckoning one for every card he plays above a nine, and the other follows him in the suit; and the highest card of the suit wins the trick.

Note, unless a trick be won with a card above a nine (except the last trick), nothing is reckoned for it; though the trick serves afterwards towards winning the cards; and that he who plays last does not reckon for his cards unless he wins the trick.

The cards being played out, he that has most tricks reckons ten for winning the cards. If they have tricks alike, neither reckons anything. The deal being finished, and each having marked up his game, they proceed to deal again as before cutting a fresh each time for the deal.

If both parties be within a few points of being up, the carte-blanche is the first thing that reckons, then the point, then the sequences, then the quartes or threes, then the tenth cards.

He that can reckon 30 in hand by carte-blanche, points, quintes, &c., without playing, is the other has reckoned anything, reckons 90 for them; and this is called a ropique. If he reckons above 30, he reckons so many above 90. If he can make up 30 part in hand and part play, ere the other has told any thing, he reckons for them 60. And this is called a copie. Whence the name of the game. He that wins all the tricks, instead of ten, which is his right for winning the cards, reckons 40. And this is called a coop.

Mr de Moive, who has made this game the object of mathematical investigations, has proposed and solved the following problem: 1. To find at piquet the probability which the dealer has for taking one ace or more in three cards, he having none in his hand. He concludes from his computation, that it is 29 to 28 that the dealer takes one ace or more. 2. To find at piquet the probability which the eldest has of taking an ace or more in five cards, he having no ace in his hand. Answer; 232 to 91, or 5 to 2, nearly. 3. To find at piquet the probability which the eldest hand has of taking an ace and a king in five cards, he having none in his hand. Answer; the odds against the eldest hand taking an ace and a king are 331 to 315, or 21 to 20 nearly. 4. To find at piquet the probability of having 12 cards dealt to, without king, queen, or knave, which case is commonly called cartes-blanches. Answer; the odds against cartes-blanches are 1791 to 1 nearly.
PIR

To find how many different sets, essentially different from one another, one may have at piquet before taking in. Anfwer; 28,967,278. This number falls short of the sum of all the di¡ferent combinations, whereby 12 cards may be taken out of 32, this number being 225,792,840; but it must be considered that in that number several sets of the same import, but differing in suit, might be taken, which would not introduce an essential difference among the sets. The same author gives also some observations on this game, which he had from an experienced player. See Doctrine of Chances, n. 179, &c. M. de Monnort has treated of piquet in his Analyt. de Jeux de Hazard, p. 162.

PIRA, is a name by which a variety of foreign fishes are distinguished. The pira-aca is a little horned fish of the West Indies, called by Clusius and others the monoceros unicornis fis. The pira acangata is the name of a Brazilian fish, which resembles the perch both in size and figure. It seldom exceeds four or five inches in length; its mouth is small; its tail forked. On the back it has only one long fin, which is supported by rigid and prickly spines. This fin can detach itself from the body, and sink within a cavity made for it in the back. Its scales are of a silvery white colour; it is wholesome and well tasted. Pira ble is the name of the mulvus, or kite-fish. Pira cocba is an American fish of the truttaçous kind, of a very delicate flavour. It grows to the length of 12 inches; its nose is pointed, and its mouth large, but without teeth; the upper-jaw is longer than the under one, and hangs over like a cartilaginous prominence; its eyes are very large, and its tail is forked; under each of the gill-fins there is a beard made of fine white filaments, and covered with silvery scales. Pira jurumenbea is a Brazilian fish, otherwise called doca molle. It lives in the muddy bottom of the American seas, and is a long bodied not flatted fish. It grows to a great size, being found nine, and sometimes even ten and eleven, feet long and two feet and a half thick. It has one long fin on the back, the anterior part of which is thin and delicate. There is also a cavity on the back, as in the pira acangata, into which the fin can be depressed at pleasure; the tail is not forked, and the scales are of a silvery colour and brightness. The fish is very well tasted; the pira pixinga is another Brazilian fish of the turbus or wrasse kind, and called by some the gate of the fish. It is generally about four or five inches long; its mouth is pretty large, and furnished with very small and very sharp teeth; its head is small, but its eyes are large and prominent, the pupil being of a fine turquoise colour, and the iris yellow and red in a variety of shades. The coverings of the gills end in a triangular figure, and are terminated by a short spine or prickl; its scales are very small, and so evenly arranged, and closely laid on the fish, that it is very smooth to the touch; its tail is rounded at the end, its whole body, head, tail, and fins, are of a pale yellow colour, variegated all over with very beautiful blood-coloured spots; these are round, and of the bighnes of hemp-feed on the back and sides, and something larger on the belly; the fins are all spotted in the same manner, and are all marked with an edge of red. It is caught among the rocks, and about the shores, and is a very well tasted fish. Piramba is an American fish, more generally known by the name piraya. Pyraquibus, or piraquibus, is the name of a fish originally Brasilian, which some writers apply to the remora or sucking fish.

PIRAUS PORTUS, (anc. geog.), a celebrated port to the west of Athens, containing naturally of three harbours or havens, (Thucydides), which lay neglected, till Themistocles put the Athenians on making it a commodious port, (Nepos); the Phalerum, a small port, and not far from the city, being what they used before that time, (Paulus, Nepos). Pirus was originally a village of Aticia, (Paulus); an island, (Strabo); and though distant 40 stadia from Athens, was joined to it by two long walls, (Thucydides), and itself locked or walled round, (Nepos).

A very commodious and safe harbour. The whole of its compass was 60 stadia, including the Mulich. Not far from the Pirus stood the sepulchre of Themistocles; whither his friends conveyed his bones from Magnesia, into the Hither Asia, (Cicero, Plutarch, Paulus). The entrance of the Pirus is narrow, Chamber's Travel in Greece, and formed by two rocky points, one belonging to the promontory of Eition, the other to that of Alcimus. Within were three flications for shipping; Kanthus, so named from a hero; Aphrodium, from a temple of Venus; and Zea, the resort of vessels laden with grain. By it was a demos or borough town of the same name before the time of Themistocles, who recommended the exchanging its triple harbour for the single one of Phalerum, both as more capacious and better situated for navigators. The wall was begun by him when archon, in the second year of the 75th Olympiad, 477 years before Christ; and afterwards he urged the Athenians to complete it as the importance of the place deserved. This whole fortification was of hewn stone, without cement or other material, except lead and iron, which were used to hold together the exterior ranges of facings. It was so wide that the loaded carts could pass on it in different directions, and it was 40 cubits high, which was about half what he had designed.

The Pirus, as Athens flourished, became the common emporium of all Greece. Hippodamus an architect, celebrated, besides other monuments of his genius, as the inventor of many improvements in house building, was employed to lay out the ground. Five porticoes, which uniting formed the Long Portico, were erected by the ports. Here was an agora or market-place, and farther from the sea, another called Hippodamia. By the vessels were dwellings for the mariners. A theatre was opened, temples were raised, and the Pirus, which furnished the city in utility, began to equal it in dignity. The cavities and windings of Munychia, natural and artificial, were filled with houses; and the whole settlement, comprehending Phalerum and the ports of the Pirus, with the arsenals, the storehouses, the famous armory of which Philo was the architect, and the sheds for 300, and afterwards 400, triremes, resembled the city of Rhodes, which had been planned by the same Hippodamus. The ports, on the commencement of the Peloponnesian war, were secured with chains. Centinals were stationed, and the Pirus was carefully guarded.

The Pirus was reduced with great difficulty by Sylla, who demolished the walls, and set fire to the armory and arsenals. In the civil war it was in a defenseless condition. Calenus, lieutenant to Cesar, seized
feized it, invested Athens, and ravaged the territory. Strabo, who lived under the emperors Augustus and Tiberius, observes, that the many wars had destroyed the long walls, with the fortress of Munychia, and had contracted the Piræus into a small settlement by the ports and the temple of Jupiter Saviour. This fabric was then adorned with wonderful pictures, the works of illustrious artists, and on the outside with statues. In the second century, besides houses for triremes, the temple of Jupiter and Minerva remained, with their images in brass, and a temple of Venus, a portico, and the tomb of Themistocles.

The port of the Piræus has been named Porto Lion from the marble lion seen in the chart, and also Porto Drake. The lion has been described as a piece of admirable sculpture, 10 feet high, and as reposing on the hinder parts. It was pierced, and, as some have conjectured, had belonged to a fountain. Near Athens, in the way to Eleusis, was another, the posture courageous; probably a companion. Both these were removed to Venice by the famous general Morosini, and are to be seen there before the arsenal. At the mouth of the port are two ruined piers. A few vessels, mostly small craft, frequent it. Some low land at the head seems an incroachment on the water. The buildings are a mean customhouse, with a few sheds; and by the shore on the calf side, a warehouse belonging to the French; and a Greek monastery dedicated to St. Spiridion. On the opposite side is a rocky ridge, on which are remnants of the ancient wall, and of a gateway towards Athens. By the water edge are vestiges of building; and going from the customhouse to the city on the right hand, traces of a small theatre in the side of the hill of Munychia.

PIRACY. The crime of robbery and depredation upon the high seas.

By the ancient common law, piracy, if committed by a subject, was held to be a species of treason, being contrary to his natural allegiance; and by an alien, to be felony only: but now, since the statute of treasons, 25 Edw. III. c. 2, it is held to be only felony in a subject. Formerly it was only cognizable by the admiralty courts, which proceed by the rules of the civil law. But, as being inconsistent with the liberties of the nation, a man's life should be taken away, unless by the judgment of his peers, or the common law of the land, the statute 28 Hen. VIII. c. 15, established a new jurisdiction for this purpose; which proceeds according to the course of the common law.

The offence of piracy, by common law, consists in committing those acts of robbery and depredation upon the high seas, which, if committed upon land, would have amounted to felony there. But, by statute, some other offences are made piracy also; as, by statute 11 and 12 W. III. c. 7, if any natural born subject commits any act of hostility upon the high seas, against others of his majesty's subjects, under colour of a commission from any foreign power; this, though it would only be an act of war in an alien, shall be construed piracy in a subject. And farther any commander, or other seafaring person, betraying his trust, and running away with any ship, boat, ordnance, ammunition, or goods; or yielding them up voluntarily to a pirate; or conspiring to do these acts; or any person assaulting the commander of a vessel, to hinder him for fighting in defence of his ship; or committing any act of piracy in a manner to cause a revolt on board; shall for each of these offences, be adjudged a pirate, felon, and rebel, and shall suffer death, whether he be principal, or merely accessory by fitting forth such pirates, or abetting them before the fact, or receiving or concealing them or their goods after it. And the statute 4 Geo. I. c. 11. expressly excludes the principals from the benefit of clergy. By the statute 8 Geo. I. c. 24, the trading with known pirates, or furnishing them with ammunition, or setting out any vessel for that purpose, or in any wise consulting, combining, confederating, or corresponding with them, or the forcibly boarding any merchant vessel, though without seizing or carrying her off, and destroying or throwing any of the goods overboard; shall be deemed piracy; and such accessories to piracy as are described by the statute of King William are declared to be principal pirates; and all pirates convicted by virtue of this act are made felons without benefit of clergy. By the same statutes also, (to encourage the defence of merchant vessels against pirates), the commanders or seamen wounded, and the widows of such seamen as are slain, in any piratical engagement, shall be entitled to a bounty to be divided among them, not exceeding one twentieth part of the value of the cargo on board; and such wounded seamen shall be entitled to the pension of Greenwich hospital; which no other seamen are, except only such as have served in a ship of war. And if the commander shall behave cowardly, by not defending the ship, or the carries guns or arms; or shall discharge the marines from fighting, so that the ship falls into the hands of pirates; such commander shall forfeit all his wages and suffer six months imprisonment. Lastly, by statute 18 Geo. II. c. 50, any natural born subject or denizen, who in time of war shall commit hostilities at sea against any of this fellow-subjects, or shall affit an enemy on that element, is liable to be tried and convicted as a pirate.

PIRATE, (σπαρτός, Gr.); a sea-rober, or an armed ship that roams the seas without any legal commission, and seizes or plunders every vessel she meets indiscriminately, whether friends or enemies. The colours usually displayed by pirates are said to be a black field, with a death's head, a battle-axe, and hour glaas. The last instrument is generally supposed to determine the time allowed to the prisoners, whom they take, to consider whether they will join the pirates in their felonious combination, or be put to death, which is often perpetrated in the most cruel manner.

Amongst the most celebrated pirates of the north is recorded Alvilda, daughter of a king of the Goths named Sigurdus. She embraced this occupation to deliver herself from the violence imposed on her inclination, by a marriage with Alfr, son of Sigarus king of Denmark. She dressed herself as a man; and composed her band of rowers, and the reft of her crew, of a number of young women attired, in the same manner. Amongst the frill of her cruizes, she touched at a place where a company of pirates bewailed the death of her consort;
death of their captain. The strangers were captivated by the agreeable manners of Alvilda, and chose her for their chief. By this reinforcement the became formidable upon the sea, that prince Alf came to engage her. She sustained his attacks for a considerable time; but, in a vigorous action, Alf boarded her vessel, and having killed the greatest part of her crew, seized the captain, namely herself; whom nevertheless he knew not, because the princes had a caque which covered her face. Being master of her person, he removed the caque; and in spite of her disguise, instantly recognized her, and offered her his hand in wedlock.

PIRENE (Pliny); a fountain facted to the muse, springing below the top of the Acrocorinthus, a high and steep mountain which hangs over Corinth. Its waters were agreeable to drink, (Paeaniadas); extremely clear, (Strabo); very light, (Athenaeus); and pale, (Periplus); having relation either to the grief of Pirene, mother of Cenchrea, from whose tears this fountain arose, (Paeaniadas); or to the palenes brought by the too eager pursuers of the muse.

PIROMALLI (Paul), a dominican of Calabria was sent a missionary into the east. He remained a long time in Armenia, where he had the happiness to bring back to the church many rhthimastics and Eutychians, and the patriarch himself, who had before thrown every obstacle in his way. He afterwards passed into Georgia and Persia, then into Poland, in quality of Pope Urban VIII.'s nuncio, in order to appease the disturbances which had been occasioned there by the disputes of the Armenians, who were very numerous in that country. Piromalli reunited them in the profession of the faith, and observance of the form ceremonies. In his return to Italy, he was taken by some Corfairs who carried him prisoner to Tunis. As soon as he was ransomed, he went to Rome, and gave an account of his mission to the pope, who conferred upon him some signal marks of his esteem. His holiness intrusted him with the revial of an Armenian Bible, and sent him again into the east, where he was promoted, in 1655, to the bishopric of Naftivan. After having governed that church for nine years, he returned to Italy, and took the charge of the church of Bajignano, where he died three years after in 1657. His charity, his zeal, and other virtues did honour to the Episcopal office. There are extant of his writings, 1. Some works of Controversy and Theology. 2. Two Dictionaries; the one a Latin-Periian, and the other an Armenian-Latin. 3. An Armenian Grammar. 4. A Directory, which is of great use in correcting Armenian books. All these works equally distinguish him for virtuous and for learning.

PIRON (Alexis), whose father was an apothecary, was born at Dijon the 9th of July, 1689 where he passed more than 30 years in the idle and depraved disaffected youth common to young men. He was at length obliged to quit the place of his nativity, in order to avoid the reproaches of his fellow-citizens, on account of an ode which he had written, and which gave great offence. His relations not being able to give him much assistance, he supported himself at Paris by means of his pen, the frolics of which were as beautiful and fair as those of an engraver. He lived in the house of M. de Bellisle as his secretary, and afterwards with a financier, who did not know that he had a man of genius under his roof. His reputation as a writer commenced with some pieces which he published for the entertainment of the populace, and which flowed from marks of original invention, but what fully established his character in this way was his comedy intituled "Mefcorams," which was the best that had appeared in France since Regnard's Gamester. This performance, in five acts, well conducted, replete with genius, wit, and humour, was acted with the greatest success upon the French stage in 1738. The author met with every attention in the capital which was due to a man of real genius, and whose flatteries of wit were inexcusable.

We shall insert a few anecdotes of him, which will serve to show his character and turn of mind. In Burgundy the inhabitants of Beaune are called the Aijes de Beaune. Piron often indulged his fatirical disposition at their expense. One day as he was taking a walk in the neighbourhood of that city, he diverted himself with cutting down all the thistles which he met with.

When a friend asked him the reason for doing so, he replied, "J'ai à me plaindre des Beaunois; je leur coupe les épines, i.e. "I am sorry indeed for the Beaunois; for I am cutting down their food." Being told again that these people would certainly be revenged of him, he replied "Allez, (says he) Allez; je ne crains point leur impiissant courage;" "Et, quand je ferai feu, je les battrai tous."

"Get you gone, get you gone: I fear not their feeble revenge; for the alone, I should beat them all." Going into a theatre one time where a play was acting, he asked what it was? The Cheats of Scapin, gravely replied a young Beaunois. "Ah! Sir, (says Piron, after thanking him), I took it to be the Cheats of Orestes." In the time of the play, some body addressed the company with "Silence there gentlemen, we dont hear." "It is not at least (cried Piron) for want of ears." A bishop one day asked Piron, during the disputes about Junienfim, "Did you read my mandate, Mr Piron?" "No, my lord; and you—the conversation turning very warm, the bishop reminded him of the distance which birth and rank had put between them. "Sir (says Piron), I have plainly the superiority over you at this moment; for I am in the right and you are in the wrong."—Voltaire's Semiramis did not meet with a very favourable reception the first time it was acted. The author finding Piron behind the scenes asked him what—he thought of his performance? "I think (replied he) you would have pleased that I had been the author it." The performer of the character Ferdinand Cortez (the title of one of Piron's Tragedies) having requested some corrections to be made on the play the first time it was acted, Piron fired at the word corrections. The player, who was deputed to wait upon the author with this request, cited the example of Voltaire, who corrected some of his pieces in order to gratify the taste of the public. "The cases are widely different (replied Piron); Voltaire works in cheaper work, and I eat in braids." If this answer be not very model, we must allow that it does not want wit. He thought himself if not superior, at least equal to Voltaire. Some person congratulating him on having composed the best comedy of this age; he answered, with more frankness than modesty, "Add too, and the best tragedy." The following verses are well known, in which he says:

Et
The grand duke's galleys are built and architraves, part of the spoils which the Pisans raised upon pillars. Those who have favoured us with an account of his many witticisms in conversation, would have done more honour to his memory if they had paused over such as were either indecent or infipid. A thing often pleases over a glass of wine, which will not give the same satisfaction, when it is repeated, especially if in repeating it, you want to make it appear of some importance. Be that as it may, Pirron's mischievous ingenuity was partly the cause which excluded him from the French Academy. —"I could not (said he) make thirty-nine people think as I do, and I could still less think as thirty-nine do." He called that celebrated society very unjustly les invalides du bel-esprit; "the invalids of wit"; and yet he often endeavoured to be one of those invalids. His death was lamented by a whole which took him a little before. He died the 21st of January 1773, at the age of 83. He had prepared for himself the following epitaph, in the way of an epigram:

**C'est Pirron, qui ne fut rien,
Pas même académicien.**

"Here lies Pirron, who was nothing, not even an academician."

His wife Maria Theresa Queandon, who died in 1751, he describes as a sweet and most agreeable companion. They lived together for several years; and no husband ever discharged his duty with more fidelity and attention.

A collection of his works appeared in 1776, in 7 vol. 8vo, and 9 vol. 12mo. The principal pieces are, The School of Fathers; a comedy, acted in 1728 under the title of Ungrateful Sons. Calidrenes, a tragedy, the subject of which is taken from Jullin. The Mysterious Lover, a comedy. Gulabius and Ferdinand Cortez, two tragedies; some scenes of which discover an original genius, but the verification neither pleases the ear nor affects the heart. Metromany, a comedy. The Course of Tempe, an ingenious pastoral, in which the manners both of the town and country are piously drawn. Some odes, poems, fables, and epigrams. In this last kind of poetry he was very successful, and he may be placed after Marot and Rousseau. There was no occasion for loading the public with 7 vols of his works; the half of that number might have sufficed. For, excepting Metromany, Gulabius, the Course of Tempe, some odes, about 20 epigrams, three or four fables, and some epistles, the rest are but indifferent, and have no claim to any extraordinary merit.

**Pisa.** A large town of Tuscany in Italy, situated on the river Arno, 52 miles from Florence. It was a famous republic, till subdued, first by the duke of Milan, and then by the Florentines in the year 1406. Before it lost its freedom, it is said to have contained near 150,000 inhabitants, but now it has not above 16,000 or 17,000. It was founded, we are told, by the Pisans of Peloponnesus, and afterwards became one of the 12 municipia of Tuscany. Its neighbourhood to Leghorn, which is now the chief port in the Mediterranean, though formerly of little or no note for trade, has contributed greatly to the decay of Pisa, which, however, begins to lift up its head again, under the auspices of the present grand duke, who has made it his winter residence. Between Pisa and Leghorn is a canal 16 Italian miles in length.—Its territory is very fruitful; abounding in corn, wine, and fruit, and fine cattle. The houses are well built, and the streets even, broad, and well paved; but in many places overrun with grafts. The university is well endowed, and has able professors, but is not in a very flourishing condition. The exchange is a faintly structure, but little frequented. The grand duke's galleys are built and commonly flat bottomed here. The city is also the principal residence of the order of St Stephen, and the see of an archbishop. The cathedral, a large Gothic pile, contains a great number of excellent paintings and other curiosities. This church is dedicated to St Mary; is very advantageously situated in the middle of a large piazza, and built out of a great heap of wrought marble, such as pillars, pedestals, capitals, cornices, and architraves, part of the spoils which the Pisans took in their Eastern expeditions, when the republic was in a flourishing condition. The roof is supported by 76 high marble pillars of different colours, and finely gilt. Both the church and the cupola are covered with lead. The choir is painted by good hands, and the floor is mosaic work. The brazen doors are curiously wrought with the history of the Old and New Testament, by Bonanno, an ancient flattary. The chapel of St Rainerius is richly adorned with gilt metals, columns of porphyry, and fine paintings. In the middle of the nave of the church you see two brazen tombs raised upon pillars. The marble pulpit was carved by John Pifano, and the choir by Julian da Maiana. Joining thereto is the altar, over which is preserved a hollow globe or vessel of marble, wherein they keep the sacrament for the new baptized, according to the opinion of Father Mabillon. In the square before the church, you see a pillar upon which is the measure of the ancient Roman talent. In the same square with the dome, stands the baptistery, a round fabric supported by flately pillars, and remarkable for a very extraordinary echo.

On the north side of the cathedral is the burying place called Campo Santo, being covered with earth, brought from the Holy Land. This burying-place is inclosed with a broad portico, well painted, and paved with grave stones. Here are a great many ancient tombs, among the rest that of Beatrice, mother of the counts Mathilda, with marble bafco relievo, which the Pisans brought from Greece, where you see the hunt of Meleager, which assisted Nicholas of Pisa in the restoration of sculpture. The walls of the Campo Santo are painted by the best masters of their times. Giotto has drawn six historical pieces of Job; and Andrea Orcagna has given a fine piece of the last judgment. Under the portico there is a decree of the city, ordering the inhabitants to wear mourning a year for the death of Cesar. Near the church you fee a steeple in the form of a cylinder, to which you ascend by
by 153 steps; it inclines 15 feet on one side, which some ascribe to art, but others to the linking of the foundation. Its inclination is so great that a plumb-line let fall from the top touches the ground at the distance of almost 15 feet from the bottom. It was built by the brothers Melani, natives of this city, in 1174. Near this steep is a fine hospital, dependent on that of St Maria Nuova in Florence.

The fleape of the church of the Augustinians is also very fine, being an octagon, adorned with pillars, and built by Nicholas of Pisa. In the great market-place there is a statue of Plenty, by Pierino da Vinci. In the church of St Matthew, the painting of the ceiling by the brothers Melani, natives of this city, is an admired performance. The church of the knights of St Stephen, decorated with the trophies taken from the Saracens, is all of marble, with marble steps, and front adorned with marble statues. In the square there is a statue of Cosmo I. upon a very fine pedestal. Contiguous to the church is the convent or palace of the knights, which is worth seeing, as also the churches Della Madonna and Della Spina; the last of which was built by a beggar, whose figure you may see on the outside of the wall. It is pretended that one of the thorns of the crown which was placed on our Saviour's head is preserved here. Belonging to the university there is a great number of colleges, the chief of which is the Sapienza, where the professors read their public lectures; next to which are the colleges Putaneo, Ferdinando, Ricci, and others. Besides the public palace, and that of the grand duke, there are several others with marble fronts, the finest of which is that of Lanfranchi, which, with the rest along the banks of the Arno, makes a very fine appearance.

There is here a good dock, where they build the galleys, which are conveyed by the Arno to Leghorn. They have a famous aqueduct in this town, confisting of 5000 arches, which conveys the water from the hills at five miles distance. This water is esteemed the best in Italy, and is carried in flasks to Florence and Leghorn. The neighbouring country produces great store of corn and wine, but the latter is not much esteemed. They have very good butter in this neighbourhood, which is a scarce commodity in Italy. The city for its defence has a moat, walls, a castle, fort, and citadel; the last of which is a modern work. The Arno is of a considerable breadth here, and has three bridges over it, one of them of marble: two leagues below the town it falls into the sea. The physic-garden is very fucicious, contains a great number of plants, and is decorated with water-work: over the door leading into it are these words, Hic Argus fed non Briareus phæ. i.e. Here the eyes of Argus, but not the hands of Briareus. The air is said to be unwholesome here in summer, on account of the neighbouring morasses. Many buffaloes are bred in the neighbouring country, and their flesh is commonly eaten. Between Pisa and Lucca are hot baths. E Long. 10. 17. N. Lat. 43. 43.

PISCARY, in the ancient Britifh statutes, the liberty of fishing in another man's waters.

PISCES, in astronomy, the 12th sign or constellation of the zodiac.

PISCOIDIA, a genus of the decandria order, belonging to the dandelia class of plants. There are two species, viz. 1. The erythrina, or dog-wood tree. This grows plentifully in Jamaica, where it rises to the height of 25 feet or more; it is long as large as a man's body, covered with a light-coloured smooth bark, and sending out several branches at the top without order; the leaves are about two inches long, winged, with oval lobes. The flowers are of a butterfly kind, and of a dirty white colour; they are succeeded by oblong pods, with 2 or longitudinal wings, and joined between the cells which contain the seeds. The Carthaginians, with oblong oval leaves, is also a native of the West Indies. It differs from the former only in the shape and confidence of the leaves which are more oblong and difter: but in other respects they are very similar. Both species are easily propagated by seeds; but require artificial heat to preserve them in Britain.—The negroes in the West Indies make use of the bark of the first species to intoxicate fish. When any number of gentlemen have an inclination to divert themselves with fishing, or more properly speaking, with fish-hunting, they send each of them a negro-faile to the woods, in order to fetch some of the bark of the dog-wood tree. This bark is next morning pounded very small with stones, put into old sacks, carried into rocky parts of the sea, steeped till thoroughly soaked with salt water, and then well squeezed by the negroes to express the juice. This juice immediately colours the sea with a reddish hue; and, being of a poisonous nature, will in an hour's time make the fishes, such as groupers, rock-fishes, old-wives, Welchmen, &c. so drunk or intoxicated, as to swim on the surface of the water, quite heedless of the danger: the gentlemen then send in their negroes, who pursue, both swimming and diving, the poor inebriated fishes, till they catch them with their hands; their masters in mean time standing by, on high rocks, to see the paltime.

It is remarkable, that though this poison kills millions of the small fry, it has never been known to impart any bad quality to the fish which have been caught in consequence of the intoxication.

The wood of this tree, although pretty hard, is only fit for fuel; and even for this purpose the negroes very seldom, if ever, employ it, on account of its toxicity and by the brothers Melani, natives of this city, is an admired performance. The church of the knights of St Stephen, decorated with the trophies taken from the Saracens, is all of marble, with marble steps, and a front adorned with marble statues. In the square there is a statue of Cosmo I. upon a very fine pedestal. Contiguous to the church is the convent or palace of the knights, which is worth seeing, as also the churches Della Madonna and Della Spina; the last of which was built by a beggar, whose figure you may see on the outside of the wall. It is pretended that one of the thorns of the crown which was placed on our Saviour's head is preserved here. Belonging to the university there is a great number of colleges, the chief of which is the Sapienza, where the professors read their public lectures; next to which are the colleges Putaneo, Ferdinando, Ricci, and others. Besides the public palace, and that of the grand duke, there are several others with marble fronts, the finest of which is that of Lanfranchi, which, with the rest along the banks of the Arno, makes a very fine appearance. There is here a good dock, where they build the galleys, which are conveyed by the Arno to Leghorn. They have a famous aqueduct in this town, consisting of 5000 arches, which conveys the water from the hills at five miles distance. This water is esteemed the best in Italy, and is carried in flasks to Florence and Leghorn. The neighbouring country produces great store of corn and wine, but the latter is not much esteemed. They have very good butter in this neighbourhood, which is a scarce commodity in Italy. The city for its defence has a moat, walls, a castle, fort, and citadel; the last of which is a modern work. The Arno is of a considerable breadth here, and has three bridges over it, one of them of marble: two leagues below the town it falls into the sea. The physic-garden is very fucicious, contains a great number of plants, and is decorated with water-work: over the door leading into it are these words, Hic Argus fed non Briareus phæ. i.e. Here the eyes of Argus, but not the hands of Briareus. The air is said to be unwholesome here in summer, on account of the neighbouring morasses. Many buffaloes are bred in the neighbouring country, and their flesh is commonly eaten. Between Pisa and Lucca are hot baths. E Long. 10. 17. N. Lat. 43. 43.

PISCARY, in antiquity, a large basin in a public place or square, where the Roman youth learned to swim, and which was surrounded with a high wall, to prevent fish from being thrown into it.—This word is also used for a lavatory among the Turks, placed in the middle court of a mosque or temple, where the Mussulmen wash themselves before they offer their prayers.

PISISTRATUS, an Athenian who early distinguisied himself by his valour in the field, and by his Clistias by address and eloquence at home. After he had rendered himself the favourite of the populace by his liberality and by the intrepidity with which he had fought their battles, particularly near Salamis, he resolved to make himself master of his country. Every thing seem-
Pisistratus, ed favourable to his ambitious views; but Solon alone, who was then at the head of affairs, and who had lately enframed his celebrated laws, opposed him, and discovered his duplicity and artful behaviour before the public assembly. Pisistratus was not disheartened by the measures of his relation Solon, but he had recourse to artifice. In returning from his country-houfe, he cut himself into various places; and after he had exposed his mangled body to the eyes of the populace, deplpied his misfortunes, and accused his enemies of attempts upon his life, because he was the friend of the people, the guardian of the poor, and the reliever of the oppressed, he claimed a chosen body of 50 men from the populace to defend his person in future from the malevolence and the cruelty of his enemies. The unsuspecting people unanimously granted his request; though Solon opposed it with all his influence; and Pisistratus had no sooner received an armed band on whose fidelity and attachment he could rely, than he seized the citadel of Athens, and made himself absolute. The people too late perceived their credulity; yet though the tyrant was popular, two of the citizens, Megacles, and Lycurgus, conspired together against him, and by their means he was forcibly ejected from the city. His house and all his effects were exposed to fate, but there was found in Athens only one man who would buy them. The private diffections of the friends of liberty proved favourable to the expelled tyrant; and Megacles, who was jealous of Lycurgus, secretly promised to restore Pisistratus to all his rights and privileges in Athens, if he would marry his daughter. Pisistratus consented; and by the abjuration of his father-in-law, he was soon enabled to expel Lycurgus and to re-establish himself. By means of a woman called Phya, whose shape was tall, whose features were noble and commanding, he imposed upon the people and created himself adherents even among his enemies. Phya was conducted through the streets of the city, and showing herself submissive to the authority of Pisistratus, she was announced as Minerva, the goddess of wisdom, and the patrons of Athens, who was come down from heaven to re-establish her favourite Pisistratus in a power which was fanned by the will of Heaven, and favoured by the affection of the people. In the midst of his triumph, however, Pisistratus found himself unsupported; and some time after, when he repudiated the daughter of Megacles, he found that not only the citizens, but even his very troops, were alienated from him by the influence, the intrigues, and the bribery of his father-law-law. He fled from Athens where he no longer could maintain his power, and retired to Euboea. Eleven years after he was withdrawn from his obscure retreat, by means of his son Hippias, and he was a third time received by the people of Athens as their master and sovereign. Upon this he sacrificed to his resentment the friends of Megacles, but he did not lose sight of the public good, and while he fought the aggrandizement of his family, he did not neglect the dignity and the honour of the Athenian name. He died about 528 years before the Christian era, after he had enjoyed the sovereign power at Athens for 33 years, and he was succeeded by his son Hippias. Pisistratus claims our admiration for his justice, his liberality, and his moderation. If he was dreaded and detested as a tyrant, the Athenians loved and respected his private virtues and his patriotism as a fellow-citizen; and the opprobrium which generally falls on his head may be attributed not to the severity of his administration, but to the republican principles of the Athenians, who hated and exclaimed against the moderation and equity of the mildest sovereign, while they flattered the pride and gratified the guilty desires of the most tyrannical of their fellow subjects. Pisistratus often refused to punish the infraction of his enemies; and when he had one day been virtuously accused of murder, rather than inflict immediate punishment upon the man who had condemned him, he went to the areopagus, and there convinced the Athenians that the accumulations of his enemies were groundless, and that his life was irreproachable. It is to his labours that we are indebted for the preservation of the poems of Homer; and he was, the first, according to Cicero, who introduced them at Athens in the order in which they now stand. He also established a public library at Athens; and the valuable books which he had diligently collected were carried into Persia when Xerxes made himself master of the capital of Attica. Hippias and Hippias the son of Pisistratus, who have received the name of Pisistratidae, rendered themselves as illustrious as their father; but the flames of liberty were too powerful to be extinguished. The Pisistratidae governed with great moderation, but the name of tyrant or sovereign was insupportable to the Athenians. Two of the most respectable of the citizens, called Harmodius and Aristogiton, conspired against them, and Hippias was dispatched in a public assembly. This murder was not, however, attended with any advantages; and though the two leaders of the conspiracy, who have been celebrated through every age for their patriotism, were supported by the people, yet Hippias quelled the tumult by his uncommon firmness and prudence, and for a while preferred that peace in Athens which his father had often been unable to command. This was not long to continue. Hippias was at last expelled by the united efforts of the Athenians and of their allies, and he left Attica, when he found himself unable to maintain his power and independence. The rest of the family of Pisistratus followed him in his banishment; and after they had refused to accept the liberal offers of the princes of Thessaly, and the king of Macedonia, who wished them to settle in their respective territories, the Pisistratidae retired to Sigeum, which their father had in the summit of his power conquered and bequeathed to his posterity. After the banishment of the Pisistratidae, the Athenians became more than commonly jealous of their liberty, and often sacrificed the most powerful of their citizens, apprehensive of the influence which popularity and a well-directed liberality might gain among a fickle and unsettled populace. The Pisistratidae were banished from Athens about 18 years after the death of Pisistratus.

PISIMIRES, are a kind of insect very common in Africa; of which there is a great variety, and such innumerable swarms, that they destroy not only the fruits of the ground but even men and beasts in so little a time as one single night; and would, without all doubt, prove more fatally destructive to the inhabitants they are not so happily destroyed by a proportionable number of monkeys, who greedily ferret and devour them.
them. For a further account of these, and some other grievous plagues with which the far greater part of the
vast continent of Africa is afflicted particularly that
most horrid vibration of locusts, which seldom fail a
year of laying waste some of the provinces, see Gryl-
lus, p. 161.

PISO (Lucius Calpurnius), surnamed Frugi on
account of his frugality, was defended of the illust-
rious family of the Pisos, which gave so many great
men to the Roman republic. He was tribune of the
people in the year 149 before Christ, and afterwards
consul. During his tribuneship, he published a law
against the crime of conciliation or extortion, intitled Lex
Calpurnia de pecunia reperundis. He happily ended the
war in Sicily. To reward the services of one of his
sons, who had distinguished himself in that expedition,
he left him by his will a golden crown, weighing 20
pounds. Piso joined to the qualities of a good citizen
the talents of a lawyer, an orator, and historian.

Piso (Cnaeus Calpurnius, a Roman consul in the
year 67 before Christ, was author of the law which
forbid canvassing for public offices, intitled Lee Cal-
purnia de ambitu. He displayed all the firmness worthy
a consul in one of the most stormy periods of the
republic. The Roman people, deceived by the flat-
tery of Marcus Placianus, a turbulent and seditious
fellow, were on the eve of loading themselves with the
greatest disgrace, by putting the supreme authority in-
to the hands of this man, who deferred punishment
rather than honour. The tribunes of the people, by
their harangues, inflamed the blind fury of the multi-
tude, already sufficiently mutinous of themselves. In
this situation, Piso mounted the rostrum, and being
asked if he would declare Placianus consul in case the
flurries of the people should concur in the nomina-
tion, he instantly replied, that "he did not think the
republic was yet involved in such dark knaves and dispair
as to be capable of committing so infamous an action."'
Being afterwards strongly and repeatedly called upon to
say, "what he would do, if the thing should hap-
pen?" his answer was, "No, I would not name him."
By this firm and laconic anwer he deprived Placianus
of the dignity to which he aspired. Piso, according to
Cicero, was not possessed of a quick conception, but
he thought maturely, and with judgment; and by a pro-
er firmness, he appeared to be an able man than
he really was.

Piso (Cneius Calpurnius), was consul in the reign of
Augustus, and governor of Syria under Tiberius,
whole confident he was. It is said, that by the order
of this emperor he caused Germanicus to be poisoned.
Being accused of that crime, and seeing himself
abandoned by every body, he laid violent hands on
himself in the 20th year of our Lord. He was a man
of infupportable pride and excessive violence. Some
inflamations of his wicked cruelty have been handed down
to us. Having given orders in the heat of his passion
to conduct to punishment a soldier, as guilty of the
death of one of his companions, because he had gone
out of the camp with him and returned without him,
no prayers or entreaty could prevail with Piso to
suspend the execution of this sentence until the affair
should be properly investigated. The soldier was led
without the entrenchments, and had already preseated
his head to receive the fatal stroke, when his compa-
nion whom he was accused of having killed made his
appearance again. Whereupon the centurion, whose
office it was to see the sentence executed, ordered the
executioner to put up his sword into the scabbard.
Those two companions, after embracing each other,
were conducted to Piso, amidst the acclamations of the
whole army, and a profligant crowd of people. Piso,
foaming with rage, ascends his tribune, and pronounces
the same sentence of death against the whole three,
without excepting the centurion who had brought
back the condemned soldier, in these terms: "You
I order to be put to death because you have been al-
ready condemned; you, because you have been the
cause of the condemnation of your co-conspirator; and you,
because having got orders to put that soldier to death,
you have not obeyed your prince."

PISASPHALTUM, EARTH-PITCH; a fluid,
opaque, mineral body, of a thick consistence, strong
smell, readily inflammable, but leaving a residuum of
vomit after burning. It arises out of the cracks
of the rocks, in several places in the Island of Sumatra,
and some other places in the East Indies, where it is
much esteemed in paralytic disorders. There is a
remarkable mine of it in the island of Bua, (see Bua),
of which the following curious description is given us
by the Abbé Fortis. "The island is divided into two
promontories between the north and west, crossing over
the top of the latter, which is not half a mile broad,
and defauncing in a right line towards the sea, one
is conducted to a hole well known to the inhabitants.
This hole extends not much above 12 feet, and from
its bottom above 25 feet perpendicular, aisle the
marble flat which sustains the irregular mallee that
surround the top of the mountain.

"The place seemed to me (continues our author),
for worthy of observation, that I caused a drawing of
it to be taken. The hole AAA is dug out of an in-
regular stratum of argillaceous sandy earth, in some
parts white, in others of a greenish colour; part
of it is half petrified, and full of minutiae of the
largest kind, lenticulares, and fragments, with here
and there a small branch of madrepores, and fre-
quently of those other fossil bodies called by Geiner
coruna ammonis candida, minima, &c. The mass B is
fallen from the height of the rock, and lies isolated.
The excavation, made by some poor man in the fofter
matter, reaches a little below the extremity CC of the
stratum DD. This is separated by the line EE from
the stratum FF, which is of hard common marble,
with marine bodes without flicts. The upper part aa
is of hard lenticular stone, intersected with flints full
of lenticulares. The mass H does not discover the di-
visions of its strata on the outside, and transtires very
small drops of pisasphaltum, scarcely discernible; but
the tears III of the same matter, which flow from the
flatteries and chinks of the whitish stratum DD, are very
obsevable. They come out most abundantly when the
sun falls on the marble rock in the heat of the day.
This pisasphaltum is of the most perfect quality, black
and shining like the bitumen Jaduaum: very pure,
odorous, and cohesive. It comes out almost liquid,
but hardens in large drops when the sun sets. On
breaking many of these drops on the spot, I found that
almost every one of them had an inner cavity full of
very clear water.

"The
The greatest breadth of the tears that I saw was two inches, and the common breadth is half an inch. The chinks and fissures of the marble, from whence this bituminous pitch transudes, are not more than the thickness of a thread; and for the most part are so imperceptible, that were it not for the pitch itself, whereby they are blackened, they could not by any means be distinguished by the naked eye. To the narrowness of these passages is, no doubt, in part owing the small quantity of pitchphalanthum that transpires.

After some conjectures about the origin of this mine, our author proceeds to inform us that the pitchphalanthum of Bia is correspondent to that fossil production which by Hallequill, in his Travels, is called *mumia minerales*, and *mumia nativa Persiana* by Kepfer, which the Egyptians made use of to embalm their kings (A). It is found in a cave of Mount Caucasus, which is kept shut, and carefully guarded by order of the king of Persia. One of the qualities assigned by M. Linnaeus to this fossil bitumen is to smoke when laid on the fire, emitting a smell of pitch not disagreeable. He believes it would be very good for wounds, as the oriental mumia is, and like the pitch of Castore, which is frequently used by the Roman chirurgeons for fractures, contusions, and in many external applications.

See MINERALOGY.

*Pisellæum Indicum, Barbadoes Tar;* a mineral fluid of the nature of the thicker bitumens, and of all others the most approaching, in appearance, colour, and consistence, to the true pitchphalanthum, but differing from it in other respects. It is very frequent in many parts of America, where it is found trickling down the sides of mountains in large quantities, and sometimes floating on the surface of the waters. It has been greatly recommended internally in coughs and other disorders of the lungs.

*Pisellæum Indicum, Barbadoes Tar;* a genus of the pentandria order, belonging to the dioecia class of plants. There are nine species; of which the most remarkable are, 1. The terebinthus, or pitchtree. This grows naturally in Arabia, Persia, and Syria, whence the nuts are annually brought to Europe. In those countries it grows to the height of 25 or 30 feet: the bark of the tree is brown; the leaves are composed of two or three pair of spear-shaped lobes, terminated by an odd one: the outer lobes are the largest; the others gradually diminish, the innermost being the least. These turn of a brownish colour towards the autumn, when the plants are exposed to the open air; but if they be under glass, they keep green. The leaves continue all the year, but are not so thick as those of the common fir, nor are the plants so hardy.

**Culture.** The first species is propagated by its nuts; which should be planted in pots filled with light kitchen-garden earth, and plunged into a moderate hot-bed to bring up the plants: when these appear, they should have a large share of air admitted to them, and by degrees they should be exposed to the open air, which at first they will bear in all seasons, though not without great danger of being destroyed in severe winters. The second fort is commonly propagated by laying down the branches, though it may also be raised from the seed in the manner already directed for the pistachia-nut tree: and in this manner also may the true mastic-tree be raised. But this being more tender than any of the other fots, requires to be constantly sheltered in winter, and have a warm situation in summer.

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[(A)]"Mumiahi, or native Persian mummy. It proceeds from a hard rock in very small quantity. It is a bituminous juice, that transudes from the flaty supercicies of the hill, resembling in appearance coarse hoe-makers, wax, as well in its colour as in its density and dulinitiy. While adherent to the rock it is lustful, but is formed by the warmth of the hands. It is easily united with oil, but repels water; it is quite void of smell, and very like in substance to the Egyptian mummy. When laid on burning coals, it has the smell of sulphur tempered a little with that of naphtha, not disagreeable. There are two kinds of this mummy; the one is valuable for its scarcity and great activity. The native place of the balt mummy is far from the access of men, from habitations, and from springs of water, in the province of Darasb. It is found in a narrow cave, not above two fathoms deep, cut like a well out of the mafs, at the foot of the ragged mountain Caucasus."—Kempfer, *Amer. Pers.*

This description agrees perfectly with the pitchphalanthum or fossil mummy of Bia, differing only in the quantity of smell, which it is difficult to imagine is totally wanting in the Persian mummy.
PITCHEIA nuts are moderately large, containing a kernel of a pale greenish colour, covered with a reddish skin. They have a pleasant, sweet, nutty taste, resembling that of almonds; and they abound with a sweet and well-tasted oil, which they yield in great abundance on being pressed after bruising them: they are reckoned amongst the analphtes, and are wholesome and nutritious, and are by some esteemed very proper to be prescribed by way of restoratives, eaten in small quantity, to people emaciated by long illnesses.

PISTIL, among botanists, the little upright column which is generally found in the centre of every flower. According to the Linnaean system, it is the female part of generation, whose office is to receive and secrete the pollen, and produce the fruit. It consists of three parts, viz. germen, hyulus, and stigma. See Botany; p. 454, and p. 455, 2d columns.

PISTOLIA is a city of Italy, in the duchy of Tuscany, situated on the river Stella, in a beautiful plain near the foot of the Apennine mountains. By Pliny it is called Pistorium, and is said to have been once a Roman colony. At present it is a bishop's see, suffragan of Florence. The streets are broad and regular, the houses tolerably well built, but poorly inhabited for want of trade. Formerly it was an independent republic, but since it was subdued by the Florentines in 1200, it has been in a declining condition. The cathedral has a very handsome cupola, and a magnificent staircase to ascend to it. In the chapel dedicated to St James, where his relics are preserved, the walls are almost covered with plates of silver. Here are four enameled statues of very good workmanship. The marble pulpit, the baso-relievo, the veil that holds the holy water, and the square fumee, are the work of John Pianino. The Jesuits have a very fine college, and the Franciscans, Dominicans, and Augustinians, good churches. In the church of Madonna dell' Umiltà there are two statues, one of Leo X, and the other of Clement VII. The public palace, situated in a large square, is a handsome building; several of the nobility have also very good houses. In the neighbouring mountains, called by the name of Pistoia, there are many large villages, the chief of which is that of S. Marcello, belonging to the family of Cartoli. These mountains are a part of the Apennines, and border on the territory of Bologna and the county of Veneto; higher up is the source of the river Reno. The country about Pistoia, especially towards Florence, is exceeding fertile and delightful, covered with all sorts of fruits, corn, wine, &c. and containing a vast number of little towns, wealthy villages, and country seats, so as to be reckoned the richest and most beautiful in all Tuscany. It is about 20 miles N. W. of Florence, and 30 N. E. of Pisa. Long. 11. 29. N. Lat. 43. 55.

PISTOLE, the smallest piece of fire-arms, borne at the saddle bow, on the girdle, and in the pocket.

PISTOLE, a gold coin, struck in Spain and in several parts of Italy, Switzerland, &c. The pistole has its augmentations and diminutions, which are quadruple pistoles, double pistoles, and half pistoles. See Money-Table.

PISTON, in pump work, is a short cylinder of metal or other solid substance, fitted exactly to the cavity of the barrel or body of the pump. See Hydrostatics, sect. v.

PISTORIUS (John), born at Nidda in 1546, applied himself at first to the study of medicine, and was admitted a doctor with applause; but his prescriptions not being attended with all the success which he expected, he quitted that profession, and studied the law. His merit procured him the appointment of counsellor to Earnest Frederick margrave of Bade-Dourlas. He had embraced the Protestant religion; but some time after he changed his opinion, and returned to the communion of the church of Rome. He became afterwards a doctor of divinity, one of the emperor's counsellors, provost of the cathedral of Brelaw, and domestic prelate to the abbot of Fulda. We have of his writings, 1. Several Controversial Treats against the Lutherans. 2. Actis Caballisticorum Scriptores, printed at Bale 1587; a scarce and curious collection. 3. Scriptores rerum Polonicarum. 4. Scriptores de rebus Germanicis, in 3 vols. folio, from 1603 to 1613. This is a curious and scarce performance, but might have been better digested. The author died in 1609, at the age of 52.

PISUM, pease; a genus of the decandria order, belonging to the diadelpha clafs of plants. The species are: 1. The sativum, or greater garden-pea, whose lower stipule are roundish, indented, with taper foot-stalks, and many flowers on a foot-stalk. 2. The humble, or dwarf pea, with an erect branching stalk, and leaves having two pair of round lobes. 3. The umbellatum, rofe, or crown-pea, with four pointed acute stipule, and foot-stalks bearing many flowers, which terminate the stipule. 4. The maritimum, or sea-pea, with foot-stalks which are plain on their upper side, an angular stalk, arrow-pointed stipule, and foot-stalks bearing many flowers. 5. The Americanum, commonly called Cape Horn pea, with an angular trailing stalk, whose lower leaves are sparsely, sharply indented, and those at the top arrow-pointed. 6. The ochrus, with membranaceous running foot-stalks, having two leaves and one flower upon a foot-stalk.

There is a great variety of garden pea now cultivated in Britain, which are disfigurished by the gardeners and feedmen, and have different titles; but as great part of these have been seminal variations, so if they are not very carefully managed, by taking away all those plants which have a tendency to alter before the seeds are formed, they will degenerate into their original state: therefore all those persons who are curious in the choice of their seeds, look carefully over those which they design for seeds at the time when they begin to flower, and draw out all the plants which they dislike from the other. This is what they call roguing their peas; meaning hereby the taking out all the bad plants from the good, that the quitina of the former may not impregnate the latter; to prevent which, they always do it before the flowers open. By thus diligently drawing out the bad, referring those which come ear-liest to flower, they have greatly improved their peas of late years, and are contantly endeavouring to get forwarder varieties; so that it would be to little purpose in this place to attempt giving a particular account of all the varieties now cultivated: therefore we shall only mention the names by which they are commonly known, placing them according to their time of coming to the table, or gathering for use.
The golden hotspur. Nonpareil.
The Charlton. Sugar dwarf.
The Reading hotspur. Sickle pea.
Master's hotspur. Marrowfat.
Elf x hotspur. Rose or crown pea.
The dwarf pea. Roundval pea.
The sugar pea. Gray pea.
Spanish Moroito. Pig pea; with some others.

The English sweet pea is found wild upon the shores in Suffolk and several other countries in England, and is undoubtedly a different species from the common pea.

The fifth species hath a biennial root, which continues two years. This was brought from Cape Horn by Lord Anson's cook, when he passed that Cape, where these peas were a great relief to the sailors. It is kept as a curiosity, but the pea are not so good for eating as the worst sort now cultivated in Britain. It is a low trailing plant; the leaves have two lobes on each foot-tall: those below are spear-shaped, and sharply indented on their edges; but the upper leaves are small, and arrow pointed. The flowers are blue, each foot-tall full, hanging four or five flowers; the pods are taper, near three inches long; and the seeds are round, about the size of peas.

The sixth sort is annual. This grows naturally among the corn in Sicily and some parts of Italy, but is in England preferred in botanic gardens for the sake of variety. It hath an angular foot-tall, rising near three feet high; the leaves stand upon winged foot-talls, each fulling two oblong lobes. The flowers are of a pale yellow colour, shaped like those of the other sort of pea, but are small, each foot-tall fulling one flower; these are succeeded by pods about two inches long, containing five or six roundish seeds, which are a little compressed on their sides. These are by some persons eaten green; but unless they are gathered very young, they are coarse, and at best not so good as the common pea. It may be sown and managed in the same way as the garden pea.

We shall now proceed to set down the method of cultivating the several sorts of garden pea, so as to continue them throughout the season.

It is a common practice with the gardeners near London to raise peas upon hot-beds, to have them very early in the spring; in which manner they sow their peas upon warm borders, under walls or hedges, about the middle of October; and when the plants come up, they draw the earth up gently to their stemns with a hoe, the better to protect them from frost. In these places they let them remain until the latter end of January, or the beginning of February, observing to earth them up from time to time as the plants advance in height (for the reasons before given); as also to cover them in very hard frost with peat-haulm, straw, or some other light covering, to preserve them from being destroyed; they then make a hot-bed (in proportion to the quantity of peas intended), which must be made of good hot dung, well prepared and properly mixed together, that the heat may not be too great. The dung should be laid for two or three feet thick, according as the beds are made earlier or later in the season; when the dung is equally levelled, then the earth (which should be light and fresh, but not over rich) must be laid thereon about six or eight inches thick, laying it equally all over the bed. This being done, the frames (which should be two feet high on the back side, and about 14 inches in front) must be put on, and covered with glass to; after which it should remain for three or four days, to let the frames of the bed pass off before you put the plants therein; observing every day to raise the glases to give vent for the rising frames to pass off; then, when you find the bed of a moderate temperature for heat, you should, with a trowel, or some other instrument, take up the plants as carefully as possible to preserve the earth to their roots; and plant them into the hot-bed in rows about two feet asunder, and the plants about an inch distant from each other in the rows, observing to water and shade them until they have taken root; after which you must be careful to give them air at all times when the season is favourable, otherwise they will draw up very weak, and be subject to grow moulty and decay. You should also draw the earth up to the sides of the plants as they advance in height, and keep them always clear from weeds. The water they should have must be given them sparingly; for if they are too much watered, it will cause them to grow too rank, and sometimes rot off the plants at their roots just above ground. When the weather is very hot, you should cover the glases with mats in the heat of the day, to fence them from the violence of the heat of the sun, which is then too great for them; but when the plants begin to fruit, they should be watered oftener, and in greater plenty than before; for by that time the plants will have nearly done growing, and the often refreshing them will occasion their producing a greater plenty of fruit.

The fort of pea which is generally used for this purpose is the dwarf; for all the other sorts ramble too much to be kept in frames: the reason for fowing them in the common ground, and afterwards transplanting them on a hot-bed, is to check their growth, and cause them to bear in less compass; for if the seeds were sown upon a hot-bed, and the plants continued thereon, they would produce such luxuriant plants as could not be contained in the frames, and would bear but little fruit.

The next sort of pea which is sown to succeed those on the hot-bed is the hotspur; of which there are reckoned several varieties, as the golden hotspur, the Charlton hotspur, the Master's hotspur, the Reading hotspur, and some others; which are very little differing from each other, except in their early bearing, for which the golden and Charlton hotspurs are chiefly preferred; though if either of these sorts is cultivated in the same place for three or four years, they are apt to degenerate, and be later in fruiting; for which reason, most curious persons procure their seeds annually from some distant place; and in the choice of these seeds, if they can be obtained from a colder situation and a poorer soil than that in which they are to be sown, it will be much better than on the contrary, and they will come earlier in the spring.

These must also be sown on warm borders, towards the latter end of October; and when the plants are come up, you should draw the earth up to their skins, and treat them in every other respect as above directed.

In the spring you must carefully clear them from weeds, and draw the same fresh earth up to their stems but do not raise it too high up to the plants, left by
In some cases, you should rot their leaves, as is sometimes done, especially in wet seasons. You should also observe to keep them free from vermin, which, if permitted to remain amongst the plants, will increase to plentifully as to devour the greatest part of them. The chief of the vermin which infest peas are flags, which lie all the day in the small hollows of the earth, near the stems of the plants, and in the night-time come out and make terrible destruction of the peas; and these chiefly abound in wet soils, or where a garden is neglected and over-run with weeds: therefore you should make the ground clear every way round the peas to destroy their harbours; and afterwards in a fine mild morning very early, when these vermin are got abroad from their holes, you should flame a quantity of lime, which should be fire-wed over the ground pretty thick, which will destroy the vermin wherever it happens to fall upon them, but will do very little injury to the peas, provided it be not scattered too thick upon them.

If this crop of peas succeeds, it will immediately follow those on the hot-bed; but for fear this should miscarry, it will be proper to sow two more crops at about a fortnight or three weeks distance from each other, so that there may be the more chances to succeed. This will be sufficient till the spring of the year, when you may sow several more crops of these peas at a fortnight distance from each other. The late sowings will be sufficient to continue the early crop of peas through the season; but it will be proper to have some of the large fort to succeed them for the use of the family: in order to which, you should sow some of the Spanifh Morotto, which is a great bearer and a hardy fort of peas, about the middle of February, upon a clear open spot of ground. These must be sown in rows about four feet asunder, and the peas should be dropped in the drills about an inch distance, covering them about two inches deep with earth, being very careful that none of them lie uncovered, which will draw the mice, pigeons, or rooks, to attack the whole spot; and it often happens, by this neglect, that a whole plantation is devoured by these creatures; whereas, when there are none of the peas left in fight, they do not easily find them out.

About a fortnight after this you should sow another spot, either of this fort or any other large fort of peas, to succeed these; and then continue to repeat sowing once a fortnight, till the middle or latter end of May; only observing to allow the marrowfats, and other very large forts of peas, at least four feet and a half between row and row; and the rose-peas should be allowed at least eight or ten inches distance plant from plant in the rows; for these grow very large, and if they have not room allowed them, they will spoil each other by drawing them up very tall, and will produce no fruit.

When the plants come up, the earth should be drawn up to their shanks (as was before directed), and the ground kept entirely clear from weeds; and when the plants are grown eight or ten inches high, you should lick some bruithood into the ground close to the peas for them to ramp upon, which will support them from trailing upon the ground, which is very apt to rot the growing forts of peas, especially in wet seasons; besides, by thus supporting them, the air can freely pass between them, which will preserve the blossoms from falling off before their time, and occasion them to bear much better than if permitted to lie upon the ground, and there will be room to pass between the rows to gather the peas when they are ripe.

The dwarf forts of peas may be sown much closer together than those before-mentioned; for these seldom rise above a foot high, and rarely spread above half a foot in width, so that these need not have more room than two feet row from row, and not above an inch asunder in the rows. These will produce a good quantity of peas, provided the seafon be not over dry; but they seldom continue long in bearing, so that they are not so proper to sow for the main crop, when a quantity of peas is expected for the table, their chief excellence being for hot-beds, where they will produce a greater quantity of peas (provided they are well-managed) than if exposed to the open air, where the heat of the sun soon dries them up.

The large growing forts may be cultivated for the common use of the family, because there will produce in greater quantities than the other, and will endure the drought better; but the early kind are by far the sweeter-tafted peas.

The beet of all the large kinds is the marrowfat, which, if gathered young, is a well-tafted pea; and this will continue good through the month of August, if planted on a strong foil.

The gray and other large winter-peas are seldom cultivated in gardens, because they require a great deal of room, but are usually sown in fields. For the proper method of managing them, see AGRICULTURE, no. 150.

In the Museum Rusticum, Vol. I. p. 109, we find the following method of preparing peas for hog-meat, which we shall give in the words of the ingenious farmer who communicated it.

"A few years ago (says he), I had a plentiful crop of peas on a ten acre piece, which lies near my house: when they were fully podded and nearly ripe, I had them hooked in the usual manner; but before I could get them in, there came a heavy shower of rain which wetted them through and through; and the dull heavy weather, with frequent showers which followed, prevented their drying for a considerable time.

"I caused the wads to be from time to time turned, to prevent the halm from rotting; and at length a few days sunshine dried them enough to be 'ined; for as they lay hollow, the wind was greatly affilint to the operation.

"Before I got them in, on examining some of the pods, I found that the peas were all sprouted to a considerable length: this was what I had expected, as I gave my crop over for left, till after a little recollection, as the weather still continued fine, I determined to thresh them in the field,

"This was accordingly done; and the corn, after it was cut and riddled to separate it from the rubbish, was dried on my malt kiln.

"When this operation was over, I began to reflect in what manner I should dispose of my peas, being sensible that they could not be proper for feed, and finding no chance of disposing of them to any advantage in the market.

"At length, as it was then a time of war, and of course there was a great demand for pork for the use of the navy, I determined to buy a considerable num-
number of lean hogs, that I might by their means con-
fume this crop on my own premises, and in that man-
ner make the most of it.

"My expectations were more than answered; for I
found, by repeated experience, that three bushels of
the pease I have mentioned were nearly as far as in fat-
tening the hogs: I bought as four bushels got in dry
and hard in the manner usually practiced.

"This discovery I made several years ago, and it
has turned out to my advantage; for since that time
I have been quite indifferent as to the weather in
which my pease are hooked, being rather better plea-
fed, as far as relates to them, with wet than dry weather;
but if the weather happens to be dry at the
time they are ripe, I always caute as many as I want
for feeding my hogs, which are not a few in a year,
to be regularly malted in the same manner nearly as
my barley: this management has of late succeeded ve-
ry well with me, and I therefore intend to continue it.

"Besides feeding my hogs with the malted pease,
I have often given them to my horses, with which
they agree very well, and are heartening food.

"Turkeys will fatten ampace on them all, and be
fine meat.

"I have applied my malted pease to many other
ufes, which I have not at present time to enumerate:
but were they only used for feeding hogs and horses,
it is still worth while to prepare some in this manner
every year."

PIT-COAL, or STONE-COAL. See COAL and Ll
THANTHRAES.
Mr Bertrand, in his Orytologie Dictionary, reduces
all kinds of coals to fix general classes, viz.: 1. Lithan-
thrax lignen; 2. Petrofifs; 3. Terretris; 4. Piceus;
5. Filiis; 6. Mineralifatus. He says, that the Scots
coals are heavier, and burn not so well as thoé of New-
castle; that thoé of Liege burn quicker; and those
from Braif ac in Auvergne, and from Ia Pofle, burn
with a more agreeable flame, &c. But Morand, in
his Nomenclature Rayonnés, distributes all sorts of pit-
coals into four classes: In the first he places nine va-
rieties, beginning with the gojas or fascium nimenum,
to the which he added lithanthrax; in the second he reckons
seven varieties, beginning with the lithanthraes eleganti
structure, to that fascie granulata: and he forms the
fourth class with the earthy and poorer kinds of foill
coals. He fseems, however, to have been puzzled with
the flaty coals, as he ranges them in a separate class,
perhaps to shelter himself from the critical objections
of those numerous superficial naturalists, who only look
for the apparent configuration, without almost any re-
gard to the component parts of foill's.

The coal-trade is of infinite importance to Great
Britain, which never could have arrived at its present
commercial eminence without it; and this eminence it
will be impossible to retain if coal should ever become
scarce. This we truit is not likely to be the cafe, though
Mr Williams expresses great fears for it, and informs us
that at Newcastle and in many parts of Scotland the
mines near the sea are already wailed, the first con-
quence of which may be an enormous rise in the price.
See his observations on this subject in his Natural Histo-
ry of the Mineral Kingdom, p. 156, &c. This author fays,
that coal was not discovered till between the middle of
the 12th and beginning of the 13th centuries: it is
therefore, according to him, 400 years since it was firly
discovered in Britain, but they have not been in com-
mon use for more than 200 years. The same author
gives us many pertinent observations on the appear-
ances and indications of coal, infcriptions about search-
ring for it, remarks on falls and doubtful symptoms of
coal; for all which, together with his observations on
the different kinds of Scots coal, we shall refer our
readers to the work itself; the first part of which, oc-
cying the largest proportion of the first volume, is
upon the stfate of coal, and on the constituent stfate. See
also our article COALERY.

PITAHAYA (Callus Pitahaya, Lin. Syfl. Vegeta-
bridum. J. Acquir. Amer. 151. ed. 2. p. 75. M. E. Car-
thagenes), a shrub peculiar to California, is a kind of
beech, the fruit of which forms the greatest harvest of
the natives. Its branches are finely fluted, and rise
vertically from the stem, so as to form a very beauti-
tful top. The fruit is like a horse-chefnut. In some
white, in others yellow, and in others red, but always
exquisitely delicious, being a rich sweet, tempered
with a grateful acid. See CACTUS.

PITCAIRNE (Dr Archibald), a most eminent
physician and ingenious poet, was descended from the
ancient family of the Pitcairnes of Pitcairne in Fife,
and was born at Edinburgh on the 25th of De-
cember 1652. He commenced his studies at the school
of Dalkeith; and from thence he was removed to the
university of Edinburgh, where he improved himself
in classical learning, and completed a regular course of
philosophy. His friends, according to the authors of
the Biographia Britannica, were disfouis that he should
follow the profession of theology. The unpleasant
GLOSSARY, however, which at that time hung over reli-
ion and its professors in Scotland, could not but very
ill suit with that native cheerfulnes of temper and li-
berality of mind which made him, long after, a
mark for the arrows of precifencis and grimace. The law
seems to have been his own choice, and to this science
he turned his attention. With an ardour peculiar to
himself, and an ambition to excel in whatever he un-
took, he pursiued it with so much intenfencis, that
his health began to be impaired. On this account,
he was desirous that he should be engaged in the pro-
dealor of philosophy, and from his health began to be
impaired. On this account,

On his return, he applied himself chiefly to the
mathematics. It is not usual to see the briers of this
science and the flowers of poetry growing in the same
foil. Here, however, they were happily united; and
to this union perhaps was owing that singular com-
mand of judgment, over one of the liveliest of fancies,
which appears in every part of his works. His intimacy
with Dr. David Gregory, the celebrated mathematical
professor, began about the same time; and probably
conduced to cherish his natural aptitude for this study.
It was then, in a great measure, new to him; it soon
began his principal delight; his progress in it was
rapid, and correspondent to his progress in other pur-
Suits. His improvements on the method of infinite
series then adopted, which Dr Wallis of Oxford af-
wards published, were a conspicuous and early proof of his abilities in this science.

had Dr Pitcairne continued to prosecute the study of the law, and could he have moulded his principles to the times, the first offices and honours of the State might have been looked for without presumption as the probable reward of such talents as he possessed. Struck, however, with the charms of mathematical truth which had been lately introduced into the philosophy of medicine, and hoping to reduce the healing art to geometric method, he unalterably determined on this less aspiring profession. At the period when he formed this resolution, the ideas of the medical world, already sufficiently confused, were still farther jumbled by the discovery of the circulation of the blood, which had as yet produced nothing but doubt, uncertainty, and astonishment. In Edinburgh at that time there was no school, no hospital, no opportunity of improvement but the chamber and the shop. He therefore soon after returned to Paris. Genius and industry are unhappily not often united in the same character; of such an union, however, Dr Pitcairne is a celebrated instance. During his residence in France, he cultivated the object of his pursuit with his natural enthusiasm, and with a steadfastness from which he could not be diverted by the allurements of that joy which, in its hours of social and feltive intercourse, he always felt and always gave. Among his various occupations, the study of the ancient physicians seems to have had a principal share. This appears from a treatise which he published some time after his return; and it shows, that he wisely determined to know the progress of medicine from its earliest periods, before he attempted to reform and improve that science.

On the 15th of August 1680, he received, from the faculty of Rheims the degree of Doctor; which, on the 7th of August 1699, was likewise conferred on him by the university of Aberdeen, both being attended with marks of peculiar distinction. Other medical honours are said to have been conferred on him in France and elsewhere; but nothing affords a more unequivocal testimony to his abilities than that which the surgeons of Edinburgh gave, in admitting him, freely and unreservedly, a member of their college. None had such opportunities of judging of his merit as a practitioner, and on no physician did they ever bow the same public mark of respect. Soon after his graduation at Rheims, he returned to Edinburgh, where, on the 29th of November 1681, the Royal College of Physicians was instituted; and his name, among others, graced the original patent from the crown.

In his Solutio Problematis de Inventoribus, the treatise above alluded to, he discovers a wonderful degree of medical literature, and makes use of it in a manner that does great honour both to his head and his heart. His object is to vindicate Dr Harvey's claim to the discovery of the circulation of the blood. The discovery was, at first, controverted by envy, and reproved by ignorance. When at length its truth was fully established, many invocatively attempted to tear the laurels from the illustrious Englishman, and to plant them on the brows of Hippocrates and others. Had the attempt been directed against himself, the generous soul of Pitcairne could not have exercised more zeal in defence; and his arguments remain unanswered.

During his residence in Scotland, his reputation became so considerable, that, in the year 1691, the university of Leyden solicited him to fill the medical chair, at that time vacant. Such an honourable testimony of respect, from a foreign nation, and from such an univeristy, cannot perhaps be produced in the medical biography of Great Britain. The lure of such characters reflects honour on their profession, and on the country which has the good fortune of giving them birth; and forces to give the individuals of that country not only a useful elevation in their own eyes, but in those all of the rest of the world. Dr Pitcairne's well known political principles excluded him from public honours and promotion at home; he therefore accepted the invitation from abroad; and, on the 26th of April 1692, delivered, at Leyden, his elegant and masterly inaugural oration: Oration qua offentitur medicinam ab omni philosophorum sefta efta ad hanc. In this he clears medicine from the rubbish of the old philosophy; separates it from the influence of the different sects; places it on the broad and only sure foundation of experience; shows how little good inquiries into the manner how medicines operate have done to the art; and demonstrates the necessity of a judicious attention to their effects, and to the various appearances of disease.

Nothing (says an elegant panegyrist* of our author) marks a superiority of intellect so much as the congenial rage requisite to stem a torrent of obliquely prevailing and groundless opinions. For this the genius and talents of Pitcairne were admirably adapted; and, in his oration, he displays them to the utmost. It was received with the highest commendations; and the address for the yearly miniaturists, to testify their sense of such an acquisition 1781; from which performance the present article is chiefly extracted to answer the most sanguine expectations. He treated with a perplicity and eloquence which met universal applause. Independently of the encomiums of Boerhaave and Mead, who were his pupils, the numerous manuscript copies of his lectures, and the mutilated specimine of them which found its way Elements into the world without his knowledge, show how justly the medical profession, within the same frame, he was not more celebrated as a professor than as a practical physician; and notwithstanding the multiplicity of his labours in both these characters, he found leisure to publish several treatises on the circulation, and some other of the most important parts of the animal economy.

At the close of the session he set out for Scotland, with an intention of returning in time for the succeeding one. On his marrying(a) the daughter of Sir Archibald...
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The only one on which they have been solicituous to interfere with, was Pitcairne. With the utmost regret. He even declined the most flattering solicitations and tempting offers to settle in London. Indeed he soon came into that extensive practice to which his abilities intituled him, and was also appointed titular professor of medicine in the university of Edinburgh.

The uniformity of a professional life is seldom interrupted by incidents worthy of record. Specimens, however, of that brilliant wit which he delighted his friends in the hours of his leisure, continue to entertain us (c); and the effects of that eminent skill which he exerted in the cure of disease, still operate to the good of posterity.

The discovery of the circulation, while in some measure it exploded the chemical and Galenical doctrines, tended to introduce mathematical and mechanical reasoning in their stead. Of this theory (u) Dr Pitcairne was the principal supporter, and the first who introduced it into Britain. A mathematical turn of mind, and a wish for mathematical certainty in medicine, biased him in its favour, and he pushed it to its utmost extent. One is at a loss whether morti to admire or regret such a waste of talents in propping a theory which, though subversive of former ones, was pitcairne.

(c) Vide Pitcairii Poemata.—Several of his poems, however, are obscure, and some of them totally unintelligible without a key. In those of them which are of a political kind, he wished not to express himself too clearly; and in others, he alludes to private occurrences which were not known beyond the circle of his companions. His poem (Ad Lindeum), addresed to his friend Lindley, is commented on by the authors of the Biographia Britanica; and it is to be regretted that it is the only one on which they have been solicitous to throw light. “Some parts (say they) of this poem, are hardly intelligible, without knowing a circumstance in the Doctor’s life, which he often told, and never without some emotion. It is a well known story of the two Platonic philosophers, who promised one another, that whichever died first should make a visit to his surviving companion. This story being read by Mr. Lindley and our author together, they, being both then very young, entered into the same engagement. Soon after, Pitcairne, at his father’s house in Fife, dreamed one morning that Lindley, who was then at Paris, came to him, and told him he was not dead, as was commonly reported, but still alive, and lived in a very agreeable place, to which he could not yet carry him. By the course of the post news came of Lindley’s death, which happened very suddenly the morning of the dream. When this is known, the poem is easily understood, and shews with no common degree of beauty.

Lyndesi f’ Stygias jamdum vesce per undas,
Stagnaque Cocyi non adeunda mihi;
Excute paulisper Lethaei vincta formam,
Ut feriant animum carmina nostra tuum.
Te nobis, te reddite tubis, promissa daturns
Gaudia; fed praevo fis comitante redux:
Namque novos viros mutataque regna videbis,
Paffaque Teutonicas sceptra Britannis manus.

He then proceeds to exclaim against the principles and practices which produced this Teutonic violence upon the British sceptre; and concludes with a wish, that Lindley might bring Rhadamantus with him to punish them.

Unus abeit feecerum vindex Rhadamantus; amice,
Dic faciant reditus fit comes ille tui!

Every one sees how much keener an edge is given to the satire upon the revolution, by making it an additional reason for his friend’s keeping his promise to return him a visit after his death.”

(u) See the article Physiology, No. 7—14.
(s) Pitcairii Dissertationes, Edin. edit. 1713. De opera quam准确 corpora acid vel alkalica in curacione morborum.

(r) De circulatione sanguinis per vas minimi.
PITCAITHLY. See PITCAITHLY.

PITCH, a tenacious oily substance drawn chiefly from pines and firs, and used in shipping, medicine, and various arts: or it is more properly tar infuriated by boiling it over a slow fire. See TAR.

Pfitz. PITCH. See PETROLEUM.

PITCHING, in sea-affairs, may be defined the vertical vibration which the length of a ship makes about her centre of gravity; or the movement by which the planks her head and after-part alternately into the hollow of the sea. This motion may proceed from two causes: the waves which agitate the vessel, and the wind upon the sails, which makes her floor to every blast thereof. The first absolutely depends upon the agitation of the sea, and is not susceptible of inquiry; and the second is occasioned by the inclination of the masts, and may be submitted to certain established maxims.

When the wind acts upon the sails, the mast yields to its effort, with an inclination which increases in proportion to the length of the mast, to the augmentation of the wind, and to the comparative weight and distribution of the ship's lading.

The repulsion of the water, to the effort of gravity, opposes itself to this inclination, or at least sustains it, by as much as the repulsion exceeds the momentum, or absolute effort of the mast, upon which the wind operates. At the end of each blast, when the wind suspends its action, this repulsion lifts the vessel; and these successive inclinations and repulsions produce the movement of pitching, which is very inconvenient; and, when it is considerable, will greatly retard the course, as well as endanger the mast, and strain the vessel.

PITH, in vegetation, the soft spongy substance contained in the central parts of plants and trees.* See Plant.

PITHEO, (fab. ill.) the goddess of persuasion among the Romans. She was supposed to be the daughter of Mercury and Venus, and was represented with a diadem on her head, to intimate her influence over the hearts of man. One of her arms appeared raised as in the attitude of an orator haranguing in a public assembly; and with the other she holds a thunderbolt and letters, made with flowers, to signify the powers of reasoning and the attractions of eloquence. A caduceus, as a symbol of persuasion, appears at her feet, with the writings of Demosthenes and Cicero, the two most celebrated among the ancients, who understood how to command the attention of their audience, and to rouse and animate their various passions.—A Roman countess. She received this name on account of the allurements which her charms possessed, and of her winning expressions.

PITHOM,
Pithom, one of the cities that the children of Israel built for Pharaoh in Egypt (Exod. i. 11.) during the time of their servitude. This is probably the same city with Pithomos mentioned by Herodotus, which he places upon the canal made by the kings Necho and Darius to join the Red sea with the Nile, and by that means with the Mediterranean. We find also in the ancient geographers, that there was an arm of the Nile called Pathmaticus, Phaitnicus, Phaitinicus, or Phaitinicus. Bochart says, that Pithom and Raamses are about five leagues above the division of the Nile, and beyond this river: but this assertion has no proof from antiquity. This author contends himself with relating what was said of Egypt in his own time. Marmar will have Pithom to be the same as Pelusium or Damietta.

Pithou or Pithoues (Peter), a Frenchman of great literary eminence, was defended from an ancient and noble family in Normandy, and born at Troyes in 1539. His taste for literature appeared very early, and his father cultivated it to the utmost. He first studied at Troyes, and was afterwards sent to Paris, where he became first the scholar, and then the friend, of Turnebus. Having finished his pursuits in languages and the belles lettres, he was removed to Bourges, and placed under Cujacius in order to study civil law. His father was well skilled in this profession, and has left no inconsiderable specimen of his judgment in the advice he gave his son with regard to acquiring a knowledge of it; which, was not to spend his time and pains upon voluminous and barren commentators, but to confine his reading chiefly to original writers. He made so rapid a progress, that at seventeen he was able to speak extemporarily upon the most difficult questions; and his master was not ashamed to own, that even himself had learned some things of him. Cujacius afterwards removed to Valence; and Pithoues followed him, and continued to profit by his lectures till the year 1560. He then returned to Paris, and frequented the bar of the parliament there, in order to join practical forms and usages to his theoretic knowledge.

In 1563, being then 24, he published Adversaria Subscientum, a work highly applauded by Turnebus, Lipfius, and other learned men; and which laid the foundation of that great and extensive fame he afterwards acquired. Soon after this, Henry III. advanced him to some considerable posts; in which, as well as at the bar, he acquitted himself most honourably. Pithoues being a Protestant, it was next to a miracle that he was not involved in the terrible massacre of St Bartholomew in 1572; for he was at Paris where it was committed, and in the same lodgings with several Huguenots, who were all killed. It seems indeed to have frightened him out of his religion; which having, according to the custom of converts, examined and found to be erroneous, he soon deserted, and openly embraced the Catholic faith. He afterwards attended the duke of Montmorency into England; and on his return, from his great wisdom, good nature, and amiable manners, he became a kind of oracle to his countrymen, and even to foreigners, who consulted him on all important occasions: an instance of which we have in Ferdinand the Grand Duke of Tuscany, who not only consulted him, but even submitted to his determination in a point contrary to his interests. Henry III. and IV. were greatly obliged to him for combating the League in the most intrepid manner, and for many other services, in which he had recourse to his pen as well as to other means.

Pithoues died upon his birth-day in 1596, leaving behind him a wife whom he had married in 1579, and some children. Thunus says he was the most excellent and accomplished man of the age in which he lived; and all the learned have agreed to speak well of him. He collected a very valuable library, containing a variety of rare manuscripts, as well as printed books; and he took many precautions to hinder its being dispersed after his death, but in vain. He published a great number of works upon law, history, and classical literature; and he gave several new and correct editions of ancient writers. He was the first who made the world acquainted with the Fables of Phedrus: which, together with the name of their author, were utterly unknown and unheard of, till published from a manuscript of his.

Pitiscus (Samuel), a learned antiquary, born at Zutphen, was rector of the college of that city, and afterwards of St Jerome at Utrecht, where he died on the 9th of February 1575, aged 92. He wrote, 1. Lexicon Antiquitatum Romanarum, in two volumes folio; a work which is esteemed. 2. Editions of many Latin authors, with notes; and other works.

Pitkeathly, or Pitcaithly, is the name of an estate in Strathern in Scotland, famous for a mineral spring. An intelligent traveller gives the following account of it. "The situation of the mineral spring at Pitcaithly, the efficacy with which its waters are said to operate in the cure of the diseases for which they are used, and the accommodations which the neighbourhood affords, are all of a nature to invite equally the sick and the healthy. Two or three houses are kept in the style of hotels for the reception of strangers. There is no long-room at the well; but there are pleasant walks through the adjoining fields. Good roads afford easy access to all the circumjacent country. This delightful tract of Lower Strathern is filled with houses and gardens, and situations from which wide and delightful prospects may be enjoyed; all of which offer agreeable points to which the company at the well may direct their attention; conversation, music, dances, whist, and that best friend to elegant, lively, and social converse, the tea-table, are sufficient to prevent the afternoons from becoming languid: and in the evenings nothing can be so delightful as a walk when the setting sun sheds a soft slanting light, and the dew has just not begun to moisten the grass. Thus is Pitcaithly truly a rural watering-place. The company cannot be at any one time more in number than two or three families. The amusements of the place are simply such as a single family might enjoy in an agreeable situation in the country; only the society is more diversified by the continual change and fluctuation of the company." See Mineral Waters, p. 55.

Pitot (Henry), of a noble family in Languedoc, was born at Aramont in the diocese of Uzès, on the 29th of May 1695; and died there on the 27th of December 1771, aged 76. He learned the mathematics without a master, and went to Paris in 1718, where he formed a close friendship with the illustrious

Pitoues
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Reaumur. In 1754, he was admitted a member of the Royal Academy of Sciences at Paris, and in a few years rose to the degree of a pensioner. Besides a vast number of Memoirs printed in the collection of that society, he published in 1731 the Theory of the Working of Ships, in one volume 4to; a work of considerable merit, which was translated into English, and made the author be admitted into the Royal Society of London. In 1740, the plates general of Languedoc made choice of him for their chief engineer, and gave him at the same time the appointment of inspector general of the canal which unites the two seas. That province is indebted to him for several monuments of his genius, which will transmit his name with laurels to posterity. The city of Montpellier being in want of water, Pitot brought from the distance of three leagues a boat brought from the distance of three leagues

The illustrious marshal de Saxe was the great patron and friend of Pitot, who had taught this hero the mathematics. In 1754 he was honoured with the order of St Michael. In 1733 he married Maria-Leonina Pharambier de Saballoua, descended of a very ancient noble family of Navarre. By this marriage he had only one son, who was first advocate-general of the Court of Accounts, Aids, and Finances of Montpellier. Pitot was a practical philosopher, and a man of uncommon probity and candour. He was also a member of the Royal Society of Sciences of Montpellier; and his eulogium was pronounced in 1772 by M. de Ratte perpetual secretary, in presence of the princes of Languedoc; as it likewise was at the Royal Academy of Sciences of Paris by Abbé de Touchi, who was then secretary.

PITTS (John), the biographer, was born in 1560, at Aldborough in the borough of Old Sarum, and educated at Wykham's school, near Winchester, till he was about 18 years of age; when he was sent to New-college in Oxford, and admitted probationer fellow. Having continued in that university not quite two years, he left the kingdom as a voluntary Romish exile, and retired to Douay; thence he went to the English college at Rheims, where he remained about a year; and then proceeded to Rome, where he continued a member of the English college near seven years, and was made a priest. In 1589 he returned to Rheims; and there, during two years, taught rhetoric and the Greek language. He now quitted Rheims on account of the civil war in France; and retired to Pont à Mousson in Lorraine, where he took the degrees of master of arts and bachelor in divinity. Hence he travelled into Germany, and refided a year and a half at Trier, where he commenced licentiate in his faculty. From Trier he visited several of the principal cities in Germany; and continuing thence to Bavaria, he obtained the degree of doctor in divinity. Thence having made the tour of Italy, he returned once more to Lorraine; where he was patronised by the cardinal of that duchy, who preferred him to a canonry of Verdun; and about two years after he became confessor to the duchess of Cleves, daughter to the duke of Lorraine. During the leisure he enjoyed in this employment, he wrote in Latin the lives of the kings, bishops, apostolical men, and writers of England. The last of these, commonly known and quoted by this title, De illustribus Angliae scriptoribus, was published after his death. The three first remain still in manuscript among the archives of the collegiate church of Liver-}

The duke of Cleves dying after Pitt had been about twelve years confessor to the duchess, she returned to Lorraine, attended by our author, who was promoted to the deanship of Liverdun, which, with a canonry and officialship, he enjoyed to the end of his life. He died in 1616, and was buried in the collegiate church. Pitt was undoubtedly a scholar, and not an inelegant writer; but he is justly accused of ingratitude to Bale, from whom he borrowed his materials, without acknowledgment. He quotes England with great familiarity, without ever having seen his book: his errors are innumerable, and his partiality to the Romish writers most obvious; nevertheless we are obliged to him for his account of several popish authors, who lived abroad at the beginning of the Reformation.

PITT (Christopher), an eminent English poet, celebrated for his excellent translation of Virgil's Æneid, was born in the year 1699. Having studied four years at New-college, Oxford, he was presented to the living of Pimperne in Dorsetshire, which he held during the remainder of his life. He had so poetical a turn, that while he was a school-boy he wrote two large folios of manuscript poems, one of which contained an entire translation of Lucan. He was much esteemed while at the university; particularly by the celebrated Dr Young, who used familiarly to call him his fon. Next to his fine translation of Virgil, Mr Pitt gained the greatest reputation by his excellent English translation of Vida's art of poetry. This amiable poet died in the year 1648, without leaving, it is said, one enemy behind him.

PITT (William), earl of Chatham, a most celebrated British statesman and patriot, was born in November 1708. He was the youngest son of Robert Pitt, Esq; of Boscrook in Cornwall; and grandson of Thomas Pitt, Esq; governor of Fort St George in the East Indies, in the reign of queen Anne, who sold an extraordinary fine diamond to the king of France for 135,000l. and thus obtained the name of Diamond Pitt. His intellectual faculties and powers of eloquence very soon made a distinguished appearance; but at the age of 16 he felt the attacks of an hereditary and incurable gout, by which he was tormented at times during the rest of his life.

His lordship entered early into the army, and served in a regiment of dragoons. Through the interest of the duchess of Marlborough he obtained a seat in parliament before he was 21 years of age. His first appearance in the house was as representative of the borough of Old Sarum, in the ninth parliament of Great Britain. In the 10th he represented Seafor, Aldborough in the 11th, and the city of Bath in the 12th; where he continued till he was called up to the house of peers in 1766. The intention of the duchess in bringing him thus early into parliament was to oppose Sir Robert Walpole, whom he kept in awe by the force of his eloquence. At her death the duchess left him 10,000l. on condition, as was then reported, that he never should receive a place in administration. However,
However, if any such condition was made, it certainly was not kept on his lordship's part. In 1746 he was appointed vice-treasurer of Ireland, and soon after paymaster general of the forces, and sworn a privy-councillor. He discharges the office of paymaster with such honour and indefatigable integrity, refusing even many of the perquisites of his office, that his bitterest enemies could lay nothing to his charge, and he soon became the darling of the people. In 1755 he resigned the office of paymaster, on seeing Mr Fox preferred to him. The people were alarmed at this resignation; and being dignityed with the unsuccessful beginning of the war, complained so loudly, that, on the 4th of December 1756, Mr Pitt was appointed secretary of state in the room of Mr Fox afterwards Lord Holland; and other promotions were made in order to second his plans. He then took such measures as were necessary for the honour and interest of the nation; but in the month of February 1757, having refused to attend the carrying on a war in Germany for the sake of his majesty's dominions on the continent, he was deprived of the seals on the 7th of April following. Upon this the complaints of the people again became so violent, that on the 29th of June he was again appointed secretary, and his friends filled other important offices. The successes with which the war was now conducted was universally known; yet on the 7th of October 1761, Mr Pitt, to the astonishment of almost the whole kingdom, resigned the seals into his majesty's own hands. The reason of this was, that Mr Pitt, having received certain intelligence that the family-compact was signed between France and Spain, and that the latter was about to join France; commencing this opinion in the privy council, the other members of this board are of a different opinion, this war is determined to leave Spain, and that the latter was about to join France. However, though he may possibly have forgotten that at this board he is responsible only to Mr Pitt, having received certain intelligence that the king was resolved to leave Spain, and that the latter was about to join France; commencing this opinion in the privy council, the other members of this board are of a different opinion, this war is determined to leave Spain, and that the latter was about to join France. However, though he may possibly have forgotten that at this board he is responsible only to Mr Pitt, having received certain intelligence that the king was determined to leave Spain, and that the latter was about to join France; commencing this opinion in the privy council, the other members of this board are of a different opinion, this war is determined to leave Spain, and that the latter was about to join France.

When he talks of being responsible to his lordship in the measure he proposes. "I desire, Mr Wood, that you will immediately go to Lord Anson; you need not trouble yourself to search the admiralty, he is not to be found there; you must pursue him to the gaming house, and tell him from me, that if he does not obey the orders of government which he has received at my hands, that I will most assuredly impeach him. Proceed from him to Lord Ligonier; and though he should be lettered with harlots, undraw his curtains, and repeat the same message. Then direct your course to Sir Charles Frederick, and assure him, that if his majesty's orders are not obeyed, they shall be the last which he shall receive from me." In consequence of these commands, Mr Wood proceeded to White's, and told his errand to the first lord of the admiralty; who informed the secretary of state was out of his senses, and it was impossible to comply with his wishes: "however, (added he), as madmen must be answered, tell him that I will do my utmost to satisfy him." From thence he went to the commander in chief of the forces, and delivered the same message. He also said that it was an impossible business; "and the secretary knows it, (added the old lord): nevertheless, he is in the right to make us do what we can; and what is possible to do, inform him, shall be done." The surveyor general of the ordnance was next informed of Mr Pitt's resolution; and, after some little consideration, he began to think that the orders might be complied with in the time prescribed. The consequence at last was, that every thing, in spite of impossibilities themselves, was ready at the time appointed. After his resignation in 1761, Mr Pitt never had any share in administration. He received a pension of £600 a year, to be continued after his decease, during the survivancy of his lady and son; and this grant was dignified with the title of Baron of Chatham to his lady, and that of Baron to her heirs male. Mr Pitt at that time declined a title of nobility; but in 1766 accepted of a peerage under the title of Baron Pynsent and Earl of Chatham, and at the same time he was appointed lord privy-seal.

This acceptance of a peerage proved very prejudicial to his lordship's character. However, he continued steadfast in his opposition to the measures of administration. His last appearance in the House of Lords was on the 2d of April 1778. He was then very ill and much debilitated: but the question was important, being a motion of the duke of Richmond to address his majesty to remove the ministers, and make peace with America on any terms. His lordship's impetuous temper of this minister. However, these very qualities were sometimes productive of great and good consequences, as appears from the following anecdote.

Preparatory to one of the secret expeditions during the war which ended in 1763, the minister had given orders to the different prefiding officers in the military, navy, and ordnance departments, to prepare a large body of forces, a certain number of ships, and a proportionable quantity of stores, &c. and to have them all ready against a certain day. To these orders he received an answer from each of the offices, declaring the total impossibility of a compliance with them. Notwithstanding it was then at a very late hour, he sent immediately for his secretary; and after expressing his resentment at the ignorance or negligence of his majesty's servants, he gave the following commands:

"I desire, Mr Wood, that you will immediately go to Lord Anson; you need not trouble yourself to search the admiralty, he is not to be found there; you must pursue him to the gaming house, and tell him from me, that if he does not obey the orders of government which he has received at my hands, that I will most assuredly impeach him. Proceed from him to Lord Ligonier; and though he should be lettered with harlots, undraw his curtains, and repeat the same message. Then direct your course to Sir Charles Frederick, and assure him, that if his majesty's orders are not obeyed, they shall be the last which he shall receive from me." In consequence of these commands, Mr Wood proceeded to White's, and told his errand to the first lord of the admiralty; who informed the secretary of state was out of his senses, and it was impossible to comply with his wishes: "however, (added he), as madmen must be answered, tell him that I will do my utmost to satisfy him." From thence he went to the commander in chief of the forces, and delivered the same message. He also said that it was an impossible business; "and the secretary knows it, (added the old lord): nevertheless, he is in the right to make us do what we can; and what is possible to do, inform him, shall be done." The surveyor general of the ordnance was next informed of Mr Pitt's resolution; and, after some little consideration, he began to think that the orders might be complied with in the time prescribed. The consequence at last was, that every thing, in spite of impossibilities themselves, was ready at the time appointed. After his resignation in 1761, Mr Pitt never had any share in administration. He received a pension of £600 a year, to be continued after his decease, during the survivancy of his lady and son; and this grant was dignified with the title of Baron of Chatham to his lady, and that of Baron to her heirs male. Mr Pitt at that time declined a title of nobility; but in 1766 accepted of a peerage under the title of Baron Pynsent and Earl of Chatham, and at the same time he was appointed lord privy-seal.

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ship made a long speech, which had certainly overcome his spirits: for, attempting to rise a second time, he fell down in a convulsive fit; and though he recovered for that time, his disorder continued to increase till the 11th of May, when he died at his seat at Hayes. His death was lamented as a national loss. As soon as the news reached the homes of commons, which was then sitting, Colonel Barré made a motion, that an address should be presented to his majesty, requesting that the Earl of Chatham should be buried at the public expense. But Mr Rigby having proposed the setting up of a statue to his memory, as more likely to perpetuate the sense of his great merits entertained by the public, this was unanimously carried. A bill was soon after passed, by which 4000L a-year was settled upon John, now Earl of Chatham, and the heirs of the late earl to whom that title may descend.—His lordship was married in 1754 to Lady Helen, sister to the earl of Temple; by whom he had three sons and two daughters.

Never perhaps was any life so multifarious as that of Lord Chatham; never did any comprise such a number of interesting situations. To bring the scattered features of such a character into one point of view, is an arduous task. The author of the history of his life has attempted to do it; and with the outlines of what he has laid in summing up his conduct, of this wonderful man. ed at the impoffible

"Patriotism was also the source of some of his im-

"His eloquence was of the Life of William Pitt, Earl of Chat-

"The author of the Life of William Pitt, Earl of Chat-

Once, however, in the enthusiasm of admiration, we can find room for the frigidity of criticism, his action seemed the most open to objection. It was forcible, uniform, and ungraceful. In a word, the most celebrated orators of antiquity were in great measure the children of labour and cultivation. Lord Chatham was always natural and himself.

To the misfortune of the republic of letters, and of poerity, his lordship never fought the prefix. Lord Chetfield says, "that he had a most happy turn for poetry: but it is more than probable that Chetfield was deceived; for we are told by his biographer that his verses to Garrick were very meagre, and Lord Chatham himself said that he seldom indulged and seldom avowed it. It should seem, then, that he himself set no great value upon it. Perhaps a proper confidence in one's self is essential to all extraordinary merit. Why should we ambitiously ascribe to one mind every species of human excellency? But though he was no poet, it is more than probable, that he would have excelled as much in writing prose as he did in speaking it.

PITTACUS, a native of Mitylene in Lesbos, was one of the seven wise men of Greece: his father's name was Hyrradius. With the affilience of the sons of Alexus, he delivered his country from the opprobrium of the tyrant Melancharus; and in the war which the Athenians waged against Lesbos, he appeared at the head of his countrymen, and challenged the single combat Phrynem the enemy's general. As the event of the war seemed to depend upon this combat, Pittacus had recourse to artifice; and when he engaged, he entangled his adversary in a net which he had concealed under his shield, and easily dispatched him. He was amply rewarded for this victory; and his countrymen, sensible of his merit, unanimously appointed him governor of their city with unlimited authority. In this capacity Pittacus behaved with great moderation and prudence; and after he had governed his fellow-citizens with the strictest justice, and after he had established and enforced the most salutary laws, he voluntarily resigned the sovereign power after having enjoyed it for 10 years, observing that the virtues and innocence of private life were incompatible with the power and influence of a sovereign. His disinterestedness gained him many admirers; and when the Mitylenians wished to reward his public services by presenting him with an immense tract of territory, he refused to accept more land than what should be contained in the distance to which he could throw a javelin. He died in the 70th year of his age, about 379 years before Christ, after he had spent the last 10 years of his life in literary ease and peaceful retirement.

The following maxims and precepts are ascribed to Pittucus: The first office of prudence is to foresee threatening misfortunes, and prevent them. Power discovers the man. Never talk of your schemes before they are executed; lest, if you fail to accomplish them, you be exposed to the double mortification of disappointment and ridicule. Whatever you do, do it well. Do not that to your neighbour which you would not take ill from him. Be watchful for opportunities.

Many of his maxims were inscribed on the walls of Apollo's temple at Delphi, to show to the world how great an opinion the Mitylenians entertained of his abilities as a philosopher, a moralist, and a man. By one of his laws, every fault committed by a man when intoxicated deferred double punishment.

PITTENWEEM, a small town situated on the Firth of Forth, towards the eastern extremity of the county of Fifeshire in North Britain. It takes its name from a small cove in the middle of it, and is remarkable for nothing but the ruins of a religious house, which is sometimes called a cloister, and sometimes a priory. Which of these is the proper denomination it is hardly worth while to inquire; but it appears from the arms of the monastery, still preserved over the principal gate, that the superior, by whatever title he was called, had the privilege of wearing a mitre. This edifice, which seems never to have been large, was, with other monuments of mistaken piety, alienated from the church at the Reformation; and what parts of it now remain are put to very different uses. Some of the cells of the monks furnish habitations tolerably convenient for the servants of him who, in the changeless change of property, has got possession of the lands which formerly belonged to them. That which seems to have been the granary is a decent parish church. The porch of the church, the only part of that building which exists, has been alternately employed as a stable and a slaughterhouse; and the meat killed there has been commonly exposed to sale in the lower part of the steeple of that edifice which is now directly devoted to the offices of parochial devotion. Had the moralizing traveller * Johnstone, who compos'd the beautiful and pathetic meditation on the ruins of Iona, confecrated to visit Pit­tenweem, he would not have viewed the abbey without emotion. Insignificant as the place at present is, it seems to have been of some consequence in the last century; and we are led to infer, from the following extract from the records, that the inhabitants were opulent, and that the town was fortified.

"Pittenweem, decimo-quarto Feb. 1651. The bailies and council being convened, and having received information that his majesty is to be in progress with his court along the coast to-morrow, and to stay at An­frutherford house that night, have thought it expedient, according to their bounden duty, with all reverence and due respect, and with all the same solemnity they can, to wait upon his majesty, as he comes through this his majesty's burgh, and invite his majesty to eat and drink as he pleases; and for that effect hath ordained, that the morrow afternoon the town's colours be put upon the belf of the steeple, and that at three o'clock the bells begin to ring, and ring on till his majesty comes hither, and pleases to Anfrutherford. And fiklike, that the minister be spoken to, to be with the bailies and council, who are to be in their belted apparel, and with them a guard of 24 of the ablest men, with pata­rones, and other 24 with muskets, all in their belted apparel, William Sutherland commanding as captain of the guard; and to wait upon his majesty, and to receive his highness at the West Port, bringing his majesty and court through the town, until they come to Robert Smith's yeet, where an table is to be covered with my Lord's + belt carpet: and that George + The Earl Hetherwick have in readiness, of fine flour, some great of Kelly, buns, and other wheaten-bread of the belt order, baken with

* Johnstone
+ The Earl
with sugar, cannon, and other spices fitting; and that James Richardson and Walter Airth have care to have ready eight or ten gallons of good strong ale, with Canary, Jack, Rhenish wine, tent, white and claret wines, that his majesty and his court may eat and drink; and that in the mean time, when his majesty is present, the guard do diligently attend about the court; and so soon as his majesty is to go away, that a flag be made to Andrew Tod, who is appointed to attend the colours on the fleape head, to the effect he may give sign to those who attend the cannon of his majesty's departure, and then the hail thirty-five cannons to be all shot at once. It is also thought fitting, that the minister, and James Richardson the oldest bailie, when his majesty comes to the table, show the great joy and fans this burgh has of his majesty's condescension to visit the same, with some other expressions of loyalty. All which was acted."

PITITOSPORUM, in botany; a genus of the monogynia order, belonging to the pantandria clafs of plants. The calyx is pentaphyllous, inferior and deciduous. The petals are five in number; this fyle thread shaped; the capsule somewhat angular, trilocular, and contains three or four angulated seeds, adhering to the capsule by means of a liquid resin in the loculaments. Of this there are three species, viz. 1. Tenusfutum. 2. Umbel- latum. 3. Coriaceum. The fift and second are natives of the Cape of Good Hope; the third grows in Madeira, and flowers in May and June.

PITUITARY GLAND. See Anatomy, p. 758.

PITYOCAMPASIS, in entomology, the caterpillar of the pine-tree, received its compound name from that substance. It was considered as a poison, and as a remedy, according to its different employment; but our chief information is derived from M. Reaumur, who has attentively observed its manner of life. The animal cannot bear much cold, and is therefore never found in the higher latitudes. It is fyled procellaneous, because it never leaves its hold, where many families reside, till the evening when it feeds in trains, led on by two or three, and this train leaves a ribbon of silk in its way for those behind follow exactly the steps of those which preceded, and each leaves its fibre of silk. Their nests are found in autumn; they are born the middle of September, become torpid in December, and recover their strength again in spring. They then descend from the trees, plunge into the earth, and undergo their last change. It is the bombix pityocampa of Fabricius, (Mantila Inferiana. tom. ii. p. 114. no 66.), and greatly resembled the procellaneous caterpillar of the oak. The ancients used it as a venificatory, and the acri- mony seems to refuse chiefly in a dust which is concealed in receptacles on its back. This is its offensive weapon, for it is thrown out at will, and produces very troublesome effects, though the hair of the animal and every part of its body seem to have a similar, but weaker power. The effect is also weaker in winter; but this may depend on the diminished irritability of the human body, as well as on the torpid state of the insect. Their silk is not sufficiently strong for the loom, and in hot water melts almost to a paste. In the earth it forms nests of stronger silk, but it is then found with difficulty; in boxes its silk is extremely tender. Adding to all these inconveniences, handling the cones produces all the bad effects of the dust. Matthiolus recommends them as a flyptic, and perhaps they may serve for burning on the skin instead of mora, the downy silk of a species of artemisia. The ancients, afraid of its hurtful qualities, used them with caution, and enacted laws against their being fold promiscuously; the modern planter is chiefly afraid of them because they destroy the beauty of his trees, and he endeavours to collect the eggs by cutting off the branches, which are burnt immediately.

PIVAT, or Pivot, a foot or shoe of iron or other metal, usually conical or terminating in a point, whereby a body, intended to turn round, bears on another fixed at refi, and performs its revolutions. The pivot usually bears or turns round in a hole, or piece of iron or brass hollowed to receive it.

PIUS II. (Eneas-Sylvius Piccolomini,) was born on the 18th of October 1405 at Corfigni in Sienae, the name of which he afterwards changed into that of Pius. His mother Victoria Forteguerra, when she was with child of him, dreamed that she should be delivered of a mitred infant; and as the way of degrading clergymen at that time, was by crowning them with a paper mitre, she believed that Eneas would be a disgrace to his family. But what to her had the appearance of being a disgrace, was a preface of the greatest honours. Eneas was carefully educated, and made considerable proficiency in the belles lettres. After having finished his studies at Sienna, he went in 1431 to the council of Bale with Cardinal Capraniua, surnamed De Fermo, because he was entrusted with the government of that church. Eneas was his secretary, and was then only 26 years of age. He afterwards acted in the same capacity to some other prelates, and to Cardinal Albergati. The council of Bale honoured him with different commissions, in order to recom-pense him for the zeal with which he defended that assembly against Pope Eugene IV. He was afterwards secretary to Frederic III. who deeded to him the poetical crown, and sent him Ambaialador to Rome, Milan, Naples, Bohemia, and other places. Nicolas V. advanced him to the bishopric of Trieste, which he quitted some time after for that of Sienna. At last, after having distinguished himself in various municiiates, he was invested with the Roman purple by Calixtus III. whom he succeeded two years after on the 27th of August 1458. Pius II. now advanced to the holy see, made good the proverb, Honoris mutandos mores. From the commencement of his pontificate, he appeared jealous of the papal prerogatives. In 1460 he issued a bull, "declaring appeals from the pope to a council to be null, erroneous, detestable, and contrary to the sacred canons." That bull, however, did not prevent the procurator-general of the parliament of Paris from appealing to a council in defence of the Pragmatic sanction, which the pope had strenuously opposed. Pius was then at Mantua, whither he had gone in order to engage the Catholic princes to unite in a war against the Turks. The greater part of them agreed to furnish either troops or money; others refused both, particularly the French, who from that moment incurred his holiness's aversion. That aversion abated under Louis XI. whom he prevailed in 1461 to abolish the Pragmatic sanction, which the parliament of Paris had supported with so much vigour.

The following year, 1462, was rendered famous by уч.
a controversy which took place between the Cordeliers and Dominicans, whether or not the blood of Jesus Christ was separated from his body while he lay in the grave. It was also made a question whether it was separated from his divinity. The Cordeliers affirmed that it was, but the Dominicans were of an opposite opinion. They called each other heretics; which obliged the pope to issue a bull, forbidding them under pain of excommunication to brand one another with such odious epithets. The bull which his holiness published on the 26th of April, retracted what he had written to the council of Bale, when he was its secretary, and did not redound much to his honour. "I am a man (says he), and as a man I have erred. I am far from denying that a great many things which I have said and written may deserve condemnation. Like Paul, I have preached through deception, and I have perverted the church of God through ignorance. I imitate the blessed Augustin, who having suffered some erroneous sentiments to creep into his works, retracted them. I do the same thing; I frankly acknowledge my ignorances, from a fear lest what I have written in my younger years should be the occasion of any error that might afterwards be prejudicial to the interests of the holy see.

For if it be proper for any one to defend and support the eminence and glory of the first throne of the church, it is in a peculiar manner my duty, whom God, out of his mercy and goodness, made whole from a fear lest what I have written in my younger years, through ignorance, I imitate the blessed Augustin, who having suffered some erroneous sentiments to creep into his works, retracted them. I do the same thing; I frankly acknowledge my ignorances, from a fear lest what I have written in my younger years should be the occasion of any error that might afterwards be prejudicial to the interests of the holy see. It is true that the editor of the bull, editing the life of the pope, placed it in the folio of 1477, in folio, in which are found some curious anecdotes. The memoirs of his own life, published by John Gobelin, his secretary, and printed at Rome in 1474, there is no doubt of the being the genuine production of that pontiff. The history of Frederic III. whole vice-chancellor he had been. This performance was published in 1785 in folio, and is believed to be pretty accurate and very particular. A treatise on the education of children. A poem upon the passion of Jesus Christ. A collection of 432 letters, printed at Milan, 1473, in folio, in which are found some curious anecdotes. The memoirs of his own life, published by John Gobelin, his secretary, and printed at Rome in 1474, there is no doubt of the being the genuine production of that pontiff.

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tle time after, on the 9th of December 1567, aged 66 years, carrying to the grave with him the hatred of the Romans, whom his severities had exasperated. He was a man of great address, and very fruitful in his resources. He adorned Rome with several public edifices; but these ornaments tended greatly to impoverish it. If he was the instrument of raising his relations in the world, it must be allowed, at least, that the greater part of them did him honour.

Pius V. (S. Michael Chiifferi), born at Bofchi or Boftco, in the diocese of Fortoná, on the 17th of January 1504, was, according to Abbé de Choisy, son to a family of Milan. He was a Dominican friar. Paul IV. informed of his merit and virtue, gave him the bishopric of Sutri, created him cardinal in 1557, and made him inquisitor-general of the faith among the Milanese and in Lombardy; but the severity with which he exercised his office obliged him to quit that country. He was sent to Venice, where the ardour of his zeal met with still greater obstacles. Pius IV. added to the cardinal's hat the bishopric of Mondovi. After the death of that pontiff, he was advanced to St Peter's chair in 1566. The Romans expressed but little joy at his coronation: he was very sensible of it, and said, “I hope they will be as sorry at my death as they are at my election;” but he was mistaken. Railed by his merit to the first ecclesiastical preferment in Christendom, he could not divest himself of the severity of his character; and the situation in which he found himself rendered, perhaps, that severity necessary. One of his first objects was to reprefent the luxury of the clergy, the pride of the cardinals, and the licentious manners of the Romans. He caused the decrees of reformation enacted by the Council of Trent to be put in execution: he prohibited the univerfities from the execution of their acts, or obferved, for instance, 23° 15' : fo is the radius of the sun's circle of longitude cuts: and therefore coincides with the longitude of the fun, planet, or star. As the line of the fun's greatest declination 23° 30': 2s to the line of any prefent declination given or obferved, for instance, 23° 15': fo is the radius of the sun's circle of longitude 81° 52': which, if the declination were north, would give 20° 52' of geometry; if south, 20° 52' of capricorn, for the fun's place. See DECLINATION, &c.

PIZZARRO (Francis), a celebrated Spanish general, the discoverer and conqueror of Peru, in conjunction with Diego Almagro, a Spanish navigator. They are both charged with horrid cruelties to the inhabitants; and they fell victims to their own ambition, jealousy, and avarice. Almagro revolting, was defeated and beheaded by Pizarro, who was assassinated by Almagro's friends in 1541. See PIZZARRO.

PLACE, locus, in philosophy, a mode of space, or that part of immovable space which any body pos­ sesses. See METAPHYSICS, § 185.

PLACE in astronomy. The place of the fun, a star, &c. denotes the sign and degree of the zodiac which the luminary is in; or the degree of the ecliptic, reckoning from the beginning of aries, which the planet or star's circle of longitude cuts: and therefore coincides with the longitude of the sun, planet, or star. As the line of the sun's greatest declination 23° 30': 2s to the line of any prefent declination given or obferved, for instance, 23° 15': fo is the radius of the sun's circle of longitude 81° 52': which, if the declination were north, would give 20° 52' of geometry; if south, 20° 52' of capricorn, for the sun's place. See DECLINATION, &c.

The place of the moon being that part of her orbit wherein she is found at any time, is of various kinds, by reason of the great inequalities of the lunar motions, which render a number of equations and reductions necessary before the juft point be found. The moon's fictitious place is her place once equated; her place nearly true, is her place twice equated; and her true place thrice equated. See ASTRONOMY, paffim.

PLACE, in war, a general name for all kinds of for­tresses.
PLA

Place tresses where a party may defend themselves. Thus, 1. A strong or fortified place is one flanked, and covered with battlements. 2. A regular place, one whose angles, sides, bastions, and other parts, are equal; and this is usually denominated from the number of its angles, as a pentagon, hexagon, &c. 3. Irregular place is one whose sides, and angles are unequal. 4. Place of arms is a strong city or town pitched up for the chief magazine of an army; or, in a city or garrison, it is a large open spot of ground, usually near the centre of the place where the grand guard is commonly kept, and the garrison holds its rendezvous at reviews, and in cafes of alarm to receive orders from the governor. 5. Places of arms of an attack, in a siege, is a spacious place covered from the enemy by a parapet or epaulement, where the soldiers are posted ready to sustain thofe at work in the trenches against the soldiers of the garrison. 6. Place of arms particular, in a garrison, a place near every battalion, where the soldiers fent from the grand place to the quarters assigned them relieve thofe that are either upon the guard or in fight. 7. Place of arms without, is a place allowed to the covert way for the planting of cannon, to oblige thofe who advance in their approaches to retire. 8. Place of arms in a camp, a large place at the head of the camp for the army to be ranged in and drawn up in battalia. There is also a place for each particular body, troop, or company, to assemblie in.

Common-Place. See Common-Place.

PLACENTA, in anatomy and midwifery, a fofl substance which covers the umbilical placenta, and the mouth of the uterus, and during the greater part of pregnancy, it serves to separate the foetus from the mother. It is ufually defcribed as a pentagon, and in cafes of alarm to the archbifhop of Milan. At Vignoli.

The ducal palace, or in Farnese, and dukes of Parma and Placentia. The ducal palace, and the principal street, called Stradone, is 25 common paces broad and 3000 feet long, in a direct line, with 600 fone polis, for separating the foft from the carriage-way, and on both fides are 11 spacious convents. The other buildings of the city are not very remarkable, though it contains 45 churches, 28 convents, and two chansons. The cathedral is pretty much in the Gothic taffe; but the church of the Augustines is reckoned the most beautiful, and esteemed worthy of its archtect, the celebrated Vignoli. The ducale palace, though large, makes no great appearance on the outside; but within are fome good apartments. In the area before the town-houfe stand two admirable brafs statues of Alexander and Renatus IV. both of the house of Farnes, and dukes of Parma and Placentia. The bishop is fuffragan to the archbifhop of Milan. At this city begins the Via A lmilia, which extends as far as Rimini on the Adriatic. The number of the inhabitants is about 30,000, among whom there are 2000 ecclesiastics. This city has been taken several times in the wars of Italy. The king of Sardina took possession of it in 1744, it being ceded to him by the queen of Hungary; but it was taken from him in 1746, after a bloody battle. It has a famous university, and the inhabitants are much esteemed for their politenes. There is a great fair here every year on the 15th of April, which is much frequented. It is about 32 miles north-west of Parma and 83 east of Turin.

E. Long. 10. 24. N. Lat. 45. 5.

PLAGIARY, in philology, the purloining another man’s works, and putting them off as our own. Among the Romans, plagiarus was properly a person who bought, sold, or retained a freeman for a slave; and was so called, because, by the Flavian law, such persons were condemned ad plagum, “to be whipped.”

Thomianus has an express treatise De plagio literario; wherein he lays down the laws and measures of the right which authors have to one another’s writings “Dictionary-writers, at least such as meddle with arts and sciences (as is pertinently observed by Mr Chambers), are exempted from the common laws of nations; yet they do not pretend to set up on their own bottom, nor to treat you at your own cost. Their works are supposed, in great measure, to suffer from other people’s; and what they take from others; they do it avowedly, and in the open face. In effect, their quality gives them a title to every thing that may be, for their purpose, wherever they find it; and if they rob, they do not do it any other way than as the bee does, for the public service. Their occupation is not pillaging, but collecting contributions; and if you ask them their authority, they will produce you the practice of their predecessors of all ages and nations.”

PLAGIUM, in law. See KIDNAPPING.

PLAGUE, Pestilence, or Poisonous Fever, is a very acute, malignant, and contagious disease; being a mortal fever of the worst kind, and seldom failing to prove mortal. Though its generally defined a malignant fever, Diemerbrock thinks they ought to be distinguished, since the fever is not the essence of the disease, but merely a symptom or effect of it. See MEDICINE, vol. 221.

The plague, as is generally agreed, is never bred or propagated in Britain, but always imported from abroad especially from the Levant, Leffer Afia, Egypt, &c. where it is very common. Sydenham has remarked that it rarely infects this country after than once in 40 years, and happily we have been free of it for a much longer period.

Authors are not as yet agreed concerning the nature of this dreadful distemper. Some think that infects are the cause of it, in the same way that they are the cause of blights, being brought in swarms from other climates, by the wind, when they are taken into the lungs in respiration; the confluence of which is, that they mix with the blood and juice, and attack and corrode the viscera. Mr Boyle, on the other hand, thinks it originates from the effluvia or exhalations breathed in the atmosphere, from noxious minerals, to which may be added stagnant waters and putrid bodies of every kind.

Mr Gibbon thinks that the plague is derived from damp, hot, and tortuating air, and the putrefaction of
of animal influences, especially locusts. See Gibbon's Roman History, 4to edit. vol. iv. p. 527—332, where there is also a very particular account of the plague which depopulated the earth in the time of the Emperor Julian.

The Mahometans believe that the plague proceeds from certain spirits, or goblins, armed with bows and arrows, sent by God to punish men for their sins; and that when the wounds are given by the spears of a black colour, they certainly prove fatal, but not so when the arrows are shot by those that appear white. They therefore take no precaution to guard themselves against it. The wise professors of this religion, however, at present abstain from it; for we find a receipt recommended by Sidy Mohammed Zerroke, one of the most celebrated Marabouts, prefaced with these remarkable words: "The lives of us all are in the hands of God, when it is we must die. However, it hath pleased him to save many persons from the plague, by taking every morning while the infection rages or plagues, the following composition: viz. of myrrh two parts, færon one part, of aloes two parts, of syrup of myrtle-berries, q.s. But this remedy is confined to the more enlightened; for the bigotry of the lower sort is so extreme as to make them despise all precautions which people of other nations use. Of this extreme and foolish prejudice Dr. Chandler gives an interesting account when speaking of the plague at Smyrna. This learned author is of opinion that the disease arises from animalcules, which he supposes to be invisible. See Chandler's Travels In Asia Minor, p. 275, &c.

It is a remarkable fact, that plagues are sometimes partial, and that they only attack particular animals, or a particular description of persons, avoiding others altogether, or attacking them but slightly. Thus Firmicus informs us of a plague, or murin, in 514, which invaded only cats. Dionyfius Halicarnæus mentions a plague which attacked none but maidens; and that which raged in the time of Gentilius, killed scarce any women, and very few but lusty men. Zoroastus mentions another plague, which affailed none but the younger sort; and we have instances of the same kind of a later blending (A). Cardon speaks of a plague at Bafli, with which the Switzers were infected, and the Italians, Germans, or French, exempted; and John Uttenhovius takes notice of a dreadful one at Copenhagen, which, tho' it raged among the Danes, spared the Germans, Dutch, and English, who went with all freedom, and without the least danger, to the houses of the infected. During the plague which ravaged Syria in 1760, it was observed that people of the foundled confidtures were the most liable to it, and that the weak and delicate were either spared or easily cured. It was most fatal to the Moors; and when it attacked them it was generally incurable.

When the plague raged in Holland in 1636, a young girl was seized with it, had three carbuncles, and was removed to a garden, where her lover, who was betrothed to her, attended her as a nurse, and slept with her as his wife. He remained uninfected, and she recovered, and was married to him. The story is related by Vinc. Fabricius in the Mifs. Cur. Ann. II. Off. 188.

Many methods have been adopted in different countries to prevent the importation of this dreadful scourge of the human race, and to stop the progress of infection after it has been imported. In England, mayors, bailiffs, head officers of corporations, and justices, of peace, have power to tax inhabitants, houses and lands, &c. within their precincts, for the relief of persons infected with the plague; and justices of the county may tax persons within five miles round, on a pariah's inability; the tax to be levied by diftricls and sale of goods, or in default thereof by imprisonment. Infected persons going abroad after being commanded to keep house for avoiding farther infection, may be refuted by watchmen, &c. and punished as vagrants, if they have no fores upon them; and if they have infectious fores on them it is felony. Justices of peace, &c. are to appoint searchers, examiners, and buriers of the dead, in places infected, and administer oaths to them for the performance of their duties, &c. flat. 1. jact. 1. cap. 31. See Quaranfines.

The commotion at Moscow, having, in the year 1770, invented a fumigation-powder, which, from several letters, had proved efficacious in preventing the infection of the plague; in order more fully to ascertain its virtue in that respect, it was determined, towards the end of the year, that ten malefactors under sentence of death should, without undergoing any other precautions than the fumigations, be confined three weeks in a lazaretto, be laid upon the beds and dressed in the clothes, which had been used by persons sick, dying, and even dead, of the plague in the hospital. The experiment was accordingly tried, and none of the ten malefactors were then infected, or have been since ill. The fumigation-powder is prepared as follows.

**Powder of the first strength.** Take leaves of juniper; juniper-berries pounded, ears of wheat, guaiacum-wood pounded, of each fix-pounds; common salt-petre pounded, four pounds; frankincense pounded grossly, one pound; common salt-petre pounded, six pounds; Smyrna tar, or myrrh, two pounds; mix all the above ingredients together, which will produce a powder of the powder of fumigation of the firm strength. [N.B. A pound is 40 pounds Russian, which, are equal to 35 pounds and a half or 36 pounds English avaricious.]

**Powder of the second strength.** Take southern-wood cut into small pieces, four pounds; juniper-berries pounded, three pounds; common salt-petre pounded, four pounds; sulphur pounded, two pounds and a half; Smyrna tar, or myrrh, one pound and a half: mix the above together, which will produce half a pound of the powder of fumigation of the second strength.

**Odoiferous Powder.** Take the root called kalmus cut into small pieces, three pounds; leaves of juniper cut into small pieces, four pounds; frankincense pounded grossly, one pound; florax pounded, and rose-flowers, half a pound; yellow amber pounded, one pound; common salt-petre pounded, one pound and a half; sulphur, a quarter of a pound: mix all the above together. See the account of the yellow fever under the article PHILADELPHIA, where we find that that disease was less fatal to some sorts of persons than to others.

(A) See the account of the yellow fever under the
above together, which will produce nine pounds and
three quarters of the odoriferous powder.

Remark on the powder of fumigation.] If guaiacum
cannot be had, the cones of pines or firs may be used
in its stead; likewise the common tar of pines and firs
may be used instead of the Smyrna tar, or myrrh, and
mugwort may supply the place of southern wood.

Thucydides, who was himself infected, lib. ii. gives
us an account of a dreadful plague which happened
at Athens about the year before Christ 430, while the
Peloponnesians under the command of Archidamus
wafted all her territory abroad; but of these two ene-
mies the plague was by far the most dreadful and
severe.

The most dreadful plague that ever raged at Rome
was in the reign of Titus, A. D. 80. The emperor
left no remedy unattempted to abate the malignity of
the distemper, acting during its continuance like a fa-
thor to his people. The fame fatal distemper raged in all
the provinces of the Roman empire in the reign of M.
Aurelius, A. D. 167, and was followed by a dreadful
famine, by earthquakes, inundations, and other cala-
mities. The Romans believed that Æsculapius some-
times entered into a serpent, and cured the plague.

About the year 430 the plague raged in Britain, juat
after the Picts and Scots had made a formidable inva-
sion of the southern part of the island. The plague
raged with uncommon fury, and swept away molt of
those whom the sword and famine had spared, fo that
the living were scarce sufficient to bury the dead.

About the year 1348 the plague became almoft ge-
neral over Europe. A great many authors give an ac-
count of this plague, which is said to have appeared
fift in the kingdom of Kathay in the year 1346, and
to have proceeded gradually westward to Constantinop-
ple and Egypt. From Constantinople it paffe into
Greece, Italy, France and Africa, and by degrees
along the coasts of the ocean into Britain and Ireland,
and afterwards into Germany, Hungary, Poland,
Denmark, and the other northern kingdoms. Ac-
cording to Antoninus archbishop of Florence the dif-
temper carried off 60,000 people in that city, among
whom was the historian John Villani.

In the year 1656 the plague was brought from
Sardinia to Naples, being introduced into the city by
a transport with soldiers on board. It raged with ex-
cessive violence, carrying off in less than fix months
400,000 of the inhabitants. The distemper was at first
called by the physicians a malignant fever; but one of them affirming it to be pestilential, the viceroy,
who was apprehensive ve should give a report would occasion all communi-
cation with Naples to be broke off, was offended with this declaration, and ordered him to be
imprisoned. As a favour, however, he allowed him to
return and die in his own house. By this proceeding
of the viceroy, the distemper being neglected, made
a most rapid and furious progress, and filled the whole
city with conformation. The streets were crowded
with confused proceedings, which served to spread
the infection through all the quarters. The terror of
the people increased their superflition; and it being
reported that a certain nun had prophesied that the
peftilence would cease upon building a hermitage for
her sister nun upon the hill of St Martin's, the edi-
ifice was immediately begun with the most ardent zeal.

The ravages of this disease have been dreadful
wherever it has made its appearance. On the first arri-
val of the Europeans at the island of Gran Canaria,
it contained 14,000 fighting men, soon after which,
two thirds of the whole inhabitants fell a sacrifice to
the plague, which had doubtless been introduced by
their new visitors. The destruction it has made in
Turkey in Europe, and particularly in Constantinople,
must be known to every reader; and its fatal effects
have been particularly heightened there by that firm
belief which prevails among the people of predetermina-
tion, &c. as has been already mentioned. It is generally
form the mearnest offices; some loading themselves with
beams, and others carrying baskets full of lime and
nails, while perfons of all ranks stripped themselves of
their most valuable effects, which they threw into empty
hogheads placed in the streets to receive the charita-
tble contributions. Their violent agitation, however,
and the increasing heats, diffused the malady through
the whole city, and the streets and the flairs of the
churches were filled with the dead; the number of
whom, for some time of the month of July, amounted
daily to 25,000.

The viceroy now used all possible precautions to
abate the fury of the distemper, and to prevent its
spreading to the provinces. The infection however,
defolated the whole kingdom, excepting the provinces
of Otranto and the farther Calabria, and the cities of
Gaeta, Sorrento, Pailo, and Belvedere. The general
 calamity was increaced in Naples by malecontents,
who infinuated that the distemper had been designally
introduced by the Spaniards, and that there were
people in disguise who went through the city fowing poi-
foned dust. This idle rumour enraged the populace,
who began to insult the Spanish soldiers, and threaten
a sedition; fo that the viceroy, to pacify the mob.,
caused a criminal to be broke upon the wheel, under
pretence that he was a disperder of the dust. A vio-
lent and plentiful rain falling about the middle of
August, the distemper began to abate; and on the eighth
of December the physicians made a solemn declaration
that the city was entirely free from infection.

Of the dreadful plague which raged at London in the
year 1665, the reader will find an account in the
article LONDON, n. 21. In 1720 the city of Marfelles
was visited with this destructive disease, brought in a
ship from the Levant; and in seven months, during
which time it continued, it carried off not less than
60,000 people. This defolation is not yet obliterated
from the minds of the inhabitants; some survivors
remained alive but a few years ago to transmit a tradi-
tional account of it to after ages. There are two fine
pictures painted by Puget representing some of the
horrid scenes of that time. "They are (says lady
Craven) only too well executed. I saw several sick
figures taking leave of their friends, and looking their
lait anxious, kind, and withful prayers on their dying
infants, that made the tears flow down my cheeks. I
was told the physicians and noblemen who were all
ifying the sick and dying, were all portraits: I can easi-
ly conceive it; for in some faces there is a look of re-
flection and concern which could only be drawn from the
life." Letters, p. 34, 35. This fatal event has caused
the laws of quarantine to be very strictly enforced in
the Lazaretto here, which is an extensive infulated
building.
brought into European Turkey from Egypt; where it is very frequent, especially at Grand Cairo. To give even a lift of all the plagues that have defolated many flourishing countries, would extend this article beyond all bounds, which minutely to describe them all would be impossible. For the plague at Smyrna we refer to Chandler's Travels as above. Respecting that which raged in Syria in 1760, we refer to the Abbé Marié's Travels through Cyprus, Syria, and Palestine, vol. ii. p. 278-296. This plague was one of the most malignant and fatal that Syria ever experienced; for it scarcely made its appearance in any part of the body when it carried off the patient.

PLAIN, or PLAN, in general, an appellation given to whatever is smooth and even, or simple, obvious, and easy to be understood; and, consequently, stands opposed to rough, enriched, or laboured. A plain figure, in geometry, is an uniform surface; from every point of whose perimeter right lines may be drawn to every other point in the same.

The doctrine of plain triangles, as those included under three right lines, is termed plain trigonometry. See the article Trigonometry.

Plain Chart. See the article Chart.

Plain-Sailing. See Navigation, p. 685.

PLAISE, the English name of a species of pleurodèles. See Pleurodèles.

PLAN, in general, denotes the representation of something drawn on a plane; such are maps, charts, ichnographies, &c. See Map, Chart, &c.

The term plan, however, is particularly used for a draught of a building, such as it appears, or is intended to appear, on the ground, showing the extent, division, and distribution of its area or ground-plot into apartments, rooms, passages, &c.

A geometrical plan is that wherein the solid and vacant parts are represented in their natural proportions.

The raised plan of a building is the same with what is otherwise called an elevation or orthography. See Orthography.

A perspective plan is that exhibited by degradations or diminutions, according to the rules of perspective. See Perspective.

To render plans intelligible, it is usual to distinguish the matrices with a black wash; the projectures on the ground are drawn in full lines, and those supposted over them in dotted lines. The augmentations or alterations to be made are distinguished by a colour different from what is already built; and the tints of each plan made lighter as the stories are raised.

In large buildings it is usual to have three several planes for the three first stories.

PLANCUS (Francis), doctor of physic, born at Amiens in 1696, and who died on the 19th of September 1755, aged 69 years, is author of some works which do honour to his memory. 1. A complete System of Surgery, in 2 vols. in 12mo; a treatise much recommended by surgeons to their pupils. 2. A choice Library of Medicine, taken from periodical publications, both French and others; this curious collection, continued and completed by M. Goulin, makes 9 vols in 4to, or 18 vols in 12mo. 3. A Translation of Vander Wiel's Observations on Medicine and Surgery, 1758, 2 vols in 12mo. Plancus was the editor of various editions of works on medicine and surgery, and enriched them with notes. He flutt himself up in his study for a long time before he practised his profession.

PLANE, in geometry, denotes a plane surface, or one that lies even between its bounding lines: and as a right line is the shortest extent from one point to another, so a plane surface is the shortest extent from one line to another.

In astronomy, conics, &c. the term plane is frequently used for an imaginary surface, supposed to cut and pass through solid bodies; and on this foundation is the whole doctrine of conic sections built. See Astronomy, Conic Sections, &c.

In mechanics planes are either horizontal, that is, parallel to the horizon, or inclined thereto. See Mechanics.

The determining how far any given plane deviates from an horizontal line, makes the whole business of levelling. See the article Levelling.

In optics, the planes of reflection and refraction are those drawn through the incident and reflected or refracted rays. See Optics.

In perspective we meet with the perspective plane, which is supposed to be pellucid, and perpendicular to the horizon; the horizontal plane, supposed to pass through the spectator's eye, parallel to the horizon; the geometrical plane, likewise parallel to the horizon, wherein the object to be represented is supposed to be placed, &c. See Perspective.

The plane of projection in the stereographic projection of the sphere, is that on which the projection is made, corresponding to the perspective plane. See Projection.

Planes, in joinery, an edged tool or instrument for parting and shaving of wood smooth. — It consists of a piece of wood very smooth at bottom, has a flock or shaft; in the midst of which is an aperture, through which a steel edge, or chisel, placed obliquely, passes; which, being very sharp, takes off the inequalities of the wood along which it slides.

Planes-Trees, in botany. See Platanes.

PLANET, a celestial body, revolving round the sun as a centre, and continually changing its position with respect to the fixed stars; whence the name Planet, which is a Greek word, signifying "wanderer.

The planets are usually distinguished into primary and secondary. The primary ones, called by way of eminence planets, are those which revolve round the sun as a centre; and the secondary planets, more usually called satellites or moons, are those which revolve round a primary planet as a centre, and constantly attend it in its revolution round the sun.

The primary planets are again distinguished into superior and inferior. The superior planets are those farther from the sun than our earth; as Mars, Jupiter, Saturn, and the Georgium Sidus; and the inferior planets are those nearer the sun than our earth, as Venus and Mercury. See Astronomy.

That the planets are opaque bodies like our earth, is thought probable for the following reasons. 1. Since in Venus, Mercury, and Mars, only that part of the disk
disks illuminated by the sun are found to shine: and again, Venus and Mercury, when between the earth and the sun, appear like dark spots or maculae on the sun's disk; it is evident, that Mars, Venus, and Mercury, are opaque bodies, illuminated with the borrowed light of the sun. And the same appears of Jupiter, from its being void of light in that part to which the shadow of the satelites reaches, as well as in that part turned from the sun; and that its satelites are opaque, and reflect the sun's light, is abundantly shown. Again, since Saturn, with his ring and satelites, only yield a faint light, fainter considerably than that of the fixed stars, though these be vasty more remote, and than that of the rest of the planets; it is past doubt that he too with his attendants are opaque bodies. Since the sun's light is not transmitted through Mercury and Venus when placed against him, it is plain they are dense opaque bodies; which is likewise evident of Jupiter, from his hiding the satelites in his shadow; and therefore, by analogy, the same may be concluded of Saturn. 3. From the variable spots of Venus, Mars, and Jupiter, it is evident these planets have a changeable atmosphere; which changeable atmosphere may, by a like argument, be inferred of the satelites of Jupiter; and therefore, by similitude, the same may be concluded of the other planets. 4. In like manner, from the mountains observed in Venus, the same may be supposed in the other planets. 5. Since, then, Saturn, Jupiter, and the satelites of both, Mars, Venus, and Mercury, are opaque bodies shining with the sun's borrowed light, are furnished with mountains, and encompassed with a changeable atmosphere; they have, of consequence, waters, seas, &c. as well as dry land, and are bodies like the moon, and therefore like the earth. Q. E. D. And hence it seems also highly probable, that the other planets have their animal inhabitants as well as our earth.

PLANETARIUM, an astronomical machine so called from its representing the motions, orbits, &c. of the planets, agreeable to the Copernican system. See Astronomy, No. 489 and Plate LXXXVIII.

PLANETARY, something that relates to the planets. Hence we say, planetary worlds, planetary inhabitants, &c. Huygens and Fontenelle bring several probable arguments for the reality of planetary animals, plants, men, &c. See Planet.

PLANETARY System is the system or assemblage of the planets, primary and secondary, moving in their respective orbits, round their common centre the sun. See Astronomy.

PLANETARY Days.—Among the ancients, the week was shared among the seven planets, each planet having its day. This we learn from Dion Cassius and Plutarch, Syr. p. 1. q. 7. Herodotus adds, that it was the Egyptians who first discovered what god, that is, what planet, presides over each day; for that among these people the planets were deities. And hence it is, that in most European languages the days of the week are still denominated from the planets; Sunday, Monday, &c. See Week.

PLANETARY Years, the periods of time in which the several planets make their revolutions round the sun or earth.—As from the proper revolution of the sun, the solar year takes its original; so from the proper revolutions of the rest of the planets about the sun, so many sorts of years do arise, viz. the Saturnian year, which is defined by 29 Egyptian years, 174 hours, 58 minutes; the latter to 30 solar years. The Jovial year, containing 317 days, 14 hours, 59 minutes. The Martial year, containing 321 days, 23 hours, 31 minutes. For Venus and Mercury, as their years, when judged of with regard to the earth, are almost equal to the solar year; they are more usually estimated from the sun, the true centre of their motions: in which case, the former is equal to 224 days, 16 hours, 40 minutes; the latter to 87 days, 23 hours, 14 minutes.

PLANIMETRY, that part of geometry which considers lines and plain figures, without considering their height or depth. See Geometry.

PLANISPHERE, signifies a projection of the sphere, and its various circles on a plane: in which sense, maps, whereon are exhibited the meridians and other circles of the sphere, are planispheres. See Map.

END OF THE FOURTEENTH VOLUME.
**DIRECTIONS FOR PLACING THE PLATES OF Vol. XIV.**

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