CHAP. V.

OF TONICS.

By Tonics, are understood those substances, the primary operation of which is to give strength to the system. It has been conceived, that muscular vigour depends on a certain degree of tension, or tone as it is termed, of the muscular fibre; and those substances which renew that vigour when impaired, have been considered as restoring this due degree of tension, and have thus received the appellation of Tonics. They are not, however, to be considered as acting by producing any mechanical change in the state of the solids, as this opinion implies. They act upon the living principle, and, so far as their action is understood, are stimulants of considerable power, permanent in their operation.

The distinction has been already pointed out between stimulants, which is founded not so much on a difference in their power, as in the quickness with which their full effect is produced, and in the transient nature of that effect. If a medicine suddenly raises a high state of excitement, this is as quickly followed by proportional languor or debility, and the changes from both modes of action, in the state of the functions of the body, are suf-

ficiently evident. But, if the stimulant operation be more slowly exerted, any change is much less conspicuous, and the succeeding collapse takes place to no considerable extent; but even when the administration of the remedy is suspended, the effect is merely a gradual abatement of excitement, counteracted even by the action of the stimulants habitually applied. On these principles, the action of tonics is to be explained. It is only by their stimulant operation that they can obviate debility; and as their effect is gradual, their action is not followed by that exhaustion and diminished susceptibility which invariably follows from excitement suddenly raised. If their administration, however, be carried to excess, or be continued too long, it may at length diminish the powers of the system; and if employed in a state of health, or high vigour, their effects may be injurious.

Tonics act primarily on the stomach, the action they excite in that organ being conveyed generally by nervous communication to the rest of the system. This is evident, from their effects often taking place in a short time; and there are experiments which prove, that when some tonics, as Peruvian bark, have been taken for a considerable length of time, no portion of them can be discovered by any chemical test in the blood. There are some of them, however, especially the metallic tonics, which are received into the circulation.

The stimulating effect of tonics is principally to be observed from their continued administration; they increase gradually the force of the circulation, promote the action

of the digestive organs, augment the secretions, or moderate them when they have been morbidly increased, and give vigour to the muscular system. From the action of some of the more powerful remedies of this class, these effects are apparent, even in a short time. The diseases in which they are employed, must be obviously those of diminished power.

Tonics may be subdivided into those derived from the mineral, and those from the vegetable kingdoms: the former division comprehends several of the metals, and one or two of the earths. Under the vegetable tonics are comprised a number of substances possessing bitterness, and an aromatic pungency. These two qualities are generally blended in the most powerful tonics belonging to the vegetable kingdom; and there is a transition from these to the more pure bitters and aromatics. The stimulating action of the latter is rather too local and transient to give rise to much permanent tonic effect: yet they can scarcely be placed under any other class, and I have therefore associated them with the substances with which they are thus connected.

TONICS.

From the Mineral Kingdom.

Argentum.
Hydrargyrum.
Ferrum.
Zincum.
Cuprum.
Arsenicum.
Bismuthum.
Barytes.
Calx.
Acidum nitricum.
Oxy-murias potassæ.

From the Vegetable Kingdom.

Cinchona officinalis.
Cinchona caribæa.
Cinchona floribunda.
Aristolochia serpentaria.
Dorstenia contrayerva.
Croton eleutheria.
Cusparia febrifuga.

SWIETENIA FEBRIFUGA.
SWIETENIA MAHAGONI.
COLOMBA.
QUASSIA SIMAROUBA.
QUASSIA EXCELSA.
GENTIANA LUTEA.
ANTHEMIS NOBILIS.
CITRUS AURANTIUM.
CITRUS MEDICA.
LAURUS CINNAMOMUM.
LAURUS CASSIA.
CANELLA ALBA.
MYRISTICA MOSCHATA.
CARYOPHYLLUS AROMATICUS.
CAPSICUM ANNUUM.
PIPER NIGRUM.
PIPER LONGUM.
MYRTUS PIMENTA.
AMOMUM ZINGIBER.
AMOMUM ZEDOARIA.
AMOMUM REPENS.
CARUM CARUI.
CORIANDRUM SATIVUM.
PIMPINELLA ANISUM.
MENTHA PIPERITA.

Tonics from the Mineral Kingdom.

These are in general more local in their action than the vegetable tonics; they either operate more directly on the stomach without their action being so quickly extended to the whole system, or they act by being received into the circulating mass. Hence they produce less immediate general excitement, and it is only from their continued administration, generally in small doses, that their tonic effect is obtained. The analogies from which I have placed together the substances associated under this division, are perhaps somewhat remote and imperfect; and, to some of them, the appellation of tonic may be considered as applied by rather too free an extension of the term. But such imperfections in the classification of substances, from their action on the living system, are in the present state of medical science unavoidable to a certain extent. The substances, with regard to which this objection may be urged in the present case, could scarcely be referred with propriety to any other class: affinities may be traced in their operation, sufficient to connect them by their medicinal effects; and, even considered individually, the claim of each may be established to a certain degree of tonic power.

Argentum. Silver.

This metal is distinguished by its pure white colour,

its high degree of lustre, and its great ductility and malleability. It is not very susceptible of oxidation; it does not suffer that change from exposure, even in a state of fusion, to the atmosphere. Those acids which yield oxygen readily oxidate and dissolve it, particularly nitric acid, which is hence employed as its usual solvent. The solution, when evaporated, affords the nitrate of silver in a crystalline form.

It appears that nitrate of silver was sometimes employed by the older physicians, but the harshness and violence of its operation led to its disuse. More lately, it has been introduced as a remedy in epilepsy,—a disease which, when not depending on organic derangement, is frequently connected with morbid susceptibility, and which tonics sometimes remove. The advantage derived from the administration of nitrate of silver has been established on the testimony of Dr Sims, Dr Cappe, Dr Bostock, and others. The dose is a quarter of a grain of the crystallized nitrate, which may be given three or four times a-day. Distilled water must be employed to dissolve it, as spring water would decompose it; and the solution may be made into pills with bread. It sometimes acts as a cathartic, and if it occasion much cathartic effect with griping, or excite nausea, the dose must be diminished. Dr Cappe has related a case of Angina Pectoris, the symptoms of which were removed by a similar administration of nitrate of silver.

HYDRARGYRUM. HYDRARGYRUS. ARGENTUM VIVUM. MERCURIUS. Mercury or Quicksilver.

IT has not been usual, in arrangements of the articles of the Materia Medica from their medicinal power, to place mercury under the class of tonics, but rather under that of sialogogues. Its power, however, of exciting the salivary discharge, is merely a secondary effect, not constant nor uniform, and which is not essential to its efficacy in any disease. On the contrary, its tonic power is its primary operation; it is the most general stimulant belonging to the Materia Medica, pervading every part of the system; acting, as Cullen has remarked, as a stimulus to every sensible and moving fibre of the body, and producing the most permanent effects. Hence, it is the most general evacuant we possess; and from its stimulant operation, exerted directly or indirectly, we are able to explain its utility in many diseases.

This metal is peculiarly distinguished by its fluidity at all natural temperatures, with the exception of the intense cold that sometimes prevails in very northern regions. Its congealing point is —40° of Fahrenheit. In its liquid state, it has the perfect opacity and lustre characteristic of metals, and likewise the property of great density, its specific gravity being to that of water as 13.5 to 1 nearly: it boils at a temperature a little above 600°, and when boiling suffers oxidation from the action of the atmospheric air. It is oxidated even at natural temperatures, when subjected to agitation; or still more easily,

when triturated with any viscid matter, which is interposed between its globules, extending their surface.

Quicksilver is usually obtained from the ore in which it is combined with sulphur, this being submitted to heat mixed with iron or lime, either of which combines with the sulphur, and the mercury is obtained by distillation. The quicksilver of commerce is sometimes impure, or adulterated by the intermixture of other metals, particularly lead and bismuth. This may be suspected when the metal loses its lustre speedily, and is covered with a grey film, or from its diminished mobility, in consequence of which its globules do not preserve exactly the spherical form, nor unite easily with each other; and it may be discovered, with more certainty, by exposing it to a heat sufficient to volatilize the quicksilver, when any other metal present will remain. It is best purified by distillation from iron-filings in an iron retort.

Mercury is not, in its metallic state, applied to any medicinal use; but under various forms of preparation, it is extensively employed, and affords a series of very active remedies.

When rendered active on the system by any of the modes of preparation to which it is subjected, it operates as a very powerful and general stimulant; as from being received into the blood, it is enabled to act on every part of the system. Hence, when given in moderate quantity, it communicates general vigour: it increases the force of the circulation when this has been languid; by the increased vascular action which it excites, it gives to the

blood the disposition to assume the buffy coat; and by its stimulant operation on secreting organs, it promotes the secretions, and hence is the most general evacuant we have. On its general stimulant operation probably depends its efficacy in diseases connected with spasmodic action, as tetanus and hydrophobia; and perhaps also that derived from it in various forms of fever, particularly the remitting fever of warm climates, and yellow fever; and its local operation is distinctly marked in the advantage derived from it in chronic hepatitis, and other varieties of visceral and glandular obstructions, and in the different species of cutaneous eruptions.

Its most important medicinal operation, however, is that displayed in removing the disease induced by the syphilitic poison. In this, its power is nearly, if not altogether specific; no article of the Materia Medica could be substituted for it; and there may be affirmed of it, what cannot with equal justice be said of any remedy employed in the treatment of any other morbid affection, that if duely administered, it will scarcely ever fail in effecting a cure. It is difficult to assign any satisfactory theory of its operation. Its efficacy has been ascribed to its general evacuant power, in consequence of which the syphilitic virus is discharged from the body. But the speedy disappearance of the local symptoms of syphilis under its use, affords a proof that it operates on some other principle; no similar advantage is derived from other evacuants; and its efficacy is not proportional to the evacuation it excites, but is frequently displayed

where this is altogether insensible. The opinion has been advanced, that it acts as an antidote to the venereal virus, neutralizing it somewhat in the manner in which one chemical agent subdues the properties of another,—an opinion extremely vague and hypothetical, and rendered improbable from the consideration of the very small quantity of some of the more active preparations of mercury, from which a cure may be obtained, compared with the large quantity of others less active, that requires to be administered. The explanation advanced by Mr Hunter, that the efficacy of mercury in the treatment of syphilis depends on its general and permanent stimulant operation on the system, by which it induces and keeps up an action incompatible with that morbid action which constitutes the disease, until the virus is destroyed by the chemical changes going on in the system, or until it is eliminated from the body by the usual excretion, is on the whole most probable: it rests on a principle undoubted, that there are states of morbid action incompatible, so that one suspends the action of the other; and mercury does exert a very general action, inducing and keeping up what may be regarded as a morbid state.

The mode of administering mercury, for the cure of the venereal disease, under all its forms, is now ascertained with sufficient precision. There is no advantage in giving it so as to induce profuse salivation; this is even to be avoided as hurtful; at the same time, it is proper that salivation should be excited to a certain extent, not probably as essential to its efficacy, but as a

proof of its full action on the system being obtained. This is kept up for a certain time, longer or shorter, according to the state of the symptoms, and the previous continuance of the disease. Exposure to cold is avoided, as being liable to cause the more partial operation of mercury on the salivary glands; and the state of irritation is diminished, or determination to the intestines producing purging is obviated, by the exhibition of an opiate. When profuse salivation occurs, the remedies employed to check it are cathartics in moderate doses, small doses of opium, the application of a blister to the throat, and the administration of sulphuret of potash; the last being employed from the doubtful hypothesis, that its chemical agency may neutralize the mercury. Free exposure to a cool dry air is, according to the observation of Mr Pearson, more effectual than any other method. When the morbid irritation, from the action of mercury, rises too high, producing a state of exhaustion, which sometimes proceeds rapidly to an alarming extent, the administration of the remedy must be immediately suspended; and in this case also, exposure to a cool atmosphere is advantageous.

The preparations of mercury, medicinally employed, are those in which it is oxidized, in which the oxidized metal is combined with an acid, or in which either the metal or the oxides of it are combined with sulphur.

The grey oxide, formed by the trituration of mercury, is the basis of a number of preparations. In these, the metal has been supposed indeed to be merely mechani-

cally divided; but in its metallic state, mercury does not appear to exert any sensible action on the living system, and the activity of it in these preparations is a proof that it is oxidated. This is established more directly; quicksilver, by agitation, being converted into a black powder, which is soluble in muriatic acid, which metallic mercury is not.

This oxidation is facilitated by the quicksilver being triturated with any viscous substance which facilitates the division of its globules. By trituration with mucilage of gum arabic, a preparation is obtained, named Plenk's Mercurial Solution, the operation of which is extremely mild. Rubbed with chalk, it forms the Hydrargus cum Creta of the London Pharmacopœia, a preparation having nothing to recommend it. The Mercurial Pill is, of all the preparations adapted to affect the general system, the one most commonly employed, and is perhaps equal to any other, having the advantage of not being liable to produce much irritation, while we can depend on the certainty and permanence of its action. It is prepared by triturating quicksilver with conserve of roses, and adding a sufficient quantity of starch to form a pill mass. In a dose of eight grains, morning and evening, it soon affects the general system; in a larger dose, it is liable to occasion purging. Triturated with lard, quicksilver soon loses its metallic form; and the ointment, after it has been kept for some time, contains little metallic matter, the unctuous matter probably promoting the oxidation. The oxide is diffused through the

lard, and it has been conjectured, is in part too combined with sebacic acid, formed from the oxygenation of the fat. Rubbed on the skin, in the quantity of one drachm of the strongest ointment, (that composed of equal parts of quicksilver and lard,) it is forced through the cuticle, and is taken up by the absorbents; the system is thus affected, without the unpleasant consequences of nausea and purging, sometimes occasioned by the internal administration of even the mildest mercurial preparation; this method is employed, therefore, where, from the state of the system, these affections are liable to be produced. Where it is necessary too to give the remedy in a large dose, or to bring the system speedily under its action, mercurial friction is employed, along with the administration of some of the mercurial preparations by the mouth. And, lastly, it has been supposed, that in certain local affections, particularly bubo, some advantage is derived from the mercury being conveyed through the affected gland.

The Mercurial Plaster is the metal triturated with melted resin and oil, and mixed with litharge plaster: it is sometimes applied to indolent glandular tumors as a discutient. Its power is supposed to be increased by the addition of gum-ammoniac, and this compound plaster has a place in the London and Dublin Pharmacopœias.

Mercury oxidated by exposure to atmospheric air, at a high temperature, gives an oxide in scales of a red colour, containing about 7 of oxygen in 100 parts. This, the red oxide, (Oxidum Hydrargyri Rubrum of the Lon-

don Pharmacopœia), affords a preparation, supposed by some to be the most uniform in its strength, and most certain in its operation, of all the mercurials. Its dose is one grain night and morning. It is more active than the grey oxide, but is more liable to produce irritation.

Various preparations are obtained from the metal oxidated by the acids. The nitrate of mercury decomposed by heat, furnishes what is named Oxidum Hydrargyri Rubrum per Acidum Nitricum by the Edinburgh College, Hydrargyri Nitrico-Oxydum by the London. It is probably not an oxide, but a sub-nitrate, and, from the acid combined with it, is derived its escharotic power, for which only it is employed, being applied externally to change the diseased surface of ulcers, or to other purposes for which escharotics are used.

When the nitrate of mercury, containing the mercury in a low state of oxidation, is decomposed by ammonia, a precipitate is thrown down of a grey colour, which appears to be nearly a pure oxide. It is the Oxidum Hydrargyri Cinereum of the Pharmacopœias; is comparatively mild in its operation, and is frequently employed, its dose being one or two grains. It is also sometimes used under the form of ointment, as a mode of applying mercurial friction.

Mercury, oxidated by sulphuric acid, forms the sulphate of mercury, which, decomposed by the affusion of boiling water, affords a yellow powder, the Sub-sulphate, or as it was formerly named, Turbith Mineral. This acts with too much violence to be used as a mercurial.

In a dose of 3 or 4 grains, it acts as a powerful emetic, and it is sometimes used as an errhine.

The preparations in which the mercury is saturated with an acid, are very active. The nitrous solution of it is highly caustic. Mixed with lard, it forms an ointment, Unguentum Nitratis Hydrargyri, used with much advantage in cutaneous diseases.

Mercury, oxidated and combined with muriatic acid, forms two very active preparations, differing in the degree of oxidation, and in the proportion of acid with which the oxide is combined. The one has been long known by the name of Corrosive Sublimate of Mercury, the other by that of Mild Sublimate or Calomel. The former is now named Muriate of Quicksilver by the Edinburgh College, and Oxymuriate of Quicksilver by the London College; the latter by both Colleges Submuriate of Mercury;—names not sufficiently distinctive, and chemically incorrect. The old distinguishing epithets are still the least ambiguous, and even as a chemical nomenclature are properly used.

The first of these, Corrosive Muriate of Mercury is composed of the metal highly oxidated, and this oxide is combined with a large proportion of muriatic acid. The proportions are 69.6 mercury, 12.3 oxygen, and 18 of acid. It is soluble in water and in alkohol, has a taste styptic and metallic, and exerts a degree of escharotic power. It is the most virulent of all the preparations of this metal, and cannot be given with safety in a larger quantity than $\frac{1}{4}$th of a grain: its medium dose is $\frac{1}{6}$th or

$\frac{1}{8}$th. It acts more generally on the system than any other preparation, and very speedily arrests the progress of syphilis, advantages which have frequently recommended its use. But it is liable to be violent in its operation, and its effects have been supposed not to be permanent, the disease frequently returning in the same or some other form; hence, as an antisyphilitic, it is not much employed in regular practice. A very dilute solution of it is used as a collyrium in venereal ophthalmia, as a gargle in venereal sore-throat, and as a lotion in some cutaneous affections.

The Mild Muriate of Mercury, or Calomel, is obtained by triturating the corrosive muriate with nearly an equal part of the metal, and favouring their mutual action by the action of heat, the product being sublimed. The additional metallic mercury which is thus brought into combination, shares the oxygen and the acid of the corrosive muriate; so that the whole of the metal is in a lower degree of oxidation, and this oxide is combined with less muriatic acid. The quantity of acid, however, is as much as the oxide requires to combine with it, and hence the product is not a sub-muriate. The proportions of its principles, according to its analysis by Chenevix, are mercury 79, oxygen 9.5, and acid 11.5. It is mild in its operation, and is one of the most useful of the mercurial preparations. In syphilis it is given in the dose of a grain night and morning; it is likewise administered with the greatest advantage in glandular obstructions, dropsy, chronic rheumatism, hydrocephalus, hydrophobia, and in

the fevers of warm climates, being given in several of these diseases in much larger quantities. It not only produces the general effects of a mercurial, but also, when given in sufficient doses, acts as a cathartic: it is often employed to promote the operation of other cathartics; and its peculiar determination to the intestines probably adapts it better to the treatment of diseases of the neighbouring organs, or to states of disease connected with affections of the intestinal canal.

Muriate of Mercury and Ammonia, Hydrargyrus Præcipitatus Albus of the London Pharmacopœia, is prepared by decomposing corrosive muriate of mercury by ammonia. A precipitate is obtained, which consists of oxide of mercury combined with a portion of muriatic acid and a small quantity of ammonia, the proportions being 81 of oxide, 16 of acid, and 3 of ammonia. It is too acrid for internal use, but is employed externally as a mild escharotic, and as an application in various cutaneous affections. An ointment adapted to these purposes has a place in the London and Dublin Pharmacopœias.

With acetous acid mercury forms the Acetis Hydrargyri,—a preparation which, as the basis of Keyser's pill, was at one time much celebrated for the mildness of its operation; it is given in a dose of from 2 to 5 grains; its operation has been supposed, however, to be uncertain, and it has fallen into disuse.

With phosphoric acid, Phosphate of Mercury is formed,—a preparation of considerable activity and certainty, but which, though introduced, has not been established

in practice. The dose of it is one grain. These, as well as other saline compounds of Mercury, are most easily obtained by adding to a solution of nitrate of mercury a solution of a compound salt, containing the acid with which the oxide of mercury is designed to be combined. Thus, to form the acetate, a solution of acetate of potash is added; or to form the phosphate, a solution of phosphate of soda.

United with sulphur, mercury forms two preparations, the black sulphuret, and the red. In both of them the metal has been supposed to be oxidized, and in the red a large quantity of oxygen has been supposed to be contained. This has not been established, however, and it is probable that they are metallic sulphurets without oxygen. The black sulphuret, formerly named Ethiops Mineral, is prepared by triturating equal parts of mercury and sulphur together, so as to form a black powder. It is a very inactive preparation, and has been used only as an anthelmintic, in a dose to an adult of one scruple or half a drachm. The red sulphuret, or Cinnabar, is the mercury united with about one-sixth of its weight of sulphur by sublimation. It is applied principally by fumigation, with the view of stopping the progress of venereal ulcers, being converted into vapour by being laid on a hot iron, and this vapour being directed on the part.

FERRUM. Iron.

THIS metal is the one which has been regarded as most salutary to the animal system. It exists as a constituent

part of the blood, and other varieties of animal matter, and it acts as a powerful tonic, increasing the power of digestion, quickening the circulation, and causing the blood, it is said, to assume a more florid hue, promoting the secretions, or restraining them when they have been morbidly increased. It has been considered as doubtful whether it acts by being received into the mass of blood; its existence as a constituent principle of the blood, and the slowness of its operation, render it probable that it does.

The diseases in which iron is used are those of chronic debility, especially chlorosis, dyspepsia, hypochondriasis, hysteria, paralysis, and rickets. It succeeds best when given in small doses continued for a considerable time.

The Limatura Ferri, or Filings of Iron, are given in any dose from one scruple to a drachm or two; their activity is probably dependent on the oxidation they may suffer in the stomach, from the action of the gastric fluids.

The Carbonate, or Rust of Iron, Carbonas Ferri, Rubigo Ferri, is the metal oxidated by exposure to the air with moisture, and combined with carbonic acid; it is more active than the pure metal, and less irritating than the saline preparations. It is given in a dose from 5 to 20 grains. Another form of it, supposed to be more pure, is what is named Carbonas Ferri Præcipitatus, prepared by adding a solution of carbonate of soda to a solution of sulphate of iron, washing and drying the precipitate formed by the mutual decomposition.

Muriate of Iron and Ammonia, of the Edinburgh Pharmacopœia, what is named by the London College Ferrum Ammoniatum, is obtained, by sublimation, from a mixture of muriate of ammonia and red oxide or carbonate of iron. It is an active preparation, but liable to be variable in composition. It is given in a dose from 5 to 10 grains. Dissolved in diluted alkohol it forms an officinal tincture, the dose of which is 30 drops.

The Muriate of Iron employed under the form of tincture, prepared by dissolving black oxide of iron in muriatic acid, and diluting the solution with alkohol, Tinctura Ferri Muriati, is a very active preparation; sometimes too much so to admit of being used in an irritable state of the stomach. Its dose is 10 or 15 drops diluted with water, or taken in wine.

Sulphate of Iron is formed in the large way, by the oxygenation of the native sulphuret by exposure to air and humidity; or it is obtained more pure by dissolving iron in diluted sulphuric acid, and evaporating the solution. It crystallizes in rhomboidal prisms of a green colour. It is one of the most active preparations of the metal, and is not unfrequently prescribed in amenorrhœa. Its dose is from one to five grains. The red sulphate, in which the metal is more highly oxidated, is also employed as a tonic in a similar dose.

The Tartrate of Potash and Iron has a place in the London Pharmacopœia, though not much employed in practice. It is prepared by rubbing equal weights of iron-filings and super-tartrate of potash with water, exposing

the mixture to the action of the air, drying the mass, and again subjecting it to the action of water to render the oxidation and combination of the iron more complete. The preparation is a mild one, and can be given to the extent of 10 or 15 grains as a dose. A similar preparation, in which the iron is more highly oxidated, and its combination with the tartaric acid probably more perfect, is obtained by a process given by the London College, in which carbonate of iron and super-tartrate of potash are boiled with a portion of water, the liquor filtered, and evaporated until on cooling it form a saline mass. This, in a dose of three or four grains twice a-day, acts not only as a tonic, but also as a diuretic, and, from the combination of these powers, has been employed with advantage as a remedy in dropsy.

The Wine of Iron, which has a place in the London and Dublin Pharmacopœias, prepared by digesting iron-filings in white wine, is another form under which the tartrate is used; the metal being dissolved by the tartaric acid of the wine. Its dose is one or two drachms.

Acetate of iron has been introduced by the Dublin College, being prepared, according to one process they have given, by digesting carbonate of iron in acetic acid; according to another, by rubbing together acetate of potash and sulphate of iron until they become soft; drying this with a moderate heat, and digesting it with alkohol. Of the tincture thus formed, 20 or 30 drops are a dose.

The London College have given a place to a preparation of iron, (Liquor Ferri Alkalini), of rather a singular

nature. Iron is dissolved in nitric acid largely diluted; and to this solution a solution of sub-carbonate of potash is added, while effervescence is excited: the liquor, after standing for six hours, is poured off. It is probably a ternary combination of oxide of iron, potash and carbonic acid; any nitric acid remaining undecomposed in the oxidation of the iron, being probably combined with a portion of potash, and this nitrate being deposited. This preparation has been long known by the name of Stahl's Martial Alkaline Tincture. It is not very apparent what advantage it has over others in common use, and it is always liable to be variable in strength.

The Mineral Chalybeate Waters afford another form under which iron may be administered. The iron is generally dissolved in them by the carbonic acid; and from the state of dilution, they are often used with more advantage than the more active preparations of the metal.

ZINCUM. Zinc.

THIS metal is of a white colour, with a shade of grey; it is brittle, except at a temperature been 200 and 300 of Fahrenheit, when it has considerable ductility and malleability; it is fusible at a heat approaching to that of ignition, and when raised to that temperature burns with a bright flame, forming a white oxide.

Zinc exerts no sensible action on the system in its metallic state; it is employed therefore under various forms of preparation.

White oxide of zinc, obtained from the combustion of

the metal, has been employed as a remedy in various spasmodic affections, particularly chorea and epilepsy, in a dose of five grains, gradually increased. There are cases on record where a cure was obtained; but it does not appear to be very active or certain in its operation, and it is not often prescribed. An ointment composed of it is used as a healing cerate, and as an application in ophthalmia.

There is a substance named Impure Oxide of Zinc by the Edinburgh College, long known by the appellation of Tutia, the nature and origin of which are not very well ascertained. It has been supposed to be artificial, and to be prepared from oxide of zinc obtained in the roasting of zinc ores, which is afterwards mixed with clay. It is used sometimes as the basis of a cerate employed as a dressing to wounds, or applied to the eye in some forms of ophthalmia.

What has been named Calamine Stone, (Lapis Calaminaris), is regarded as a carbonate of zinc; and it generally is so, though there are varieties of it composed of oxide of zinc and silicious earth. It is employed only externally as the basis of the common healing cerate.

Sulphate of Zinc, formed by exposure of the native sulphuret to air and humidity, is obtained by evaporation of its solution in a solid mass, forming the white vitriol of commerce; or it is procured more pure, and in a crystalline form, by evaporation of the solution of zinc in diluted sulphuric acid. It has been employed in the same cases as the oxide, and Dr Cullen has observed that it is

possessed of the same powers; it has likewise been given as a tonic in intermittent fever, and as a tonic and astringent in chronic dysentery. It is difficult, however, to regulate its administration so as to obviate the nausea which it is liable to occasion. It is given sometimes as a powerful emetic, in a dose from 10 to 20 grains, particularly where the stomach is not easily roused to action, as where a narcotic poison has been swallowed. Its solution is a common astringent injection in gonorrhœa in the strength of a grain and a half to an ounce of water; and nearly of the same strength it is often employed as a collyrium in ophthalmia.

Acetate of Zinc, under the form of solution, has a place in the Edinburgh Pharmacopœia, being obtained by mixing solutions of acetate of lead and sulphate of zinc, when sulphate of lead is precipitated, and the acetate of zinc remains dissolved. It is used as a collyrium in ophthalmia, and an astringent injection in gonorrhœa.

Cuprum. Copper.

This metal is not like the greater number of the metals, insipid and inodorous; it has an unpleasant styptic taste, and when rubbed a perceptible smell. It is extremely noxious to animal life. Still, when properly administered, it proves a remedy of some value, and like zinc has some claim to be ranked as a tonic, from its successful operation in epilepsy, chorea, and several other spasmodic affections dependent on or connected with debility.

Copper is employed in various forms of saline combination. The sulphate is rather too active to admit of internal administration; even in a very small dose it excites nausea and vomiting; and as a powerful emetic it is employed, where from the state of the stomach it is difficult to excite vomiting, as where a narcotic has been taken in too large a quantity; the dose being from 2 to 5 grains, or even larger, according as it is more difficult to excite vomiting. Externally it is used as an astringent and escharotic,—applications of it to be afterwards noticed.

Sub-acetate of Copper, Verdegrease as it has been named, is also employed on account of its escharotic power.

The preparation named Ammoniuret of Copper (Ammoniaretum Cupri, Cuprum Ammoniatum) is the one usually employed to obtain the action of copper on the system. It is prepared by triturating sulphate of copper and carbonate of ammonia together, and is either a ternary compound of oxide of copper, ammonia and sulphuric acid, or a mixture of sulphate of ammonia, and the compound of ammonia with oxide of copper. It is given in epilepsy, in a dose of half a grain twice a-day, increasing it gradually as far as the stomach or system will bear it, continuing it until the remedy has received a fair trial. It has in many cases proved successful, though in a disease arising from such various causes, and so frequently depending on derangement of organic structure, any

remedy must frequently fail. It has been given in a similar manner with advantage in chorea and dysphagia.

ARSENICUM. Arsenic.

THE name arsenic, used to be appropriated to what has been ascertained to be the oxide of a peculiar metal, and in chemical nomenclature it is to this metal that the name is now applied. In its metallic state, it is of a dark grey colour, with considerable lustre; its texture is foliated, and it is extremely brittle. It is volatile at a heat considerably inferior to that of ignition, and when in vapour has a peculiar smell, often compared to that of garlic. At the same temperature, it is oxidated rapidly by the action of the air, forming a white vapour which condenses. At a higher temperature it burns, and affords the same product. This product used to be regarded as an oxide. Being soluble however in water, capable of crystallizing, reddening the infusion of litmus, and combining with the alkalis, it has been regarded as an acid, and has been named Arsenious Acid. Though there is some foundation for this conclusion, this substance may perhaps still be ranked as an oxide; for it does not neutralize the alkaline properties, nor act on them more forcibly than many other metallic oxides; and it even neutralizes the properties of acids. By a higher degree of oxygenation, it is converted into a substance of undoubted acid powers, the arsénic acid.

The oxide of arsenic, or white arsenic of commerce, is not formed from the oxygenation of the metal, but is ob-

tained by sublimation from various metallic ores in which it exists. The sublimate is in the form of a white dense cake, which is reduced to powder, for the uses to which it is applied. In the London Pharmacopœia, this is ordered to be prepared for medicinal use by a second sublimation. It consists of 75.2 of arsenic, and 24.8 of oxygen. Its taste is acrid and penetrating; it is soluble in 80 parts of cold, and in 15 parts of boiling water; the latter solution, on cooling, affording minute crystals.

This substance has been long known as the most virulent of the mineral poisons. Even in a very small quantity, it occasions vomiting, purging, tremors, and paralysis; in a quantity a little larger, it excites severe pain in the stomach, extreme thirst, violent vomiting, with great anxiety and depression. The pain extends over the abdomen, respiration becomes difficult, the pulse is quick and irregular, the vomiting is incessant, accompanied with tremors and convulsions, and the patient dies exhausted. On dissection, the internal surface of the stomach and upper part of the intestines is found inflamed or eroded.

Though so violent in its operation, arsenic has been frequently employed in medical practice; and when properly administered, we obtain from it, in certain diseases, all the advantage which is derived from the operation of the most safe and powerful tonic. This is well displayed in its efficacy in the treatment of intermittent fever, the disease in which it has been principally used.

It is employed medicinally under various forms. A preparation of it introduced by Fowler, and analogous to

one which had been known under the name of Tasteless Ague Drop, has been adopted by the London College, and named Liquor Arsenicalis. It is prepared by dissolving sixty-four grains of the white oxide, and the same quantity of sub-carbonate of potash, in sixteen ounces of water, adding half an ounce of compound spirit of lavender. This is given in a dose of 4 drops, three times a-day, and gradually increased to double that quantity; its use being occasionally intermitted, not persisted in if it does not soon prove effectual, and immediately relinquished if it occasion nausea or purging. The arseniate of potash, prepared by exposing the white oxide of arsenic with an equal weight of nitre, to a heat gradually raised to redness, and crystallizing the residual mass, is another preparation which has been employed, and has been lately sanctioned by the Dublin College. It is used in the same manner, in the dose of the eighth part of a grain of the crystallized salt. Under the same forms arsenic has been used in remitting fever, in periodical headach, in dropsy, hydrophobia, lepra, and elephantiasis, and undoubtedly with safety and advantage, though its administration will always require to be conducted with much care. Externally, it is used in scirrhus and cancer;—applications of it which will be noticed under the class of Escharotics.

The antidotes which have been employed to counteract the poisonous operation of arsenic are various. Vomiting, if not produced by the arsenic, which it generally is, must be immediately excited, and as the stomach is highly irritable in such cases, the milder emetics, and espe-

cially oil, which is supposed to involve the particles of the poison, have been recommended. According to the assertion of Renault, oil appears from experiments rather to favour its action; and tepid water, or mucilaginous liquors, ought to be preferred; these too are useful in facilitating vomiting, and scarcely any thing more than this is within the power of the practitioner. Reliance has been placed on solutions of the alkaline sulphurets, or of sulphuretted hydrogen. The latter appears, from Renault's experiments, to have some power, since, if it were previously combined with the arsenious acid, it rendered it nearly inert; but if merely introduced into the stomach with it, or after it had been swallowed, especially if the arsenic were not dissolved, it seemed to have little efficacy as an antidote, and indeed cannot be expected to have much effect.

BISMUTHUM. Bismuth.

THIS metal is of a white colour, with a shade of yellow, has a foliated fracture, is brittle, very fusible, capable of being volatilized, and easily susceptible of oxidation. Though it has not been received into the Pharmacopœias, it has a claim to a place in the Materia Medica, as its oxide, or rather sub-nitrate, has been employed with considerable advantage in Gastrodynia, Pyrosis, and other affections connected with debility of the digestive organs. This preparation is obtained by decomposing the solution of bismuth in nitric acid by the affusion of water; the sub-nitrate is precipitated, and is washed and dried. It

is given in a dose from two to six grains, two grains being given twice or thrice a-day, or in more severe cases five grains being given at once. In these doses, it scarcely produces any other sensible effect than a remission of pain, and ultimately a removal of the morbid state from which this has arisen.

BARYTES. Terra Ponderosa. Barytes. Heavy Earth.

THIS earth is found in nature combined with sulphuric acid, and with carbonic acid. The native carbonate was known to prove poisonous to animals, and this suggested the application of it to medicinal purposes. The form under which the barytes has been used, is in combination with the muriatic acid; for the preparation of which a formula has been inserted in the Edinburgh Pharmacopœia, either by decomposing the native carbonate by muriatic acid, or decomposing the sulphate by heating it with charcoal, and adding this acid to the solution obtained by washing the residual matter with water. The muriate is obtained by crystallization. This salt has been employed as a remedy in scrofula, in cancer, some forms of syphilis, and in hectic fever connected with ulceration. Its sensible effects, where advantage has been derived from it, have been improving the appetite and general strength; sometimes it occasions diaphoresis or diuresis, and in an over dose is liable to produce nausea, vertigo, tremors, and insensibility. Its usual dose is 5 drops, gradually increased to 20 or more. Its virtues have been perhaps overrated, as it is rather falling into disuse.

CALX. Lime.

THIS earth exists abundantly in nature combined with carbonic and other acids. From the native carbonate it is obtained by expelling the carbonic acid by heat. It is soluble in water in small quantity; the solution has a styptic taste, and is the form under which lime has been medicinally employed. It is used with advantage in dyspepsia, its beneficial effects arising principally from its tonic and astringent quality, as in the small quantity which water can dissolve, it can have little effect by any chemical agency in obviating acidity. It is employed too as an astringent in chronic diarrhœa and in leucorrhœa. As a pure tonic, the product of the combination of it with muriatic acid, the muriate has been introduced into practice as much superior in efficacy to muriate of barytes, and a formula for preparing it is given by the Edinburgh and Dublin Colleges. It has been used principally in scrofula and hectic fever, and in dyspepsia. Its dose is from half a drachm to a drachm of the saturated solution; and as it is a medicine of considerable activity, it requires to be given with caution. Carbonate of lime is used as an antacid: and Phosphate of lime has from theoretical views been proposed as a remedy in rickets and mollities ossium.

THE two following substances, though not strictly belonging to the mineral kingdom, may be associated with the preceding tonics, as connected with them by chemical relations.

ACIDUM NITRICUM. Nitric Acid.

THIS acid is the product of the saturation of nitrogen with oxygen, and consists of 29.5 of the former, and 70.5 of the latter. It is generally obtained by decomposing nitrate of potash by sulphuric acid, assisted by heat. It is colourless; emits white fumes; its specific gravity is 1.504; is extremely corrosive, acts with much energy on inflammables and metals from parting with oxygen readily, and is eminently possessed of all the acid properties.

The tonic powers of this acid are conspicuous in supporting the system under the irritation of a mercurial course. As a remedy against lues venerea, it was some years ago introduced into practice, and received a very extensive trial; and the result appears to have been sufficiently established, that it is, to a certain extent at least, capable of counteracting the syphilitic poison. The secondary symptoms of the disease have disappeared under its use, and the primary symptoms been completely removed. It is however inferior to mercury in the certainty of its operation, but still is a valuable remedy combined with it, both as promoting its operation, and as obviating the injurious effects of mercurial irritation. With such views, it is given in a dose of from 1 to 2 drachms, this being taken largely diluted with water, in the course of the day. It is likewise administered with advantage in that chronic affection of the liver frequently arising from residence in a warm climate, in dyspepsia particularly with the view of relieving sickness and anorexia, and in obstinate cutaneous eruptions.

OXY-MURIAS POTASSÆ. Oxy-muriate of Potash.

THIS salt, which, strictly speaking, is the Hyper-oxy-muriate of Potash, is prepared by introducing a current of oxy-muriatic acid gas into a solution of potash. The acid is decomposed, one portion of it yielding oxygen to the other; the one therefore returns to the state of muriatic acid, the other becomes hyper-oxymuriatic acid, and common muriate and hyper-oxymuriate of potash are formed, the latter separating by crystallization in brilliant white flakes. The process has been introduced into the Dublin Pharmacopœia.

As a remedy, it may be classed with the nitric acid, and it was the hypothesis of nitric acid acting medicinally by imparting oxygen to the system, that led to its medicinal use. Its operation in checking or removing the symptoms of syphilis is similar; it also increases the force of the circulation, and excites the actions of the system. Its efficacy as an anti-venereal is considered as superior to that of the nitric acid, but it does not appear to be equally advantageous as an auxiliary to mercury. Hence, as its operation alone cannot be relied on for certainty, and as it frequently fails, it is little employed, while nitric acid still continues to be occasionally used. The dose in which the oxy-muriate has been given, is 10 grains three or four times a-day, and increased gradually to 20 or 25.

Tonics from the Vegetable Kingdom.

The tonic power of vegetable substances is intimately connected with certain sensible properties which they possess, particularly with bitterness, and the aromatic quality. In those tonics in which these qualities are blended, they are their most distinctive properties; and in those in which either of them is predominant, we still discover a degree of tonic power, or of that stimulating operation on which this power depends.

The vegetable products in which bitterness, without any other marked sensible medicinal quality, predominates, have always more or less of a tonic power; the stimulant operation on which this depends, seems, however, to be not much extended over the system: hence they have scarcely any sensible effect in augmenting the force of the circulation, or the heat of the body, in increasing the secretions, or in stimulating to action any particular part: their operation is principally in giving vigour to the stomach, and other digestive organs, and obviating those symptoms connected with debility of these organs. Still their operation is not entirely local; they prove tonic to the general system, not only indirectly by their action on the stomach, but by a more direct operation. This is displayed in their power of removing diseases connected with general debility, as intermittent

fever, or the different species of dropsy, particularly anasarca, which so frequently depend on diminished energy of the absorbents. The injurious consequences which sometimes arise from the use of bitters too long continued, affords another proof of their action on the general system.

Bitterness in vegetables has been supposed to reside in a peculiar proximate principle, which has been named the Bitter Principle. This opinion, however, is extremely vague, and rests on no sufficient evidence. The quality of bitterness may reside in any of the known principles of vegetable matter: in many of the bitters of the Materia Medica, it appears to be connected with their extract, as it is obtained equally by the action of water in alkohol; it is not volatile, and in general is not much impaired by decoction.

Aromatics are more rapid and diffusible in their action; they sensibly stimulate the general system, and augment the force of the circulation; but this is scarcely sufficiently permanent to admit of their being administered with advantage as tonics. They are therefore rather employed as temporary stimulants, to obviate debility of the digestive organs, or as promoting the action of bitters. Still, as strictly connected with the substances belonging to this class, I have not hesitated to place them under it. There is one general virtue they possess, and for which they are often used, that of preventing or relieving nausea; this they do partly from their agreeable taste and odour, and partly probably from their stimulant

operation on the stomach. The aromatic quality in general resides in their essential oil; hence it is communicated both to water and alkohol by infusion: their oils are usually pungent and stimulant, and their distilled waters and spirits partake of these powers.

From the qualities which bitters and aromatics possess, the stimulant operation of the one being slow and permanent, that of the other being more diffusible and transient, it might be inferred perhaps, that their combination will afford a superiority of tonic power. In the most powerful vegetable tonics, accordingly, these qualities are generally blended; these may be placed first, and from them there is a series to the more pure bitters and aromatics.

CINCHONA OFFICINALIS. *Cortex Peruvianus.* Cinchona. Peruvian Bark. *Pentand. Monogyn. Contortæ. Cortex, Peru.*

THE natural history of the genus Cinchona has been but imperfectly elucidated, and hence the Edinburgh College have inserted in their catalogue of the articles of the Materia Medica, the three kinds of Peruvian bark at present met with in the shops, the Pale, the Red, and the Yellow, leaving undetermined their natural distinctions. The species of this genus, it now appears, are numerous, and many of them natives of Peru; and it is not improbable that all, or the greater number of these contribute to furnish the Peruvian bark of commerce. The London College have inserted three species, Cinchona Lancifolia, Cinchona Cordifolia, and Cinchona Oblongi-

folia; the first, according to Dr Powel, furnishing the pale bark, the second the yellow, and the third the red.

These barks appear to be procured and prepared in a similar manner. The bark is stripped from the trunk and branches; it is dried by exposure to the sun, and after being imported into Europe, is sorted by separating the finer from the coarser.

The pale bark is in the form of small quilled twigs, thin, breaking close and smooth, friable between the teeth, covered with a rough coat of a greyish brown colour, internally smooth and of a light brown; when thick and not convoluted, it is considered as of inferior quality; its taste is bitter, and slightly astringent; its flavour slightly aromatic, with some degree of mustiness.

The Red is in large thick pieces, usually flat, though sometimes quilled, externally covered with a brown rugged coat, internally more smooth and compact, but fibrous, of a dark red colour; its taste and smell are similar to those of the pale, but the taste is rather stronger.

The Yellow, so named because it approaches more to that colour than either of the others do, is the variety last introduced. It is in flat pieces, not convoluted like the pale, nor dark-coloured like the red; externally smooth, internally of a light cinnamon colour, friable and fibrous; it has no peculiar odour different from the others, but a taste incomparably more bitter, with some degree of astringency.

Cinchona has often been subjected to chemical exami-

nation, but its constituent proximate principles are still not well determined. This indeed appears to be attended with peculiar difficulties, from the different species containing different principles, and from the nature of some of these being not well ascertained.

The basis of all of them is the ligneous fibre, constituting the greater part of their weight, but to this are attached various principles capable of being extracted by different solvents. Cold water infused on pale bark for some hours, acquires a bitter taste, with some share of its odour; when assisted by a moderate heat, the water takes up more of the active matter; this infusion is transparent while warm, but as it cools becomes slightly turbid; by decoction, a fluid, deep coloured, of a bitter styptic taste, is obtained, which, when cold, deposites a precipitate soluble in alkohol. By long decoction, the virtues of the bark are nearly impaired or destroyed, owing to the chemical change and precipitation of its active matter. Alkohol is a more powerful solvent of its active principles than water, the tincture being of a much deeper colour and stronger taste, and holding more matter dissolved. Brandy and other spirits and wines afford also strong solutions in proportion to the quantity of alkohol they contain. A saturated solution of ammonia is also a powerful solvent; vinegar is less so even than water. By distillation, water is slightly impregnated with the flavour of bark; but it is doubtful whether any essential oil can be obtained.

The action of menstrua on the red bark is nearly the

same, the solutions only being stronger, or containing a larger quantity of the matter which is precipitated from the decoction as it cools, and which is more peculiarly soluble in alkohol, this matter being apparently composed of the principles in which the activity of the bark resides.

The analysis of the yellow bark shows that its active principles are more powerful than in either of the others, as it affords to water, alkohol, &c. tinctures much stronger both in bitterness and astringency, especially in the former quality.

It is not easy to determine from these results, the nature of the principles extracted, or what relation they have to the powers of the bark. As the active matter appears to be more soluble in hot than in cold water, being partially precipitated from the former as it cools, and as it is still more soluble in alkohol, it might be concluded to be of a resinous nature. Being soluble to a certain extent, however, in water, and suffering at least a partial decomposition when boiled under exposure to the air, it may also be considered as approaching in its characters to extract.

Besides this, from the effects of re-agents, Peruvian bark has been considered as containing a quantity of astringent matter, and this matter appears to have some relation to the matter extracted by water with the aid of heat, and by alkohol. On adding a solution of sulphate of iron to the infusion, a deep colour is struck, not purple indeed like that usually produced by the action of

that test in the vegetable astringents, but rather of a dark olive green; the same colour is still deeper when the salt is added to the decoction, or the tincture. This was regarded as a proof of the presence of the astringent principle or tannin, and hence it might be inferred, that a precipitate would be produced by the addition of gelatin. This accordingly happens with some kinds of Peruvian bark; a solution of gelatin added to the infusion giving a precipitate more or less copious. But the singular fact has been discovered, that there are other varieties which do not precipitate gelatin, but have the opposite property of giving a precipitate with tannin, or at least with infusion of oak bark, or of infusion of galls. This latter phenomenon, Seguin considered absurdly as depending on the presence of gelatin, and pretended that gelatin exerted the specific power of Peruvian bark on the system, so that with animal glue he had cured intermittent fever. Dr Duncan inferred, that the phenomenon is owing to the presence of a peculiar proximate principle of vegetable matter not before observed, to which he has given the name of Cinchonin. Vanquelin, in his analysis of the different species of Peruvian bark, found generally, that their aqueous infusion gave a precipitate both with tannin and gelatin; some, however, gave no sensible precipitate with gelatin, while they precipitated tannin. Among these, he ranks the common pale bark. Others again did not precipitate tannin, but formed a precipitate with gelatin. His observations, however, are of less value, as although deduced from experiments on seven-

teen species, as he calls them, of cinchona, these are not distinguished by their specific characters, and we therefore scarcely know to what the observations apply. From the intermixture of different kinds of Peruvian bark in commerce, and the uncertainty of their uniformity, it is not easy to determine what species more peculiarly afford this principle. I have found, that the watery infusion of the pale bark is not sensibly precipitated either by gelatin or tannin; that of the red bark is not precipitated by gelatin, but gives a copious precipitate with tannin; and that of the yellow is rendered turbid by gelatin, and precipitated copiously by tannin.

There is a difficulty in determining the nature of the principles on which these phenomena depend,—either that which gives a precipitate with gelatin, or is precipitated by tannin, if these differ from each other. Neither is it very apparent what relation they have to the matter in which the active powers reside; it may be concluded, however, that they are not essential to it, since they are not found in pale bark, and since they are not uniform in the other species in any relation to the medicinal qualities. The same facts prove, that they have no relation to the resino-extractive matter, the principle probably of greatest activity of any which bark contains.

The infusions of some varieties of bark redden the more delicate vegetable infusions, and Vauquelin has discovered, in the matter extracted by water with the aid of heat, a salt composed of lime, with a peculiar crystallizable acid, which he has named Kinic Acid.

The active matter of bark is rendered more soluble in water by acids, a circumstance of some importance in its pharmaceutic preparation. The alkalis also add to its solubility; and some of the earths, particularly lime and magnesia, have the same effect.

The comparative medicinal activity of the different kinds of Peruvian bark is not easily determined, owing to the variable state in which they are found in the shops. The red, at its first introduction, was represented as much superior in efficacy to the pale, and this appeared to be confirmed by chemical experiments on the proportion of active matter in it to that of the ligneous fibre; but there is some reason to doubt of this superiority with regard to the red bark now frequently met with. The yellow bark has a much greater degree of bitterness, and some clinical observations appeared to establish its superior medicinal power. Even if this be admitted, its intense bitterness renders it unpleasant, and liable to occasion nausea.

The effects of Peruvian bark are those of a powerful and permanent tonic, so slow in its operation as to be scarcely perceptible by any alteration in the state of the pulse, or of the temperature of the body. Its tonic power is inferred, therefore, principally from obviating states of debility; and it is one of those medicines, the efficacy of which, in removing disease, is much greater than could be expected, *à priori*, from its effects on the system in a healthy state. The only effects arising from too large a dose are nausea and headach.

Intermittent fever is the disease for the cure of which bark was introduced into practice, and there is still no remedy which equals it in power,—a superiority of which, from its known operation, it is difficult to give any explanation. Little diversity of opinion now exists with regard to the rules regulating its administration. It is given freely in the earliest stage of the disease, and without any previous preparation, farther than the exhibition of an emetic to evacuate the stomach. And it may be employed with safety and advantage in every period of the fever. It has been supposed rather more effectual when given before the recurrence of the paroxysm, and that from this mode of employing it, less is required for that cure. The usual practice, however, is to give it in doses of a scruple or half a drachm every fifth or sixth hour during the interval of the paroxysm; and it may be given with safety during the hot fit, being then only more apt to excite nausea. It requires to be given for some time, and continued after the fever has been removed, in order to prevent a relapse.

In remittent fever it is given with equal freedom, even though the remission of the fever may be obscure, and frequently with advantage.

In those forms of continued fever which are connected with debility, as in typhus, cynanche maligna, and confluent small-pox, &c. bark has been regarded as one of the most valuable remedies. It is difficult, however, to give it in such quantities as to obtain much sensible effect from it, as from the weakened state of the organs of

digestion, it remains in the stomach unaltered, and is liable to produce nausea and irritation. In modern practice, therefore, bark is less employed in typhus, preference being given to the more powerful exciting operation of opium and wine. It has been regarded as hurtful even in those forms of fever, where the brain or its membranes are inflamed, or where there is much irritation, marked by subsultus tendinum, and convulsive motions of the extremities. Advantage is sometimes derived from it in the convalescent stage of the disease.

Even in fevers of an opposite type, where there are marks of inflammatory action, particularly in acute rheumatism, bark has been found useful, blood-letting being generally previously employed.

In erysipelas, in gangrene, in extensive suppuration, and in scrofulous and venereal ulceration, the free use of bark is of the greatest advantage.

In the various forms of passive hæmorrhagy, in many other diseases of chronic debility, dyspepsia, hypochondriasis, paralysis, rickets, scrofula, dropsy, and in a variety of spasmodic affections, epilepsy, chorea, and hysteria, cinchona is administered as a powerful and permanent tonic, either alone, or combined with other remedies suited to the particular case. The more common combinations of it are with sulphuric acid as an astringent, with preparations of iron as a tonic, with mercury in syphilis, in spasmodic diseases with valerian, and with cicuta in scrofula, and extensive ulceration.

Its usual dose is half a drachm. The only inconvenience of a larger dose is its sitting uneasy on the stomach. It may, therefore, if necessary, be frequently repeated, and in urgent cases may be taken to the extent of an ounce or even 2 ounces, in twenty-four hours, though from such large doses probably no adequate advantage is derived.

The powder is more effectual than any of the preparations; it is given in wine, in any spiritous liquor, or, if it excite nausea, combined with an aromatic. The cold infusion is the least powerful preparation, but is grateful and sits easy on the stomach; it is however so weak, that it is scarcely used but as a bitter in dyspepsia. Prepared by previous trituration of the bark with a little magnesia, it is rather more active. The decoction contains more of the active matter of the bark, and is the preparation generally used when the powder is rejected; its dose is from 2 to 4 ounces; but even it cannot be relied on for any important effect. The spiritous tincture, though containing more of the active principles, cannot be extensively used on account of the menstruum, but is principally employed, occasionally and in small doses, of 2 or 3 drachms, as a stomachic. The extract is a preparation of some power, when properly prepared by the joint action of alkohol and water; but as this is expensive, the watery extract only is usually found in the shops, and it is very variable in strength. It is given in the form of pill, in a dose from 5 to 15 grains, and affords the best form for combining bark with iron.

Bark is likewise sometimes given in the form of enema; 1 scruple of the extract, or 2 drachms of the powder, being diffused in 4 ounces of starch mucilage. The decoction is sometimes applied as a fomentation to ill-conditioned ulcers, or the powder is sprinkled on the ulcerated surface.

Offic. Prep.—Decoct. Cinch. Extr. Cinch. Inf. Cinch. Tinct. Cinch. *Ed.*—T. Cinch. C. *Lond. Dub.*

CINCHONA CARIBÆA. Caribæan Bark.

THIS species, belonging to the same genus, a native of the Caribee Islands, has been proposed as a substitute for Peruvian bark, and has as such been received into the Edinburgh Pharmacopœia. It is more bitter, and less aromatic, is of a brown colour, somewhat convoluted and fibrous. According to the observations of Dr Wright, who employed it in Jamaica, its effects are similar to those of the officinal cinchona. The Cinchona Floribunda, or St Lucia bark, has been also sometimes used. It is of a darker brown colour; its taste is sweetish, but becomes extremely bitter. It has been found more liable than the other species to produce nausea and purging.

ARISTOLOCHIA SERPENTARIA. Serpentaria Virginiana. Virginian Snake-root. *Gynand. Hexand. Sarmentosæ. Radix. Virginia, Carolina.*

THIS root consists of a number of small fibres, issuing from one head, of a greyish brown colour; it has a slightly aromatic smell, and a warm bitterish taste. Its active

matter is extracted partially by water, and by alkohol; entirely by proof spirit. By distillation, it affords a small quantity of an essential oil; somewhat fragrant, but not pungent.

Serpentaria is a stimulating aromatic tonic, which used formerly to be much employed in fevers of the typhoid type, to support the powers of the system. It was given in a dose of from 10 to 20 grains every fourth or fifth hour; with this intention, it is now however very rarely prescribed, and in any tonic power it possesses is probably considerably inferior to cinchona. It is sometimes combined with cinchona in the treatment of intermittent fever, and occasionally enters as an ingredient into the composition of bitter infusions and tinctures used in dyspepsia.

Offic. Prep.—T. Arist. Serpent. *Ed. L. D.*

DORSTENIA CONTRAYERVA. Contrayerva. *Tetrand. Monog. Scabridæ. Radix. Peru, West Indies.*

THIS root is in small twisted fibres, of a yellowish colour; has an aromatic smell, and a bitterish taste; yields its active matter to water and alkohol. Contrayerva, like serpentaria, was formerly used as a stimulant in typhoid fever, in a dose from 5 to 20 grains, but like it too has fallen into disuse. Mixed with carbonate of lime, it forms the compound powder of contrayerva of the London Pharmacopœia, which is used as a remedy in diarrhœa.

Offic. Prep.—P. Contrayerv. C. *Lond.*

CROTON ELEUTHERIA. Cascarilla. *Monoec. Monadelph. Tricoccæ. Cortex. Bahama Islands, North America.*

CASCARILLA bark is in small quills of a grey colour; has a slightly aromatic smell, and a warm bitter taste; it is highly inflammable. It has been used as a substitute for the Peruvian bark, and has been employed too as a remedy in dysentery, and in obstinate diarrhœa. Its usual dose is a scruple or half a drachm, but in modern practice it is little used.

Offic. Prep.—Infus. Casc. Tinct. Casc. *Lond.*—Extr. Casc. Resin. *Dub.*

CUSPARIA FEBRIFUGA. Angustura. *Pentand. Monogyn. South America.*

THIS bark was imported a few years ago from the Spanish West Indies, the botanical characters of the tree producing it being unknown. These have been lately determined by Humboldt, and the London College have adopted the name Cusparia Febrifuga, by which they distinguish it. It is in flat pieces, externally grey and wrinkled, internally of a yellowish-brown colour, and smooth; it has little odour; its taste is bitter and slightly aromatic. Water, assisted by heat, takes up the greater part of its active matter, which does not seem to be injured by decoction. Alkohol dissolves its bitter and aromatic parts, but precipitates the extractive matter dissolved by water, and its solution is on the contrary decomposed by water. Proof spirit appears to be its proper menstruum. By distillation, it affords a small quantity

of essential oil. The bark, triturated with lime or potash, and water, gives a smell of ammonia.

Angustura is a powerful antiseptic. It was originally introduced in the West Indies as a remedy in fevers, equal or even superior to the Peruvian bark. In this country it has not been much employed as a substitute for cinchona; and in the treatment of intermittent, it has in the trials that have been made of it failed. It has been used principally in obstinate diarrhœa, and in chronic dysentery, or as a remedy in dyspepsia. Its dose is from 10 to 20 grains of the powder, or one drachm in infusion or decoction. Its tincture with proof spirit is given in a dose of one or two drachms.

Offic. Prep.—Infus. Cuspar. *Lond.*—Tinct. Angust. *Ph. Dub.*

Swietenia febrifuga. Swietenia. *Decand. Monogyn. Trihilatæ. Cortex. East Indies.*

The bark of the wood of this tree is of a red colour internally; externally it is covered with a gray epidermis; it has an astringent bitter taste; it yields its active matter to water, by infusion or decoction, and by evaporation an extract is obtained, highly astringent. It was introduced as a substitute for Peruvian bark, and in India has been used as such with advantage. Its dose in substance is half a drachm.

SWIETENIA MAHAGONI. Mahogany. *Cortex. Spanish America, West Indies.*

THIS species, of the same genus as the preceding, has similar qualities and virtues, being equally bitter and astringent. It has therefore been received into the Edinburgh Pharmacopœia, and may be employed to answer similar indications.

COLOMBA. (Calumba, *Pharm. Lond.*) Colomba.

OF the plant which furnishes this root, no botanical account has been obtained. It has been said to be brought from Ceylon; but from later accounts, it appears to be the produce of Southern Africa. It is in round thin pieces, evidently formed by transverse sections of the root; the circumference of these is covered with a bark; the woody part is of a light yellow colour. It has an aromatic smell, and a bitter taste. It yields its bitterness to water; but proof spirit is its proper menstruum, though the tincture is not very strong.

Colomba is a powerful antiseptic and bitter; it is used with much advantage in affections of the stomach and intestinal canal, accompanied with redundance of bile; it is also employed in dyspepsia, and forms a more powerful and grateful stomachic than the common bitters. Its dose is half a drachm of the powder, which in urgent cases may be repeated every third or fourth hour.

Offic. Prep.—Tinct. Colomb. *Ed. Lond. Dub.*—Infus. Colomb. *Lond.*

QUASSIA SIMAROUBA. Simarouba. *Decand. Monogyn. Gruinales. Cortex. South America.*

THE bark of the root of this tree, which is the part medicinally employed, is in long pieces, of a fibrous texture and yellowish colour; destitute of odour, and having a strong bitter taste. It is however very variable in its sensible qualities, some having scarcely any bitterness. Water and alkohol dissolve its active matter; the solution in either suffers no change from sulphate of iron.

Simarouba has been celebrated as a remedy in intermittent fever, dysentery and chronic diarrhœa, and has been given generally in the form of decoction: in substance the dose is one scruple. Though used in the countries of which it is a native, it is with us rarely prescribed. An infusion of it has a place in the London Pharmacopœia.

Offic. Prep.—Infus. Simaroub. *Ph. Lond.*

QUASSIA EXCELSA. Quassia. *Decand. Monogyn. Gruinales. Lignum. West Indies.*

THE wood of the root of this tree is of a yellowish white colour; it has a taste intensely bitter, without any odour or aromatic flavour. The bitterness is extracted equally by water and by alkohol.

It is used as a remedy in dyspepsia, diarrhœa, and in remittent and intermittent fevers, and is also sometimes employed to check vomiting. It is commonly given under the form of the watery infusion; in substance, in

substance, in which state it has been employed in the treatment of intermittents; its dose is from 10 to 30 grains.

Offic. Prep.—Infus. Quass. *Ph. Lond.*—Tinct. Quass. *Ph. Dub.*

GENTIANA LUTEA. Gentian. *Pentand. Digyn. Rotaceæ. Radix. Switzerland, Germany.*

THIS root is in long slender pieces, soft and flexible, of a yellowish colour, with a greyish epidermis. It has a very bitter taste, without any peculiar flavour. This bitterness is extracted both by water and alkohol. Diluted alkohol is its proper solvent.

Gentian is a common remedy in dyspepsia, in the form of infusion or tincture; and as a bitter, usually forms the basis of stomachic remedies. In substance, it has been used, though much more rarely, for the cure of intermittents, in a dose of half a drachm.

Offic. Prep.—Extr. Gent. Lut. Inf. Gent. C. T. Gent. C. *Ph. Ed. Lond. Dub.*—Vin. Gent. C. *Ed.*

ANTHEMIS NOBILIS. Chamæmelum. Chamomile. *Syngenes. Polygam. superfl. Compositæ. Flores. Indigenous.*

THERE are two varieties of these flowers obtained by cultivation, the single and double flowered: the former is much stronger, the odour and taste residing not in the white petals, but in the disk or tubular florets. Both have a bitter nauseous taste, and a strong unpleasant odour. The bitterness, with part of the odour, is ex-

tracted by water and alkohol, and if the infusion has been made with warm water, it is nauseous. Distilled with water, they yield a small quantity of essential oil.

Chamomile is a powerful bitter, and as such is useful in dyspepsia, forming a popular remedy which is in common use. When employed for this purpose, it ought to be under the form of the cold infusion, which is most grateful. The infusion in tepid water, when strong, acts as an emetic, and is often used to promote the action of other emetics. In substance, it has been given as a remedy in intermittent fever, in a dose of half a drachm three or four times a-day. Externally, the flowers steeped in water are employed as a fomentation. The extract, which is intensely bitter, is a convenient vehicle for forming pills, especially when it coincides in virtue with the substance prescribed under that form.

Offic. Prep.—Extr. Anth. N. *Edin. Dub. Lond.*—Inf. Anth. Ol. Anth. *Lond.*—Decoct. Anthem. *Ed. Dub.*

THE following plants, possessing bitterness in a greater or less degree, were formerly much employed, but are now discarded from practice. They possess no virtues but those of bitters, and as they have all more or less of a nauseous flavour, gentian, colomba or quassia is preferred to them. It is necessary to notice only their botanical characters.

ARTEMISIA ABSINTHIUM. Wormwood. *Syngenes. Polygam. superfl. Compositæ. Herba. Indigenous.*

CHIRONIA CENTAURIUM. Centaury. *Pentand. Monogyn. Rotaceæ. Herba.*

MARRUBIUM VULGARE. Hoarhound. *Didynam. Gymnosperm. Verticillatæ. Herba.*

MENYANTHES TRIFOLIATA. Trefoil. *Pentand. Monog. Rotaceæ. Herba.*

CENTAUREA BENEDICTA. Blessed Thistle. *Syngenes. Polygam. frustran. Compositæ. Herba. Spain.*

THE remaining substances belonging to this class are those in which the aromatic quality predominates, blended in some of them with a degree of bitterness.

CITRUS AURANTIUM. Orange. *Polyadelph. Icosand. Pomaceæ. Cortex flavus Fructus; Fructus; Fructus immaturus. India.*

THOUGH a native of India, this fruit is abundantly cultivated in the south of Europe. The outer rind of the fruit has a grateful aromatic flavour, and a warm bitterish taste. It is dried for use; both taste and flavour are extracted by water by infusion, as well as by alkohol; and by distillation a small quantity of essential oil is obtained. Its qualities are those of an aromatic and bitter. It has been employed to restore the tone of

the stomach; and it is a very common addition to combinations of bitters used in dyspepsia, communicating to them its grateful odour, and coinciding with them in power. It has likewise been given in intermittents in a dose of a drachm twice or thrice a-day.

Offic. Prep.—Aq. Citri Aur. Cons. Citr. Aur. Syr. Citr. Aur. *Ed.*—T. Cort. Aur. *Lond. Dub.*—Inf. Citr. Aur. *Lond.*

The unripe fruit, *Aurantia Curasslaventia*, Curassoa Oranges as they are named, retain when dried the aromatic flavour of the peel, with rather a larger share of bitterness, and are applied to the same uses. The juice of the ripe fruit consists principally of acid and saccharine matter, and so far as it has any medicinal virtue is a refrigerant.

Citrus medica. Lemon. *Polyadelph. Icosand. Pomaceæ. Cortex fructus. Asia.*

The exterior rind of the fruit of the lemon is similar in flavour and taste to that of the orange, but is rather less bitter and aromatic; its flavour too is more perishable, and from both circumstances it is less frequently used, though it may be employed for similar purposes. The juice is strongly acid, consisting chiefly of citric acid; its medicinal applications fall to be considered under the class of refrigerants.

Offic. Prep.—Aq. Citr. Med.—Syr. Citr. Med. *Ed.*—Acid. Citric. *Pharm. Lond.*

LAURUS CINNAMOMUM. Cinnamon. *Enneand. Monogyn. Oleraceæ. Cortex. Ceylon.*

THIS tree, a native of Ceylon, is now cultivated in India. The cinnamon is the interior bark of the branches of the tree; it is thin and much convoluted, of a texture somewhat fibrous, friable, of a light brown colour, having an agreeable pungent taste, with a degree of sweetness, and a grateful aromatic flavour. Its virtues chiefly depend on a small quantity of essential oil which it contains, and which, when obtained by distillation, is highly odorous and pungent.

Cinnamon is the most grateful of the aromatics. It is used to cover the unpleasant taste and flavour of other medicines, and to reconcile them to the stomach. It is also employed by itself as a moderate stimulant, given generally under the form of the watery infusion or distilled water. The former is more grateful, and is often successful in relieving nausea and checking vomiting.

Offic. Prep.—Aq. L. Cinn. Sp. L. Cinn. T. L. Cinn. T. L. Cinn. C. Pulv. Cinn. Comp. *Ed. Lond. Dub.*

LAURUS CASSIA. Cassia. *Enneand. Monogyn. Oleraceæ. Cortex. Flores nondum expliciti. India.*

THE Cassia Bark resembles that of cinnamon in appearance, taste and flavour; but is distinguished by its taste being more pungent, less sweet, and more mucilaginous than that of the real cinnamon; by its texture being denser, or less shivery, so that it breaks close and smooth, and by the pieces of it being thicker and less

convoluted. Its aromatic quality, like that of cinnamon, resides in an essential oil. It affords a distilled water, stronger than that of the genuine cinnamon, and yields also its taste and flavour to water by infusion. It is used for the same purposes as cinnamon; it is, however, much less agreeable to the stomach, and rather more pungent and stimulating. It cannot, therefore, be always with propriety substituted for the other, especially where the stomach is in an irritable state. The Cassia buds dried, are similar in taste and flavour to the bark, and are often substituted for it in officinal preparations.

Offic. Prep.—Aq. L. Cass. *Ed.*

CANELLA ALBA. *Dodecand. Monogyn. Oloraceæ. Cortex. West Indies.*

THIS is the inner bark of the branches of the tree. It is in quills or flat pieces, of a light greyish colour; its flavour is somewhat aromatic, and its taste is pungent. By distillation it affords a thick essential oil.

Canella is employed principally on account of its aromatic quality, and generally in combination with other remedies to render them more grateful. It thus enters into the composition of several officinal tinctures, and has been supposed, in particular, well adapted to cover the flavour of aloes.

Offic. Prep.—V. Aloes cum Canella. *Ph. Ed.* Pulv. Aloes cum Canella. *Ph. Dub.*

MYRISTICA MOSCHATA. *Monoec. Monand. Oleraceæ. Fructus nucleus, Nux Moschata dictus; Macis; Hujus Oleum fixum. India.*

UNDER the officinal name Myristica, are comprehended Nux Moschata or Nutmeg, and Macis or Mace; the former being the seed or kernel of the fruit, the latter the covering with which it is immediately surrounded. The tree is a native of the Molucca islands. The external covering and pulp of the fruit are removed, and the nutmeg and mace are dried by exposure to the sun.

Nutmegs are round, of a greyish colour, streaked with brown lines, slightly unctuous; they have a strong aromatic flavour, and a pungent taste. They yield their active matter entirely to alkohol: distilled with water, they afford a fragrant and pungent essential oil; by expression, a sebaceous oil is obtained from them, retaining their fragrant odour, and part of their pungency.

Nutmeg is used in medicine as a grateful aromatic. It may be given in a dose from 5 to 15 grains, and is sometimes employed to relieve nausea or vomiting, or to check diarrhœa, taken generally in wine. It has been said to prove narcotic in a large dose. It is also frequently employed to conceal the taste and flavour of unpleasant medicines, and to obviate the nausea they might excite.

Mace is a membranous substance, unctuous, of an orange yellow colour, and having a flavour and taste similar to the nutmeg, but rather less strong. It is used for the same purposes.

The expressed oil of nutmeg, which is generally known

by the name of Oil of Mace, derives its smell and taste from the essential oil mixed with it. It is sometimes used as an external stimulating application, but in the shops is seldom found genuine.

Offic. Prep.—Ol. Myrist. Mosch. Sp. Myrist. Mosch. —*Ed. Lond. Dub.*

EUGENIA CARYOPHYLLATA. Caryophyllus Aromaticus. Clove. *Polyand. Monog. Hesperideæ. Flores cum pericarpio immaturo. India.*

THE tree producing cloves is a native of the Molucca islands, and is cultivated in other parts of India. The cloves are the unexpanded flowers, which are dried by fumigating them, and exposing them to the sun. They are somewhat round, the division of the petals of the corolla being perceptible, of a greyish brown colour, slightly unctuous; they have a strong aromatic odour, and a pungent taste. They afford to water their flavour principally; to alkohol their taste. By distillation with water, they yield a fragrant essential oil, not very pungent. The oil of cloves commonly met with is rendered acrid by a portion of the resinous extract obtained by the action of alkohol being dissolved in it.

Cloves are among the most stimulating of the aromatics. They are employed principally as adjuvants or corrigents to other medicines. The essential oil is used with the same intention, and likewise as a local application to toothach. The infusion in tepid water has been employ-

ed as a grateful stimulant to relieve the sense of coldness in the stomach, which attends some forms of dyspepsia.

Offic. Prep.—Infus. Caryoph. *Ph. Lond.*—Ol. Caryoph. Ar.—*Ph. Ed.*

CAPSICUM ANNUUM. Capsicum. Guinea Pepper, or Capsicum. *Pentand. Monog. Solanaceæ. Fructus. East and West Indies.*

THE fruit of this plant is an oblong pod, of an orange colour, containing a pulp inclosing seeds. The membranous pod has an odour aromatic and penetrating, but which is impaired by drying; its taste is extremely hot and acrid, the sensation which it excites remaining long impressed on the palate. Its pungency is completely extracted by alkohol, and partially by water.

Capsicum is a very powerful stimulant. As such, it has been given in atonic gout, in palsy and dyspepsia, and in the latter stage of fever where the powers of life are nearly exhausted. It is also used as a condiment to food, especially in warm climates, and proves useful by obviating flatulence and promoting digestion. An infusion of it in vinegar, with the addition of salt, has been used as a gargle in cynanche; but the practice, though it has been successful in the West Indies, is not without danger from the inflammation it is liable to induce. The seeds have been found useful in obstinate intermittents, two grains being given at the approach of the cold paroxysm. The dose of the pod is from 5 to 10 grains.

Offic. Prep.—Tinct. Capsici. *Ph. Lond.*

PIPER NIGRUM. Black Pepper. *Diand. Trigyn. Piperitæ. Fruct. India.*

BLACK or Common Culinary Pepper is the unripe fruit of this plant dried in the sun. Its smell is aromatic; its taste pungent. Both taste and smell are extracted by water, and partially by alkohol. The essential oil, obtained by distillation, has little or no pungency.

Pepper, from its stimulating and aromatic quality, is employed as a condiment to promote digestion: as a medicine it is given to relieve nausea, or check vomiting, to remove singultus, and as a stimulant in retrocedent gout, and paralysis. Its dose is 10 to 15 grains. Its infusion has been used as a gargle in relaxation of the uvula.

White Pepper is the ripe berries of the same plant, freed from the outer covering, and dried in the sun. It is less pungent than the black.

PIPER LONGUM. Long Pepper. *Diand. Trigyn. Piperitæ. Fructus. East Indies.*

THIS is the berry of the plant, gathered before it is fully ripened, and dried in the sun. It is oblong, indented on the surface, of a dark grey colour. In flavour, taste, and other qualities, it is similar to the black pepper, and may be used for the same purposes.

PIPER CUBEBA. Cubebs. *Diand. Trigyn. Piperitæ. Fructus. East Indies.*

CUBEBS are the dried fruit of this tree. They have an aromatic odour, and a moderately warm taste. Their

virtues are similar to those of the other peppers, and being rather weaker, they are little used.

MYRTUS PIMENTA. Piper Jamaicensis. Jamaica Pepper. *Icosand. Monog. Hesperideæ. Baccæ. West Indies.*

THE berries of this tree are collected before they are ripe, and are dried in the sun. Their taste, though pungent, is much less so than that of the peppers; their flavour is fragrant, and has often been compared to that of a mixture of cloves, nutmeg, and cinnamon. The flavour resides in an essential oil; the pungency in a resin. Pimento is used in medicine merely as an aromatic, and principally on account of its flavour.

Offic. Prep.—Aq. Myrt. Pim. Ol. Vol. Myrt. Pim. Sp. Myrt. Pim. *Ph. Ed. Lond. Dub.*

AMOMUM ZEDOARIA. Zedoaria. Zedoary. *Monand. Monog. Scitamineæ. Radix. India.*

THIS root is in oblong pieces, of an ash colour; its smell is aromatic; its taste pungent and bitterish. It contains a portion of camphor along with its essential oil.

Its virtues are merely those of an aromatic, and as it is rather weak, it is little used.

AMOMUM ZINGIBER. Ginger. *Monand. Monog. Scitamineæ. Radix. India.*

THIS plant is cultivated in the West Indies, whence the dried root is imported. It is in small wrinkled pie-

ces, of a greyish or white colour, having an aromatic odour, and a very pungent, somewhat acrid taste. The Black Ginger is the root prepared with less care than the White; the latter, previous to drying, being scraped and washed.

Ginger yields its active matter completely to alkohol, and in a great measure to water. By distillation it affords a small quantity of essential oil, which is fragrant, but not pungent, the pungency residing in a resino-extractive matter.

This root is frequently employed as a grateful and moderately powerful aromatic, either in combination with other remedies, to promote their efficacy, or obviate symptoms arising from their operation, or by itself as a stimulant. With the latter intention, it is used in dyspepsia, flatulence, and tympanitis. Its dose may be 10 grains.

Offic. Prep.—Syrup. Amom. Zingib. *Ph. Ed. Lond. Dub.*—Tinct. Zingib. *P. Lond Dub.*

AMOMUM REPENS. Amomum Cardamomum. Cardamomum minus. Lesser Cardamom. *Monand. Monogyn. Scitamineæ. Semen. India.*

IT was always somewhat uncertain, from which of the above species these seeds are obtained; and more lately, from a more accurate description of the plant, it has been entirely removed from the genus amomum; and placed under a new genus, named Elettaria, the name chosen for

the species being Elettaria Cardamomum. This has been admitted by the London College.

The seeds are dried, and imported in their capsules, by which their flavour is better preserved. Their smell is aromatic; their taste pungent, and both are communicated by infusion to water, as well as to alkohol. They afford by distillation an essential oil. They are used merely as grateful aromatics, and are frequently combined with bitters.

Offic. Prep.—Tinct. Amom. R. *Ed. Lond. Dub.*—Tinct. Cardom. Comp. *Lond. Dub.*

CARUM CARUI. Caraway. *Pentand. Digyn. Umbellatæ. Semen. Indigenous.*

CARAWAY Seeds have an aromatic flavour, and a warm taste, depending principally on an essential oil, which they contain in considerable quantity. They are used to relieve flatulence, one or two drachms being swallowed entire; their essential oil, which has considerable pungency, and is grateful, is not unfrequently added to other medicines, to obviate nausea or griping.

Offic. Prep.—Sp. Car. Carv. *Ed. Lond. Dub.*—Aq. Car. *Lond.*—Ol. Car. *Lond. Dub.*

CORIANDRUM SATIVUM. Coriander. *Pentand. Digyn. Umbellatæ. Semen. South of Europe.*

THE seeds of this plant have a more pleasant odour when dried than when fresh; their taste is moderately warm. Like caraway, they are used as carminative, and

likewise to cover the taste and flavour of some medicines, particularly of senna, when given under the form of infusion or tincture.

PIMPINELLA ANISUM. Anise. *Pentand. Digyn. Umbellatæ. Semen. Egypt.*

THE seeds of anise have an aromatic odour, and a warm taste, with a share of sweetness. They afford, by distillation with water, a considerable quantity of an essential oil, having a strong, rather unpleasant odour, and a sweet taste, without much pungency. They are used chiefly as a carminative in dyspepsia, and in the flatulence to which infants are subject. A small quantity of the seeds may be taken, or, what is preferable, a powder composed of a few drops of the oil rubbed with sugar.

Offic. Prep.—Ol. Pimpin. Anis. *Ed. Lond. Dub.*—Sp. Anis. *Lond.*—Sp. Anis. C. *Dub.*

THE seeds of the following plants have qualities and virtues so very similar to those of the anise or caraway, that they do not require distinct consideration. They are used for similar purposes, but are scarcely entitled to a place in the Materia Medica.

ANETHUM FOENICULUM. Fœniculum dulce. Sweet Fennel. *Pentand. Digyn. Umbellatæ. Semen. Indigenous.*

ANETHUM GRAVEOLENS. Dill. *Pentand. Digyn. Umbellatæ. Semen. Spain and Portugal.*

CUMINUM CYMINUM. Cumin. *Pentand. Digyn. Umbellatæ. Semen. South of Europe.*

ANGELICA ARCHANGELICA. Angelica sativa. Garden Angelica. *Pentand. Digyn. Umbellatæ. Semen; Folia; Radix. North of Europe.*

Of this plant, the root possesses the greatest share of the aromatic quality, though it also belongs to the seeds and leaves.

MENTHA PIPERITA. Mentha Piperitis. Peppermint. *Didynam. Gymnosp. Verticillatæ. Herba. Indigenous.*

Of the different mints, this is the one which has the greatest degree of pungency. The leaves have a considerable degree of aromatic odour and taste. They afford an essential oil, rich in the aromatic quality and pungency of the herb. Peppermint is used as a stimulant and carminative, to obviate nausea or griping, or to relieve the symptoms arising from flatulence, and very frequently to cover the taste and odour of other medicines. It is used for these purposes under the forms of the watery infusion, the distilled water, and the essential oil.

Offic. Prep.—Aq. Menth. P. Sp. Menth. P. Ol. Menth. P. *Ed.*

MENTHA VIRIDIS. Mentha sativa. Spearmint. *Didynam. Gymnosperm. Verticillatæ. Herb. Indigenous.*

MENTHA PULEGIUM. Pennyroyal. *Didynam. Gymnosp. Verticillatæ. Herba. Indigenous.*

THESE two mints, spearmint and pennyroyal, resemble the peppermint in their general qualities, and are used for the same purposes, but are rather less agreeable and pungent. Their essential oil and distilled water are also inserted in the Pharmacopœia.

HYSSOPUS OFFICINALIS. Hyssop. *Didynam. Gymnosp. Verticillatæ. Herba. Asia, South and East of Europe.*

THIS plant, nearly allied to the preceding in botanical characters, is possessed of very similar qualities and virtues, and is sometimes employed for the purposes for which they are used. It has also been considered as a remedy in catarrh, though it can have no efficacy.