## SECOND DIVISION.—OF LOCAL STIMULANTS.

Under this division are comprehended those remedies, the stimulant operation of which is directed to particular organs. This comprises Emetics, Cathartics, Diuretics, Sialogogues, and those various other classes that have usually been arranged under the title of Evacuants, their local operation giving rise to increased secretion, or increased evacuation.

## CHAP. VII.

### OF EMETICS.

Emetics are defined, Medicines which excite vomiting, independent of any effect arising from the mere quantity of matter introduced into the stomach. This definition, however, requires to be still more limited; for there are many substances which occasionally induce vomiting, that are not usually ranked as emetics. All bitter and nauseous drugs have this effect, when given in large doses, or in an irritable state of the stomach; and it oc-

curs frequently as the consequence of the action of many stimulants and narcotics. The emetic operation, however, from these causes, is neither uniform nor certain: there are, on the contrary, a number of substances, many of which have no very nauseous taste, or which can have that taste concealed, but which still excite vomiting when given in a sufficient dose in every individual, and in every state of the stomach. To these substances the appellation of Emetics is exclusively applied. They may therefore be defined, Substances which excite vomiting, independent of any effect arising from the quantity of matter introduced into the stomach, of any nauseous taste or flavour, or of any narcotic or acrid power.

When an emetic has been given in a proper dose, the stomach remains for some time undisturbed. But in 10, 15, or 20 minutes an uneasy sensation, with nausea, supervenes, which continues increasing until vomiting begin. While the nausea only is present, the countenance is pale, the pulse is feeble, quick and irregular, and there is a feeling of cold; but during the action of vomiting the face becomes flushed, the pulse is quickened, though still feeble, and remains so in the interval of vomiting. The vomiting generally recurs twice or thrice, and then ceases; a degree of nausea remains, which goes off only gradually; there is a degree of languor, and often a disposition to sleep; the pulse is weak and slow, but becomes gradually fuller; the skin is usually moist.

The general theory of the operation of vomiting is suf-

ficiently evident. The vermicular or peristaltic motion of the stomach, by which the food is propelled through the pylorus, is inverted; the diaphragm and abdominal muscles are called into action by association; the pylorus is contracted, and the contents of the stomach are forcibly discharged upwards. In many cases of vomiting, especially when violent, the peristaltic motion even of the upper part of the intestinal canal is also inverted, and bile is brought into the stomach from the duodenum.

At the same sime, it is very difficult to explain how the peristaltic motion is inverted by emetics. It is a singular fact, that any substance acting as an unusual stimulus to the stomach seldom increases its motion, so as to occasion a more speedy discharge of its contents by the pylorus. The motion, instead of being increased, is more commonly inverted, and hence vomiting is the effect peculiarly resulting from such local stimulant action. Nor is it easy to assign any cause for this specific operation.

Dr Darwin gave a different explanation of the nature of vomiting. He considered it as the effect, not of increased, but of decreased action of the fibres of the stomach. When an emetic is administered, it produces, he observes, the pain of sickness, as a disagreeable taste in the mouth produces the pain of nausea: these uneasy sensations not being acutely painful, do not excite the organ into greater action, but rather repress the motions already existing. The peristaltic motion of the fibres of the stomach becomes languid from the want of the usual

stimulus of pleasurable sensation, and in consequence stops for a time, and then becomes inverted, which gives rise to the phenomena. In this theory, there is however equally a deficiency in explaining how the inversion of the motion is effected.

There is a considerable difference among individuals with regard to the facility with which vomiting is excited. This susceptibility is also liable to be altered by disease. In the greater number of febrile affections, vomiting is easily excited; while in several of the diseases of the class Neuroses, as mania, melancholia and hypochondriasis, it is excited with much more difficulty. In the case of poisons, which induce inflammation of the stomach, vomiting is almost a constant symptom; while in those which act by a narcotic power, and in which the irritability of the stomach is impaired, a very powerful emetic is required to produce any effect.

Although nausea or sickness generally accompanies vomiting, this connection is not a necessary one. Some emetics, as sulphate of zinc, act without occasioning much nausea; while others, as tobacco, excite it in a greater degree than is proportioned to their emetic power, —a circumstance sometimes requiring to be attended to in the administration of individuals of this class.

The feeble and low state of the pulse, which attends vomiting, has been ascribed either to direct association between the motions of the stomach and those of the heart; or to the nausea excited, which, like other disagreeable sensations not acutely painful, have a depressing

effect, being equivalent probably to an abstraction of stimulus.

Emetics, at least those which are mild in their operation, do not appear to waste the irritability of the stomach: they have rather an opposite effect: hence digestion is often vigorous after vomiting, and hence too gentle emetics are often serviceable in dyspepsia, and in the temporary diminished tone of the stomach occasioned by intoxication.

The state of the stomach produced by vomiting seems to be often extended to the vessels of the skin; it is therefore followed frequently by diaphoresis, and is one of the most powerful means of removing spasmodic stricture from the surface of the body.

Emetics have a remarkable power of increasing absorption: hence the benefit they afford in anasarca, and the sudden disappearance of tumors which sometimes happens after violent vomiting.

Emetics frequently occasion increased evacuation from the intestinal canal; and if they fail to excite vomiting, very generally operate as cathartics. Some are more apt to have this effect than others, as the preparations of antimony compared with ipecacuan.

From the different indications which emetics are capable of fulfilling, they are adapted to the treatment of many morbid affections.

Where disease depends on a disordered state of the stomach, arising from over-distention, the presence of acrid or indigestible matters, or any other cause, vomiting

is the easiest and most effectual mode of affording at least present relief. Hence its utility in all cases of indigestion, impaired appetite, acidity in the stomach, pyrosis, or anorexia; in the symptoms arising from intoxication, and where poisons of any kind have been swallowed.

From the strong action of the diaphragm and abdominal muscles in vomiting, the gall bladder and hepatic ducts are emptied of their contents; and hence jaundice, owing to obstruction from biliary calculi, is sometimes suddenly relieved by vomiting. A similar pressure is supposed to be exerted during vomiting on the thoracic viscera, and from this has been explained the expectorant effects of emetics, and the relief they afford in some varieties of asthma and catarrh.

In the different varieties of febrile diseases, much advantage is derived from the administration of an emetic, especially in the commencement of the disease. In synocha, where there are symptoms of highly increased action, and particularly where there is determination of blood to the head, full vomiting may be attended with some danger; and in typhus fully established, it cannot be expected to be of much benefit. In the slighter cases of pyrexia, it is often attended with marked advantage. The emetic should be given in the evening, as its operation leaves a tendency to sleep, and to diaphoresis, which it is useful to promote.

At one time, the practice of giving emetics in fever in such doses as to excite nausea without producing vomiting was common. It is more distressing to the

patient, and does not appear to be equally effectual in stopping the progress of the disease. This mode, however, of giving nauseating doses of emetics, is often useful in hæmorrhage, where full vomiting would be dangerous; the nausea excited diminishes the force of the circulation, and hence it is sometimes employed in hæmoptysis and menorrhagia.

From the powerful effects of emetics, their improper administration may be extremely hurtful, and there are various states of the system which either prohibit their use, or allow them to be employed only with caution. During the operation of vomiting, the blood returns with more difficulty from the head, owing partly to the pressure on the descending aorta, and partly to the interrupted respiration, by which the transmission of blood through the lungs is impeded; hence the redness of the countenance, and the vertigo which sometimes accompany it. From this cause it must be attended with danger in all cases where there are symptoms of determination to the head, and more especially in plethoric habits. From the strong action of the abdominal muscles exerted in vomiting, it has been considered as not without risk in visceral inflammation, in the advanced stage of pregnancy, and in hernia and prolapsus uteri. In extreme debility, there is danger of the patient sinking under the violence of the operation. The frequent repetition of emetics in chronic diseases is in general prejudicial, by weakening the tone of the stomach, and rendering its motions more liable to be inverted by slight causes.

The mode of administering emetics does not admit of many general observations. They should be given in the form of draught; as if in a solid form, the emetic might pass from the stomach into the intestines, without exciting vomiting. A common practice is to promote the action of emetics by taking large draughts of tepid water, or of an infusion of chamomile. If an emetic is given in a large dose, this is not necessary, as it will excite vomiting repeatedly at intervals; but if given in a moderate dose, it may excite vomiting only once; nausea and efforts to vomit will recur, however, at intervals, and then vomiting may be renewed by a draught of tepid water, or of a bitter infusion. We thus obtain the advantages of repeated vomiting, without the risk attending a large dose of a powerful emetic. Too large a draught ought not to be taken, as it renders the operation more difficult or painful. Some acrid emetics, however, as mustard, require always to be largely diluted.

The most natural subdivision of this class is into Emetics from the Vegetable, and from the Mineral Kingdom,

# EMETICS.

*From the Mineral Kingdom.*

Antimonium.
Zincum.
Cuprum.

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Ammonia.
Hydro-sulphuretum ammoniæ.

*From the Vegetable Kingdom.*

Callicocca ipecacuanha.
Scilla maritima.
Anthemis nobilis.
Sinapis alba.
Asarum europæum.
Nicotiana tabacum.

## *Emetics from the Mineral Kingdom.*

### Antimonium. Stibium. Antimony.

The metal to which this name is appropriated, is peculiarly distinguished as an evacuant, and under various forms of preparation furnishes some of our most powerful cathartics, diaphoretics, and expectorants. All its preparations in larger doses act as emetics, and several of them are in common use for their emetic power. It is therefore under this class that its general history may be introduced.

Antimony, in the modern chemical nomenclature, is the name applied to the pure metal. This metal is found in nature most abundantly combined with sulphur, and to this ore the name of Antimony was once generally given by chemical and medical writers; the epithet Crude being frequently added to distinguish it, when it is melted out from the impurities mingled with it. The ore in this state is now named Sulphuret of Antimony, and the simple name Antimony is appropriated to the metal itself.

The native sulphuret is of a grey or blue colour, with metallic lustre; it is opaque, and has usually a striated texture. To free it from the earthy matter with which it is mixed, when dug from the vein, it is fused. Its lustre is greater the more completely it is purified. The

proportions of its principles are various; sometimes they are nearly equal; in other specimens the quantity of metal is larger; and there are some varieties unfit for medicinal use, as containing other metals, particularly lead, and sometimes copper. These have inferior lustre, and a less distinctly striated texture.

The pure metal is usually obtained from the ore by melting the latter with iron-filings, the iron combining with the sulphur, while the antimony, being very fusible, is run out. The metal is of a bluish white colour, and plated texture, moderately hard, and very brittle; it melts easily, and is even volatilized by a heat not very intense; it is oxidated by exposure to the air at a temperature moderately increased; and in the state of oxide, it is capable of combining with the greater number of the acids.

The sulphuret of antimony has little activity, and indeed produces scarcely any sensible effect on the system. The preparations of the metal are much more active, and though of very different degrees of strength, retain the same general mode of action, and possess therefore the same medicinal virtues. They do not exert any general stimulant operation on the system, but are always directed in their action to particular parts, so as to occasion some sensible evacuation.

The principal general medicinal application of antimony in these preparations has been for the cure of febrile affections. It is given either so as to induce vomiting or purging, or sometimes in smaller doses, so as

to produce only gentle diaphoresis; and exhibited in either mode in the commencement of the disease, it has been considered as capable of cutting short its progress. The use of James's powder, which is an antimonial, has been extensive with this view, and both it, the emetic tartar, and other antimonials, are still employed. Their efficacy has usually been ascribed to the evacuation they occasion, while others have considered antimony, apparently with little reason, as exerting an action specific or peculiar in itself in the cure of fever, and not explicable on the known effects it produces. Its administration is not easily regulated with precision; in small doses it often fails in producing the favourable crisis expected from its operation; and in larger doses it is liable to act with violence, and produce evacuations under which the powers of the system have sunk. It is principally in the commencement of fever that advantage is derived; in the more advanced stages, when the state of debility is induced, more hazard attends its employment, and less advantage is to be expected from it.

Antimonials have been found to have good effects in intermittent as well as in continued fever, in several of the phlegmasiæ and exanthemata, and even in several of the profluvia, probably from their evacuating operation.

As an emetic, antimony is distinguished by the certainty, extent, and permanence of its operation. The action it excites in the stomach is both more forcible, and continues for a longer time, than that from other eme-

tics, and hence it produces more complete evacuation, and occasions in a greater degree all those effects which result from the action of vomiting. Its action is also less local. It is generally extended to the intestinal canal, so as to produce purging, and very frequently to the surface of the body, so as to occasion diaphoresis or sweat. It is used more particularly where the effects of full vomiting are required; but where these are not wished for, more gentle emetics are usually preferred.

Of the preparations of antimony, it is necessary to take only a very cursory view, as they are to be more fully noticed in another part of the work. They may be arranged under those in which the metal is combined with sulphur; those in which it is oxidated; and those in which it is brought into a saline state by combination with acids.

Of the first, the Levigated Antimony (Antimonium Præparatum), which is merely the native sulphuret reduced to a state of mechanical division, is the only preparation. It has been given as a diaphoretic, especially in chronic rheumatism, and in some cutaneous affections, in a dose from 15 grains to 1 drachm; but it is so inert and uncertain, that it is now discarded from practice.

The oxides of antimony are more active, but they are liable to the inconvenience of being uncertain in their operation, partly perhaps from their activity being dependent on the state of the stomach with regard to acidity, partly from the various degrees of oxidation in which they may exist, and which are not easily rendered uniform,

and partly too from their state of aggregation. Proust has supposed, that there are only two oxides of antimony, one at the *minimum*, containing 18.5 of oxygen in 100 parts, the other at the *maximum*, containing 23 of oxygen. This supposition rests principally, however, on the vague assumption, that metals are susceptible only of two degrees of oxidation. Thenard has, on the contrary, endeavoured to prove, that there are at least six oxides of antimony capable of being distinguished by the proportions of oxygen which they contain; the one in the lowest degree of oxidation, containing not more than 0.02 of oxygen, that in the highest degree containing 0.32; and the others containing intermediate proportions. It may be doubtful whether these degrees of oxidation can be established with perfect precision; but it is sufficiently probable, that antimony may combine with very different quantities of oxygen, and that even, like other metals, its degrees of oxidation are indeterminate, when they are not fixed by external circumstances connected with their formation. One other circumstance rendering the composition of the preparations of this class more complicated and variable, is that they are usually obtained by processes performed on the sulphuret of antimony, and hence they frequently retain a portion of sulphur in their composition.

The following oxides of antimony retain a place in one or other of the Pharmacopœias.

Oxidum Antimonii Sulphurettum. Sulphuretted Oxide of Antimony.—Of this there are two varieties, differing in the proportions of their elements, and in the

state of aggregation. The first is what used to be named Crocus of Antimony (Crocus Antimonii), what is now named by the Edinburgh College, Oxidum Antimonii per Nitratem Potassæ. It is prepared by deflagrating sulphuret of antimony with an equal part of nitrate of potash. The greater part of the sulphur is oxidated, and either dissipated in the state of sulphurous acid, or in the state of sulphuric acid remains combined with the potash of the nitre; a brown oxide of antimony remains, combined, according to Proust, with one-fourth of sulphuret of antimony, but which it is more probable is directly combined with a portion of sulphur. It acts as a diaphoretic, emetic, or cathartic, but is so uncertain in its operation that it is never prescribed. It serves for the preparation of some other antimonials, and is now employed by the Edinburgh College for the preparation of emetic tartar.

The second oxide of this family is what is named Oxidum Antimonii cum Sulphure Vitrificatum, formerly Vitrum Antimonii.—This is prepared by exposing sulphuret of antimony to the action of atmospheric air at a high temperature. The sulphur is dissipated, and the antimony oxidated, and by the intensity of the heat the oxide is vitrified. It still retains combined with it a portion of sulphur, or, according to Proust, one-ninth of sulphuret of antimony. The oxide which forms its basis, contains, according to Thenard, 16 of oxygen in 100 parts. It has always combined with it too a portion of silex, derived from the crucible in which it is melted, this earth

probably promoting its vitrification. Its operation is extremely harsh, and at the same time so uncertain, that it cannot be medicinally employed.

Oxidum Antimonii Vitrificatum cum Cera.—This is prepared by exposing the powder of the preceding preparation with an eighth part of wax to heat. It is thus rendered milder, probably by part of its oxygen being abstracted by the carbonaceous matter of the wax. It is a preparation, however, which has no advantage, and though once highly celebrated in dysentery, in a dose of from 5 to 15 grains, has been long in disuse, and might be expunged from the Pharmacopœias in which it is still retained.

Oxidum Antimonii Album, formerly named Antimonium Calcinatum.—This is prepared by deflagrating sulphuret of antimony with a large quantity of nitrate of potash, (three times its weight), so that the sulphur is entirely abstracted, and the metal is saturated with oxygen. This oxide retains also combined with it a portion of the potash of the nitre. The preparation is one comparatively inactive, and does not excite vomiting in a dose less than a scruple or half a drachm. In smaller doses, it has been used as a diaphoretic in the treatment of fever.

Oxidum Antimonii cum Phosphate Calcis, also named Pulvis Antimonialis.—This is prepared by exposing to heat sulphuret of antimony and bone-shavings, until they are converted into a grey coloured substance, which is exposed in a crucible to a more intense heat, until it become white. The animal matter of the bones is de-

composed, the sulphur of the sulphuret is dissipated, the metal is oxidated, and this oxide remains mixed or combined (part of it being also in a vitrified state,) with the phosphate of lime of the bones. The preparation is similar in composition to the celebrated James's Powder, for which it is designed as a substitute. It acts as a diaphoretic, emetic, or cathartic, according to the dose in which it is administered, and is employed principally as a remedy in fever, to arrest the progress of the disease at its commencement, or afterwards to obtain a favourable crisis. It is given in a dose from 5 to 10 grains, repeated, if necessary, after an interval of five or six hours, until sweat, purging, or vomiting, is induced. Its peculiar advantages are, that with a considerable degree of activity, it is less harsh in its operation, and more uniform than some of the other antimonial oxides, while, from its insolubility, it acts less rapidly on the stomach than emetic tartar does; it is therefore less liable to excite nausea or vomiting, and can be given so as to obtain with more certainty the general action of antimonials on the system. Its exhibition is best adapted to those forms of fever in which there is increased vascular action: in typhus, less advantage can be expected from it, and it is even hazardous from the excessive evacuations it is liable to induce.

Sulphurettum Antimonii Præcipitatum.—This name, obviously incorrect, is given by the London and Edinburgh Colleges to a preparation formerly named Sulphur Auratum Antimonii. The Dublin College have named it Sulphur Antimoniatum Fuscum. It is prepared by

boiling sulphuret of antimony with a solution of potash, and adding to the filtered liquor, sulphuric acid, while any precipitate is thrown down. This precipitate is of a reddish yellow colour; it is a combination of oxide of antimony with sulphuretted hydrogen and sulphur. In a dose from 5 to 10 grains, it produces the usual effects of antimonials, and has been employed as a remedy in fever; but from the uncertainty of its operation, it is discarded from practice.

The preparation named Kermes Mineral, and which is used on the continent, is the precipitate that subsides on cooling from the liquor formed by the boiling a solution of potash on sulphuret of antimony; it differs from the former in containing less sulphur, and appears indeed to be merely a combination of oxide of antimony with sulphuretted hydrogen. It is given in a similar dose.

Antimonii Oxidum.—Under this name, which is far from being distinctive, a preparation is inserted in the London Pharmacopœia, formed by boiling sulphuret of antimony in muriatic acid, with the addition of a little nitric acid; straining the liquor, and adding to it a solution of sub-carbonate of potash. The precipitate is probably a sub-muriate. It is designed to be employed only in the preparation of other antimonials.

By combining the oxides of antimony with an acid, the sources of uncertainty in their operation are in a great measure removed, as their degree of oxidation is rendered determinate, and their activity is not influenced by the

state of the stomach with regard to acidity. The greater number of these saline combinations, however, are too acrid to admit of internal administration, and there is one only, that in which the oxide of antimony is combined with tartaric acid, employed in practice. Of all the antimonials, this is most extensively used, and it is also the principal emetic derived from the mineral kingdom.

This preparation, the Emetic Tartar of the old nomenclature, the Tartrate of Antimony and Potash of Modern Chemistry (Tartras Antimonii et Potassæ), improperly named in the Pharmacopœias, Tartris Antimonii, and Antimonium Tartarizatum, is obtained by boiling super-tartrate of potash with oxide of antimony; the brown oxide obtained by the deflagration of sulphuret of antimony with nitre, is ordered by the Edinburgh College; the white oxide, or rather sub-muriate, obtained from the decomposition of muriate of antimony, is employed by the London and Dublin Colleges: the excess of tartaric acid in the super-tartrate, is saturated by the antimonial oxide; and by evaporation and crystallization, a triple salt, tartrate of antimony and potash, is procured. Its crystals are triedral pyramids, generally small; and it is readily soluble in water. It consists, according to Thenard's analysis of it, of 38 of oxide of antimony, 16 of potash, 34 of tartaric acid, and 8 of water of crystallization.

Tartrate of antimony and potash is superior to all the antimonials, at least as an emetic; as with a degree of activity, which admits of its being administered with safety, its operation is sufficiently certain and uniform.

As an emetic, it is established in common practice: it usually excites vomiting in the dose of a grain, or a grain and a half; but the proper mode of administering it is in divided doses, three or four grains being dissolved in four ounces of water, and an ounce of this solution being given every quarter of an hour, until it operate. It generally excites full vomiting, and is liable to be somewhat more active in its operation than the milder emetics, such as ipecacuan, evacuating not only the contents of the stomach, but inverting even the motion of the duodenum, and either by this or by the compression exerted by the action of the muscles on the abdominal viscera causing bile to be discharged: it also frequently excites purging. In many cases, however, these are advantages, and in these, as well as in all morbid affections, where the stomach is not easily affected, it is the emetic properly employed; while, when the stomach is irritable, where its contents are merely to be evacuated, or when the strength is exhausted, the milder emetics are to be preferred. In smaller doses, it has been employed as a nauseating remedy in fever,—a practice, however, now nearly relinquished. Assisted in its operation by tepid diluents, it may also be brought to operate as a diaphoretic, and to produce the effects of antimonials on the general system, though from its action being exerted at once on the stomach, owing to its solubility, it is more difficult to administer it with this intention without occasioning nausea or vomiting, than some of the less active antimonials, as the phosphate of antimony and lime.

Vinum Tartritis Antimonii.—This name is given to a solution of tartrate of antimony and potash in white wine, in the proportion of two grains to the ounce, and is intended as a substitute to what was formerly named Antimonial Wine,—a preparation obtained by digesting wine on oxide of antimony, and owing its power to the portion of oxide which the tartaric acid of the wine dissolved. A similar preparation is inserted in the London Pharmacopœia, under the name of Liquor Antimonii Tartarizati, in which the tartrate of antimony and potash is dissolved in wine diluted with water. The propriety of either is doubtful. It has no advantage over a solution of extemporaneous preparation; and there is some reason to believe, that the tartrate in this state of solution is liable to spontaneous decomposition. In the preparation of the London College, this will probably happen still more readily from the dilution of the wine. It is principally as a diaphoretic that antimonial wine has been employed, in a dose of one drachm, its operation being often promoted by combination with tincture of opium.

Murias Antimonii.—Muriate of Antimony is the only other saline preparation of this metal inserted in the Pharmacopœias; and it has a place as affording a product employed in the preparation of other antimonials. Sometimes it has been applied externally as an escharotic.

Zincum, Zinc. (Page 227.).

Sulphate of Zinc, it has already been remarked, is a

powerful emetic; and as it operates speedily, and with much force, it is sometimes employed in cases where it is difficult to excite vomiting, but where it is of importance that the contents of the stomach should be immediately evacuated, where any narcotic poison has been swallowed. Its dose is from 5 to 20 grains, according to the state of the stomach, and it should be given in a state of solution.

CUPRUM. Copper. (Page 229.).

SULPHATE of Copper acts as an emetic, and its operation taking place almost as soon as it has reached the stomach, and without inducing much nausea, it has been recommended in some cases, where the object is merely to obtain the mechanical effects from the operation of vomiting, as in incipient phthisis, in which advantage has been supposed to be derived from the compression exerted on the thoracic viscera. Its operation is, however, liable to be very harsh even in the small dose of 1 or 2 grains, in which it has been prescribed. In a larger dose, it has sometimes succeeded in producing vomiting, where the stomach, from the operation of a narcotic poison, had not been affected even by the sulphate of zinc. The acetate or sub-acetate of copper has, like the sulphate, an emetic power, and has been employed in similar cases in a dose of one or two grains. It is liable to the same disadvantages.

AMMONIA.—Ammonia dissolved in water is applied to different medicinal purposes, and under some of the other classes it is to be more fully considered. When given in a pretty large dose, it is liable to excite vomiting, and it is sometimes employed to quicken the operation of other emetics where they have failed, a tea-spoonful being given in a cupful of cold water, and a draught of tepid water being swallowed after it.

HYDRO-SULPHURETUM AMMONIÆ.—The Hydro-sulphuret of Ammonia obtained by passing a current of sulphuretted hydrogen gas through a solution of ammonia in water, was introduced by Dr Rollo, and has been received into the Edinburgh Pharmacopœia. It acts with much energy on the stomach, inducing nausea in a small dose, and in a larger dose occasioning vomiting. It is scarcely used as an emetic, but rather as a nauseating remedy; and the principal application of it has been in the treatment of diabetes, with the view of reducing the morbid appetite and increased action of the stomach. It was given in a dose of from 5 to 15 drops, twice a-day, and with advantage so far as related to the reduction of the increased action of the digestive organs.

## *Emetics from the Vegetable Kingdom.*

Ipecacuanha. Ipecacuan. Callicocca Ipecacuanha. Cephaëlis Ipecacuanha of Wildenow. *Pentand. Monogyn. Aggregatæ. Radix. South America.*

The natural history of this vegetable is still somewhat obscure, and the obscurity is increased by the roots of different plants being sometimes met with in the shops as ipecacuan. Hence the plant affording it has been successively referred to different genera. It is now, by the Edinburgh and London Colleges, referred to the genus Callicocca, and distinguished as a species by the name Ipecacuanha; but it appears still uncertain, whether the two more common varieties of ipecacuan are products of the same vegetable, the Peruvian and the Brazilian. The former has been even considered as a different species. The ipecacuan of the shops is usually in small wrinkled pieces, externally grey, internally whiter; has a faint smell, and a bitter, slightly acrid taste. It contains both a resinous and gummy matter, or at least a matter principally soluble in alkohol, and another more soluble in water. It is generally stated, that its emetic power, and indeed its principal virtues, reside in the former. Dr Irving has affirmed that they depend on the latter. Its active matter is completely extracted by proof-spirit or wine. Vinegar likewise dissolves it, but

at the same time greatly weakens its power. By decoction with water, its activity is greatly impaired, though the water distilled from it has scarcely any emetic effect. It is even injured by being kept long exposed in the state of powder to the air and light.

Ipecacuan is the mildest of those emetics which are at the same time sufficiently certain in their operation. It evacuates the contents of the stomach, without exciting violent vomiting, or extending its action beyond this organ; and is hence adapted to many cases where violent vomiting would be prejudicial. The medium dose of it as an emetic is 15 grains, though 20 or 30 may be taken with perfect safety, as it only operates more speedily, and a dose rather large is even preferable to a small dose, as more certain, and producing less nausea. The ipecacuan wine acts as an emetic in the dose of an ounce. Though principally employed as an emetic, ipecacuan is occasionally prescribed with other views. It was originally introduced as a remedy in dysentery, given either in such a dose as to produce full vomiting, or in the quantity of 2 or 3 grains repeated every three or four hours, till it occasioned vomiting, diaphoresis, or purging. It has been given in a similar mode in obstinate diarrhœa. In spasmodic asthma, it is exhibited in a full dose to relieve the paroxysm; and in a dose of 3 or 4 grains continued every morning for some weeks to prevent the disease. A singular idiosyncrasy has been observed in some individuals with regard to it, difficulty of breathing being induced by the

effluvia arising from it in powder, especially when it is diffused in the air. In hæmorrhagies it is given in nauseating doses, the nausea diminishing the force of the circulation. Combined with opium, it forms a very powerful sudorific.

*Offic. Prep.*—P. Ipecac. et Opii. Vin. Ipecac. *Edin. Lond.*

Scilla maritima. Squill. *Hexand. Monog. Liliaceæ.*
*Radix. South of Europe.*

Squill is the bulbous root of a plant growing on the sandy shores of Spain and Italy. It has little smell; its taste is bitter and acrid, and it is capable of inflaming the skin; its acrimony is lessened by drying; but its bitterness and active powers as a medicine are little impaired. In drying, it loses about four-fifths of its weight. Its active matter is extracted by water, alkohol, and vinegar. The latter is the solvent commonly employed, as it best covers its nauseous taste, and it does not appear to injure its powers.

Squill, when given in a sufficient dose, excites vomiting, though it is seldom used with that intention in substance. The vinegar of squill acts as an emetic in a dose of 2 or 3 drachms, as does the syrup when given in double that quantity; and either of them is sometimes given in pertussis; the syrup, in particular, from its sweetness, being easily given to children. The dose is a drachm to a child below five years of age, and its activity is advantageously promoted by the addition of a little

ipecacuan wine. This root is, however, much more used as a diuretic and expectorant; uses of it which are afterwards to be noticed.

*Offic. Prep.*—Acet. Scill. Mar. Pil. Scill. Syr. Scill. Mar. *Ed. Lond. Dub.*—Tinct. Scill. *Lond. Dub.*

ANTHEMIS NOBILIS. Chamomile. (See p. 257.)

ALL bitter drugs are liable to excite nausea or vomiting. Chamomile has perhaps more peculiarly this effect; a strong infusion of the dried flowers in tepid water excites vomiting, and a weaker infusion is often employed to quicken the action of other emetics, a draught of it being taken instead of tepid water.

SINAPIS ALBA. Mustard. *Tetradyn. Siliq. Siloquosæ. Semen. Indigenous.*

MUSTARD-SEED, when bruised, has a very considerable degree of pungency, and in powder, given in the dose of a large tea-spoonful, mixed with water, operates as an emetic. From its stimulant quality, it has been recommended in preference to other emetics in apoplexy and paralytic affections, and in such cases has sometimes been found to excite vomiting, when these had failed. It is convenient also as an auxiliary, when the dose of an emetic has not operated, a little of the powder of mustard being taken diffused in tepid water.

ASARUM EUROPÆUM. Asarabacca. *Dodecand. Monogyn. Sarmentaceæ. Folia. Indigenous.*

THE leaves and root of this vegetable, prior to the introduction of ipecacuan, were frequently employed on account of their emetic quality; the dose of the dried leaves was 20 grains: of the dried root, 10 grains. As they were occasionally violent in their operation, and at the same time uncertain, they have fallen altogether into disuse. The plant is still retained in the Materia Medica as an errhine.

NICOTIANA TABACUM. Tobacco. (See p. 183.)

THE leaves of this plant, in a person unaccustomed to their use, by chewing, or smoking, excite even in a small dose very severe and permanent nausea and vomiting: the same effects have followed even from their external application to the region of the stomach; and this method of exciting vomiting has been proposed to be employed in cases in which emetics cannot be easily administered by the mouth. Tobacco is sometimes taken under the form of infusion by the common people, but its operation is always harsh, and accompanied with severe sickness.

## CHAP. VIII.

### OF CATHARTICS.

Cathartics are those medicines which quicken or increase the evacuation from the intestines; or which, when given in a certain dose, produce purging. They are medicines of considerable importance, and differ from each other very considerably in their powers.

Cathartics evidently act, by stimulating the intestines so as to increase the natural peristaltic motion. Their contents are thus more quickly propelled and evacuated. The greater number, or perhaps all of them, have however a farther effect. They stimulate the extremities of the exhalant vessels, terminating on the inner surface of the intestines: they thus cause a larger portion of fluid to be poured out, and hence the evacuations are more copious, and of a thinner consistence. Some cathartics have this power of increasing the effusion of fluids from the exhalants much more than others, such for instance are the Saline Purgatives. Dr Cullen has even supposed that some may act solely in this way, and without increasing directly the peristaltic motion. There is, however, no proof of this; and it seems scarcely pro-

bable that any substance should act as a stimulant on these vessels, without at the same time stimulating the moving fibres of the intestines.

The action of cathartics is not confined to the parts to which they are directly applied. Their stimulus is extended to the neighbouring organs, and hence they promote the secretion, and increase the discharge of the bile and other fluids usually poured into the intestinal canal. These effects are produced in very different degrees, by different cathartics, and there seems some reason for admitting an opinion adopted by the ancients, that certain cathartics have peculiar powers, in this respect; some for instance, having the power more particularly of promoting the discharge of bile, others that of the mucus of the intestines, or of the serum; and it is not improbable, adds Dr Darwin, that the pancreas and spleen may be peculiarly stimulated into action, by some others of this class of medicines.

There is likewise a difference in cathartics with respect to the parts of the intestinal canal on which they act. Some increase its peristaltic motion through its whole length; others, as aloes, have their action more confined to the lower part, and principally to the rectum.

Lastly, it is to be observed, that the action of many cathartics is extended even to the stomach; its peristaltic motion is increased, either from association with the motion of the intestinal canal, or from the action of the stimulus of the cathartic applied, and its contents are therefore more quickly discharged by the pylorus. From this

cause, a full dose of a saline purgative will sometimes operate in half an hour after it is given.

There are several other differences between the medicines belonging to this class: some act slowly; others more quickly: some are liable to occasion nausea and griping, and in a large dose tenesmus; others, even when they operate effectually, are free from these disagreeable effects: some produce only one evacuation, others continue to act for a considerable time.

Besides the differences between particular cathartics, a general difference in their mode of operation has been supposed to exist, from which they have been classed under two divisions. Some operate mildly, without exciting any general affection of the system, without even stimulating perceptibly the vessels of the intestines, and hence they merely evacuate the contents of the canal. Others are more powerfully stimulant: they occasion an influx of fluids from the exhalant vessels, and from the neighbouring secreting organs: they even extend their stimulant effect to the system in general, and if taken in too large a dose are liable to excite much irritation, and even inflammation on the surface of the intestines. The former are distinguished by the title of Laxatives, the latter are named Purgatives, and the stronger of them, Drastic Purgatives. The distinction is not altogether correct, since it refers merely to a difference in power; yet neither is it one to be altogether neglected.

From the indications which cathartics are capable of

fulfilling, their utility in many cases of morbid affection must be obvious. In some general affections of the system, they procure a prompt, copious, and therefore useful depletion. And wherever there exists retention of the contents of the intestinal canal, where these contents are acrid, or where extraneous bodies are present, their evacuation by the operation of a cathartic is the obvious method of treatment.

The valuable observations of Dr Hamilton have established, however, still more clearly the importance of this class of remedies, have shewn that they admit of more extensive application, and have pointed out with more precision than has hitherto been done, the principles which regulate their administration.

In many diseases, there exists a state of the intestinal canal giving rise to retention of its contents, which is not to be obviated by the occasional administration of a cathartic, but which requires a continuation of the operation short of that of purging, until the healthy state of the bowels be restored. By this practice the cure of diseases has been accomplished, which, previously to Dr Hamilton's publication, were treated by very different methods, and were not supposed to be so peculiarly connected with any state of the alvine evacuation.

Thus in fever, the peristaltic motion of the intestines is diminished, the fœculent matter is retained, and becomes a source of irritation; its evacuation, therefore, by the exhibition of purgatives is clearly indicated, nor has this been altogether neglected. Physicians, however, were

scarcely aware of the necessity of producing it to a sufficient extent; and in fevers of the typhoid type in particular, were frequently deterred from doing so by the fear of reducing the strength of the system by an evacuation considered as debilitating. Dr Hamilton's observations establish the propriety of the freer use of purgatives in fever, so as to produce complete and regular evacuation of the bowels, through the whole progress of the disease; and the cases he has published afford striking proofs of the advantages derived from the practice. It is attended with equal advantage in scarlatina.

Several of the diseases comprehended under the class Neuroses appear to depend on, or to be very intimately connected with a torpid state of the intestines, from which an accumulation of their contents takes place, proving a source of irritation that often affects the general system. Chorea is proved by Dr Hamilton's observations to arise from this cause; and he has introduced with great success the mode of treatment, by the free use of purgatives, continued until the healthy state of the alvine evacuation has been established. The same practice, and with similar success, applies to hysteria, and, in Dr Hamilton's opinion, to that species of tetanus, which, prevailing in warm climates, and in warm seasons, appears to have its origin in disorder of the stomach and bowels. And ample evidence has established the success of the same treatment in the marasmus which attacks the young of both sexes, which is marked by loss of appetite, weakness, wasting of the body, and at length total prostra-

tion of strength; likewise in chlorosis, and in that hæmatemesis to which females are liable between eighteen and thirty years of age. In some of these diseases, the quantity of matter accumulated in the intestines is extremely great; the extent to which the exhibition of purgatives must be carried, and the length of time during which they must be continued, much exceed what would be calculated on from the usual administration of remedies of this class. The whole practice requires therefore both decision and perseverance.

Analogies from some of these diseases lead to a similar exhibition of cathartics in other fevers, particularly in the bilious remitting fever of warm climates, in measles, erysipelas, and small pox; likewise in scrofula, in dyspepsia, whether simple, or complicated with hysterical or hypochondriacal mania; in cramp of the stomach, or of the extremities; in palpitation of the heart, and in those cases of hydrophobia which are not the effect of specific contagion. With regard to several of these, experience has established the soundness of the analogy.

In cholic, and in ileus, the exhibition of cathartics is required, though there is considerable caution necessary in their application to avoid such irritation as would excite or increase inflammation. In dysentery, similar advantages are derived from them, and the same caution is requisite in their use.

Cathartics are farther employed with other intentions than merely to evacuate the intestinal canal. From the effusion of serous fluid which they occasion, by their sti-

mulant action on the exhalant vessels, they are supposed to produce a diminution of fluids with regard to the whole body. This is in some measure an abstraction of the usual exciting powers acting on the system, and hence purging constitutes a part of what is named the Antiphlogistic Regimen, and is employed in inflammatory affections. By a similar operation, it increases absorption. There exists a certain relation between the exhaling and absorbing powers, so that when the action of the one is increased, that of the other is augmented: the increased exhalation of serous fluid, therefore, into the intestines, which cathartics occasion, causes an increased absorption; and thus the different species of dropsy are often cured by purging. It is evident that those cathartics which stimulate the exhalant vessels are best calculated to fulfil this indication; hence saline purgatives are in general most serviceable in dropsy.

Partly, it is supposed, from the serous evacuation which cathartics occasion, and partly on the derivation which they make from the head, and partly, no doubt, by removing a source of irritation, cathartics are of utility in preventing and removing apoplexy; in all comatose affections, in mania, phrenitis, and the different species of headach.

Cathartics, especially the more powerful ones, require to be administered with caution even in diseases where they are indicated, by peculiar circumstances, particularly any tendency to inflammation or to extreme debility; also during pregnancy, immediately after delivery, during

the flow of the menses, and in those liable to hæmorrhoidal affections. The too frequent use of them induces wasting of the body, and sometimes renders the intestines morbidly irritable, so that purging is easily excited, while in other habits it renders them more torpid, and induces costiveness.

Some cautions are requisite with respect to the mode of administering cathartics. Many of them are apt to excite nausea or vomiting,—effects which are prevented by giving them at intervals in divided doses, or often by combining them with some aromatic. Such a combination also obviates the griping which they often occasion. The more acrid cathartics ought always to be given in divided doses; as in certain habits, even a small dose is liable to occasion unpleasant symptoms. In general also, these acrid cathartics ought to be given rather in combination, as the effect is obtained with more certainty. Colocynth, or scammony, or any other drastic purgative, may fail if given alone in such a dose as it is proper to venture on; but if smaller doses of two or three of them be mixed, their operation is more certain and easy. They irritate less when given in a liquid form: in that form too they act more speedily than when given in a solid state: hence, when we wish a cathartic to operate slowly, it is best given in the form of pill, and at bed time, as the state of diminished susceptibility in sleep retards the operation. In general, however, it is preferable to give the dose of a cathartic in the morning, as the operation of it is less troublesome to the patient. Dr Hamilton has

pointed out the common error in the exhibition of cathartics, that of their not being given to the requisite extent; and given the general rule in all morbid affections, of repeating, and, if necessary, enlarging the dose while the evacuations remain offensive, or of an unnatural appearance, without however carrying their administration so far as to produce purging, unless this be the indication which is designed to be fulfilled.

Cathartics may be arranged in some measure according to their power, placing those first which operate mildly, and which have usually been denominated Laxatives, and proceeding to those which are more powerful, and have other effects than merely evacuating the contents of the canal. The Saline Cathartics may be placed under the latter division, though their operation, as has been already explained, is somewhat peculiar. To the class may also be added those substances which act as cathartics under the form of Enema.

# CATHARTICS.

A.—*LAXATIVES.*

MANNA.
CASSIA FISTULA.
TAMARINDUS INDICA.
RICINUS COMMUNIS.
SULPHUR.
MAGNESIA.

B.—*PURGATIVES.*

CASSIA SENNA.
RHEUM PALMATUM.
CONVOLVOLUS JALAPA.
HELLEBORUS NIGER.
BRYONIA ALBA.
CUCUMIS COLOCYNTHIS.
MOMORDICA ELATERIUM.
RHAMNUS CATHARTICUS.
ALOE PERFOLIATA.
CONVOLVOLUS SCAMMONIA.
STALAGMITIS CAMBOGIOIDES.
SUB-MURIAS HYDRARGYRI.
SULPHAS MAGNESIÆ.

Sulphas sodæ.
Sulphas potassæ.
Super-tartras potassæ.
Tartras potassæ.
Tartras potassæ et sodæ.
Phosphas sodæ.

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Murias sodæ.
Terebinthina veneta.
Nicotiana tabacum.

## LAXATIVES.

MANNA. Manna. Fraxinus Ornus. Fraxinus Rotundifolia. *Polygam. Diœc. Ascyroid. Succus concretus. South of Europe.*

THIS substance, though afforded by several vegetables, is usually obtained from different species of the ash-tree, particularly those mentioned above, which are cultivated in Sicily and Calabria. It is procured by spontaneous exudation, but more copiously by incisions made in the bark of the trunk. The juice, which exudes, soon becomes concrete. When it exudes slowly, the manna is more dry and white, and of a texture somewhat granulated, forming what is named Flake Manna. When the exudation is more copious, the juice is of a darker colour, and concretes into a soft unctuous-like mass, less pure than the other.

Manna has a sweet, though somewhat unpleasant taste, and possesses the general chemical properties of saccharine matter; it is entirely soluble in water and alkohol. The chemical difference between it and pure sugar is not very well established. When dissolved in alkohol, with the aid of heat, the solution on cooling deposites crystals apparently purely saccharine; and by concentration of the residual liquor, a mucilaginous extractive matter remains not crystallizable, having the peculiar taste of the manna.

Although sugar in its unrefined state proves laxative, manna is so in a greater degree.

The dose of manna, as a laxative, is from one to two ounces to an adult, but it scarcely operates with sufficient effect to admit of being employed alone. Though mild in its operation, it is apt too to produce flatulence and griping, and hence it is principally used in combination with other cathartics, particularly with senna, the bitter taste of which it covers. This combination is in common use as a purgative to children.

*Offic. Prep.*—Syrup. Mannæ. *Pharm. Dub.*

Cassia fistula. Purging Cassia, or Cassia in pods. *Decand. Monog. Lomentaceæ. Fructus; Pulpa Fructus. Egypt; East and West Indies.*

The fruit of this tree is in pods, nearly an inch in diameter, and ten or twelve in length. The external membranous part is firm and hard, the pulp within is of a black colour, and has a sweet taste, with a slight degree of acidity. It is extracted by boiling the bruised pods in water, and evaporating the decoction. It is soluble in water. According to Vauquelin's analysis of it, it contains, besides the fibrous part, gluten, jelly, mucilage, and saccharine matter.

This pulp proves gently laxative in a dose of four or six drachms; in the large dose necessary to occasion purging, it is apt to induce nausea or griping, and even as a laxative it has no particular advantage. The sole consumption of it is in the composition of the officinal pre-

paration known by the name of Electuarium Sennæ. There is another electuary in the Pharmacopœias, to which, as being the principal ingredient, it gives its name, and in which it is combined with manna and pulp of tamarinds, but this is never used.

*Offic. Prep.*—Elect. Cass. Fist. *Ed. Lond. Dub.*

TAMARINDUS INDICA. Tamarind. *Monadelph. Triand. Lomentaceæ. Fructus conditus. East and West Indies, America, Arabia.*

THE pod of this tree includes several large hard seeds, with a brown viscid pulp, very acid. This pulp, mixed with the seeds and small fibres, and with a quantity of unrefined sugar added to preserve it, forms the Tamarinds of the shops. Vauquelin found it to contain, besides the sugar mixed with it, citric and malic acids, super-tartrate of potash, tartaric acid, jelly, mucilage, and fibrous matter.

The pulp of tamarinds, besides its virtues as an acid, proves laxative, when taken to the extent of an ounce, or an ounce and a half, but it is too weak to be employed alone. It is generally added to other cathartics, which are given in the form of infusion, with the view of promoting their operation, or of covering their taste. It is an ingredient in the Electuarium Sennæ, and there is an officinal infusion of it with senna, which affords a very pleasant purgative.

*Offic. Prep.*—Inf. Tam. Ind. cum Cass. Sen. *Ed.*

THERE are some other sweet fruits which have a laxative quality, as the Fig (Ficus Carica), and the Prune (Prunus Domestica.). These are sometimes used in domestic practice, and they are also ingredients in the Electuary of Senna.

RICINUS COMMUNIS. Palma Christi. *Monœc. Monadelph. Tricoceæ. Oleum; Semen. West Indies.*

THE seeds of the capsules of this plant are farinaceous, with a considerable quantity of unctuous matter intermixed. They afford, by expression or decoction, an oil which is used in medicine in this country under the name of Castor Oil. When obtained by decoction of the bruised seeds in water, it is purer and less acrimonious than when obtained by expression. It is of a yellowish colour, and has scarcely any peculiar taste or smell. It is the only example of an expressed oil having any medicinal activity.

As a laxative, castor oil acts mildly, and at the same time very effectually; it also operates in a shorter time than almost any other cathartic. Possessed of these advantages, it is a cathartic frequently employed; and is more peculiarly adapted for exhibition, where any degree of irritation is to be avoided. Its dose is one ounce. It is taken floating on peppermint-water, mixed with any spiritous liquor, or any purgative tincture, as that of senna; or diffused in water by the medium of gum, sugar, or the yolk of an egg.

From the Mineral Kingdom, two laxatives are derived, Sulphur and Magnesia.

Sulphur is an inflammable substance, found in nature nearly pure, and likewise in combination with several of the metals. The greater part of the sulphur of commerce is the produce of volcanic countries. It is naturally mixed with earthy matter, from which it is freed by sublimation, forming the Sulphur Sublimatum, Flores Sulphuris, or Flowers of Sulphur. When melted and run into cylindrical molds, it forms Roll Sulphur, which is usually less pure.

Sulphur is of a light yellow colour; is insipid; has a faint smell, when rubbed or heated; is very fusible and volatile; and when heated in atmospheric air, burns with a blue flame, and the production of suffocating fumes. It is insoluble in water or alkohol, but is dissolved by oils, and combines with the alkalies, several of the earths, metals, and metallic oxides. It was, until lately, regarded as a simple substance; there is reason to believe, however, that it contains hydrogen, and that the pure inflammable base has not yet been obtained.

Sulphur, in a dose of 2 or 3 drachms, acts as a laxative, and so mildly, that it is often used in hæmorrhoidal affections, and in other cases where, though the operation of a purgative is indicated, any irritation would be injurious. It likewise passes off by the skin, and is administered internally, and is applied externally in psora.

In habitual dyspnœa and in chronic cattarh, advantage has been derived from it, probably partly from its action as a laxative, and partly as a diaphoretic. The solution of it in oil has been used in these cases, but this preparation is both acrid and extremely nauseous. Sulphur is always best given in the form of electuary. The purification of sulphur by washing is ordered in the Pharmacopœias, but is a process altogether unnecessary. Precipitated by an acid from its solution by an alkali or lime, it is obtained of a whiter colour than in its usual state, and this precipitated sulphur is used in preference to the sublimed sulphur in forming ointments. The combination of it with potash, Sulphurettum Potassæ, has also been introduced into the Pharmacopœias, principally with the view of affording a substance which has been supposed capable, by its chemical action, of counteracting the operation of metallic preparations where these have been taken in excess.

*Offic. Prep.*—Sulphur Lotum. Ol. Sulph. Ung. Sulph. *Ph. Ed. Lond. Dub.*—Sulph. Præcipit. *Ph. Lond.* Sulph. Potass. *Ed. Dub.*

Magnesia is a simple earth, not found pure in nature, but existing abundantly combined with certain acids, and from these saline combinations it is obtained by processes to be afterwards noticed. Either pure, or in the state of carbonate, it is used as an antacid and laxative, in a dose of a drachm or more. Its laxative effect is generally considered as owing to its forming with the acid in the stomach a saline combination, which, like its

other salts, is purgative, though, as it generally has this effect, it probably has itself a weak cathartic quality. From being insipid and mild, it is well adapted for exhibition to infants.

## PURGATIVES.

CASSIA SENNA. Senna. *Decand. Monog. Lomentaceæ.* *Folia. Egypt, Arabia.*

THE dried leaves of this plant are of a yellowish green colour; have a faint smell, and a bitter taste. Their active matter is extracted both by water and alkohol by infusion. By decoction with water, its activity is much impaired.

Senna is a purgative very frequently employed, having a considerable degree of activity, without being liable to be violent in its operation. It is usually given in the form of the watery infusion, 2 drachms being infused in 4 or 6 ounces of tepid water, generally with the addition of a few coriander seeds, to cover its flavour, and obviate griping. It is also frequently combined with manna, with tamarinds, or with super-tartrate of potash; and as its taste can be covered by sugar or manna, it is a purgative very generally given to children. There is an officinal tincture of it which operates as a purgative in the dose of an ounce; there are also officinal infusions of it; and it enters into the composition of several other preparations employed as cathartics.

*Offic. Prep.*—Elect. Cass. Senn. Extr. Cass. Senn. Inf. Tam. Ind. cum Cass Sen. T. Cass. Senn. C. *Ed.*— Inf. Senn. Pulv. Senn. C. *Lond.* Syrup. Senn. *Lond. Dub.*

RHEUM PALMATUM. Rhubarb. *Enneand. Trigyn. Oleraceæ. Radix. Tartary.*

BESIDES the Rheum Palmatum, two other species, the Rheum Undulatum, and Rheum Compactum, are cultivated with the view of obtaining their roots, to be used in medicine; nor is any considerable difference, it is said, to be observed between the root obtained from any of them when it is properly dried and preserved. The best rhubarb is that named Russian or Turkey; it is in small pieces, with a large hole in the middle; of a lively yellow colour, with streaks of white; has a smell peculiar, and somewhat aromatic; and a bitter slightly styptic taste. Another kind is imported from the East Indies, or rather from China, in larger masses, more compact and hard, heavier, less friable than the other, and having less of an aromatic flavour. Rhubarb, cultivated in this country, has been prepared equal to either of the others, but in general it is inferior, probably from less care being bestowed on its cultivation and preparation.

The active principles of rhubarb are not very well ascertained. It is somewhat mucilaginous, and yields part of its powers to water by infusion. Alkohol likewise dissolves a considerable proportion of it; and diluted alkohol appears to be its most proper solvent, dissol-

ving all its active matter. It appears too to contain a portion of tannin, as it gives a deep colour with the salts of iron. It has the combination rather singular, of an astringent, with a cathartic power; and it does not appear, from any analysis of it, whether these reside in different proximate principles or not. The watery infusion is said to be more purgative than the spiritous, and by applying heat to the rhubarb in substance, its purgative quality is lessened, while its astringency remains. The Chinese rhubarb is supposed to be more astringent than the Turkey. Every kind of it contains a quantity of earthy matter, chiefly lime, combined with sulphuric and citric acids, forming the principal part of the white streaks. This is generally more abundant in the Turkey rhubarb than in the others.

The dose of rhubarb as a cathartic is one scruple or half a drachm. Along with its purgative operation, it exerts a moderately astringent power, and has hence been considered as peculiarly adapted for exhibition in diarrhœa, any acrid matter being evacuated before it acts as an astringent. From the conjunction of bitterness with these qualities, it is likewise often used in dyspepsia and hypochondriasis, to obviate costiveness. And it enters into a number of officinal preparations, in which it is either the principal medicine, or combined with aloes, bitters, or aromatics.

*Offic. Prep.*—Inf. Rhei P. T. Rhei P. *Ed. Lond. Dub.* —Vin. Rhei. T. Rhei et Aloe. Tinct. Rhei et Gent. Pil. Rhei. C. *Ed.*—Tinct. Rhei, C. Extr. Rhei, *Lond.*

CONVOLVOLUS JALAPA. Jalap. *Pentand. Monogyn. Campanaceæ. Radix. Mexico.*

THE dried root of jalap is imported in thin transverse slices; it is solid, hard, and heavy; of a dark grey colour, and striated texture. It has little smell; its taste is bitter and subacrid.

Jalap contains a resinous and a gummy matter, its purgative quality appearing to reside in the former, as it is extracted by alkohol, while its watery infusion is comparatively inert. Proof-spirit is its proper menstruum.

This root is an active purgative, producing full evacuation from the intestines; sometimes occasioning, however, nausea or griping. Its medium dose is half a drachm. Besides being given alone, it is very frequently used to quicken the action of other cathartics, of mild muriate of mercury for example; or it is combined with others, which are supposed to render it less stimulating, as with the super-tartrate of potash. It operates most mildly and effectually in substance, and is therefore seldom given under any form of preparation.

*Offic. Prep.*—T. Conv. Jal. *Ed. Lond. Dub.*—Extr. Conv. Jalap. *Ed. Dub.*—Pulv. Jalap. C. *Ed.*

HELLEBORUS NIGER. Melampodium. Black Hellebore. *Polyand. Polygn. Multisiliquæ. Radix. Austria, Italy.*

THE root of this plant consists of short articulated fibres attached to one head, externally dark-coloured, internally white. Its taste is very acrid, but the acrimony

is much impaired by drying and by age. Its active power seems principally to reside in its resinous part. By decoction with water it yields half its weight of gummy matter, with some resin; and the extract obtained by inspissation of this, is milder than the root itself. Its distilled water, it is affirmed, is acrid, and even cathartic.

Black hellebore root is a very powerful cathartic, so violent, indeed, and at the same time uncertain in its operation, that it is scarcely ever used in substance: the watery extract of it, which is milder, has sometimes been employed. On its cathartic power probably depends any advantage that may be derived from its administration in mania and melancholia, in which diseases it was highly celebrated by the ancients. In dropsy it has been employed as a hydragogue cathartic, principally under the form of the spiritous extract. It was likewise strongly recommended by Mead as an emmenagogue, in the form of tincture, but with others has seldom been successful.

*Offic. Prep.*—T. Helleb. N. *Ed. Lond. Dub.*—Extr. Helleb. *Ed. Dub.*

Bryonia alba. Bryony. *Monœc. Syngenes. Cucurbitaceæ. Radix. Indigenous.*

The root of this plant, when recent, is highly acrid; by drying it becomes milder. In a dose of 20 grains of the dried root, it acts as a strong cathartic, and generally also as a diuretic. It is, however, somewhat uncertain,

and liable to be violent in its operation, and is therefore little used.

CUCUMIS COLOCYNTHIS. Colocynth. *Monœc. Syngenes. Cucurbitaceæ. Fructûs pulpa. Syria.*

THE part of this plant used in medicine, is the dried spongy or medullary part of the fruit. It is white, soft and porous, and has the seeds, which are comparatively inert, mixed with it. Its taste is intensely bitter. Boiled in water, it gives out a large portion of mucilage, less active than the colocynth itself. Alkohol also dissolves only part of its active matter.

Colocynth is one of the most drastic purgatives, so much so that its operation is not easily regulated. Its dose is from 3 to 6 grains, but it is seldom that it is given by itself, being rather used to promote the operation of other cathartics. Combinations of it with jalap, aloes, or mild muriate of mercury, are thus given in obstinate constipation, in mania, and coma, and in these combinations it operates more mildly and more effectually than if given alone. Its infusion has been recommended as an anthelmintic.

*Offic. Prep.*—Pil. Aloes cum Colocynth. *Ed.*—Extr. Colocynth. *Lond.*—Extr. Colocynth. Comp. *Lond. Dub.*

MOMORDICA ELATERIUM. Wild Cucumber. *Monœc. Syngenes. Cucurbitaceæ. Fecula Fructus. South of Europe.*

THE expressed juice of the fruit of this plant depo-

sites a fecula, which, when dried, has been known by the name of Elaterium. It is a very powerful cathartic, and from the violence of its operation has been ventured to be exhibited only in the most obstinate cases. Its dose is half a grain, repeated every hour, or every second hour, till it operate. As a hydragogue cathartic, it has sometimes been given in dropsy.

Rhamnus catharticus. Buckthorn. *Pentand. Monogyn. Dumosæ. Baccarum succus. Indigenous.*

The berries of this vegetable are very succulent, and the juice they afford by expression has a cathartic power. Made into a syrup by boiling with sugar, it operates in a dose of an ounce. It is disagreeable, however, in its operation, being liable to occasion thirst and griping, and is seldom used.

*Offic. Prep.*—Syr. Rhamn. C. *Ed. Lond.*

Aloe. Aloe Socotorina. Aloe Barbadensis. Aloes Socotorine, and Barbadoes. Aloe Perfoliata, et Spicata. *Hexand. Monogyn. Liliaceæ. Succus spissatus. Africa, Asia, America.*

Aloes is a concrete resinous juice. Several varieties of it are met with in the shops, which differ in their purity, and likewise in their sensible qualities. The Socotorine, brought from the African island of Socotora, is considered as the purest. It is in small pieces of a reddish-brown colour. The Barbadoes aloes is in large masses, of a lighter colour, and having an odour much

stronger, and more unpleasant than the former. It is also named Hepatic Aloes. The Cabbaline is still more impure, more fœtid, and is weaker in its power. There is still some uncertainty with regard to the species producing these varieties. The Aloe Perfoliata is that referred to by the Edinburgh College, as affording the varieties both of hepatic and socotorine aloes. The Dublin College refer to the Aloe Spicata, and it is said to be this species which is a native of the Cape of Good Hope, whence much of the aloes of the shops is imported. The London College give the same species as that which affords the Socotorine Aloes; while the Barbadoes Aloes, on the authority of Sibthorp, they consider as the produce of a species named Aloe Vulgaris. The Socotorine aloes is the inspissated expressed juice of the leaves of the plant. The Barbadoes Aloes is prepared by cutting the plant, and boiling it in water. The liquor is evaporated to the consistence of honey, and is run into large gourd shells, in which it becomes concrete.

The taste of all the kinds of aloes is intensely bitter; their odour disagreeable. They consist of extract and resinous matter, the former being in larger quantity; the latter, obtained by the action of alkohol, has little smell or taste. Diluted alkohol dissolves all the active matter of this concrete juice.

Aloes, as a cathartic, has some peculiarities. It is more slow in its operation than any other purgative; it merely evacuates the contents of the intestines, and no greater effect is obtained from a large dose than from

one comparatively moderate. These have been regarded as proofs, and perhaps justly, that its operation is principally on the larger intestines. Its medium dose is 10 grains. As a purgative, it is often employed to obviate habitual costiveness, and it is often combined with other cathartics to produce more complete evacuation. From the supposition of its stimulant operation being more particularly exerted on the rectum, it has been supposed to have a tendency to occasion hæmorrhoids,—an opinion for which there does not appear much foundation. On the supposition too of its stimulating effect being extended to the uterus, it has been regarded as a purgative to be avoided during pregnancy, and on the same hypothesis it has been supposed to exert an emmenagogue power.

*Offic. Prep.*—Pil. Aloes. Pil. Al. cum Assafœt. Pil. Aloes cum Colocynth. P. Aloes cum Myrrh. T. Aloes Æth. T. Aloes cum Myrrh. Vin. Aloes Socc. *Ed.*—Pil. Aloes cum Zingib. Pulv. Al. cum Canella. Pulv. Al. cum Guaiac. *Ph. Dub.*—Pulv. Aloes Comp. T. Aloes C. Decoct. Aloes. Extract Aloes. *Lond.*

CONVOLVOLUS SCAMMONIA. Scammony. *Pentand. Monogyn. Campanaceæ. Gummi-resina. Syria.*

SCAMMONY is obtained by cutting the root of the plant, and inspissating the juice which exudes, by exposure to the sun and air. It is in small fragments, of a blackish grey colour, having little smell, and a bitter subacrid taste. It is however variable in its qualities, and is often

adulterated by the intermixture of earthy matter. It is one of what are named Gum-resins, and consists of resin and gum in general nearly in equal proportions.

Scammony is one of the most drastic purgatives, and is employed chiefly where the less powerful substances of this class would fail. Its dose is from 5 to 10 grains, but it is generally combined in a smaller dose with other cathartics. It is also used as a hydragogue purgative in dropsy, combined usually with super-tartrate of potash.

*Offic. Prep.*—Pulv. Scamm. C. *Ed.*—Pulv. Scamm. C. Confect. Scamm. *Lond.*

GAMBOGIA. Gamboge. Stalagmitis Cambogioides. *Polyand. Monoec. Tricoccæ. Gummi-resina. India.*

THIS gum-resin is obtained by exudation, from incisions made in the branches and trunk of the tree. It is brittle, of a lively yellow colour, and resinous fracture, has a taste bitter and acrid. Water and alkohol partially dissolve it, and its solution in alkohol becomes turbid on the addition of water.

Gamboge is a very powerful cathartic, liable in large doses to excite vomiting, or to act with violence, and occasion profuse evacuations, with griping and tenesmus. Its medium dose is from 2 to 6 grains. It is seldom employed but in combination with some of the other powerful cathartics, in obstinate constipation. It is also used to expel the tape-worm, and as a powerful hydragogue cathartic in dropsy. In the latter application of it, it is frequently combined with super-tartrate of potash.

*Offic. Prep.*—Pil. Gambog. Comp. *Ph. Lond.*

MURIAS HYDRARGYRI. MITIS. CALOMELAS, Mild Muriate of Mercury. Calomel. Sub-muriate of Mercury of the London and Edinburgh Pharmacopœias.

THOUGH several of the preparations of mercury have a degree of cathartic power, this is most evident in the mild muriate; and this preparation is even in common use as a cathartic. It operates as such, when given alone in a dose of from 5 to 10 grains, but with more certainty and power when its operation is promoted by the addition of a little jalap or rhubarb. One valuable quality which it has, is that of promoting the operation of other cathartics, without exciting any additional irritation, or rendering them liable to act with violence: it is therefore, in more obstinate cases, combined with colocynth, scammony, or gamboge; and such a combination affords the safest of the powerful cathartics.

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A DIVISION of Cathartics remains, intermediate in their operation between the Laxatives and Purgatives, more powerful than the one, less acrid and stimulating than the other. These are the Neutral Salts. They appear to act principally by stimulating the exhalant vessels on the inner surface of the intestines, so as to cause a larger portion of serous fluid to be poured out, which at once dilutes the contents of the canal, and by its operation, aided by the stimulus of the saline matter, accelerates the pe-

ristaltic motion. By the watery evacuation which they thus occasion from the general system, they are particularly adapted to those cases where inflammatory action or tendency to it exists.

SULPHAS MAGNESIÆ. Sulphate of Magnesia.

THIS salt, formerly known by the names of Bitter Purging Salt, and Epsom Salt, is found in mineral waters, whence it has been extracted, but at present is principally obtained from the liquor remaining after the crystallization of muriate of soda from sea-water, which holds a quantity of it, and of muriate of magnesia dissolved. This is boiled down, and when exposed to sufficient cold affords a mass of slender needle like crystals. These are deliquescent from the presence of a little muriate of magnesia; the sulphate, when pure, forms large regular crystals, which are rather efflorescent. They are soluble in nearly an equal weight of water. Their taste is extremely bitter.

This salt is used as a purgative, in a dose of from one to two ounces, dissolved in water. Though its taste be bitter, it has been remarked that it remains better on the stomach than many other cathartics, especially when given in small repeated doses, and in a solution largely diluted. Exhibited in this manner, it has been particularly recommended in ileus and colica pictonum.

SULPHAS SODÆ, Sulphate of Soda, long known by the name of Glauber's Salt, is prepared by various processes on a large scale; but in that given in the pharmacopœias, it is obtained from the residuum of the decomposition of

muriate of soda, by sulphuric acid, in the preparation of muriatic acid. The saline mass is dissolved in water; any excess of acid is neutralized by the addition of lime, and the pure sulphate of soda is obtained by evaporation. Its crystals are six-sided prisms; they are efflorescent, soluble in three parts of cold, and in an equal part of boiling water. The taste of this salt is very bitter and nauseous. It is one of the saline purgatives in most common use. Its medium dose is an ounce and a half, dissolved in six or eight ounces of water.

Sulphas potassæ. Sulphate of Potash, formerly named Vitriolated Tartar, is prepared by the direct combination of its principles, or by neutralizing the excess of acid, in the residuum of the distillation of nitric acid from sulphuric acid and nitre. It forms in small irregular crystals, which require 17 parts of cold water for their solution. In a dose of 4 or 6 drachms, this salt acts as a purgative, but its comparatively sparing solubility prevents it from being much employed; in one of 2 or 3 drachms, it is given as an aperient, frequently in combination with rhubarb or other vegetable cathartics.

Super-tartras potassæ. Super-Tartrate of Potash, formerly Crystals or Cream of Tartar, (Crystalli vel Cremor Tartari).

This salt is gradually deposited from wine, in the progress of the slow fermentation which it suffers when kept, and is purified by repeated solutions and crystallizations. It consists of potash, with an excess of tartaric acid. Its taste is sour. It is in irregular crystals, which

are sparingly soluble in water, requiring about 60 parts of cold, or 30 of boiling water. This salt operates as a purgative in a dose of 4 or 6 drachms, and being free from any unpleasant taste, it is not unfrequently used, given generally under the form of electuary; the only inconvenience attending its operation, is its being liable to occasion flatulence; and if habitually used, it is liable from its acidity to injure the tone of the stomach. It appears, at the same time, to increase the action of the absorbent system; hence as a hydragogue and diuretic it is employed in dropsy, and is also the cathartic most effectual in removing obesity.

TARTRAS POTASSÆ. Tartrate of Potash. Tartarum Solubile. Soluble Tartar.

THIS salt, the neutral tartrate of potash, formerly named Soluble Tartar from its greater solubility, is prepared by saturating the excess of acid in the super-tartrate by the addition of potash. From its affinity to water, it is not easily crystallized with regularity; when obtained by evaporation, it is even somewhat deliquescent: its taste is bitter. It is a mild purgative, and at the same time operates effectually, given in a dose of six drachms or an ounce.

TARTRAS SODÆ ET POTASSÆ. Tartrate of Soda and Potash.

THIS salt, formerly known by the name of Rochelle Salt, is a triple one, being prepared by saturating the excess of acid in the super-tartrate of potash by soda. It

crystallizes in large and regular transparent rhomboidal prisms, which are permanent in the air, and soluble in about six parts of cold water. Its taste is less unpleasant than that of the greater number of the saline purgatives, and it operates in a similar manner. Its medium dose is an ounce, given usually dissolved in tepid water.

PHOSPHAS SODÆ. Phosphate of Soda.

To prepare this salt, bones are calcined to whiteness, so as to obtain the phosphate of lime which is their base. This is submitted to the action of sulphuric acid, which combines with part of the lime, and leaves a super-phosphate of lime, which is dissolved by water. To this solution, a solution of carbonate of soda is added, till there be a slight excess of alkali; the soda combines with the excess of phosphoric acid, and by evaporation the phosphate of soda is crystallized. Its crystals are rhomboidal prisms. Its taste is the least nauseous of all the saline purgatives, and its operation is equally mild and effectual. Hence it has been established in practice, and is useful as a cathartic where there is any tendency to nausea. One ounce of it is given, dissolved generally in tepid water, or soup made without salt.

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BESIDES the preceding Cathartics, there are some which are employed only under the form of Enema.

MURIAS SODÆ. Muriate of Soda, Common Sea Salt.

THIS salt probably has some cathartic power, but its

strongly saline taste prevents it from being employed. It forms the active ingredient, however, of the common domestic enema; from half an ounce to an ounce of it being dissolved in a pound of tepid water, and a small quantity of expressed oil added.

TEREBINTHINA VENETA. Venice Turpentine. *Pinus Larix. Monœc. Monadelph. Coniferæ.*

THE resinous juice of this tree, the Larch, exudes from incisions made in its trunk. It is of the consistence of honey, has the peculiar smell of the turpentines, and a bitter acrid taste. It consists of resin and essential oil; sometimes it is employed as a cathartic under the form of enema, half an ounce of it being triturated with the yolk of an egg, and suspended in a sufficient quantity of water. As it has a considerable share of acrimony, it is employed only where those of milder operation fail.

NICOTIANA TABACUM. Tobacco. (p. 183.)

THE smoke of tobacco, introduced into the intestines, has sometimes succeeded in producing evacuation in colic and ileus, after other purgatives have failed, not improbably from its narcotic operation inducing relaxation of the muscular fibre. An infusion of 1 or 2 drachms of it in a pint of warm water is more convenient; but much caution is requisite in the use of either, as tobacco, from its narcotic power, is apt to induce extreme sickness and debility. It is only where other methods have been unsuccessful, that its administration can be proper.

## CHAP. IX.

### OF EMMENAGOGUES.

The medicines distinguished by the appellation of emmenagogues, are those which are capable of promoting the menstrual discharge.

The suppression of this discharge is supposed to arise from debility of the uterine vessels, or deficiency of action in them. Hence, it might be inferred, that the medicines capable of exciting it must be such as can stimulate these vessels.

General stimulants, or tonics, may to a certain degree have this effect, since, in consequence of their action, the uterine vessels must be stimulated in common with other parts. There are accordingly several stimulants, both diffusible and permanent, employed as emmenagogues.

It is doubtful whether there is farther any particular determination to these vessels. It is sufficiently certain, that there are many substances, which, when received into the stomach, have their stimulant operation more particularly determined to one part than to another; to the kidneys for example, the bladder or other organs. It seems possible, *à priori*, that there may be substances dis-

posed to act more peculiarly on the uterus; yet experience does not confirm this supposition; there being perhaps no proof of any of the substances styled Emmenagogue, producing their effect from any specific power.

A stimulant effect, however, produced in neighbouring parts, seems to be in some degree propagated to the uterine vessels; and hence several medicines exert an emmenagogue power, greater than can be ascribed to any general action they exert on the system. It is thus that some substances, belonging to the class of cathartics, have been supposed to act, their stimulus being communicated from the larger intestines to the uterus. They are probably of advantage too in amenorrhœa, simply as cathartics, removing that state of torpor in the intestinal canal connected with the disease.

There is also one stimulus, that of electricity, which can be brought to act directly on the uterine system, and it has been sometimes found to operate as a powerful emmenagogue.

The individuals belonging to this class may be arranged in some measure according to these distinctions; the most active of them being substances belonging to other classes; and there being a few only supposed to be possessed of any specific emmenagogue power. With regard to all of them, it may be added, that there are no medicines so uncertain in their operation, and none in which the conclusions respecting their efficacy are more liable to fallacy.

# EMMENAGOGUES.

*From the Class of Antispasmodics.*

Castoreum.
Ferula assafoetida.
Bubon galbanum.

*From the Class of Tonics.*

Ferrum.
Hydrargyrum.

*From the Class of Cathartics.*

Aloe.
Helleborus niger.

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Sinapis alba.
Rubia tinctorum.
Ruta graveolens.
Juniperus sabina.

CASTOREUM. Castor. (Page 196.)

UNDER the history of Castor already given, it was remarked, that it appears to be a substance wholly inert. As an emmenagogue, it has been given in the dose of 10 grains in substance, or more frequently under the form of tincture in the dose of one drachm. No reliance is now placed on its powers.

ASSAFOETIDA. Assafœtida. (Page 199.)

ALL the fœtid gums have been supposed to possess, along with their antispasmodic property, the power of acting more peculiarly on the uterine system, and have been therefore employed as emmenagogues. Assafœtida, the strongest of them, has been given in amenorrhœa in a dose of 10 or 15 grains, or in the form of tincture; but probably with little advantage. GALBANUM, another of these fœtid gums, next in strength to assafœtida, has been given in a similar dose.

FERRUM. Iron. (Page 223.)

THE powers of iron as a tonic may be supposed capable of being exerted on the uterine system, and of removing suppression of the discharge arising from deficient action of the uterine vessels, more especially when this is connected with a state of general languor and debility. In such cases, accordingly, it is frequently employed as

an emmenagogue. The carbonate of iron is given in a dose of 5 or 10 grains daily, continued for some time; the more active preparations of the sulphate and muriate are likewise prescribed, but in general there is some difficulty in continuing their administration, unless in small doses, from the irritation they are liable to occasion. The chalybeate mineral waters afford perhaps the best form of administering iron in amenorrhœa.

HYDRARGYRUM. Quicksilver. (Page 212.)

THE general stimulant operation of this metal may, like that of iron, be supposed to be so far exerted on the uterine system, as to obviate any state of diminished action; some of its preparations are accordingly occasionally employed in amenorrhœa. The mild muriate or calomel is the preparation generally used. It is given in the dose of a grain; more frequently, however, in combination with other emmenagogues, to promote their action, than alone.

ALOE. Aloes. (Page 357.)

THIS cathartic, it has already been remarked, is supposed to operate more peculiarly on the larger intestines; and its stimulant operation, it has been imagined, is thence propagated to the uterus. Hence its celebrity as an emmenagogue, though what efficacy it has probably depends principally, if not entirely, on its mere cathartic power. It is given under the form of pill or tincture; and frequently in combination with other remedies,

particularly with myrrh, rhubarb, and the preparations of iron.

HELLEBORUS NIGER. Black Hellebore. (Page 354.)

BLACK Hellebore is a powerful cathartic; it was also highly recommended by Mead as an emmenagogue under the form of tincture, one drachm of this being given as a dose at bed-time, and continued for some time. Its emmenagogue might be supposed to depend on its cathartic power; in this dose, however, and under this form, it has little sensible effect; and any advantage derived from it is extremely doubtful. The extract has been employed as a more active preparation in combination with aloes, or with carbonate of iron.

SINAPIS ALBA. Mustard. (Page 332.) *Semen.*

THE seeds of this plant have a considerable degree of pungency, and when taken unbruised to the extent of half an ounce or an ounce have a purgative effect. This is a popular remedy, not unfrequently used in amenorrhœa and chlorosis.

RUBIA TINCTORUM. Madder. *Tetrand. Monogyn. Stellatæ. Radix. South of Europe.*

THE root of this plant is in slender twigs, of a red colour; it has a bitter taste, with little smell. It has been recommended as an emmenagogue, in a dose of half a drachm thrice a-day. It appears to be nearly inert, and its inefficacy is generally acknowledged.

RUTA GRAVEOLENS. Ruta. Rue. *Decand. Monogyn. Multisiliquæ. Herba. South of Europe.*

THIS herb, when recent, has a strong unpleasant smell, and a bitter taste. By distillation it affords a pungent essential oil. It has been prescribed as an emmenagogue under the form of the watery infusion; and the oil is sometimes combined with aloes, and other medicines of the same class, probably with little advantage.

*Offic. Prep.*—Extr. Rutæ Gr. *Ed. Dub.*—Ol. Rutæ, *Dub.*—Confect. Rutæ, *Lond.*

JUNIPERUS SABINA. Savin. *Dioecia. Monadelph. Coniferæ. Folia. South of Europe.*

THE leaves of this plant have a bitter penetrating taste, a strong unpleasant odour, and a considerable degree of acrimony. They afford a very large quantity of essential oil, possessing the general virtues of the plant.

Savin is a stimulant, the operation of which has been supposed to be powerfully directed to the uterine system; so much so, that, according to the common opinion, it is capable of procuring abortion. It has in conformity to this been considered as an emmenagogue, but it is scarcely ever administered internally. Externally, the powder of the dried leaves is used as an escharotic, and mixed with lard as a stimulant to excite suppuration from inflamed surfaces.

*Offic. Prep.*—Extr. Sabinæ, *Ph. Dub.*—Cerat. Sabin. *Dub. Lond.*—Ol. Sabinæ, *Ed. Dub.*

## CHAP. X.

### OF DIURETICS.

Diuretics are those medicines which increase the urinary discharge;—an effect which is probably produced by different modes of operation.

It is obvious, that any substance capable of stimulating the secreting vessels of the kidneys, by direct application to them, may increase their action, and thus produce a more copious discharge of urine. It is probably in this way, that many of the saline diuretics act: the principal office of these organs seems to be to separate from the blood the saline matter it contains, and which would otherwise accumulate in the system; when substances of this kind, therefore, do not operate as cathartics, but are received into the circulating mass, they are brought to the kidneys in the course of the circulation, are secreted by their vessels, and exciting in them increased action, a larger portion of watery fluid is also secreted. Several of these substances, as nitre, or the fixed alkalis, can be detected in the urine by chemical tests after they have been administered, and therefore there can be little doubt of this being the mode in which they o-

perate. There is evidence even of some vegetable diuretics passing off by the same emunctories. The flavour of asparagus, or of garlic, or turpentine, for example, may be observed in the urine discharged an hour or two after they have been received into the stomach.

It is also probable, however, that a diuretic effect is in other cases produced by substances acting only on the stomach, the action they excite being communicated by sympathy to the kidneys. Squill and tobacco appear to act in this manner, as there is no proof that they are received into the circulating mass; they act very peculiarly on the stomach, and when they occasion vomiting or purging, they generally fail in their diuretic effect. It may be concluded, therefore, that they exert a peculiar action on the stomach, which, propagated to the kidneys, by means of the general connection subsisting between all the parts of the system, causes an increase in the urinary discharge. The different kinds of ardent spirits diluted with water, seem to act in a similar manner, as their diuretic effect usually takes place very speedily.

There is still a third mode, in which it seems probable that some substances produce a diuretic effect, especially in a state of disease. It is known that persons who drink sparingly, discharge less urine than others; or that where the watery part of the blood is carried off by perspiration, the urinary discharge is diminished. It is farther known, that large draughts of water, or of any mild diluent, if not determined to the skin by external warmth, occasion an increased discharge of urine. It seems probable,

therefore, that a similar effect may be produced, by the action of substances which powerfully stimulate the absorbent system, and thus bring an increased quantity of serous fluid into the course of the circulation. Digitalis is probably a remedy of this kind. Its effect as a diuretic is more certain and powerful, when given to a person labouring under dropsy, than to one in health; it appears too to be one of those medicines which stimulate most powerfully the absorbent system; its diuretic power in dropsy, therefore, is probably principally owing to its enabling the absorbents to take up the serous fluid effused; this is of course brought into the circulation, and like any other watery fluid is discharged by the kidneys.

On the same principle is explained the utility of a practice, which has been employed to promote the action of diuretics, that of conjoining mercury with them. Thus, the action of squill as a diuretic, is rendered more certain and powerful by combination with calomel; each of them being given in separate doses, or both being united in one formula. The efficacy of this is probably derived from the mercury stimulating the absorbents, and, by introducing the effused fluid into the system, promoting the direct diuretic action of the squill.

The action of diuretics is promoted, by drinking moderately of watery liquors; hence the practice that was formerly adopted in dropsy, of diminishing the allowance of drink, is exploded; it was of little benefit in preventing the accumulation of effused fluid, and the abstinence from liquids that was enjoined, rather prevented the ac-

tion of the diuretic remedies that were employed for the cure of the disease. Many cases even have occurred, in which pure water, mineral waters, or mild diluents, have acted as diuretics, and effected a cure in dropsy.

The action of diuretics is also considerably dependent on the state of the vessels of the skin. If, when a medicine of this class has been given, these vessels are stimulated by external warmth, its action is rather determined to the surface, and sweat or diaphoresis takes place. But if the surface is kept cool, the diuretic effect is more certain; so much indeed does this state of the surface determine to the kidneys, that the usual diaphoretics may be brought to act as diuretics.

The general effects of diuretics are sufficiently evident. They discharge the watery part of the blood, and by that discharge they indirectly promote absorption. Dropsy is the disease in which they are principally employed, and they are adapted to every form of it. The disease can also be removed with less injury to the patient, by exciting the urinary discharge, than by any other method. The success of diuretics in dropsy is however very precarious; sometimes none of them succeed; sometimes one acts more powerfully than another, though in this there is no uniformity; nor are the causes of this variety of operation well understood. In general, it is obvious, that where a strong predisposition to the disease exists, or where it originates from organic affections of the liver, or other chylopoëtic viscera, no great advantage can be expected from the mere evacuation of the water by the action of diuretics:

it is only in those cases where an accumulation of fluid has taken place from diminished absorption, or some similar cause, that they can be expected to effect a cure. It accordingly often happens in practice, that an increased discharge of urine is effected by the exhibition of diuretics, and still the dropsical swellings are not removed, or, if they are, they speedily return.

Diuretics have been likewise used in calculous affections, with the view of preventing at least the increase of the calculus, by rendering the urine more watery : and they have occasionally, though rarely, been employed to lessen plethora, or check profuse perspiration. The use of diluents, so as to increase the quantity of urine, is of use in gonorrhœa, and other affections of the urinary passages, by lessening the acrimony of the urine, which excites pain from its action on these parts, when they are in an inflamed state.

The cautions with regard to the administration of diuretics, are obvious from what has been said of their operation. The surface of the boyd must be kept cool, and therefore the doses of the medicine ought to be given in the course of the day, and the patient should if possible be kept out of bed. The use of diluents ought to be permitted, at least this is more necessary with respect to those diuretics belonging to the class of salts, and which operate directly on the secreting vessels of the kidneys.

The individual diuretics may be considered under the subdivisions of Salts, Vegetable Diuretics, and one or two derived from the animal kingdom.

# DIURETICS.

*Saline Diuretics.*

Potassa.

Acetas potassæ.

Super-tartras potassæ.

Nitras potassæ.

Spiritus etheris nitrosi.

*From the Vegetable Kingdom.*

Scilla maritima.

Digitalis purpurea.

Nicotiana tabacum.

Solanum dulcamara.

Lactuca virosa.

Colchicum autumnale.

Gratiola officinalis.

Spartium scoparium.

Juniperus communis.

Copaifera officinalis.

Pinus balsamea.

Pinus larix.

*From the Animal Kingdom.*

Meloe vesicatorius.

## *Saline Diuretics.*

Potassa. Potash, either pure, or in the state of sub-carbonate, is a diuretic; and, as has been already remarked, is secreted by the kidneys, so that when continued for a sufficient time, it renders the urine alkaline. The saline matter from the ashes of broom, wormwood and other plants, which is sub-carbonate of potash, more or less pure, used formerly to be frequently prescribed in dropsy. It is difficult to continue the administration of the alkali, however, to the requisite extent, without occasioning irritation; and being inferior in diuretic power to the super-tartrate of potash, it has fallen into disuse. When employed, the dose of the sub-carbonate is 20 or 30 grains dissolved in a large quantity of water, and repeated three or four times in the course of the day.

Acetas potassæ. Acetate of Potash. Sal Diureticus.

This salt, prepared by saturating potash with acetic acid, and evaporating the solution to dryness, is obtained in the state of a white foliated mass, deliquescent and very soluble in water. It has been considered as a powerful diuretic, and has been used in dropsy, half a drachm of it dissolved in water being given every hour or two until it operate. It is uncertain in its operation, however, and has therefore fallen into disuse.

SUPER-TARTRAS POTASSÆ. Super-tartrate of Potash. Cream of Tartar. (Page 363.)

THIS salt, of which the chemical history has been already given, and its applications as a cathartic noticed, is extensively employed as a remedy in dropsy, and is inferior to few of the substances belonging to this class. There are two modes under which it is exhibited, either so as to obtain principally its diuretic effect, or along with this its action as a hydragogue cathartic. When given with the first intention, the form of exhibition is solution in water, from half an ounce to an ounce being dissolved in the due proportion of water, and this being taken in the course of the day, its operation on the kidneys being promoted by dilution. The more usual practice, however, is to give it in substance, either diffused in a little water, or made into an electuary with syrup, and in such doses as to occasion purging to a certain extent. The dose is various, its operation being apparently much dependent on the action of the absorbents being excited, and this, in different states of disease, being effected with more or less difficulty. Half an ounce is given at first, and this is increased to an ounce, or even two ounces in twenty-four hours, the increase of dose being continued until its effects on the kidneys or bowels is obtained, and care being taken not to push it so far as to produce greater evacuation than the strength of the patient can support. It generally causes a considerable discharge of serous fluid into the intestinal canal, so as to produce watery evacuations, and at the same time augments the

quantity of urine; the size of the dropsical swelling soon begins to be reduced; and the effused water, according to those practitioners who have represented its efficacy in the most favourable light, is not only removed, but any renewal of the effusion is prevented with more certainty than by the action of other diuretics: hence it has been regarded as in general superior to the other medicines of this class in the treatment of dropsy.

There can be no doubt that super-tartrate of potash proves often a powerful remedy; yet the general remark applies to this as well as to the other diuretics, that it sometimes fails, where others succeed. It is frequently necessary too to give it in such large doses to obtain its diuretic or hydragogue effect, that it excites nausea and flatulence, weakens the appetite, and injures the tone of the stomach: and as a greater degree of debility is induced by the operation of purging than by merely exciting the urinary discharge, there is some risk of the powers of the system being exhausted under its protracted use. These effects, therefore, require to be guarded against, and sometimes render it necessary to substitute other diuretics where it has received a fair trial.

NITRAS POTASSÆ. Nitrate of Potash. Nitrum. Nitre.

THIS salt, consisting of nitric acid and potash, is frequently formed on the surface of the soil, in warm climates. In the South of Europe, its production is accelerated by artificial arrangements. Animal and vegetable substances, in a state of decomposition, are mixed with a

quantity of carbonate of lime, the mass is exposed to the air, but protected from the rain, and is occasionally stirred up. After a number of months, the materials are found to contain nitrate of lime and nitrate of potash. These salts are extracted by lixiviation with water: impure sub-carbonate of potash is added, by which the nitrate of lime is decomposed, and the quantity of nitrate of potash increased; and this salt is purified by repeated solutions and crystallizations. During the process by which the nitrate of potash is formed, it appears that the oxygen of the atmospheric air, and partly with the nitrogen of the animal matter combines partly with the oxygen of the vegetable matter, so as to form nitric acid; this is attracted in part by the lime present, and in part by a quantity of potash, either contained in the materials, or, as some have supposed, actually formed during the process.

Nitrate of potash is crystallized in hexaedral prisms. Its crystals are soluble in six parts of cold, and in an equal weight of boiling water. It is decomposed by heat, affording a large quantity of oxygen gas; and from the facility of this decomposition, is an important pharmaceutic agent in oxidating bodies.

This salt has a cool and sharp taste, and occasions a sense of coldness in the stomach when swallowed. When given in moderate doses, continued for some time, its presence can at length be detected in the urine by chemical tests. Its virtues are those of a refrigerant and diuretic; and, as possessing both, it has been used principally to relieve ardor urinæ in gonorrhœa. The prac-

tice, however, is now relinquished, either as inefficacious, or as rather hurtful, if the nitre is secreted with the urine, as it must render it more stimulating. Its dose is from 5 to 20 grains repeated twice or thrice a-day, with the free use of diluents or demulcents. Its diuretic power is too inconsiderable to admit of its being employed as a remedy in dropsy.

*Offic. Prep.*—Troch. Nitrat. Pot. *Ed.*

SPIRITUS ETHERIS NITROSI. Spirit of Nitrous Ether.

NITRIC acid, added in due proportion to alkohol, converts it into a species of ether; but as the process is difficult, from the violent chemical action that takes place, it has long been the practice to use less acid than is required to change the whole alkohol into this product; a portion of nitric ether is formed, and this is obtained by distillation, combined with the unchanged alkohol, and generally also from the mutual action not having been complete with a portion of free acid. This forms what used to be named Spiritus Nitri Dulcis, what is now named Spiritus Etheris Nitrosi. Its odour is fragrant; its taste sharp and acidulous. In medicine it is employed as a refrigerant and diuretic, in a dose of 20 or 30 drops. Being grateful to the stomach, and relieving flatulence, it is often used to correct or promote the action of more powerful diuretics in dropsy.

## *Diuretics from the Vegetable Kingdom.*

### Scilla maritima. Squill. (Page 331.)

The medicinal applications of squill as an emetic have been already stated. Under this article are to be considered its powers as a diuretic.

Squill, foxglove, and super-tartrate of potash, are the diuretics principally employed in modern practice in the treatment of dropsy; and it is not easy to assign precisely their comparative powers, one frequently proving successful when either of the others has previously failed. Squill operates more directly as a diuretic than the super-tartrate of potash does, and is not liable, even if its administration has been carried rather far, to produce those injurious effects which arise from the action of foxglove in an over dose.

As a diuretic, squill is always given in substance, under the form of the dried root. Its dose is from one to three grains. A grain may be given at first, morning and evening, in the form of pill, and this increased slowly until its diuretic effect is obtained. If the dose is too large, it is liable to excite nausea, and the rule has even been delivered, to give it always to the extent necessary to induce some degree of nausea. The production of this effect can be regarded, however, only as a test of the squill being in an active state; it is not necessary to its

diuretic operation; it proves distressing to the patient; and it has been observed, that when it has once been given to such an extent as to induce this state of the stomach, the same state is more liable to recur even when after an interval it is given in smaller doses. Its nauseating operation, therefore, ought rather to be avoided by the due regulation of the dose.

The diuretic power of squill is much promoted by combination with mercury, and it is more frequently perhaps employed in this combination than alone. Of the mercurial preparations, either the common pill, or calomel, may be used; the usual medium dose from which we obtain the general action of either on the system, being added to the dose of the squill, or being given in the evening, while the squill is given in the morning. The superiority of their combined action probably depends on the mercury stimulating the absorbent system, while the squill excites the action of the vessels of the kidneys. This combination is farther well adapted to the treatment of dropsy, connected as it frequently is with obstruction or chronic inflammation of the liver or neighbouring organs. Where the mercurial preparation occasions purging, as this impedes the diuretic action of the squill, mercurial friction may be substituted.

DIGITALIS PURPUREA. Foxglove. (Page 177.)

FOXGLOVE has already been considered as a narcotic; it is a still more important article of the Materia Medica as a diuretic. It had frequently been used as an empi-

rical remedy in dropsy; but the occasional violence of its narcotic operation, when not administered with due precaution, prevented it from being employed in practice, until Dr Withering pointed out, with more precision, the rules to be attended to in its exhibition.

It is difficult, as has been already remarked, to compare the powers of the principal diuretics; yet, on the whole, perhaps foxglove is superior to all of them in evacuating the water in dropsy: and the conclusions of Withering are still nearly just, that "so far as the removal of the water will contribute to cure the patient, "so far may be expected from this medicine;" and that "although digitalis does not act universally as a diuretic, "it does so more generally than any other."—In hydrothorax, its superiority to other diuretics is more clearly established than in ascites or anasarca; and in the first of these states of dropsy, it is unquestionably superior to any other remedy. Withering remarked, that it was most successful in those cases of dropsy in which debility was completely marked, where the countenance is pale, the pulse weak, and the muscular energy reduced; while, in an opposite state of the system, it was more liable to fail. In the latter case, therefore, he recommended a previous exhibition of squill, or of super-tartrate of potash, by which some reduction of strength might be induced. The observation, however, has not altogether been confirmed by subsequent experience. If it were, it would afford a strong presumptive proof, that the efficacy of foxglove in dropsy depends on its stimulant action.

There is a peculiarity in its operation, that it may be continued for some time without sensibly increasing the flow of urine; the increase then suddenly commences, and continues of itself without requiring the continued administration of the remedy for several days, and to a very great extent, so that the dropsical effusion is more speedily reduced by the action of it than by any other diuretic. Its diuretic power too appears only when it is administered in dropsy, and hence there can be little doubt that it operates principally, if not entirely, by exciting the action of the absorbents. The absorbed fluid is then discharged by the kidneys. The diuretic effect is not connected with its nauseating operation, or with the reduction in the force of the circulation; it can, on the contrary, be obtained without either of these accompanying it; and Withering remarked even, that he had found the increased discharge of urine to be checked, when the doses had been imprudently urged so as to occasion sickness. He observed also, that if it purges, it is almost certain to fail.

Foxglove is given under the form of the dried leaves in substance, or in infusion or tincture. The tincture has been supposed to be better adapted to its exhibition as a narcotic. The infusion is a preparation sufficiently uniform and active, and its dose is rather more easily regulated with precision, so as to admit of a gradual increase, than that of the powder. Its action too is at once exerted on the stomach, and there is therefore less risk of its effect being delayed until it is accumulated. The

medium dose of the powder is at first from half a grain to a grain twice a-day: from half an ounce to an ounce of the infusion, prepared according to the formula of Withering, now received into the Pharmacopœias, is a similar medium dose.

The great desideratum with regard to this remedy, is to conduct its administration so as to obtain its full diuretic effect, without those consequences which arise from it when its action is accumulated in the system. The rules given by Withering for its administration, are to give it in a dose from 1 to 3 grains of the powder twice a-day; or one ounce of the infusion, which, if the symptoms be urgent, or the patient stronger than usual, may be given once in eight hours: and the dose is to be continued until the medicine either acts on the kidneys, the stomach, the pulse, or the bowels; and is to be stopped on the first appearance of any one of these effects.

Though Withering enjoined strictly the caution necessary in the use of this remedy, the doses prescribed in his directions are perhaps rather large; and the method which has sometimes too been recommended of progressively increasing the dose until the effects are obtained, is improper. If the dose be at first small, or at least if having been raised to one grain of the powder, or one ounce of the infusion, twice in twenty four hours, it be continued at this quantity, the diuretic operation will be obtained in no long time without any unpleasant symptom, and when it commences, will continue of itself, even though the dose be suspended. Or if, from

peculiarity of habit, or state of disease, the dose requires to be increased, it ought to be done slowly, and without that regularly progressive augmentation which has been recommended. And if the effect begin to cease before the reduction of the dropsical swelling be completed, it may be easily renewed by a repetition of this moderate dose. This mode of administering foxglove is that suggested by the nature of its action. The peculiarity which has always been pointed out as characteristic of this medicine, is its tendency to accumulate in the system, its effects not appearing for a time, but at length being suddenly induced. There is no necessity, therefore, to increase its dose, or to give one that is large, with the view of speedily inducing its action, since, merely from its continued administration, this will in no long time be established, and without that hazard which is otherwise incurred from this peculiarity in its operation. The alarming symptoms which foxglove is liable to produce, it has already been remarked, are best obviated by small doses of spiritous cordials warm; sulphuric ether, aromatic spirit of ammonia, bitter infusions, and aromatics. Vinegar, which is an antidote to other narcotics, might be tried.

There are other diseases in which foxglove has been supposed to prove useful by its diuretic power; as in insania, or in epilepsy connected with serous effusion in the brain; and more especially in dyspnœa arising from serous effusion in the bronchiæ,—anasarca pulmonum, as this affection is named.

It may, in the treatment of dropsy, be advantageously combined with other diuretics; and its action, like that of squill, is said to be promoted by the operation of mercury.

NICOTIANA TABACUM. Tobacco. (See p. 183.)

TOBACCO, in its general action, has some resemblance to foxglove, being narcotic, emetic, and diuretic. As a diuretic, it has been employed in dropsy, under the form of infusion, one ounce of the dried leaves being infused in a pint of water, and six or ten drops being given, and gradually increased to 60 or even 100. It possesses, however, no peculiar advantage to recommend it, and its diuretic effect is generally accompanied with sickness and vertigo.

SOLANUM DULCAMARA. Woody Nightshade. Bitter-Sweet. *Pentand. Monogyn. Solanaceæ. Stipites. Indigenous.*

THE young shoots or branches are the part of this plant used in medicine; when first chewed, they have a bitter taste, which is soon followed by a degree of sweetishness, a peculiarity whence its name is derived; their smell is strong and disagreeable. By drying, their activity is much impaired. An infusion or decoction of the dried stalks in water has been recommended as a diuretic in dropsy, but it is a remedy of uncertain operation, and is scarcely ever prescribed.

*Offic. Prep.*—Decoct. Dulcamar. *Ph. Lond.*

LACTUCA VIROSA. Strong-scented Lettuce. (P. 185.)

THIS plant, though it possesses a narcotic quality, is also a diuretic, and has been recommended under the form of the inspissated juice as a remedy in dropsy, the dose being gradually increased from 5 or 10 grains to 2 or 3 drachms. Though celebrated by the German practitioners, it is never used in this country.

COLCHICUM AUTUMNALE. Meadow Saffron. Colchicum. *Hexand. Trigyn. Liliaceæ. Radix. Indigenous.*

THE root of this plant is bulbous; when recent, it is extremely acrid, a small quantity occasioning a sense of burning heat in the stomach, strangury and tenesmus; at other times, it is entirely void of acrimony; differences owing to climate, age or season. It was recommended by Störck as a remedy in dropsy, under the form of oxymel or syrup; these have been received into the Pharmacopœias, the dose of either being 2 or 3 drachms. From the uncertainty, however, of its operation, colchicum has not been established in practice.

*Offic. Prep.*—Syr. Colch. A. *Ed.*—Oxymel. Colch. *Dub.*—Acet. Colch. *Lond.*

GRATIOLA OFFICINALIS. Hedge-Hyssop. *Diand. Monogyn. Personatæ. Herba. South of Europe.*

THE leaves of this plant have a strong bitter taste, with little smell. They prove emetic and cathartic, but in a smaller dose produce a diuretic effect, and have been

recommended under the form of infusion in the treatment of dropsy. Their operation, however, is always uncertain, and liable to be violent.

SPARTIUM SCOPARIUM. Broom. *Diadelph. Decand. Papilionaceæ. Summitates. Indigenous.*

THE tops of the young branches of the broom have a bitter taste, which is communicated both to water and alkohol. The watery decoction is used as a popular remedy in dropsy, and sometimes with success. It acts in general both as a cathartic and diuretic.

*Offic. Prep.*—Extr. Genist. *Ph. Dub.*

JUNIPERUS COMMUNIS. Juniper. *Diœcia. Monadelph. Coniferæ. Baccæ. Indigenous.*

THE berries of this shrub have an aromatic smell, and a warm sweetish taste, with a degree of bitterness, the former qualities residing in the pulp, the last in the seeds. Distilled with water they afford a considerable quantity of essential oil.

Juniper berries given in infusion prove diuretic. The essential oil retains this property; and the spirit of juniper, or diluted alkohol impregnated with it, has been prescribed as a cordial and diuretic in dropsy.

*Offic. Prep.* — Ol. Juniper. Spir. Junip. C. Comp. *Ed. Lond. Dub.*

COPAIFERA OFFICINALIS. Balsamum Copaibæ. Balsam of Copaiba or Copaiva. *Decand. Monogyn. Dumosæ. Balsamum. South America.*

THIS resinous juice, for it is improperly named a balsam, is the produce by exudation from incisions made in the trunk of the tree. It is thick and tenacious, transparent, with a yellow tinge; has a peculiar smell not disagreeable, and a pungent bitter taste. It is soluble in alkohol, and in expressed and essential oils. Distilled with water, it affords nearly half its weight of an essential oil, an insipid resin being the residuum.

Balsam of Copaiba increases the urinary discharge, and communicates to the urine a violet odour. In too large a dose it is liable to excite inflammation of the urinary passages. From its power of stimulating these parts, it frequently proves successful in the cure of gleet, where the inflammation has entirely subsided, and the discharge continues from weakness of the exhalants or absorbents. It has also been given in leucorrhœa, and in hæmorrhoidal affections. Its dose is 20 or 30 drops twice or thrice a-day, given in the form of bolus, or, what is preferable, as remaining more easily on the stomach, and less irritating, diffused in water by the medium of mucilage.

PINUS BALSAMEA. Balsamum Canadense. Canadian Balsam. *Monœcia. Monadelph. Coniferæ. Balsamum. North America.*

THIS resinous juice, for it, like the preceding, is improperly named a balsam, as it affords no benzoic acid,

exudes spontaneously from the trunk of the tree. It is of a light yellow colour, transparent, tenacious, and inflammable. By age it becomes thicker; its smell is agreeable; its taste pungent. It is soluble in alkohol and oils, and affords an essential oil by distillation, similar to the oil obtained from the other turpentines or resinous juices of the different species of pinus.

The medicinal virtues of this resinous juice seem to be the same as those of copaiba, and it is used for the same purposes. Its dose is from 30 to 50 drops. Of any of the turpentines it is the purest.

PINUS LARIX. Terebinthina Veneta. Venice Turpentine. *Monoecia. Monadelph. Coniferæ.*

THIS juice exudes spontaneously, and in still greater abundance from incisions in the trunk of the tree. It is thick and tenacious, semi-pellucid, of a yellowish colour, has a peculiar smell, and a bitter pungent taste. By distillation, with the addition of a small quantity of water, to prevent the temperature from rising too high, it affords a large quantity of an essential oil, which is light, volatile, and inflammable, but more sparingly soluble in alkohol than any other essential oil. The residuum is a resin nearly insipid.

Venice turpentine derives all its virtues from its essential oil, and it is this oil, Oleum Terebinthinæ, Oil of Turpentine, that is used in medicine, more frequently than the juice itself. It is a powerful stimulant, directed more particularly in its action to the urinary passages,

as is evident from the violet odour it communicates to the urine, and from the inflammation it excites when given in too large a dose. From this specific action it has been employed in gleet in a dose from 5 to 10 drops, but its operation is always liable to be violent. It was highly recommended by Cheyne as a remedy in chronic rheumatism, especially lumbago, given to the extent of 2 or 3 drachms mixed with honey. It is scarcely possible, however, to give it in such a dose without being rejected from the stomach, or acting violently on the urinary organs. Externally it is applied by friction as a stimulant to parts affected with cramp and rheumatism; sometimes too it is used as an application to burns, or as a styptic to bleeding wounds.

Resina Alba vel Flava. White or yellow resin is the residuum of the distillation of turpentine; its various shades of colour arising from the purity of the juice, or from the degree of heat applied. It has little smell or taste, but appears from the practice of the farriers, who give it to horses, to have some degree of diuretic power. It is only employed in the composition of ointments and plasters, which it renders more adhesive, and perhaps more stimulating. Various compositions of this kind have a place in the Pharmacopœias, as the Ceratum Resinæ, or Unguentum Resinosum, long known by the name of Basilicon, the Emplastrum Resinosum and others.

PISTACIA TEREBINTHINUS. Chio or Cyprus Turpentine.—PINUS PICEA. Strasburgh Turpentine.—PINUS SYLVESTRIS. Common Turpentine. *Diœc. Pentand.*

THE Chio turpentine is more fragrant and grateful than the preceding; its powers are the same, and not being easily procured, it is never used. The same observation may be made with respect to the Strasburgh Turpentine, the produce of the Pinus Picea. The Common Turpentine (Terebinthinus Communis), the produce of the Pinus Sylvestris, contains less essential oil, and is more offensive to the stomach than any of the other turpentines.

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*DIURETICS FROM THE ANIMAL KINGDOM.*

MELOE VESICATORIUS. Cantharis. Spanish Fly. Lytta Vesicatoria. Blistering Fly. *Coleoptera.*

THIS insect is collected from the leaves of certain plants in Spain and Italy, to which it adheres; they are first exposed to the vapours of vinegar, and are then dried in the sun. They are of a rich, lively green and yellow colour; have a faint unpleasant smell, and a taste slightly acrid. The active matter of cantharides inflames and excoriates the skin, and is used as the basis of the common vesicatories. It appears to have a peculiar determination to the urinary organs, as even from the external application strangury is sometimes induced; and a small

dose of the cantharides internally administered acts with much violence on the kidneys and bladder, producing inflammation and a discharge of bloody urine. In dropsy, it has been given as a diuretic in a dose of one grain once or twice a-day, continued for some time: it has been prescribed in a similar dose in obstinate gleet and leucorrhœa, and in retention of urine arising from debility of the body of the bladder, or in the opposite affection of incontinence of urine. It is principally in the latter of these affections that the internal administration of cantharides is attempted,—where the inability to retain the urine arises from weakness of the sphincter vesicæ, a state which the cantharides by its local stimulant action is adapted to remove. Its action requires to be moderated by the free use of diluents. It has also been employed as a stimulant in amenorrhœa; and it is still more extensively used externally as an epispastic.

*Offic. Prep.*—Emp. Mel. Ves. T. Mel. Ves. Ung. Pulv. Mel. V. *Ph. Ed. Lond. Dub.*—Emp. Mel. Vesic. Comp. Ung. Inf. Mel. V. *Ed.*—Emp. Calefac. *Dub.*

## CHAP. XI.

### OF DIAPHORETICS.

DIAPHORETICS are those medicines which increase the natural exhalation by the skin. When they excite this so copiously as to produce sweat, they are named Sudorifics. The operation of both is the same, differing only in degree; diaphoretics in doses sufficiently large acting as sudorifics, and sudorifics in diminished doses, or under peculiar circumstances, occasioning only a slight diaphoresis. The fluid effused too is in both cases alike, being chiefly the watery part of the blood, with a slight impregnation of saline matter. In the one case it is discharged more slowly, and therefore passes off in the state of vapour; in the other it is discharged copiously from the exhalant vessels in the liquid form.

The operation of these medicines is not obscure; the natural exhalation is merely increased; the action of the exhalant vessels on the surface must therefore have been augmented, and the substances belonging to this class must be those which stimulate these vessels.

Of stimuli of this kind, external heat affords an example; it is directly applied to the vessels, and must occa-

sion in them an increased action; hence it often produces sweat, and always promotes the action of sudorifics.

The same effect may be likewise produced by a different operation,—by increasing the general force of the circulation; this acts as a stimulus on the exhalant vessels, and increases their discharge. Hence violent muscular exercise is perhaps always attended with copious sweating.

In one or other of these modes, the medicines belonging to this class operate,—either by directly stimulating the cutaneous exhalant vessels, or by indirectly communicating to them an increased action by increasing the force of the circulation.

The saline diaphoretics seem to act in the former manner; they have little or no action on the vascular system, neither increasing the velocity nor force of the circulation; their action therefore is exerted on the stomach, and thence communicated to the vessels of the skin. Perhaps they may likewise be absorbed into the mass of blood, as they readily pass with the chyle, or enter the absorbent vessels, and may act more directly on the cutaneous vessels.

Those diaphoretics, on the contrary, which are more stimulating, probably act by increasing the force of the vascular system, as they usually augment the force and frequency of the pulse, previous to occasioning sweat.

Diaphoresis is not, however, the necessary consequence of the circulation being increased in force; for it often happens that the pulse is frequent and hard,

when the skin remains dry. In this case there seems to exist a constriction of the exhalants, sufficient to resist the impetus of the blood, and whatever can remove this will favour sweating. Diaphoresis, therefore, it may in general be said, will follow from increased vascular action, when the exhalants of the skin are not morbidly constricted; and it will take place still more copiously when the circulation is increased in the larger vessels, while the exhalants themselves are relaxed. On this view is to be explained the operation of tepid diluents, and of external warmth in promoting sweat, the tendency of both being to increase the force of the circulation, and at the same time occasion relaxation of the cutaneous vessels. From the latter effect, small doses of emetics are favourable to diaphoresis; and, from the same principle, the superior sudorific power of the combination of opium with ipecacuan, or the preparations of antimony, may perhaps be accounted for; the primary operation of the one being to increase the action of the vascular system; that of the other, by its nauseating effect, to diminish the action at the surface, as is apparent from the paleness of the skin and the sense of coldness with which nausea is attended.

The primary effects of diaphoretics are to evacuate the watery part of the blood, and thus lessen the quantity of it in the circulating system; to determine the blood to the surface from the internal parts; to increase the action of the absorbents, and to remove spasmodic stricture of the cutaneous vessels, and render the skin moist and relaxed.

It is doubtful, however, whether the first of these ef-

fects takes place to any extent; for, during sweating, there is generally considerable thirst: as much fluid may therefore be taken in, as will supply what is thrown out; and farther, the other fluid secretions, particularly that of urine, are diminished during this operation. It is probable, therefore, that little alteration takes place in the quantity of fluid contained in the body from the action of diaphoretics; and we can scarcely, in any case, ascribe any beneficial effects they produce to this cause.

The last effect is perhaps the most important; at least it is on this principle, the removing spasmodic stricture of the cutaneous vessels, that the efficacy of diaphoretics in inflammatory diseases has been explained. In such affections the skin is dry, and the external heat augmented; but when diaphoresis has been induced, that state is removed, and the skin remains moist and cool. It is with the view of producing these effects that diaphoretics are used in synocha, acute rheumatism, and in the various phlegmasiæ.

Several circumstances contributed to lead physicians to the free use of diaphoretics in fevers. The skin is generally dry and hot; and it was often observed, that a spontaneous salutary crisis was marked by diaphoresis, or even by a copious sweat. Hence it was concluded, that by following the path nature pointed out, and inducing this relaxed state of the vessels of the skin, the disease might be removed. Theory too had its influence in carrying this practice to an immoderate extent, fever being supposed to arise from the presence of morbific matter in the

system, and sweating being an evacuation by which it was supposed to be discharged. The limits to the practice have long been established; little advantage appears to be derived from it in the treatment of fevers of the typhoid type, and it is principally in the various phlegmasiæ that it is employed.

As evacuating the serous part of the blood, and as promoting absorption, sudorifics have been sometimes employed in the different species of dropsy, especially in anasarca, in which the circulation in the extreme vessels on the surface is more or less languid. Cases occur where it is not easy to increase the discharge by urine, and in these sweating has been had recourse to as less debilitating than purging, the only other evacuation that can be excited with advantage. It has been remarked too, that the operation of diaphoretics, when it has been excited, has been accompanied by an increase in the quantity of urine, a proof of absorption having been promoted. It is difficult, however, to excite sweating in dropsy, and the practice is rarely attempted.

By determining to the surface, and preserving a gentle diaphoresis, they are found serviceable in asthma, dyspepsia, habitual diarrhœa, chronic dysentery, and chronic rheumatism.

In various obstinate cutaneous affections, as herpes and lepra, advantage has been derived from the use of diaphoretics, probably from altering the morbid state of the extreme vessels on the surface. The use of the warm bath,

and the antimonial and mercurial diaphoretics, are found more particularly serviceable in such affections.

Several circumstances require to be attended to in the administration of sudorifics. If the disease is inflammatory, the action of the vascular system strong, and the skin dry, with great heat on the surface, those which are of the stimulating kind are to be avoided, as if they fail in producing sweat, they may aggravate the symptoms. The free use of warm diluents is proper and even necessary, under the operation of full sweating. The patient should be laid in flannel, not only as preserving the temperature more uniform, but also as it absorbs the moisture which would otherwise carry off the heat too rapidly, and cool the surface. The covering ought rather to be light, as there is no necessity for much external warmth. Too much heat, especially when unaccompanied by humidity, sometimes rather prevents sweating, probably by stimulating the exhalant vessels, and increasing their force of resistance. It is promoted by partial fomentation, as the application of flannel dipped in warm water, and pressed out, to the feet. Lastly, care is to be taken to avoid the application of cold, either by the admission of cold air to the surface, or the drinking of cold water while the sweat continues, or for some time after it has ceased. When the sweat is to be checked, it is best done by drying the surface, removing the patient into dry flannel, and allowing him to expose his hands and arms to the air.

The particular diaphoretics may be arranged according to the affinity in their operation, as they operate by increasing the action of the vascular system, or as they act without any sensible stimulant operation, though it is somewhat difficult to trace the distinctions of these, or even with regard to every individual to assign the kind of action it exerts.

## DIAPHORETICS.

ACETAS AMMONIÆ.
CITRAS AMMONIÆ.
CARBONAS AMMONIÆ.
MURIAS AMMONIÆ.
SUB-MURIAS HYDRARGYRI.
ANTIMONIUM.
SULPHUR.
OPIUM.
CAMPHOR.
GUAIACUM OFFICINALE.
DAPHNE MEZEREUM.
LAURUS SASSAFRAS.
SALVIA OFFICINALIS.

ACETAS AMMONIÆ. Acetate of Ammonia.

ALL the ammoniacal salts are supposed to have a diaphoretic power. The acetate is the one which has been principally used; its solution (Aqua Acetatis Ammoniæ) having been long celebrated under the name of Spirit of Mindererus (Spiritus Mindereri) as a diaphoretic in febrile affections. It is prepared by neutralizing distilled vinegar, by adding to it carbonate of ammonia, the carbonic acid being disengaged with effervescence, and the acetate of ammonia remaining in solution. Its strength must be various, according to the degree of concentration of the vinegar, and hence it is given in divided doses, an ounce being given every hour or two, and its operation promoted by tepid diluents and the sweating regimen. As it produces no increase of vascular action, it has been supposed well adapted to exhibition in inflammatory fevers, as synocha and acute rheumatism, and it is in such cases that it is usually employed. Its diaphoretic power, however, there is reason to suspect, is not very great, though it may be employed perhaps with some advantage when its operation is promoted by the addition of small proportions of opium and antimony. Externally it is used as a discutient, and sometimes as an application to inflamed parts.

CITRAS AMMONIÆ. Citrate of Ammonia.

LEMON juice, neutralized by potash, affords a remedy, which has long been employed under the name of Saline Mixture, as a refrigerant in fever. When it is neutralized by ammonia, it is supposed, along with its refrigerant, to have a diaphoretic power. Citric acid being the chief constituent ingredient of the juice of the lemon, this preparation is of course a citrate of ammonia. In the diluted state in which the mixture is prepared, it can have no great power; but its diaphoretic operation is sometimes promoted by the addition of a few drops of tincture of opium and antimonial wine.

CARBONAS AMMONIÆ. Carbonate of Ammonia.

THIS salt is employed either under the solid form, or in a state of solution. In the former state, it is obtained by sublimation from a mixture of muriate of ammonia and carbonate of lime, the heat applied giving rise to a double decomposition, and the carbonate of ammonia being sublimed. It forms a concrete mass, white and efflorescent, which retains the pungent ammoniacal odour, and which, as it also changes the vegetable colours to a green, is probably to be regarded as a sub-carbonate. Its solution (Aqua Carbonatis Ammoniæ) is prepared by distilling water from a mixture of muriate of ammonia and sub-carbonate of potash, carbonate of ammonia being formed, sublimed, and dissolved by the water which distils over. Under either form it is used as a stimulant, and

sometimes as a sudorific, its dose being 10 or 15 grains of the concrete salt, and from half a drachm to a drachm of the solution. Its operation is promoted by the sweating regimen. As a stimulant, the solution is given in a similar dose in languor or faintness; and the concrete salt is applied to the nostrils, forming what is named the pungent smelling salt.

MURIAS AMMONIÆ. Muriate of Ammonia. Sal Ammoniacus. Sal Ammoniac.

THIS salt is prepared by various processes, on a large scale, for the purposes to which it is applied in the arts. The greater number of these consist in obtaining an impure ammonia from animal substances by distillation, combining it with sulphuric acid, and decomposing this sulphate of ammonia by muriate of soda, the muriate of ammonia formed from the mutual action of these compound salts being sublimed. It is thus obtained in a solid dense mass, somewhat ductile and semi-transparent. It is soluble in about three parts of cold water, and may be crystallized from its hot solution. In medical practice it is little employed. It has been supposed, in the dose of one drachm, to act either as a diuretic or diaphoretic, according to the mode in which it is administered; the first effect being obtained when the surface of the body is kept cool; the other when external warmth is applied, with the use of tepid diluents. It is also sometimes applied externally as a discutient, dissolved in dis-

tilled vinegar. But it has a place in the Pharmacopœias principally as being employed in pharmacy.

HYDRARGYRI MURIAS MITIS. Sub-murias Hydrargyri. Mild Muriate of Mercury. Sub-muriate of Mercury or Calomel. (Page 361.)

THIS preparation of mercury is sometimes employed to obtain its action on the cutaneous vessels; and in certain diseases, particularly eruptions on the surface, and chronic rheumatism, has been supposed to prove useful by increasing the insensible perspiration. Combined with opium, or with guaiac, it has been supposed to exert a still greater degree of diaphoretic power.

ANTIMONIUM. Antimony. (Page 315.)

A sympathy appears to exist between the stomach and the surface of the body, in consequence of which, the state of the one is to a certain extent communicated to the other; the nauseating effect, for example, of emetics being accompanied with diminished action at the surface. This effect is apparently produced by the preparations of antimony; and some of them, particularly the oxide of antimony with phosphate of lime, and the tartrate of antimony and potash, are hence employed as diaphoretics in febrile affections. The former is given in a dose from 5 to 10 grains, repeated every third or fourth hour, until its operation as a sudorific, cathartic or emetic, is produced; the latter being given in a dose of one-half or one-fourth of a grain in a similar manner. The action

of both is aided by warm diluents, and sometimes that of the tartrate of antimony and potash is rendered more certain and powerful by combination with opium. The sulphuret of antimony levigated has been employed as a remedy in some cutaneous diseases, and chronic rheumatism; and has been supposed to operate by increasing the insensible perspiration.

SULPHUR. Sulphur. (Page 349.)

SULPHUR, it has already been remarked, passes off by the cutaneous vessels, and with some increase, it has been supposed, of the insensible perspiration. Hence has been explained the advantage sometimes derived from it in habitual dyspnœa, and in chronic cattarh. The solution of it in oil, Oleum Sulphuratum, has been used in the same cases, but is a preparation both acrid and nauseous.

OPIUM. Opium. (Page 158.)

OPIUM, in a pretty large dose, produces sweat, particularly when its operation is promoted by diluents and external warmth. It is difficult, however, to employ it alone as a sudorific, from its narcotic power being necessarily exerted at the same time. But by combination with antimony or ipecacuan, a modification of power is produced, more important perhaps than any other arising from the combination of remedies: the narcotic operation of the opium is in a great measure prevented, the nauseating effect of the ipecacuan or antimony is also diminished, and we obtain a sudorific more powerful and certain

than any other. In the combination with antimony, thirty-five drops of antimonial wine are usually added to twenty-five of tincture of opium. The combination with ipecacuan is still more powerful. It is an officinal preparation (Pulvis Ipecacuanhæ et Opii), and consists of one part of ipecacuan, one of opium, and eight parts of sulphate of potash; these being rubbed together into a fine powder, the sulphate of potash rendering this more easy by dividing the opium, and lessening its tenacity. This has long been celebrated as a sudorific, under the name of Dover's Powder, and is the medicine which is uniformly employed where copious sweating is to be induced, as in acute rheumatism, in anasarca, and in every other disease in which this indication is to be fulfilled. Its medium dose is ten grains, given generally in a bolus; its operation is promoted by tepid diluents and external warmth, the patient being confined to bed. If it fail in producing sweat, other five grains may be given at the end of an hour, and sometimes even it is necessary to give a larger dose. When it operates, the sweating is generally profuse, and by the proper management can be kept up for several hours. The power of the combination probably depends on the joint action of the opium and ipecacuan, the former increasing the force of the circulation, the latter, by its action, propagated to the surface, diminishing the resistance in the exhalant vessels, and causing, therefore, the fluid to be more easily and copiously poured out. Such is the effect of this modification, that the combination can be given with safety in

pure inflammatory affections, attended with increased vascular action, where the exhibition of opium alone would be attended with hazard.

CAMPHORA. Camphor. (Page 154.)

CAMPHOR has been employed as a diaphoretic in acute rheumatism, in different forms of fever, and in several of the exanthemata, particularly small pox, in a dose from 5 to 15 grains. Its operation as a sudorific is not sufficiently certain, however, when it is given alone. Sometimes it is combined with nitre, with antimonials, mild muriate of mercury or opium.

GUAIACUM OFFICINALE. Guaiac. *Decand. Monogyn. Gruinales. Lignum et Gummi resina. South America and West Indies.*

THE wood of this tree, and a concrete resinous substance obtained by exudation from incisions in its trunk, are the parts of it used in medicine.

The wood is hard and heavy, of a yellowish colour, has little smell, and a slightly warm bitter taste. Its virtues depend on the small portion of resinous matter which it contains.

Guaiac wood was introduced into practice as a remedy in the treatment of lues venerea, and was at one time even considered capable of effecting a radical cure. Its powers are now better ascertained. It is employed merely as an auxiliary, and sometimes with advantage, in promoting the action of mercury in the confirmed state of the disease, and in alleviating the various symp-

toms which arise from a protracted mercurial course. It is likewise occasionally prescribed in cutaneous diseases, in scrofulous affections, and in chronic rheumatism. The form under which it is administered, is always that of decoction, for which a formula is given in the Pharmacopœias. A quart of this is drunk in the course of the day. If taken warm it produces diaphoresis.

*Offic. Prep.*—Dec. Guaiac. Off. Comp. *Ed.*

GUAIACUM. Gummi-Resina.

This is obtained by exudation from incisions made in the trunk of the guaiac tree. It is friable, of a greenish or greyish colour, and resinous lustre, has an odour somewhat fragrant, and a warm bitterish taste. It was usually regarded as a gum-resin, but the experiments of Mr Brande have shewn that it possesses some peculiar properties, whence it has been regarded as a distinct principle. It is very liable to changes of colour, apparently from the action of oxygen. Its powder is at first of a grey colour, but becomes green from exposure to the air; and when its solution in alkohol is decomposed by acids, the precipitate assumes various tints of colour. When acted on by concentrated nitric acid, it affords oxalic acid; by the diluted acid a product is formed more highly resinous. It is almost entirely soluble in alkohol. Water by digestion on it dissolves a little extractive matter.

Guaiac is a stimulating medicine, proving diaphoretic in a dose of about half a drachm, and purgative in a larger dose. It is a remedy employed in chronic rheuma-

tism, being given so as to excite sweat, or more usually in smaller doses to keep up a gentle diaphoresis. Its sudorific power is promoted by opium or the preparations of antimony. It is given either in substance in the form of bolus, or diffused in water by the medium of mucilage, or in tincture. The tincture of it in spirit of ammonia is more highly stimulating than that in proof-spirit, and is generally preferred.

*Offic. Prep.*—T. Guajac. T. Guajac. Amm. *Edin. Lond. Dub.*—Mist. Guaiac. *Lond.*

Daphne mezereum. Mezereon. *Pentand. Monogyn. Vepreculæ. Cortex radicis. Indigenous.*

The bark of the root of this plant is the part of it used in medicine: its taste when it is chewed for some time is extremely acrid; but this acrimony is somewhat impaired by drying; it is extracted by water and by vinegar.

Mezereon is a stimulating diaphoretic, which, by determining to the surface of the body, has been found of service in chronic rheumatism, and in cutaneous diseases. Its principal medicinal application has been in syphilis; and it has been regarded as peculiarly efficacious in removing venereal nodes, and thickening of the ligaments and periosteum, and in disposing ulcerations to heal. It is given in the form of decoction; 2 drachms of the bark, with half an ounce of liquorice root, being boiled in 3 pounds of water, to 2 pounds, and 4 or 6 ounces of this decoction being given four times a-day. From its acri-

mony it is somewhat liable to excite nausea, hence it is often given in a weaker decoction, and combined with guaiac and sarsaparilla. Such a combination forms the Decoctum Sarsaparillæ Compositum, an improved formula for the Lisbon diet drink, which has been so highly celebrated in the treatment of these affections.

*Offic. Prep.*—Dec. Daphn. Mez. *Ed.*

Laurus sassafras. Sassafras. *Enneand. Monogyn. Oleraceæ. Lignum. America.*

This wood has a moderately fragrant smell, and a sweetish aromatic taste. It affords an essential oil by distillation, and yields to water, by infusion or decoction, its flavour, and part of its taste. It is slightly stimulant and diaphoretic. Its infusion has been drunk freely in cutaneous diseases, and in chronic rheumatism; and it is frequently added to decoctions of sarsaparilla, guaiac and mezereon, probably without communicating any real virtue.

*Offic. Prep.*—Ol. Laur. Sassaf. *Ph. Ed.*

Salvia officinalis. Sage. *Diand. Monogyn. Verticillatæ. Folia. South of Europe.*

The leaves of this shrub have an aromatic smell, and a warm bitterish taste. Its aqueous infusion drunk warm, has been used to produce sweat, or to promote the action of sudorifics; the aromatic quality of the sage adding something perhaps to the power of the warm diluent.

## CHAP. XII.

### OF EXPECTORANTS.

Expectorants have been defined, those medicines which facilitate, or promote the rejection of mucus, or other fluids from the lungs and trachea. The theory that has been given of their mode of operation is extremely obscure and hypothetical. It has been supposed, that in certain diseases, a greater quantity of serous fluid is thrown out by the exhalant vessels in the lungs than the absorbents can take up, and that expectorants facilitate the rejection of this fluid. But as expectoration of this kind is a complicated, and partly voluntary operation, dependent on the action of a variety of muscles, it is difficult to perceive how these remedies can produce this effect. There are only two classes of medicines which seem capable of promoting expectoration in this manner, powerful stimulants, which, when extreme debility is present, may promote it by giving vigour to the voluntary muscles exerted in this operation, and emetics, which, by exciting vomiting, compress the thoracic viscera, and by calling all the neighbouring muscles into strong action, and rendering both expiration and inspiration more

forcible, may facilitate the expulsion of matter from the cavity of the lungs. But these exert no specific action, and are therefore not entitled to the appellation of expectorants; nor indeed are they usually considered as such.

If, therefore, by expectorants, are understood substances capable of promoting, by some specific action on the parts concerned, the expulsion of fluid from the lungs, there seems no reason to believe in the existence of such remedies.

Dr Cullen, after admitting the difficulty of giving a satisfactory theory on this subject, supposes that the promoting of expectoration by these remedies may be owing to their "increasing the secretion of the liquid, that is, to afford a mucus: this, as it is poured from the arteries into the follicles, being always a thin fluid, it may dilute the mucus in the follicles, and may cause it to be poured out from these in a less viscid state, and thereby render it more easy to be brought up by coughing, that is, to be more freely expectorated."

It is possible that some expectorants may act in this manner; but the action of the different individuals belonging to the class, and especially their action in different diseases, cannot always be explained on this principle. It is probable that there are several modes of operation, in which certain medicines may appear to promote expectoration, and which may give them a claim to the title of expectorants.

In the first place, by removing constriction on the ex-

halant vessels in the lungs, expectoration will appear to be promoted. From this constricted state, the usual quantity of fluid is not thrown out to lubricate these parts: expectoration must of course be more scanty than usual; and if medicines be given capable of removing the constriction, expectoration will become more copious. At the same time, the disease will be at least partially relieved, as that morbid state of the vessels, from which some of its symptoms originate, is removed. It is apparently by such a mode of operation that the promoting of expectoration is of service in pneumonia, catarrh, and asthma, the principal diseases in which expectorants are employed.

The remedies by which such an effect is induced, according to this mode of operation, must be principally those belonging to the class of antispasmodics, or those which have the power of inducing nausea, either of these being capable by their action of removing constriction of the exhalant vessels.

It is not possible, however, to reduce all the medicines ranked as expectorants to this mode of operation. On the contrary, some of them seem to act on a very different principle. In certain diseases, as in humoral asthma and catarrhus senilis, there seems to be, from debility of the exhalants, or from deficient action of the absorbents, an increased quantity of fluid in the lungs. There appear to be certain substances more peculiarly determined to the pulmonary vessels, as their odour is discernible in the air expired. These may stimulate the exhalant

vessels through which they pass, and by this stimulus may moderate the effusion of fluid, and thus render the expectoration of the remainder more easy. Any medicine promoting absorption of this effused fluid, will to a certain extent have a similar effect.

There is still another mode in which the quantity of fluid in the lungs may be diminished, that of determining to the surface of the body, so as to increase the insensible perspiration; and it is probable, that some of the substances which have been used as expectorants, particularly those connected with the class of diaphoretics, owe what virtues they have to this operation.

Expectorants are not then to be regarded as medicines, which assist the rejection of a fluid already secreted, or which, according to Dr Cullen's opinion, alter its consistence, and render it thin where it is too viscid, by which its expulsion is rendered more easy. They are rather to be considered either as increasing the natural exhalation, where it has been deficient, in which case the expectoration that takes place is the consequence of this, and not the cause of any relief that is afforded; or as diminishing the quantity of fluid where it is too copious, either by stimulating the exhalant vessels, increasing the action of the pulmonary absorbents, or determining to the surface of the body, by which diminution the expulsion of the remaining fluid is facilitated. On one or other of these principles, we may, with sufficient probability, explain the effects of this class of remedies, and their application to the treatment of diseases.

From this difference in the mode of operation of expectorants, it is evident that they will prove useful in opposite diseases, and that in some diseases advantage may be derived from those belonging to one division, but not from the others.

In pneumonia, where the expectoration is deficient, as this arises not from any deficiency of power to expectorate, but from a diminution of the fluid usually thrown out into the bronchiæ, owing to a constricted state of the exhalant vessels, it is evident that those expectorants, which act by removing such a state, will be most useful, while such expectorants as stimulate these vessels would be rather prejudicial. Hence the utility in such cases of nauseating doses of tartrate of antimony, or of ipecacuan; and similar advantage may be derived from their use in catarrh, and perhaps also in spasmodic asthma. On the contrary, where the effusion of fluids into the bronchiæ is too great, as in humoral asthma, or in the chronic catarrh to which old people are subject, those expectorants which are more directly stimulant, as the different balsams, and several of the gum-resins, as myrrh or ammoniacum, or those which promote absorption, as squill or foxglove, will be found more useful. In considering the particular expectorants, they may be arranged as nearly as possible according to these subdivisions.

# EXPECTORANTS.

ANTIMONIUM.
IPECACUANHA.
DIGITALIS PURPUREA.
NICOTIANA TABACUM.
SCILLA MARITIMA.
ALLIUM SATIVUM.
POLYGALA SENEGA.
AMMONIACUM.
MYRRHA.
MYROXYLON PERUIFERUM.
TOLUIFERA BALSAMUM.
STYRAX BENZOIN.
STYRAX OFFICINALE.
AMYRIS GILEADENSIS.

ANTIMONIUM. Antimony. (Page 315.)

OF the preparations of antimony which have been employed as expectorants, the principal are the hydro-sulphuretted oxide, and the tartrate of antimony and potash. The first, under the forms of what are named Kermes mineral, and golden precipitate of antimony, was at one time celebrated as a remedy in pertussis and in pneumonia, in a dose of from 5 to 10 grains; but being uncertain in its strength, has fallen into disuse. The tartrate of antimony and potash is used in the same cases, and in some forms of asthma and catarrh, in the dose of one-eighth of a grain, repeated every second or third hour. It is also frequently combined with squill and other expectorants.

IPECACUANHA. Ipecacuan. (Page 329.)

IPECACUAN, operating in the same manner nearly as antimony, has like it been used as an expectorant in a dose of two or three grains. It is, however, less frequently employed.

DIGITALIS PURPUREA. Foxglove. (Page 177.)

DIGITALIS is employed with much advantage in humoral asthma,—dyspnœa aquosa, and in catarrhus senilis, obviously from its power of promoting absorption, by which it removes the fluid accumulated in the lungs ap-

parently from diminished action of the absorbents. By diminishing the quantity of this fluid, it facilitates the expectoration of the remainder, and hence appears to act as an expectorant, and it relieves the difficulty of breathing, and the irritation to which its accumulation gives rise. In such cases, it is proper to give it rather in small doses, than to push its operation to any great extent; a grain of the dried leaves, or half an ounce of the infusion daily, will be a sufficient dose.

NICOTIANA TABACUM. Tobacco. (Page 183.)

TOBACCO has been celebrated as an expectorant in chronic catarrh and humoral asthma, under the form of the watery extract, the dose of which is two or three grains. Its general action being similar to that of foxglove, it no doubt operates in these morbid affections on the same principle, though probably much inferior to the other.

SCILLA MARITIMA. Squill. (Page 331.)

SQUILL, next to its employment as a diuretic in dropsy, is most frequently used as an expectorant; and it is more particularly in those cases where there is an accumulation of the pulmonary mucus that it is prescribed; hence it probably operates by its power of promoting absorption. In inflammatory states of the system, where, from constriction of the pulmonary vessels, the exhalation is diminished, it is probably less useful; it has even been considered injurious in pneumonia, unless when

combined with tartrate of antimony. As an expectorant, it is also used in pertussis, and in that disease is frequently given in such a dose as to produce vomiting. In all these cases it is generally used under the form of the vinegar or syrup of squill, the dose of the former being half a drachm, of the latter a drachm, repeated every third or fourth hour. The squill pill is sometimes used in chronic catarrh in a dose of 10 grains daily.

ALLIUM SATIVUM. Garlic. *Hexand. Monogyn. Liliaceæ. Radix. South of Europe.*

THE root of this plant, which is of the bulbous kind, has, when recent, a fœtid smell and acrid taste. By being long kept it becomes shrivelled and inert. Its taste and smell are extracted by water by infusion; by decoction they are nearly lost. By distillation it affords an essential oil odorous and acrid.

Garlic has a considerable analogy to squill, and its operation is probably nearly the same: it acts as a diuretic, diaphoretic, and expectorant; hence its use in dropsy, rheumatalgia, and humoral asthma. Its dose is half a drachm or 2 scruples, swallowed whole, or made into pills with soap. A syrup prepared by digesting it in vinegar, and boiling the liquid with the due proportion of sugar, has been used as an expectorant. Externally garlic bruised is applied as a stimulant and rubefacient.

*Offic. Prep.*—Syr. Alii, *Ph. Dub.*

POLYGALA SENEGA. Seneka. Rattlesnake-root. *Diadelph. Octand Lomentac. Radix. North America.*

THIS root is in articulated shoots, of a greyish yellow colour; its taste is bitter and pungent. Its active matter is extracted partially by water with the assistance of heat, and completely by alkohol.

Seneka has been frequently employed as an expectorant in pneumonia, after the highly inflammatory stage of the disease has been subdued. Its dose in substance is from 10 to 20 grains, but it is generally used in the form of decoction, of which, when prepared according to the formula of the Edinburgh College, an ounce, or an ounce and a half may be given every second or third hour. As it operates also as a diuretic, it is probable that its efficacy depends on its power of increasing absorption, and hence that it is more adapted to those cases where there is an accumulation of fluid in the bronchiæ, than to affections of an opposite nature.

*Offic. Prep.*—Dec. Polygal. Seneg. *Ed. Lond.*

AMMONIACUM. Ammoniac. *Gummi-resina.*

THIS gum-resin is brought from Egypt and the East Indies; the tree which produces it having not been accurately known. The London College have now, on the authority of Wildenow, designated it as the Heracleum Gummiferum, this having been raised by that botanist from the seeds often found mixed in the gum-ammoniac of the shops. It is in large masses, or, when of the best quality, in small round fragments, yellow on the surface,

and white within. It has a faint smell, and a nauseous taste. It is partially soluble in alkohol. Water triturated with it forms a milky-like mixture, from which, on standing, a resinous matter subsides.

Gum-ammoniac is principally employed as an expectorant, and is frequently prescribed in asthma and chronic catarrh. Its dose is from 10 to 30 grains; either given under the form of pill, or diffused in water, and frequently combined with squill or tartrate of antimony. Externally it is applied as a discutient, under the form of plaster, to white swelling of the knee, and to indolent tumors, being beat into a soft mass with vinegar, and spread on leather.

*Offic. Prep.*—Emp. Amm. Emp. Ammon. cum Hydr. *Lond.*—Mist. Ammon. *Lond. Dub.*

MYRRHA. Myrrh. *Gummi-resina.*

MYRRH is the produce of Arabia and Abyssinia; the plant from which it is obtained has never yet been accurately described. It is in small irregular pieces of a reddish brown colour, has a smell rather fragrant, and a warm bitter taste. It consists of gum and resin; the latter appearing to constitute its active matter. Alkohol dissolves the resin, and the solution is rendered turbid by the affusion of water. Water boiled on the myrrh dissolves the gummy matter, to which part of the resin adheres, and this evaporated affords the watery extract, which is less active than the myrrh itself.

Myrrh is an expectorant, which has been regarded as

too stimulating to be employed in pneumonic inflammation, but which has been often employed in asthma and chronic catarrh, and sometimes in phthisis. Its dose is from 10 to 20 grains. The watery extract, which has been preferred by many physicians to the myrrh itself, and which is the form under which it has been used in phthisis, seems to be an injudicious preparation, as the myrrh is merely weakened in power. Myrrh is also sometimes employed in amenorrhœa. Its tincture is in common use as a stimulating application in sponginess of the gums, and sometimes also to foul ulcers.

*Offic. Prep.*—Tinct. Myrrh. *Ph. Ed. Lond. Dub.*

MYROXYLON PERUIFERUM. Balsamum Peruvianum. Peruvian Balsam. *Decand. Monogyn. Lomentaceæ. South America.*

THIS balsam is said to be extracted by boiling the bark and young branches of the tree with water; it has also been affirmed that it is obtained by exudation. It is thick and viscid, of a reddish-brown colour, has a strong smell somewhat fragrant, and a bitter pungent taste. It affords a small portion of essential oil by distillation, and of acid of benzoin by sublimation. Its remaining matter is resinous. It is entirely soluble in alkohol.

Peruvian balsam is considerably stimulant. It has been employed as an expectorant in catarrh and dyspnœa, more particularly in those forms of these diseases where the secretion of pulmonary mucus is increased, and may perhaps be of some advantage in stimulating the exhalants

or absorbents. It has likewise been prescribed as a remedy in paralysis, chronic rheumatism, and leucorrhœa. Its dose is from 5 to 15 grains, and it is best given diffused by mucilage, or made into pills by any vegetable powder.

*Offic. Prep.*—T. Bals. Per. *Lond.*

TOLUIFERA BALSAMUM. Balsamum Tolutanum. Balsam of Tolu. *Decand. Monogyn. Lomentaceæ. South America.*

TOLU balsam is obtained from incisions in the trunk of the tree; it thickens, and in time becomes concrete, and of a resinous fracture and appearance; it has a fragrant odour, and a warm sweetish taste. It dissolves entirely in alkohol, and communicates its odour and taste to water by boiling. It contains a small quantity of acid of benzoin.

This is the mildest of all the balsams. It has been used as an expectorant, and its tincture or syrup sometimes enters into the composition of mucilaginous mixtures used in cattarh, but its powers are very inconsiderable, and it is employed principally on account of its flavour.

*Offic. Prep.*—Syr. Toluif. Bals. *Ph. Ed. Lond.*—Tinct. Toluif. B. *Ed. Dub.*

STYRAX BENZOIN. Benzoinum. Benzoin or Benjamin. *Decand. Monogyn. Bicornes. Balsamum. India.*

THIS balsam is obtained by exudation; it is in brittle masses, composed of brown and white fragments; its

smell is fragrant; it has little taste. It consists almost wholly of resin, and is therefore nearly entirely soluble in alkohol. It likewise contains a considerable portion of that peculiar acid, which, as it exists in greater quantity in it than in any other vegetable matter, is named Benzoic acid. This is obtained from it by sublimation, or by decoction with water, and likewise by boiling it with potash or lime, with either of which it combines, and is afterwards separated by the addition of an acid. It is in white brilliant scales, retains the flavour of the benzoin, and with acidity has likewise a degree of pungency.

Benzoin is rarely employed in medicine. Its acid is used as an expectorant in asthma, in a dose of 10 or 15 grains; but it is probably a medicine of little power. It enters into the composition of the ammoniated and camphorated tinctures of opium, and is scarcely applied to any other use.

*Offic. Prep.*—T. Benz. C. *Ed. Lond. Dub.*

STYRAX OFFICINALE. Storax. *Decand. Monogyn. Bicornes. Balsamum. South of Europe, Asia.*

THIS substance is in masses soft and slightly unctuous, of a brown colour, with scarcely any resinous lustre or appearance; it has a strong fragrant odour, and a bitterish pungent taste. It consists principally of resin, with a small portion of benzoic acid. It resembles benzoin in its virtues; was formerly used as an expectorant, but is now little regarded. The purification of it, ordered in some of the Pharmacopœias, is altogether superfluous.

*Offic. Prep.*—Styrax. Purif. *Ph. Lond. Dub.*—Pil. Styrac. *Dub.*

AMYRIS GILEADENSIS. Balsamum Gileadense. Balsam or Balm of Gilead. *Octand. Monogyn. Dumosæ. Arabia.*

THIS balsam, obtained by incisions made in the trunk of the tree, is in the form of a milky juice, highly fragrant, and is so much valued in the East, that it is said not to be imported into Europe. A coarser kind is obtained by strong decoction of the branches and leaves, of a yellow colour, and thick consistence; its taste is warm and bitter; its flavour somewhat fragrant. What is met with in the shops, under the name of Balsam of Gilead, is a resinous juice having none of these qualities, and probably the produce of a different plant. It seems little superior to the finer kinds of turpentine.

The medicinal virtues of the genuine balsam of Gilead have been very highly extolled, undoubtedly with much exaggeration. The common balsam is scarcely used; but its qualities seem to be similar to those of the balsam of Peru, with more acrimony.

## CHAP. XIII.

### OF SIALAGOGUES.

Sialagogues are substances which increase the salivary discharge. This may be effected either by the mastication of substances, which, by their acrimony and pungency, excite the action of the vessels which secrete the saliva, or by the internal exhibition of certain medicines. Of the latter, mercury is the only certain sialagogue; and all its preparations, when administered in certain quantities, produce salivation to a greater or less extent.

As a class of remedies, sialagogues are of little importance. The sialagogue operation of mercury, it has already been remarked, does not appear essential to its efficacy in any disease, but is regarded merely as a test of the mercury acting on the system. The acrid sialagogues, by increasing the secretion of saliva, and by their pungency, sometimes relieve the pain of toothach, and have been supposed useful, by the derivation they occasion, in some kinds of headach.

# SIALAGOGUES.

HYDRARGYRUS.
ANTHEMIS PYRETHRUM.
ARUM MACULATUM.
COCHLEARIA ARMORACIA.
DAPHNE MEZEREUM.
AMOMUM ZINGIBER.
NICOTIANA TABACUM.

HYDRARGYRUS. Quicksilver. (Page 212.)

No satisfactory explanation has been given of the peculiarity which mercury, under every form of preparation, has of exciting the secretion of the saliva. Some have remarked, that in consequence of the gravity of this metal, by which, when received into the circulation, it is disposed to retain the "direct line in which it is propelled from the heart, it is more certainly determined to the vessels of the head," a solution of the difficulty which is altogether absurd. It has likewise been supposed to

act by lessening the consistence of the blood, and disposing it to pass more easily into the salivary glands, so as to increase their secretion,—an opinion equally gratuitous and improbable. Dr Cullen endeavoured to solve the problem, by supposing that mercury has "a particular disposition to unite with ammoniacal salts, and that such salts are disposed to pass off by the salivary glands more copiously than by any other excretion." But mercury has no peculiar tendency of this kind; and if it had, these salts are not more abundant in the saliva, than in some other secretions. If another hypothesis might be hazarded, the following perhaps would afford some explanation of this singular property. The urine appears more peculiarly designed to convey matter which has been received into the circulating mass, but which is still excrementitious, from the system. To pass, however, with this fluid, it is necessary that the matter conveyed should be soluble in it; and when it is so, we can discover it in the secretion by chemical tests. If there is any property connected with it, therefore, which shall prevent this solubility, it probably will prevent the substance from being secreted. Now, the phosphoric acid, abundant in urine, must in this mode counteract the secretion of mercury in any form of preparation, by forming with it a compound insoluble, and to which the slight excess of acid cannot communicate solubility. The mercury, therefore, existing in the circulating mass, when brought, in the course of the circulation, to the secreting vessels of the kidneys, will not pass through their whole

course, but if conveyed so far as to be combined with phosphoric acid, will, from this combination, be incapable of being conveyed onwards, and will therefore be retained in the composition of that part of the blood which does not enter into the secretion, but returns into the circulation. It must be discharged by some other emunctory: a portion of it appears, from some facts, to pass off by the insensible perspiration; but the tenuity of this secretion, if the term may be employed, must be unfavourable to this mode of discharge. The salivary secretion is one by which it may be more easily transmitted; and this transmission may even be facilitated by the affinity exerted to the oxide of mercury by the muriatic acid, the soda and ammonia, which are the chief saline ingredients in saliva; for it deserves to be remarked, that triple compounds of these substances,—a soda-muriate, and ammoniaco-muriate of mercury, are to a certain extent soluble in water; and if the mercury is thus secreted, it will of course stimulate the secreting vessels through which it passes, and increase the discharge.

The increase in the salivary discharge, effected by mercury, is attended with pain and a sense of heat in the mouth, with softness and swelling of the gums, and sometimes with slight ulceration, or with a considerable degree of swelling, extending over the throat and face. These effects, when excessive, are best checked by the use of opium, of purgatives, of a blister applied to the throat, and, as Mr Pearson has recommended, free exposure to a cool dry air. From theory, the administration of sul-

phur, or sulphuret of potash, has also been recommended.

The remaining Sialogogues act only by topical application.

ANTHEMIS PYRETHRUM. Pellitory of Spain. *Syngenes. Polygam. superfl. Compositæ. Radix. South of Europe.*

THIS root, though cultivated in this country, is generally imported from Spain. Its taste is hot and acrid, its acrimony residing in a resinous principle, which alkohol dissolves, forming a very acrid tincture. It is a remedy which, from stimulating the salivary glands, and exciting a discharge of saliva, is used in toothach, and sometimes gives relief. It has also been chewed in palsy of the muscles of the throat.

ARUM MACULATUM. Wake-Robin. *Gynand. Polyand. Piperitæ. Radix. Indigenous.*

THE root of this plant, when recent, is extremely acrid; by drying, its acrimony is much impaired. In digesting it with alkohol, or with water, and evaporating either solution, an extract is obtained less acrid than the root itself, the vapour condensed has not much acrimony, and hence the principle in which this property resides appears to be one very easily decomposed. It resembles pellitory, and may be applied to the same purposes, but its pungency is unpleasant. Internally, it has sometimes been used as a stimulant in palsy and rheumatism.

COCHLEARIA ARMORACIA. Raphanus rusticanus. Horse-radish. *Tetradyn. Silic. Siliquosæ. Radix. Indigenous.*

THE root of this plant, when recent, has a penetrating taste, with a degree of sweetness. It excites, when chewed, a sense of heat, and a discharge of saliva. Its pungency resides in an essential oil, and is therefore lost by drying. Water and alkohol may be impregnated with it.

Horse-radish is a stimulant, which, as a sialagogue, has been used in paralysis of the tongue. It has also been used internally in paralysis and rheumatism, in asthma and dropsy, about a drachm of the recent root cut in small pieces being swallowed entire. Externally it has been applied as a rubefacient, and its syrup has been used as a remedy for hoarseness.

*Offic. Prep.*—Infus. Armorac. Comp. *Lond. Dub.*—Spir. Armorac. Comp. *Ph. Lond.*

DAPHNE MEZEREUM. Mezereon. (Page 415.)

THE bark of the root of mezereon has a very considerable degree of acrimony, so that when chewed it impresses a sense of heat and irritation in the mouth and upper part of the throat, and at the same time excites the salivary discharge. As a sialagogue, however, it is scarcely used.

AMOMUM ZINGIBER. Ginger. (Page 267.)

GINGER-ROOT, from its pungency, excites, when mas-

ticated, a sense of heat and increased discharge of saliva, and is sometimes, like other sialagogues, employed to relieve the pain of toothach.

NICOTIANA TABACUM. Tobacco. (Page 183.)

TOBACCO, when chewed, increases the action of the salivary glands, and the same effect is produced in the usual method of smoking it. Partly from this, and partly from its narcotic operation, exerted at the same time to a certain extent, it sometimes relieves, especially in the latter mode of using it, the pain of toothach, or of earach.

## CHAP. XIV.

### OF ERRHINES.

Errhines or Sternutatories, are substances which occasion a discharge from the nostrils, either of a mucous or serous fluid. They all operate by direct application, and generally in consequence of a slightly acrid quality. Any substance in fine powder snuffed up the nostrils has this effect in a certain degree; but it is, as is to be expected, more copious as the substance is more acrid or stimulating. The discharge, as produced by different errhines, varies in extent, and in the time during which it continues. Some also occasion a sense of heat, or even inflame the membrane to which they are applied, while others have no such effects.

It is evident, that the effects of this class of remedies must be very limited, as applied to the treatment of disease. By the evacuation they occasion, it has been supposed that they diminish the quantity of fluid circulating in the neighbouring vessels; hence they have been inferred to be useful in rheumatic affections of the muscles of these parts, and in toothach. It has even been supposed, that their effects may extend to all the branches

of the external carotid, and Dr Cullen mentions, that he has, apparently from this operation, known headach, pain of the ear, and some cases of ophthalmia, cured or relieved by the use of errhines. He has likewise supposed, that they may have been of use in preventing apoplexy or palsy: this at least should, he remarks, be so far attended to, that whenever any approach to these diseases is suspected, the drying up of the mucous discharge should be attended to, and if possible obviated.

## ERRHINES.

IRIS FLORENTINA.
ÆSCULUS HIPPOCASTANUM.
ORIGANUM MAJORANA.
LAVANDULA SPICA.
RORISMARINUS OFFICINALIS.
ASARUM EUROPÆUM.
VERATRUM ALBUM.
NICOTIANA TABACUM.
EUPHORBIA OFFICINALIS.
SUB-SULPHAS HYDRARGYRI.

IRIS FLORENTINA. Florentine Orris. *Triand. Monogyn.—Ensatæ. Radix. South of Europe.*

THE root of this plant, freed from its outer bark, is of a white colour, has a pleasant odour, and slightly bitter taste. It is a mild sternutatory, and enters into the composition of some cephalic snuffs.

ÆSCULUS HIPPOCASTANUM. Horse-Chesnut. *Heptand. Monogyn. Trifoliatæ. Semen. Cortex.*

THE fruit of this tree is principally farinaceous; and this farina acts as a sternutatory. The bark is bitter, and has been proposed as a substitute for Peruvian Bark.

ORIGANUM MAJORANA. Sweet Majoram. *Didynam. Gymnosperm. Verticillatæ. Herba. South of Europe.*

THE leaves of this herb have an aromatic odour, and, when dried and reduced to power, a slight errhine power.

ROSMARINUS OFFICINALIS. Rosemary. *Diand. Monogyn. Verticillatæ. Summitates florentes.*

THE flowers and flowering tops of this plant have a fragrant odour, which resides in an essential oil. It is used as a stimulating perfume, under the form of the distilled spirit, and the powder is sometimes mixed with other errhines.

*Offic. Prep.*—Ol. Ess. Rorism. Spirit. Rorism. *Ph. Lond. Dub. Ed.*

LAVANDULA SPICA. Lavender. *Didynam. Gymnosperm. Verticillatæ. Spicæ florentes. South of Europe.*

LAVENDER flowers have a fragrant smell, and a warm bitterish taste. They yield a quantity of essential oil, which is employed in medicine as a stimulant, when combined with alkohol, and other aromatics, under the form of what is named Compound Spirit of Lavender. The simple spirit or solution of the oil in alkohol is used as a perfume, and the dried leaves in powder are errhine.

*Offic. Prep.*—Spir. Lavand. T. Lav. C. Ol. Lavand. *Ph. Ed. Lond. Dub.*

NICOTIANA. Tobacco. (Page 183.)

THE leaves of tobacco are in common use as an errhine; their powder forming the different kinds of snuff.

ASARUM EUROPÆUM. Asarabacca. *Dodecand. Monogyn. Sarmentaceæ. Folia. Indigenous.*

THE leaves of this plant possess rather more errhine power than those hitherto noticed, and are employed as the basis of the officinal sternutatory powders.

*Offic. Prep.*—P. Asar. Europ. C. *Pharm. Ed. Dub.*

VERATRUM ALBUM. Helleborus Albus. White Hellebore. *Polygam. Monœc. Liliaceæ. South of Europe.*

THE root of this plant has a strong disagreeable smell when fresh, which is lost by drying, and an acrid taste which is retained. Snuffed up the nostrils in very small

quantity, it excites violent sneezing, with a sense of heat, and a copious discharge of thin mucus. It is therefore sometimes used as a sternutatory mixed with some of the milder and more fragrant errhines. Taken internally, in the dose of a few grains, it acts as a violent emetic and cathartic. Externally, when mixed with lard, so as to form an ointment, or in the form of decoction, it is used as an application in some cutaneous diseases.

*Offic. Prep.*—T. Verat. A. *Ed.*—Dec. Verat. Ungt. Verat. *Lond.*—Ung. Helleb. A. *Dub.*

EUPHORBIA OFFICINALIS. *Dodecand. Trigynia. Gummiresina. Africa.*

THIS substance, which is of a resinous nature, is said to be obtained by exudation from incisions in the branches of the plant producing it. It is in small round fragments, having scarcely any smell, but a very acrimonious taste. Its operation as a drastic purgative is so violent, that it is never given internally. Its powder is the most violent of all the errhines, occasioning a copious discharge of mucus, with a sense of heat, and even inflammation. Hence it is scarcely ever employed. Externally it has been used as a rubefacient or vesicatory.

SUB-SULPHAS HYDRARGYRI. Sub-Sulphate of Mercury.

THIS preparation of mercury is an errhine, and has been employed in chronic ophthalmia and amaurosis; one grain of it being mixed with six or eight grains of any mild vegetable powder, and snuffed up the nostrils occasionally.

## CHAP. XV.

### RUBEFACIENTS AND EPISPASTICS.

Rubefacients and Epispastics operate nearly on the same principle, and produce similar effects, differing only in degree. They may therefore be considered as subdivisions of one class.

The term Epispastic has been applied to whatever application has the power of producing a serous or puriform discharge, by exciting a previous state of inflammation or suppuration. The term includes blisters, issues and setons; but it is more commonly restricted to the first of these, and it is this which chiefly falls under the department of Materia Medica.

Blisters are those external applications which excite inflammation on the skin, and which, occasioning a thin serous fluid to be poured from the exhalants, separate the cuticle from the true skin, and form the appearance of a vesicle or blister.

The mode in which they produce this effect is sufficiently evident; it is to be referred to the stimulating power of the substances applied, which exciting increased action in the extreme blood vessels, induces inflamma-

tion, and causes the pouring out of the serous fluid with which the vesicle is filled. Hence we deduce the primary effects of these applications on the general system. By the increased action they excite, and the pain they occasion, they act as stimulants, and they may act, it has been supposed, as evacuants, by the quantity of fluid which they cause to be poured out.

There can now be little dispute by which of these modes of operation blisters are used with advantage in the treatment of diseases. The quantity of fluid discharged is so inconsiderable, and the relief obtained often so sudden and complete, that it would be assigning a very inadequate cause for their effects, if we should ascribe these to any evacuating power.

Some have imagined that cantharides, which forms the basis of the common blistering applications, are absorbed in part by the inflamed surface, and that it is to the peculiar action of this acrid matter stimulating the system, that many of the effects of blisters are owing. But there is no proof, nor indeed any reason to believe, that this absorption is uniform or frequent; the same effects are obtained from blistering applications into the composition of which cantharides do not enter, while they are not obtained from the internal administration of cantharides. The effects of blisters are therefore to be ascribed to the pain and inflammation they excite, and the stimulus which is thence propagated to the general system.

It is a principle with regard to the living body, demonstrated by many facts, that where a morbid action exists,

it may be often removed by inducing a different action, even of a morbid kind, in the same part, or in parts as contiguous to it as possible; and where the morbid action extends to the whole system, it may be removed by one of a different kind being excited either generally, or in any particular part of the body.

From this principle is explained the efficacy of blisters in all cases of inflammation and spasmodic constriction; a new inflammation being excited by the blister which occasions derivation of action. Hence, too, the advantage obtained is greater when the blister is applied as near as possible to the part affected. This principle regulates the application of blisters in pneumonia, hepatitis, phrenitis, angina, ophthalmia, rheumatism, and every other case of active inflammation. In these affections, blisters are used with evident advantage; the local inflammation which is excited more than counterbalancing, by this operation, the stimulant effects at the same time produced.

A similar principle exists with respect to the pain excited by blisters, which may also be applied to the explanation of the advantages derived from them in other diseases. It has long been remarked, that exciting one pain often relieves another, and hence blisters afford relief in toothach, and other painful affections. Epilepsy and hysteria arising from irritation have been removed by blisters; apparently from their exciting pain, engaging the attention, and diminishing the sensibility to irritation.

Lastly, blisters exert a stimulant operation on the general system, and raise the vigour of the circulation.

Hence their utility in fevers of the typhoid kind, where extreme debility prevails. From their peculiar operation too, they are the only remedy that can be used to obviate the local inflammation of the brain, or other parts, that sometimes exists in fevers of this kind, as they contribute to resolve it without reducing the strength of the system.

It is also from their stimulating power, and perhaps from exciting pain, that blisters are of advantage in apoplexy and paralysis.

RUBEFACIENTS operate precisely in the same manner as blisters; they excite pain and inflammation, but only in an inferior degree, so that no fluid is discharged; and by these effects they more peculiarly obviate local inflammation. They are used, therefore, for the same purposes.

## EPISPASTICS AND RUBEFACIENTS.

MELOE VESICATORIUS.
EUPHORBIUM.
PIX BURGUNDICA.
SINAPIS ALBA.
ALLIUM SATIVUM.
AMMONIA.

CANTHARIDES. Meloe Vesicatorius. Lytta Vesicatoria.

UNDER the history of this substance as a diuretic, it has been remarked, that it is a still more important article of the Materia Medica as an epispastic. It is the substance, indeed, which is now almost exclusively employed to raise a blister, as it acts with certainty, and is not liable to induce that deep-seated ulceration, which sometimes follows the application of other acrid substances that have been used for the same purpose. The cantharides in powder is mixed with lard and wax, so as to form a plaster of a proper consistence, which is applied to the part, generally for 10 or 12 hours: at the end of that time, the proper vesicle is usually formed; it is then cut, to allow the serous fluid to be discharged, and the inflamed part is dressed with any mild ointment. Camphor has been sometimes added to the blistering plaster, with the view of obviating the strangury which is liable to be occasioned. But it is very doubtful if it has any such effect: the plentiful use of diluents, while the blister is applied, prevents it much more certainly; and it is always proper when a blister is applied, especially if large, or in inflammatory diseases, to order the patient to drink freely of any mild diluent liquor. Where the strangury does occur, from the application of a blister, it is relieved by an enema of tepid water, with a little of expressed oil, and 30 drops of tincture of opium.

In some diseases, as in apoplexy, it is of importance to be certain of the operation of an epispastic, and to have its effect produced in a short time. To attain these, a compound plaster is ordered by the Edinburgh College, Emplast. Meloes Vesicat. Comp. in which the stimulating and epispastic power of the cantharides is increased by the addition of other acrid substances, burgundy pitch, turpentine, verdigrease, mustard and pepper.

After a blister has been raised, it is often of advantage to convert the serous discharge into one of a purulent nature, by exciting suppuration, or to form what is termed an Issue: this can easily be effected by the application of any acrid stimulating ointment; one composed of wax and oil, with a small proportion of cantharides, is commonly used for this purpose, as by the irritation it excites, it keeps up the inflammation, and at length produces suppuration. Any foreign body retained on the inflamed part answers the same purpose. What are named Orange Peas, the small unripe fruit of the orange, polished, are usually employed, as by their odour they cover the fœtor of the discharge. One of these is retained on the blistered part by a slip of adhesive plaster, and by the irritation it occasions keeps up a constant discharge. A seton, or cord introduced by means of a needle, answers the same purpose. When by any of these methods a puriform discharge is established in a part, considerable effects arise from the morbid action which it continues, and the evacuation it occasions. It is a practice often employed with advantage in asthma, paralysis, and a number of chronic affections.

EUPHORBIUM. Euphorbia Officinalis. (Page 442.)

THIS resinous substance, already considered as an errhine, is a powerful vesicatory. It enters into the epispastic compositions of the farrier, and might be employed, mixed with other epispastics, when it is of importance to obtain the effects of a blister in their full extent, speedily and with certainty.

PIX BURGUNDICA. Burgundy Pitch. Pinus Abies. *Monœcia. Monadelph. Coniferæ.*

THIS resinous concrete is obtained by exudation from incisions made in the trunk of the tree. It is boiled with a small quantity of water; is strained; and when cold forms a concrete resinous matter, retaining a little essential oil. As a rubefacient, it is spread upon leather, and applied to the skin: it excites a slight degree of inflammation, and an exudation of serous fluid, without entirely separating the cuticle, so as to produce a blister. Hence it is less painful in its operation, and the application of it can be continued for a considerable time. It is used with advantage in catarrh, pertussis and dyspnœa.

*Offic. Prep.*—Emp. Pic. Burg. *Dub.*

SINAPIS. Mustard. (See page 332.)—The flour of mustard-seed, mixed with an equal part of wheat-flour or crumbs of bread, and made into a paste with vinegar, forms what is named a Sinapism, an application which acts as a powerful rubefacient. It is applied to the soles of the feet in typhoid fevers, where there is extreme de-

bility, or determination to the head. It is used in the same manner in comatose affections; the application of it in either case being continued for an hour or two. It soon excites a sense of pain, and if applied long produces inflammation.

*Offic. Prep.*—Catap. Sinapeos. *Lond. Dub.*

Allium. Garlic. (See p. 424.)—The bruised root of this plant, applied to the soles of the feet, produces effects similar to those of the sinapism, and is used for the same purpose. It is less powerful, and its odour is ungrateful.

Ammonia. Ammonia.

The solution of ammonia in water (Aq. Ammoniæ) is obtained by decomposing muriate of ammonia by lime, with the assistance of heat, the ammoniacal gas being absorbed by water, through which it is transmitted. The solution has a very pungent odour, and applied to the skin acts as a rubefacient. The common form under which it has been employed, is mixed with two or three parts of expressed oil, with which it forms a thick saponaceous compound, formerly known by the name of Volatile Liniment. A piece of flannel moistened with this, and applied to the skin, soon excites pain and superficial inflammation. It is often employed instead of a blister to the throat, in angina tonsillaris, being less painful, yet frequently effectual. It is also sometimes applied by friction to relieve the pain of rheumatism.

*Offic. Prep.*—Ol. Ammon. *Ed. Dub.*