

swallowed in solution, quickly passes into the blood, the stomach being but little affected; but if swallowed in the solid form, owing to its high melting point, it remains long enough in the stomach to excite severe inflammation, and most of it escapes undissolved with the motions.

Few if any remedies are comparable to camphor in summer diarrhoea and cholera. Its benign influence in cholera is most conspicuous; for it generally checks the vomiting and diarrhoea immediately, prevents cramps, and restores warmth to the extremities. It must be given at the very commencement of the disease, and must be administered frequently, otherwise it is useless. Four to six drops of strong spirits of camphor must be given every ten minutes till the symptoms abate, and hourly afterwards. It is a good plan to mix it with a little brandy, but it acts admirably alone.

Dr. George Bird employs spirits of camphor with good results in the acute diarrhoea of infants. He administers it in milk. Camphor generally restrains the diarrhoea excited by the effluvia of drains. Some persons, especially women, on exposure to cold, suffer from diarrhoea accompanied with severe cutting pains. Standing on cold objects is especially liable to excite this diarrhoea. The pain may be very severe, continuing till the bowels have acted three or four times. Camphor generally relieves the pain, and restrains this diarrhoea.

Camphor readily passes into the blood, and manifests itself there and in most of the organs of the body by its odour. Its influence on the blood is unknown. Its influence on the heart appears to be capricious. Large doses often slacken, but sometimes quicken, and generally weaken the pulse. Moderate doses, it is said, quicken and strengthen the pulse. Large doses sometimes disturb the brain, causing at first, increased activity with a rapid flow of pleasant ideas; but subsequently, and in some cases even at first, it produces great faintness, giddiness, noises in the ears, much delirium, and even convulsions, with coldness of the surface, shrunk features, and clamminess of the skin. Large doses often

induce some smarting and pain of the urinary organs, with urgent desire to pass water.

It is mainly given in adynamic fevers, and according to Graves and others, it is very valuable. It is said to strengthen while reducing the frequency of the pulse, moistening the skin, and removing the delirium, especially when of a low and muttering character. To control delirium it must be given in considerable quantity, to the extent of twenty grains or more every two or three hours, and its effects must be watched. Some practical authorities, however, deny the efficacy of camphor in fever delirium.

It has also mainly been recommended in melancholia, in spasmodic affections, in nervous palpitation, and hiccup.

It is reputed on high authority, that camphor, given in considerable doses, will control inordinate sexual desire. It is said to relieve strangury. Drachm doses of the spirit relieve chordee.

Camphor is eliminated by the breath, probably with the perspiration, and a small proportion with the urine. The irritation it produces in the urinary mucous membrane, and the small amount separated by the urine, has led to the assumption that some of the products of its decomposition in the body escape with that secretion, irritating the mucous membrane over which this passes; but on this point nothing definite is known, and at present there is no proof that camphor is consumed in the body.

TURPENTINE.

TURPENTINE applied to the skin excites a sensation of warmth, with some redness; and if the application is sustained, blistering takes place. It is in common use as a rubefacient and counter-irritant. Over a flannel wrung out in hot water some turpentine or turpentine liniment may be sprinkled, and ap-

plied till it produces redness, tingling, and smarting. It is well to bear in mind that as the smarting arising from the application of a turpentine stupe, goes on augmenting for some time after its removal, it should not be kept on longer than just sufficient to excite a moderate degree of pain. An equal quantity of yolk of egg and turpentine is a useful form, to be dabbed on the skin with a piece of sponge. Turpentine stupes may be employed as a rubefacient, for the same purposes as a mustard poultice.

Turpentine in the stomach excites a sensation of warmth, and large doses sometimes produce nausea and vomiting. It generally acts as a purgative, but not invariably; and if, after large doses, purgation does not take place, serious symptoms sometimes arise from the absorption of the turpentine, and from its action on the organs at a distance from the intestinal canal. Thus, when administered in considerable doses, it is desirable to give, either simultaneously or soon afterwards, some more active and certain purgative, as castor oil. Even after large doses, the stomach and intestines of animals have been found free from inflammation.

This drug is successful as a tapeworm poison, but it has now given place to milder and more efficient remedies.

Turpentine injected into the rectum will destroy thread-worms. Many other substances are just as good vermicides.

In staying hæmorrhage from the stomach, arising from chronic ulcer or other causes, from the intestines in typhoid, etc., few remedies are more successful than turpentine given in small doses of five to ten drops, very frequently repeated. Later on we shall speak of the use of turpentine in controlling hæmorrhages from other organs.

Turpentine proves useful in certain states of typhoid fever, probably from its direct action on the intestinal mucous coat. Thus Dr. Wood has drawn attention to its value in ten-minim doses repeated every two hours, when the tongue parts with its fur in flakes, and instead of becoming and remaining moist, looks dry and glazed, a condition usually observed towards the end of the disease, and accompanied always by

an increase of the tympanites, and an aggravation of the other symptoms. In "the course of twenty-four or at most forty-eight hours some amelioration of the symptoms may be observed. The tongue becomes gradually moister, and covers itself with a whitish fur; the tympanitic distension ceases to augment, and after a time diminishes; the pulse becomes less frequent and the skin less dry and harsh, and the patient enters slowly but regularly into convalescence often without any other remedy. As the case improves, the quantity of the oil should be diminished, but care should be taken not to omit it too hastily." Dr. Wood further says, "I will repeat, that oil of turpentine may be used, with great hope of benefit, in any case of enteric fever in the advanced stage, with a dry tongue."

Dr. Graves employed it in the same disease, in drachm doses every six hours in extreme tympanites, and he pointed out that the remedy is of no use if, before and during the production of the flatulent distension, there is diarrhœa, when acetate of lead is invaluable. With the tympanites there is very often much prostration, with muscular tremblings, and picking of the bed-clothes, and low, muttering delirium—symptoms all, according to Graves, in many cases, benefited by the use of turpentine.

Turpentine passes readily into the blood, and may be detected in the breath and sweat, and in an altered state in the urine, giving to this excretion an odour of violets or of mignonette.

In large quantities, and especially if it fail to purge, and thus escape soon by the rectum, turpentine produces in most persons some excitement, with giddiness, confusion of sight, quickened pulse, and, in extreme cases, insensibility, with dilated pupils. In many instances it produces bloody and scanty urine; or, indeed, it may suppress this secretion; occasionally it excites pain along the urinary tract, with frequent and painful micturition.

As we have said, it is very efficacious in bleeding from the various organs of the body, as the lungs, nose, uterus, kid-

neys, and bladder. A drachm should be given every three hours: a dose which sometimes causes sickness, diarrhoea, and even blood in the urine: but on discontinuing the drug the blood soon disappears. Given to check bleeding from the kidneys, as in Bright's disease, it must be administered in very small quantities. It is also reputed to possess the power of checking bleeding in the hæmorrhagic diathesis, and to be useful in purpura.

Puerperal fever has been treated with large doses of this medicine, but authorities are divided as to its usefulness.

According to some authorities, it has been employed with great success in sciatica, in half-ounce doses, given for four or eight successive nights, when, if it fail to give relief, it may be pronounced useless in that particular case.

It is asserted that turpentine is an antidote to phosphorus, and Dr. Letheby says that at a lucifer-match factory at Stafford the workmen prevent necrosis of the jaw by wearing near their breasts a small open vessel containing turpentine.

The experiments of Personne on fifteen dogs support this view. To five dogs he gave phosphorus alone, and they all died. To five others, an hour or two after the phosphorus, he gave turpentine and only one died. To five others he gave turpentine immediately after the phosphorus, and only one dog died. These experiments, however, are not so satisfactory as they easily might have been, as he does not appear to have given an identical dose of phosphorus in all his experiments. Personne thinks that phosphorus produces asphyxia by becoming oxidized and abstracting oxygen from the blood. Pyrogallic acid absorbs oxygen from the blood, and Personne asserts that it produces the same symptoms and *post-mortem* appearances in dogs as phosphorus. He thinks that turpentine prevents the oxidation of phosphorus, so that it is eliminated unchanged without inflicting injury to the body.

Kohler confirms Personne's statement of the antidotal power of turpentine, but controverts his explanation of its action. He gave to twenty-five animals, without injury, from

0.006 to 0.09 grms, of phosphorus and 4.5 grms. of turpentine. On killing the animals the tissues showed no fatty degeneration or other signs of phosphorus poisoning. Kohler says that a compound of phosphorus and turpentine is formed, which is eliminated through the kidneys, giving to the urine a smell like opodeldoc and not of violets.

Turpentine is reputed to be diuretic, and is sometimes administered in small doses with this intent in Bright's disease.

It has been used in chronic cystitis, in gonorrhoea, and in gleet.

It has been given, with apparent advantage, in biliary colic.

Group containing:—

NUTMEGS.	OIL OF PEPPERMINT.
CLOVES.	OIL OF SPEARMINT.
CANELLA BARK.	OIL OF RUE.
CINNAMON BARK.	OIL OF LEMONS.
CAJEPUT OIL.	CUBEBS.
OIL OF ANISE.	BUCHU LEAVES.
FENNEL FRUIT.	BALSAM OF TOLU.
CARAWAY FRUIT.	BALSAM OF PERU.
CORIANDER FRUIT.	COPAIBA.
DILL FRUIT.	MEZEREON.
ELDER FLOWERS.	SASSAFRAS.
LAVENDER OIL.	STORAX.
OIL OF ROSEMARY.	JUNIPER.
	BENZOIN, etc.

This group consists of volatile oils, or substances containing volatile oils. Some of the members, containing a bitter constituent, are tonics.

The ethereal oils penetrate the cuticle, and excite slight

inflammation. Some have been employed as rubefacients to rheumatic and gouty joints, to the face in toothache, etc., but they are in no respect superior to turpentine and other "counter-irritants." Dr. Alfred Wright of Finchley, however, says that in China he learned from the natives the practice of painting oil of peppermint on the face in facial neuralgia. He uses it also for gout, the relief it gives in both instances being almost instantaneous. Balsam of Peru is a useful adjunct to ointments for broken chilblains. Dr. Copland states that in the form of ointment, for which he gives a formula, it stimulates the growth of the hair.

All the essential oils destroy lice, whether situated on the head, trunk, or pubis; but oil of rosemary and powdered pyrethrum are generally preferred in "louse-disease."

Many excellent authorities extol storax and Peruvian balsam in itch. The following preparations are very useful:— Storax, an ounce; olive oil, two drachms. Or, rectified spirit, two drachms; storax, an ounce; olive oil, a drachm; the first two ingredients are mixed together, and the olive oil added to them. The whole body, except the head, is carefully rubbed with either compound. One application it is said kills the insects; but, to avoid the risk of failure, it is better to employ a second application in twelve or twenty-four hours. Although not necessary to the success of this treatment, yet, for the sake of cleanliness, a warm bath should be given before and after these inunctions. These applications cause no irritation of the skin, and they possess the additional advantage of an agreeable odour.

Dr. McCall Anderson praises storax highly, asserting that it is as certain as sulphur, while, unlike sulphur, it soothes instead of irritates the skin.

The members of this group have a warm, and many of them an agreeable taste. Oil of peppermint, orange-flower water, oil of cinnamon, oil of lemons, are used to conceal the flavour of disagreeable medicines.

These oils excite a sensation of warmth in the stomach; some of them are used to increase appetite and digestion. In

large doses they excite slight inflammation of the stomach and intestines. Many of them, as oil of cloves, oil of cinnamon, oil of anise, oil of fennel, oil of coriander, oil of caraway, oil of peppermint, are employed to prevent the griping pains of purgative medicines.

Some of these substances, as cloves and cinnamon, are useful in diarrhoea as adjuncts to astringents. Their stimulant action on the muscular coat of the stomach and intestines removes colic, and expels wind; oil of cajeput and oil of cloves are generally preferred in flatulence. Spirit of horseradish, in half-drachm to drachm doses, is highly approved in flatulence.

These oils probably pass readily into the blood, and for the most part act like turpentine. Many of them have been employed as antispasmodics, but they are inferior to chloroform and ether. Whether they undergo any changes in the blood is at present unknown.

Balsam of Tolu, and balsam of Peru, and copaiba, are given in chronic bronchitis with a copious secretion of pus.

Mezereon and sassafras are reputed to be useful in syphilis and chronic rheumatism.

Lavender, rosemary, rue, cinnamon, and some other members of this group, are given as stimulants to nervous and hysterical persons affected with depression of spirits and other symptoms. They soon, however, lose their effects, unless given in increased doses.

These oils, and the resins derived from them, escape from the body in part with the breath and perspiration, but chiefly with the urine, and in their passage along the urinary tract they stimulate or irritate its mucous membrane. Copaiba sometimes causes bloody urine, with strangury and pain in the bladder.

Copaiba, cubebs, and especially buchu, are commonly used in chronic inflammation of the bladder and urethra.

Copaiba and cubebs are used in gonorrhoea and gleet. Copaiba benefits, it is said, the chronic, but aggravates the acute stages of gonorrhoea; while cubebs, which must be

given in large doses, is considered only useful at the commencement of an attack. Copaiba has been used, especially for women, as an injection for gonorrhœa.

Balsam of copaiba in ten to fifteen minim doses sometimes acts as a powerful diuretic. Dr. Wilks who has used copaiba with much success finds that the diuretic properties reside in the resin. Copaiba has been found very useful in some cases of ascites, entirely removing the abdominal dropsy, and also in Bright's disease. I have used the resin in ten to fifteen grain doses in many cases and often with great effect, I have seen it answer in cardiac dropsy and in ascites where the kidneys were healthy, I have seen it successful in ascites where there was fatty degeneration of the kidneys, and in Bright's disease, where after death the kidneys were much contracted, granular, red, firm, the cortex much contracted, with numerous small opaque buff-coloured spots, the kidneys seemed the seat of fibroid change and fatty degeneration. I have also seen it remove, speedily and entirely, extensive dropsy, due probably to pale fatty kidney. I have known it also benefit the chronic disease left by an attack of acute Bright's disease, and prevail over a case of cardiac dropsy, with a small amount of albumen in the urine, and with signs of general decay. Yet in cases which appeared exactly similar I have known it entirely fail, leading me to think that success or failure depends less on the nature of the disease than on some individual peculiarity. In some cases copaiba causes bloody urine, in others I have seen a large amount of blood in the urine quickly disappear under the influence of copaiba resin.

Copaiba occasionally produces a rash, sometimes like urticaria, sometimes very closely simulating the papules of measles; but there is no fever with copaiba-rash, and the papules last many days if the medicine is continued, and the rash does not begin on the face, then spreading downwards over the body, but is patchy, and shows a preference for the neighbourhood of joints. In doubtful cases, where patients deny that they have taken copaiba, it may be detected in the

urine by the smell, and with still greater certainty by chemical re-agents; for, if copaiba is present, nitric acid makes the urine turbid, which heat dispels. Copaiba may also be extracted from the urine by shaking it up with ether.

Oil of sandal-wood, in doses of fifteen minims three times a day, is strongly recommended in acute and chronic gonorrhœa.

Probably most of these ethereal oils escape from the body with the urine; but from Weikart's experiments, quoted by Parkes, this does not appear to be the case with copaiba, the volatile oil being destroyed in the body, and only its resinous acid appearing in the urine.

Many persons highly esteem juniper as a diuretic in scarlatinal dropsy.

Compound tincture of benzoin painted on the skin sometimes allays itching from urticaria, eczema, &c. In quantities of a drachm added to boiling water, and used as an inhalation night and morning, it is often useful in bronchitis and even in chronic phthisis—easing cough and lessening expectoration.

VALERIAN.

VALERIANATE OF ZINC.

VALERIANATE OF QUININE.

VALERIANATE OF AMMONIA.

LIKE turpentine and the volatile oils, valerian produces a sensation of warmth in the stomach, a quickened pulse, some mental excitement, and after a large dose, even delirium.

Neligan considers valerian a powerful anthelmintic, and especially recommends it when the worms excite convulsions.

Valerianate of zinc is useful for those numerous, distressing and changeable symptoms, included under hysteria, most

often occurring in women at the time the catamenia cease. Thus it often removes "flushings of the face," "hot and cold perspirations," restlessness, nervousness, depression of spirits, sensation of suffocation in the throat, throbbing of the temples, fluttering at the heart. In many instances, these symptoms depend on uterine derangements, piles, dyspepsia, or constipation; but after the removal of all discoverable disease, or in cases where no cause for the symptoms can be detected, valerianate of zinc often proves of great service. Oxide of zinc does good, but is certainly inferior to the valerianate. In many instances, however, valerianate of zinc fails in the very cases we should expect it to be useful. Our knowledge of the conditions indicating the employment of these medicines is not at present sufficiently precise to enable us to predict in what cases they will be likely to succeed.

Some prefer valerian or its tincture, and ascribe most of its efficacy to the volatile oil. Other authorities prefer the salts of valerianic acid.

Valerian has been used with occasional advantage in epilepsy; but we are ignorant whether the cases were true epilepsy, or merely the hysterical form of the disease.

Valerianate of zinc, or valerianate of ammonia, in twenty-grain doses, sometimes relieve neuralgia of the face or head. It is recommended in megrim, in doses of from two to five grains thrice daily. It is said that preparations of valerian will control the paroxysms of whooping cough, and the involuntary movements of chorea. Large and increasing doses of valerian are stated to be useful in diabetes insipidus.

SAVINE.

SAVINE is an irritant, and excites inflammation in the tissues. It is sometimes used to keep blistered surfaces open and discharging.

It is employed both in menorrhagia and amenorrhœa due to a want of tone in the uterus. It is used by ignorant people to produce abortion.

ASSAFŒTIDA. AMMONIACUM. GALBANUM.

THESE medicines act very similarly on the body; but assafœtida, probably from its containing most volatile oil, is the most powerful.

Assafœtida has a warm taste; it stimulates the stomach and intestines, and expels wind. In large doses it often excites nausea and vomiting. It increases the secretion from the mucous membrane of the intestines, and hence acts as a mild purgative. Probably the active principle of these drugs does not pass quickly into the blood; for it makes the eructations offensive for twenty-four hours, or longer.

They generally quicken, but sometimes slacken the pulse.

After a full dose of assafœtidâ general exhilaration occurs, and sometimes "various nervous or hysterical phenomena, and a general sense of *malaise* (Jörg, quoted by Stillé). It often produces headache and giddiness. It is said to increase the bronchial secretion and perspiration. All persons, however, are not thus affected, as Pidoux took enormous doses of assafœtida, and experienced no inconvenience, except from the offensive smell of his excretions.

Assafœtida is very useful in hysteria, in many cases remov-

ing hysterical headache and peculiar sensations in the head. It is also useful in hysterical flatulence.

Assafoetida is useful in the flatulence of young children, unconnected with constipation or diarrhoea. A tea-spoonful every hour of a mixture containing a drachm of the tincture to half-a-pint of water, is strong enough to relieve distension speedily, and is readily taken by children. When the flatulence is due to constipation or diarrhoea, assafoetida does very little good.

Assafoetida has been recommended in asthma, and all members of this group are useful in chronic bronchitis, with much wheezing and abundant discharge, symptoms commonly met with in elderly people; but in cases like these, ammoniacum is generally preferred to assafoetida.

ON CANTHARIDES, BLISTERS, AND COUNTER-IRRITATION.

THE preparations of cantharides are chiefly used as rubefacients or vesicants, to control disease in neighbouring or distant parts.

That impressions made on the skin, and other parts do affect deep-seated and even distant parts, is proved by the following facts:—

I. Dr. Inman and others have shown that blisters and other counter-irritants, applied to the chest or abdomen, excite in many instances inflammation of the corresponding part of the pleura or peritoneum. An irritant applied to a knee distended by synovitis or rheumatism, increases the distension for a day or two.

II. Inflammation may spread from one part to another by mere contact, a fact well exemplified in that form of ulcerative stomatitis affecting the edges of the gums; the cheek and tongue opposed to the inflamed and ulcerated gums be-

coming often inflamed and ulcerated. Similar extension of inflammation and ulceration by mere contact is witnessed in the spread of non-specific as well as specific sores from the glans to the prepuce, or *vice versa*. Rindfleisch describes a case where from a cheesy mass a group of tubercles formed on the pulmonary pleura, on the opposing part of the costal pleura there was found a group of tubercles, although no adhesions existed between the pulmonary and costal membranes. Here the disease probably travelled by mere contact.

III. Brown-Séquard states that on irritating the skin over the kidneys, the renal arteries contract. Cold applied to part of a bat's wing causes contraction of the vessels of the corresponding part of the opposite wing.

IV. A local irritation will produce neuralgic pains at a distance from the point of irritation, well exemplified in neuralgia of the different branches of the fifth nerve from a diseased tooth. Indeed, cases are on record, where irritation of one nerve has excited neuralgia in another nerve anatomically unrelated to it; for instance, injury to the ulnar nerve has produced neuralgia of the fifth. Various serious nutritive changes may take place over the secondary seat of pain, the implicated tissues becoming red, swollen, very tender, and even indurated. Neuralgia of the temple often turns the hair of the temple rapidly grey. Neuralgia of the eye leads to serious inflammation, sometimes even ulceration, of that organ. Secretion, too, may become modified; thus each paroxysm of pain may increase, diminish, or alter the salivary or lachrymal secretions.

V. The application of aconitia ointment over a painful neuralgic nerve often relieves distant neuralgias, and sometimes sickness. (See Aconite.) For instance, we often witness a case of neuralgia of the ophthalmic branch of the fifth nerve followed in some hours by neuralgia of the auricular or occipital nerve. Here the ointment, by relieving the supra-orbital pain, will prevent the neuralgia of the other nerves. Again, in neuralgic sick headache this ointment, by