MATERIA MEDICA,

WITH

COMPOUNDS AND PREPARATIONS.

Not Official.

ABRUS PRECATORIUS.

JEQUIRITY.

Medicinal Properties.—An infusion of the **seeds** has been used in the treatment of granular lids; it sets up a purulent conjunctivitis, varying in intensity with the strength and frequency of the applications. A very strong **infusion**, or rather **paste**, was found useful by Dr. Shoemaker in the treatment of affections of the skin, dependent upon exuberant granulations, though only to be used under careful supervision and with due caution.—*Med. Bulletin*, Nov. 1884; a 1 to 3 p.c. **infusion** has been used in granular lids.—*L.* '85, ii. 733; also in cases of abscess of the cornea.—*L.M.R.* '86, 126, and *T.G.* '87, 640; a 1 p.c. **infusion** in granular metritis.—*L.M.R.* '86, 541.

Dr. Martin's researches show that the determining causes of the inflammation and the toxic properties in general are due to a globulin and an albumose, the activity of which is rapidly destroyed by a moist heat of 85° C. (180° F.).

It is uncertain whether the toxic properties are due to the proteids or to some toxic ferment associated with them.—*B.M.J.* '89, ii. 184, and *P.J.* (3) xx. 197.

Ehrlich has shown that the continuous use of Abrin produces tolerance to its toxicity.—*B.M.J.* '97, ii. 705.

The **root** has been used in many hot countries for the same purpose as liquorice root, hence it is called Indian liquorice, but considering the known poisonous character of the seed, the title is dangerously misleading.

Chemical examination of the root and leaves.—*P.J.* (3) xxiv. 937.

The **root** and an **extract** prepared from it are official in the Pharmacopœia of India.

Preparations.

INFUSUM ABRI (*L.O.H.*).—Pour 12½ fl. drms. of Water at 120° F. on 1 drm. of powdered Jequirity seeds, allow it to stand till cold, then decant.

INFUSUM ABRI (Moyne).—Jequirity seeds in powder, 3·2; macerate in cold Water, 500, for 24 hours, and then add hot Water, 500; when cold, filter.

It is used as a lotion three times in one day and repeated on the second and third days if necessary.

PASTA ABRI (Shoemaker).—Decorticated seeds carefully freed from testa, 200; macerate in Water for 24 hours, reduce in a mortar to a smooth paste, and add sufficient Water to make 800.

To be applied with a camel's hair pencil.

Not Official.

ABSINTHIUM.

WORMWOOD.

The leaves and flowering tops of *Artemisia Absinthium*. The drug possesses an aromatic odour and a very bitter taste. It contains a crystallisable bitter principle, **Absinthin**, slightly soluble in Water, readily in Absolute Alcohol, Chloroform and Ether; also a volatile oil, to which its physiological properties are due.

Medicinal Properties.—Tonic and febrifuge. Alcohol containing it is much used on the Continent as a beverage; its excessive use causes the disease known as absinthism.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Assencis), Mex., Norw., Port. (Losna), Russ., Span. (Ajenjo), Swed., Swiss, and U.S.

Preparation.

TINCTURA ABSINTHII.—Wormwood. 1; Alcohol (60 p.c.) to make 10.

Dose.—1 to 4 drm.

Foreign Pharmacopœias.—Official in Belg., Dan., Fr., Ger., Mex., Norw., Port., Russ., Span., Swed., and Swiss, 1 in 5; Austr. and Hung. (compound), 1 in 10; Fr. (compound), 1 in 40; all by weight. Not in Ital., Jap. or U.S.

ACACIÆ GUMMI.

GUM ACACIA.

A gummy exudation from the stem and branches of *Acacia Senegal*, and of other species of Acacia.

Solubility.—1 in 1 of Water. Insoluble in Absolute Alcohol, Ether, and Oils.

Medicinal Properties.—Demulcent. Allowed to dissolve slowly in the mouth, allays tickling cough. For a demulcent drink, 1 of Mucilage, 1 of Syrup, and 20 of Water.

Prescribing Notes.—It is chiefly used in the form of Mucilage in cough linctuses and lozenges, and to render oils, &c., emulsive with aqueous fluids.

In an 8 oz. mixture 3 drms. of Mucilage of Acacia are usually required for 1 oz. of oils or resinous tinctures, and 10 drms for 1 oz. of Balsam of Copaiba. The Mucilage should be put into a mortar and the oil added by degrees with constant trituration until an emulsion is formed, then the remainder of the water or other aqueous fluid can be added by degrees. Resinous tinctures should be added to the Mucilage which has been first diluted with twice its volume of Water, but Fixed and Volatile Oils are best added to the undiluted Mucilage. It is impossible to make a nice emulsion with Oil of Male Fern unless the Mucilage be quite fresh; in such case it is better to make the Mucilage at the time by rubbing 2 of powdered Gum with 3 of Water. Another method, which gives good results with fixed oils, is to replace the Mucilage by half its weight of powdered Gum Acacia, rub the oil with the powder, then add all at once Water equal to double the weight of the powder and rub till an emulsion is formed, now add by degrees the remainder of any aqueous liquid ordered in the prescription. Resin of Copaiba makes a nice emulsion with powdered Gum and Water, the Resin is liquefied in a warm mortar, the powdered Gum mixed with it and then the Water added as in the last instance. Mucilage is used to suspend insoluble powders in mixtures, but in some cases (Bismuth salts for

instance) Tragacanth answers better. It used to be employed for making powders into pills, but they soon become hard and it is now replaced by 'Dispensing Syrup' (*see* 'Glycerin'), Glucose, Syrup of Glucose, Glucose and Treacle, or Glycerin of Tragacanth.

Official Preparations.—Mucilago Acaciæ, also used in the preparation of Pulvis Amygdalæ Compositus, Pulvis Tragacanthæ Compositus, and all Trochisci.

Not Official.—Potion Gommeuse, Sirop de Gomme, Syrupus Acaciæ, also used in the preparation of Unna's Gum Pastes.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss, and U.S.

Description.—In rounded or ovoid tears, or masses, of various sizes; or in more or less angular fragments with glistening surfaces; nearly colourless, often with a yellowish tint. The tears are opaque from numerous minute external fissures, and very brittle; the fractured surfaces are vitreous in appearance. Taste bland and mucilaginous; nearly inodorous.

It is collected chiefly in Kordofan in Africa, and imported from Alexandria.

We have taken the sp. gr. of several samples of good white Gum Acacia, and find that it varies very little from 1·5.

It consists chiefly of Calcium Arabate, containing also Potassium and Magnesium, and contains 12 to 17 p.c. of Water. The formula for Calcium Arabate is $C_{39}H_{142}O_{74}$, CaO, corresponding to 2·3 p.c. of Lime, but the total ash should not exceed 4 p.c.

Tests.—Insoluble in Alcohol (90 p.c.) but entirely soluble in Water, forming a translucent viscid solution which feebly reddens Litmus. When dissolved in an equal weight of Water, the solution should neither form a glairy mucilage nor, after admixture with more Water, should it yield a gummy deposit on standing. The aqueous solution forms with Solution of Lead Subacetate an opaque, and with Solution of Borax a more or less translucent, white jelly; it gives no precipitate with Solution of Lead Acetate; is not coloured blue or brown by a small quantity of Solution of Iodine (absence of Starch or of ordinary 'Dextrin' of commerce), nor bluish-black by Test-solution of Ferric Chloride (absence of Tannic Acid); and does not give a red precipitate when boiled with Solution of Potassio-cupric Tartrate (absence of certain Sugars.) Gum Acacia should not yield more than 4 p.c. of Ash.

Adulteration with Dextrin can be detected by the use of Ferric Chloride and Alcohol. For process see *Allen*.

Preparation.

MUCILAGO ACACIÆ. Mucilage of Gum Acacia. (Modified.)

Gum Acacia, in small pieces, 40; Distilled Water, a sufficient quantity. Rapidly rinse the Gum Acacia with a little Distilled Water; then dissolve it in 60 of Distilled Water in a closed vessel and strain.

The Gum is now washed before dissolving.

It is best filtered through well-shrunk flannel.

The product measures 87, therefore 4 of Gum are contained in $8\frac{1}{4}$ measures of Mucilage. Sp. gr. 1·160 to 1·170.

Dose.—Not given in B.P.; 1 to 4 drm.

Mucilage keeps well if made cold, then poured into small bottles quite full, and stored in a cool place.

Squibb states that solution of the Gum is facilitated by using it in the form of a coarse powder, not larger than No. 50, nor smaller than No. 80 sieve, free from fine powder.

German and United States Pharmacopœias direct that the Gum should be washed with cold Water, before being dissolved, and this plan is now adopted in B.P. '98.

Mucilage, if kept carelessly becomes sour very quickly in hot weather, and its emulsive property is impaired; if made with hot Water the change is more rapid.

The substitution of Glycerin for half the Water has been suggested; it makes a clearer solution, and keeps about as well, but the Gum takes much longer to dissolve.

B.P. Mucilage of Acacia keeps better than the weaker preparation of U.S.P., even when Cinnamic Acid has been added to the latter.

Incompatibles.—Strong Alcohol and Sulphuric Acid; Borax, Ferric salts, and Lead Subacetate render it gelatinous. It is not affected by neutral Lead Acetate.

Foreign Pharmacopœias.—Official in Dutch and Port., 2 and 3; Fr. and Mex., 1 and 1; Austr., Dan., Ger., Hung., Ital., Jap., Norw., Russ., Swed., and Swiss, 1 and 2; Span., 1 and 3; Belg., 1 and 4—also M. Spissa, 1 and 2—and M. Levis, 1 and 9; U.S. 34 and 66.

Not Official.

POTION GOMMEUSE (Fr.).—Powdered Gum Arabic, 1; Simple Syrup, 3; Orange Flower Water, 1; Water, 10. All by weight.

SIROP DE GOMME (Fr.).—Gum, 10; Sugar, 67; Water, 43; dissolve the Gum in cold Water, then the Sugar by the aid of a water-bath; and strain.

SYRUPUS ACACIÆ (U.S.).—Mucilage of Acacia, 1; Syrup, 3. Mix when required, as it does not keep well.

UNNA'S GUM PASTES.—A mixture of equal parts of Mucilage of Acacia and Glycerin, with which are incorporated various medicaments such as Zinc Oxide and Mercuric Oxide.

ACETANILIDUM.

ACETANILIDE.

$CH_3 \cdot CO \cdot NH \cdot C_6H_5$, eq. 134·10.

B.P.Syn.—PHENYL-ACETAMIDE.

Commonly known as 'Antifebrin.'

Acetanilide may be obtained by the interaction of Glacial Acetic Acid and Aniline.

Solubility.—1 in 190 of Water; 1 in 18 of boiling Water; 1 in 12 of Alcohol (60 p.c.); 1 in 4 of Alcohol (90 p.c.); about 1 in 40 of Glycerin; it is also soluble in Ether, Benzol, and Chloroform.

Medicinal Properties.—A powerful antipyretic. Useful in the pyrexia of typhoid fever, erysipelas, phthisis, acute rheumatism, and small-pox. An analgesic in neuralgia and other painful nerve affections.

In some cases it produces profuse sweating, accompanied with cyanosis and rigor; it is therefore safer to commence with small doses.

Nervous affections, *L.* '87, i. 41, 104; *B.M.J.* '87, ii. 431; *L.* '88, i. 191. Phthisis, *B.M.J.* '87, i. 590; '87, ii. 1396. Typhoid, *T.G.* '87, 123; *B.M.J.* '90, ii. 1238; *B.M.J.* '91, i. 172. Small-pox, *T.G.* '88, 630. Bronchitis, *L.* '91, i. 1424. Summary, *B.M.J.* '87, ii. 1438; *T.G.* '88, 571. Not altogether without danger, *L.* '90 i. 376, 575, 1136; and '92, ii. 620. *B.M.J.* '93, ii. 119, and '94, ii. 1444. Externally as a surgical dressing, *T.G.* '94, 640; *L.* '97, i. 1613. Useful in obstinate vomiting, particularly after surgical operations, *T.G.* '94, 736.

From the report of a committee of the British Medical Association, it would appear that Antifebrin is less safe and less constant in its action than Antipyrine, and still less so than Phenacetin; but it is possible that the ill-effects noted were brought about by injudicious dosage. To give it in doses of 5, 6, 8, or even 10 grains, still more to repeat these after a short interval, is highly injudicious; such doses are excessive. The relative dose appears to be about one-fifth that of Antipyrine (*see* Phenazonum).—*B.M.J.* '94, i. 89.

The therapeutic value of recent synthetic analgesics, their benefits and attendant risks.—*B.M.J.* '98, ii. 1054; Antifebrin headache powders.—*B.M.J.* '98, i. 1538; ii. 434; mixed powders containing Acetanilide.—*P.J.* (3) xxv. 19; *B.M.J.* '96, i. 285; *L.* '97, ii. 25.

Dose.—1 to 3 grains.

Prescribing Notes.—Best given in wafer paper or **cachets**, or dissolved in some weak spirit. May also be suspended in Water by Compound Powder of Tragacanth or Mucilage of Acacia. It is sometimes given as a compressed tablet.

Not Official.—Mistura Acetanilidi.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Russ., Swiss and U.S.; not in the others.

Description.—In colourless, inodorous, glistening, lamellar crystals, having a slightly pungent taste.

Tests.—Melting point, when dry, 236·5° F. (113·5° C.). On boiling with Test-solution of Ferric Chloride a reddish-brown colour is produced and this is almost entirely discharged by Hydrochloric Acid. If Acetanilide be heated with Solution of Potassium Hydroxide until the odour of Aniline is given off, and the liquid be then warmed with a few drops of Chloroform, the unpleasant and penetrating odour of Phenyl-isonitrile (Isocyanide) is developed; and an aqueous solution mixed with Solution of Bromine gives a yellowish-white precipitate (distinctions from Phenacetin). Heated with free access of air, it burns, leaving no residue. With Sulphuric Acid or with cold Nitric Acid it forms a colourless solution. A cold, saturated aqueous solution does not affect Solution of Litmus (absence of free acid), and is not affected by Test-solution of Ferric Chloride (absence of Acetone, Phenazone, and salts of Aniline).

The melting point given above will only be found when the substance has been dried at 212° F. (100° C.); most commercial samples melt somewhat lower. It visibly softens several degrees below the actual melting point. If heated below water, it fuses considerably under 212° F. (100° C.) **Boiling point** usually given is 295° C. (563° F.), but it volatilises to a considerable extent at 100° C. (212° F.), and if an aqueous solution be distilled, Acetanilide may be detected in the distillate by the Iso-Nitrile test.

A cold saturated aqueous solution decolourises Bromine Water, and at the same

time throws down a white precipitate, quite distinct even at a dilution of 1 in 2000. If the Bromine Water precipitate be dissolved by heat, it crystallises out on cooling in long tufted needles.

Acetanilide forms a practically colourless solution with strong Nitric Acid and strong Sulphuric Acid, whereas Phenacetin gives a colourless solution with Sulphuric, but a deep orange with Nitric Acid.

Acetanilide is neutral to Litmus solution, as also is Phenacetin; but with Acetone and salts of Aniline the solution becomes red, and with Phenazone blue.

Ferric Chloride in the cold does not affect aqueous solutions of Acetanilide or Phenacetin, but with Phenazone gives a deep red, which is discharged by strong Hydrochloric Acid:—On boiling, the solutions of Acetanilide and Phenacetin become red, and in both is the colour discharged by strong Hydrochloric Acid.

Aniline Chloride with Ferric Chloride gives no change at first, but in a few minutes becomes green.

In a paper on the detection of Acetanilide in some closely related synthetical remedies by Moerk (*A.J.P.* '96, 393), experiments for the Bromine test are summarised as follows:—After trying the effect of varying quantities of Bromine Water added slowly or in one portion to solutions which had been rendered neutral, acid or alkaline without better success, the test was finally given up as far as detecting 5 p.c. Acetanilide in Phenacetin, Methacetin, Phenocoll, and Lactophenin was concerned, *A.J.P.* '96, 391. The Iso-Nitrile test is recommended for the detection of 1 p.c. of Acetanilide in other allied substances, with the addition of Potassium Permanganate to destroy the odours which are formed by other substances during that test:—0·1 gramme of Methacetin, Phenacetin, Lactophenin, Salophen, or Phenocoll Hydrochloride are boiled with 10 c.c. Water (Salophen is the only one not soluble in 10 c.c. boiling Water); then cool quickly by immersion in cold water and filter through cotton-wool. To 2 to 3 c.c. of the filtrate add an equal volume of 5 p.c. solution of Potassa (or Soda), boil and add small fragments of Potassium Permanganate until the green colour first produced gives way to a violet or purple; then add two or three drops of a mixture made of Chloroform 10 c.c., Alcohol 10 c.c., and Water of Ammonia ·5 c.c.; boil and again add some of this mixture if the Permanganate has not been reduced completely to brown Manganic Hydrate; after the Chloroform has vaporised by standing a few moments, note the odour and compare it, if doubtful, with that yielded by a dilute Acetanilide Solution. In testing Exalgin omit the Potassium Permanganate, otherwise the test is made as above.

We have tried the above modification and found it very satisfactory, detecting readily an addition of 2 p.c. of Acetanilide.

Not Official.

MISTURA ACETANILIDI (*L.H.*).—Acetanilide 5 grains, Compound Tincture of Lavender 1 fl. drm., Spirit of Chloroform 15 minims, Water to 1 fl. oz.

Not Official.

ACETOPHENONE.

Syn.—Hypnone; Methylphenylacetone; Methyl-Benzoyl.

A colourless, very refrangent liquid (C_6H_5, $CO.CH_3$) with a persistent odour of Essential Oil of Almonds. A commercial sample crystallised at about 4° C. (39·2° F.), the temperature rising at the same time to 12° C. The melting point of the crystals was 14° C. (57·2° F.); sp. gr. 1·027; commenced to boil at 153° C., and rose to 200° C.

Solubility.—Insoluble in Water; soluble 1 in 90 of Glycerin; mixes in all proportions with Alcohol (90 p.c.), Ether, Chloroform, and Olive Oil.

Medicinal Properties.—Hypnotic, but rarely used now.—*L.M.R.* '87, 545; *T.G.* '86, 648; and '87, 253; *P.J.* (3) xvi. 582; *B.M.J.* '89, ii. 969.

Dose.—2 to 8 minims.

Prescribing Notes.—Can be given dissolved in ten times as much Oleum Amygdalæ. Given also in **capsules** and in **syrup**.

Not Official.

ACETUM.

VINEGAR.

An acid liquid produced by the alcoholic and acetous fermentation of a vegetable juice or infusion.

Medicinal Properties.—Refrigerant and sialagogue. As a cooling **lotion** in bruises and sprains. Sponged on the skin in fever or given internally checks excessive perspiration and lowers temperature. A wineglassful of Vinegar is useful to counteract the intoxicating effects of Alcohol.

The most ready and safe antidote in cases of poisoning by alkalis.

In post-partum hæmorrhage.—*B.M.J.* '84, i. 56.

Lewin recommends Vinegar after Chloroform to prevent sickness, by immediately replacing the inhaler by a linen cloth steeped in Vinegar, and allowing this to remain over the patient's face for at least three hours after the completion of the operation.—*B.M.J.E.* '95, ii. 63.

Dose.—1 drm. to 1 oz. diluted.

Incompatibles.—Ammonia, Lime, all the Alkalis, and Carbonates.

Foreign Pharmacopœias.—Official in Austr., Belg., Ger. and Hung., 6 p.c. Acetic Acid; Dan. and Swed., 4·7 p.c.; Port., 7—9 p.c.; Russ., 6 p.c.; Span., sp. gr. 1·018—1·020; Swiss, 5 p.c.: all are without Sulphuric Acid; Mex., Vinagre; not in the others.

Vinegar is defined by A. H. Allen (*P.J.* 96, ii. 104) as an acid liquid produced by the alcoholic and acetous fermentations of a vegetable juice or infusion. This description includes Vinegars prepared from Malt, Wine, Raisins, Cider, etc.; but excludes Acetic Acid produced by the distillation of Wood. Where it is desired to define the nature and origin of the Vinegar more clearly it is easy to describe it as 'Malt Vinegar,' 'Wine Vinegar,' 'Sugar Vinegar,' 'Cider Vinegar,' etc. But as pointed out by Proctor (*P.J.* '96, ii. 138) Diluted Acetic Acid is the article frequently required.

Wine Vinegar has a sp. gr. about 1·02, contains from 6 to 8 p.c. of Acetic Acid, about 1½ p.c. of extractive matter, and from a ¼ to ½ p.c. of mineral matter.

Allen has attempted to find some compound which would be directly indicative of a brewed Vinegar as distinguished from the various forms of distilled Acetic Acid. 'Alcohol is only practically valuable for this purpose in special cases, and the objections to relying implicitly on the natural presumption from its presence are obvious. Glycerin, another constant product of the alcoholic fermentation, is very difficult to determine in the presence of some of the other constituents of Vinegar. We have attempted, therefore, to determine the Succinic Acid, which substance the experiments of Pasteur showed to be also a constant product of the alcoholic fermentation. There are great difficulties in its accurate determination under the conditions with which analysts have to deal in practice, but the experiments in this direction are not complete, and we are not hopeless that we may be able to devise a practicable method of dealing with it.'—*Analyst* '93, 245.

ACIDUM ACETICUM.

ACETIC ACID.

Acetic Acid is a product of the destructive distillation of Wood, and of the oxidation of Ethylic Alcohol. 100 parts by weight should contain 33 parts of Hydrogen Acetate, $CH_3 \cdot COOH$, and 67 parts of Water.

The combining weight of Hydrogen Acetate is 59·58.

Medicinal Properties.—A local stimulant, sialagogue, refrigerant and antiseptic. Used in parasitic skin diseases. 'A good application for ringworm of the body' (*Ringer*). As a **gargle** 15 minims to 1 ounce of Water. When diluted it can be used for the same purposes as Vinegar, *q.v.*

Official Preparations.—Acidum Aceticum Dilutum. Used in the preparation of Liquor Ammonii Acetatis, Oxymel, and Oxymel Scillæ.

Foreign Pharmacopœias.—Official in Jap. and U.S., 36 p.c. Acid, sp. gr. 1·048; Norw. and Swed., 29 p.c., sp. gr. 1·040; Dan., Dutch, and Russ., 30 p.c.; Port. (Acido Acetico Hydratado), 38 p.c., sp. gr. 1·050; Fr., 50 p.c., sp. gr. 1·060.

The Acidum Aceticum of Belg., Ger., and Span. is practically Glacial; Belg. and Ger., 96 p.c., sp. gr. 1·064; Span., 94—98 p. c., sp. gr. 1·060—1·067.

The Acidum Aceticum Dilutum of Austr., Ger., Hung., and Swiss more resembles B.P. Acidum Aceticum; Austr., 20·4 p.c.; Hung., 20 p.c.; Ger. and Swiss, 30 p.c.

Description.—A clear, colourless liquid with a pungent odour, affording, when neutralised with alkali, the reactions characteristic of Acetates.

Tests.—Sp. gr. 1·044. Each gramme should require for neutralisation 5·5 c.c. of the Volumetric Solution of Sodium Hydroxide. It should yield no residue on evaporation and no characteristic reaction with the tests for Lead, Copper, Arsenium, Chlorides, Nitrates, Sulphates, and Sulphites. It should not darken in colour when exactly neutralised with Solution of Ammonia and warmed with Solution of Silver Nitrate (absence of Formates). 2 c.c. of Acetic Acid diluted with 10 c.c. of Water should not immediately discharge the colour of one drop of Solution of Potassium Permanganate, but at the end of half a minute the mixture should retain a shade of crimson (limit of empyreumatic matter).

A ready test for Sulphurous Acid is to add a drop of Tincture of Iodine to a drachm of the Acid, which gives it a yellowish-brown tint if the Acid be pure, but is instantly decolourised if Sulphurous Acid is present equal to $\frac{1}{100}$ grain in the fl. drm. —*P.J.* (3) xix. 566.

When supersaturated with Solution of Potash it should not have a smoky odour or taste, indicating absence of empyreumatic substances.— *U.S.*

Preparation.

ACIDUM ACETICUM DILUTUM. Diluted Acetic Acid.

Acetic Acid, 2½, diluted with sufficient Distilled Water to form 20 of Diluted Acetic Acid.

100 parts by weight should contain 4·27 parts of Hydrogen Acetate, $CH_3 \cdot COOH$.

Dose.—½ to 2 fl. drm.

Official Preparations.—Used in the preparation of Acetum Ipecacuanhæ, Acetum Scillæ and Liquor Morphinæ Acetatis.

Foreign Pharmacopœias.—Official in Austr., 20·4 p.c. Acetic Acid, sp. gr. 1·028; Ger. and Swiss, 30 p.c. sp. gr. 1·041; Hung., 20 p.c.; Ital., 19 p.c.; Belg., 9·6 p.c., sp. gr. 1·014; Jap. and Dutch, 6 p.c.; Port. (A. A. Aquoso), 10 p.c., sp. gr. 1·015; Russ., 5 p.c.; U.S., 6 p.c., sp. gr. 1·008; Mex., 3·63 p.c.; see also Acetum.

Tests.—Sp. gr. 1·006. Each gramme should require for neutralisation 7·1 c.c. of a Decinormal Volumetric Solution of Sodium Hydroxide. It must be free from the impurities indicated under 'Acidum Aceticum.'

ACIDUM ACETICUM GLACIALE.

GLACIAL ACETIC ACID.

100 parts by weight should contain 99 parts of Hydrogen Acetate $CH_3 \cdot COOH$ (eq. 59·58).

It is three times as strong as Acidum Aceticum, and nearly twenty-four times as strong as Acidum Aceticum Dilutum.

Solubility.—It **dissolves** Camphor, Gum-resins, Resins, and Volatile Oils. It mixes with Water and Absolute Alcohol.

Medicinal Properties.—Escharotic; used for corns and warts; it speedily vesicates, and thus is useful in cases where Cantharides may do harm by being absorbed, but it causes much pain, and if applied incautiously may produce a most troublesome sore. When scented, it is employed to fill vinaigrettes containing sponge or fragments of Potassium Sulphate.

Official Preparations.—Used in the preparation of Acetum Cantharidis, Linimentum Terebinthinæ Aceticum, and Liquor Ferri Acetatis.

Not Official.—Acidum Aceticum Aromaticum, Acetum Aromaticum, Vinaigre Anglais, Vinaigre des Quatre Voleurs, Vapor Acidi Acetici, Acidum Trichloraceticum.

Antidotes.—Large quantity of Soap and Water to be swallowed; Lime Water, or Chalk and Water; Fluid Magnesia. Stomach-pump *not* to be used.—*Murrell.*

Foreign Pharmacopœias.—Official in Austr. and Hung. (A. A. Concentratum), Belg., Ger. and Swiss (Acidum Aceticum), Ital. (Acido Acetico Concentrato), all 96 p.c., sp. gr. 1·064; Jap., 96 p.c., sp. gr. 1·056—1·064; Russ. (A. A. Concentratum), 95—96 p.c.; Mex. (Acido Acetico Cristalizable), sp. gr. 1·063; Span. (Acido Acetico), 94—98 p.c., sp. gr. 1·060—1·067; U.S., sp. gr. not higher than 1·058, at least 99 p.c.; Fr. (Acide Acétique Crystallisable), Port. (A. A. Glacial) and Swed. (A. A. Concentratum), nearly 100 p.c.; not in the others.

Description.—At summer temperatures it is a clear, colourless liquid, with a very pungent odour. It crystallises when cooled, and remains crystalline until the temperature rises above 60° F. (15·5° C.).

Useful table for determining the strength of Glacial Acid by the freezing point will be found *P.J.* (3) ii. 241.

Tests.—It affords, when neutralised, the reactions characteristic of Acetates. Sp. gr. 1·058, and this is increased by the addition of 10

p.c. of Water (distinction from a diluted acid of 46 p.c., which has the same sp. gr.). Each gramme diluted with 50 c.c. of Water should require for neutralisation 16·6 c.c. of the Volumetric Solution of Sodium Hydroxide. It must be free from the impurities indicated under 'Acidum Aceticum.'

The sp. gr. increases with the gradual addition of Water until 30 per cent. has been added, when it will have sp. gr. 1·078; the further addition of Water again reduces it. When 100 p.c. (equal volumes) of Water have been added, it will have sp. gr. 1·063.

Not Official.

ACIDUM ACETICUM AROMATICUM (Belg. and Russ.).—Glacial Acetic Acid, 72; Oil of Cloves, 9; do. Lavender, 6; do. Orange, 6; do. Bergamot, 3; do. Thyme, 3; do. Cinnamon, 1; all by weight; mix and filter.

ACETUM AROMATICUM (Ger.).—Oils of Lavender, Peppermint, Rosemary, Juniper, and Cinnamon, of each 1; Oil of Lemon, 2; Oil of Cloves, 2; Spirit, 450; Diluted Acetic Acid, 650; Water, 1900; all by weight: digest some days and filter.

VINAIGRE ANGLAIS (Fr.).—Glacial Acetic Acid, 500; Camphor, 50; Oil of Cinnamon, 1; Oil of Cloves, 1; Oil of Lavender, ½; all by weight: mix.

VINAIGRE DES QUATRE VOLEURS (Fr.).—Tops of the Greater and Lesser Wormwood (*Artemisia Absinthium* and *A. pontica*), Rosemary, Sage, Peppermint, Rue, and Lavender Flowers, of each 15; Calamus Root, Cinnamon, Cloves, Nutmeg, and Garlic, of each 2; Camphor, 4; Glacial Acetic Acid, 15; Strong White Vinegar, 1000; dissolve the Camphor in the Glacial Acid; macerate the other ingredients in the Vinegar for ten days; press and mix.

VAPOR ACIDI ACETICI (*T. H.*).—Glacial Acetic Acid and Acetic Acid, equal parts; mix. Two teaspoonfuls in a pint of water at 140° F. for each inhalation. Sedative and antiseptic; used for inflammatory sore throat of scarlet fever.

ACIDUM TRICHLORACETICUM (Ger. and Russ.).—A substitution product from Acetic Acid, but it is most readily prepared by acting on Chloral Hydrate with Nitric Acid in sunlight. Colourless, deliquescent crystals, which fuse at 51° C., and boil at 195° C.

Readily soluble in Water and Alcohol (90 p.c.).

It is a powerful antiseptic and caustic. 1 or 2 p.c. solutions have been used as a dressing for wounds and as a lotion and spray in acute coryza. Internally, in dilute solution, 2 to 5 grains for adults, ½ to 1 grain for children in gastric catarrh and summer diarrhœa.—*L.M.R.* '83, 285; *T.G.* '85, 63; and '94, 349.

A test for Albumen in Urine.—*B.M.J.* '89, ii., 1114, and '90, i., 681.

ACIDUM ARSENIOSUM.

ARSENIOUS ANHYDRIDE.

B.P.Syns.—Arsenic; White Arsenic; Arsenious Acid.

As_4O_6, eq. 393·28.

Arsenious Anhydride or Arsenious Oxide is obtained by roasting certain arsenical ores.

Solubility.—1 in 100 of cold Water; 1 in 20 of boiling Water; 1 in 500 of Alcohol (90 p.c.); 1 in 6 of Hydrochloric Acid; 1 in 8 of Glycerin; 1 in 11 of Solution of Potash; 1 in 40 of saturated solution of Sodium Carbonate.

These figures are approximate. The published solubilities of Arsenious Acid are very contradictory, owing, no doubt, to the specimens examined being either vitreous, opaque, or a mixture of the two, and therefore of different solubilities.

Medicinal Properties.—A general tonic and alterative. Valuable in chorea, chronic (not acute) eczema, lichen, acne and psoriasis, in gout and chronic rheumatism, in painful dyspepsia, in neuralgia and spasmodic asthma, especially if anæmic or malarial in origin; in the intervals between the attacks of angina pectoris. Indispensable in all forms of weak heart accompanied by pain. In the form of **paste** it is used to destroy the pulp before stopping carious teeth. Antiperiodic in malaria; in small doses it is stimulant to nervous system. Best given immediately after meals. Externally is a powerful caustic for fungoid growths, phagedenic and syphilitic ulcers, and requires great care, as there is danger of absorption; but this can be prevented by using 'sufficient quantity to produce active inflammation' (*Ringer*). Given in pernicious anæmia with good result (*L.* '85, i. 653, and '94, ii. 1274; *B.M.J.* '88, ii. 982, '90, i. 130, and '95, i. 1084); also in various chronic glandular affections (*L.M.R.* '81, 98, 103; also *B.M.J.* '85, ii. 598, and *L.* '87, i. 679); in paroxysmal sneezing (*B.M.J.* '87, ii. 921); hypodermically in chorea (*B.M.J.* '94, ii. 1176); internally in chorea (*L.* '97, ii. 248); in pemphigus (*L.* 93, ii. 421); internally to remove warts (*T.G.* '94, 129); in gastralgia (*L.* '96, ii. 25); as an application in epithelioma (*B.M.J.E.* '97, ii. 3).

Dose.—$\frac{1}{60}$ to $\frac{1}{15}$ of a grain.

Ph. Ger. maximum single dose, ·005 gramme (= $\frac{1}{12}$ grain), maximum daily dose, ·02 gramme (= $\frac{2}{5}$ grain).

Prescribing Notes.—In **solution, tablet** or **pill.** A good **pill** is made by well triturating with Milk Sugar and massing with Glucose. Solution of Arsenic is frequently prescribed with Solution of Strychnine; in such cases the (acid) Liq. Arsenici Hydrochloricus should be ordered and not the (alkaline) Liquor Arsenicalis as is sometimes seen.

Incompatibles.—Salts of Iron, Magnesia, Lime Water, and astringent matters.

Official Preparations.—Liquor Arsenicalis, Liquor Arsenici Hydrochloricus. Other preparations containing Arsenium; Arsenii Iodidum, Ferri Arsenas, Sodii Arsenas, Liquor Sodii Arsenatis and Liquor Arsenii et Hydrargyri Iodidi.

Not Official.—Liquor Ammonii Arsenitis, Pilula Asiatica, Solutio Solventis Mineralis, Arsenical Paste, Arsenical Caustic Powders.

Antidotes.—The freshly prepared moist Ferric Hydroxide, or large quantities of Calcined Magnesia; Dialysed Iron, followed by some Common Salt (to ensure precipitation of Ferric Hydroxide); Stomach pump, Emetics; Mucilaginous drinks, Olive Oil, or Carron Oil; stimulants freely, if much prostration; warmth (hot blankets and bottles).

Antidotum Arsenici (Belg., Dan., Dutch, Hung., Port., Russ., Swed., and Swiss).

They vary considerably in the quantities of Iron, Magnesia, and Water; Hung., Russ., Swiss, and U.S. employ Ferric Sulphate; Belg., Dan., Dutch, Port. and Swed. use Ferric Chloride.

U.S. formula (Ferri Oxidum Hydratum cum Magnesia).—Mix 50 grammes of Solution of Ferric Sulphate (sp. gr. 1·320) with 100 c.c. of Water, and keep the liquid in a large, well-stoppered bottle. Rub 10 grammes of Magnesia with cold water to a

smooth and thin mixture, transfer this to a bottle capable of holding about 1000 c.c., and fill it with water to about three-fourths of its capacity. When the preparation is wanted for use, shake the Magnesia mixture to a homogeneous, thin magma, gradually add to it the Iron solution, and shake them together until a uniform smooth mixture results.

NOTE.—The diluted Solution of Ferric Sulphate, and the mixture of Magnesia with Water, should always be kept on hand, ready for immediate use.

Foreign Pharmacopœias.—Official in Belg., A. Arseniosum; Austr., Dan., Dutch, Ger., Hung., Jap., Norw., Russ., Swed. and Swiss, A. Arsenicosum; Fr., Acide Arsenieux; Ital., Anidride Arseniosa; Mex., and Port. Acido Arsenioso; Span., Arsenic Blanco; U.S., A. Arsenosum.

Description.—Occurs as a heavy white powder, or in masses which usually present a stratified appearance caused by the presence, in separate layers, of the crystalline and opaque and of the amorphous and vitreous allotropic modifications of Arsenious Anhydride. Slowly heated in a test-tube it yields a sublimate of minute, brilliant, transparent octahedral crystals.

It is **vitreous or glassy** when condensed on a surface, the temperature of which is little below the subliming point of the Acid, and is more soluble than the **octahedral or opaque** which is formed when the vapour condenses on a cold surface and passes directly from the gaseous to the solid form. The **vitreous** in course of time becomes **opaque** from the outside inwards from gradual change to the crystalline condition. The vitreous oxide on h ating fuses before it volatilises to any considerable extent, but the opaque sublimes without previous fusion.

Tests.—Its aqueous solution, which is odourless, tasteless, and faintly acid to Litmus, gives with Solution of Silver Ammonio-Nitrate a canary-yellow precipitate readily dissolved by Solution of Ammonia and by Nitric Acid. Sprinkled on ignited charcoal, it emits an alliaceous odour. It is volatilised at 400° F. (204·4° C.). ·25 gramme, dissolved quickly in boiling Water with five times its weight of Sodium Bicarbonate, should, after the cooled solution is well shaken with three successive drops of Hydrochloric Acid, discharge the colour of 50·8 to 50·9 c.c. of the Volumetric Solution of Iodine. It should yield no characteristic reaction with the tests for Lead, Cadmium, Antimony, Tin or Sulphides. It should dissolve completely in Solution of Ammonia, and the resulting liquid when diluted with an equal volume of Water, and acidulated with Hydrochloric Acid should not have a yellow colour (absence of Arsenious Sulphide).

Preparations.

LIQUOR ARSENICALIS. ARSENICAL SOLUTION. *B.P.Syn.*—LIQUOR POTASSÆ ARSENITIS. FOWLER'S SOLUTION. (MODIFIED.)

Arsenious Anhydride, in powder, 87½ grains; Potassium Carbonate, 87½ grains; Compound Tincture of Lavender, 5 fl. drm.; Distilled Water a sufficient quantity. Heat the Arsenious Anhydride and the Potassium Carbonate with 10 oz. of Distilled Water in a 20 oz. flask until a clear solution is obtained; cool; add the Compound Tincture of Lavender and sufficient Distilled Water to produce 1 pint of the solution.

The metric quantities are respectively 10 grammes, 10 grammes, 31·25 c.c., to make 1000 c.c. of the solution.

=(1 grain of Arsenious Anhydride in 110 minims; 1 gramme in 100 c.c.).

Solution is much more readily effected by using ½ oz. of Water to dissolve these quantities, then diluting to 10 oz., and proceeding as directed above.

This preparation is practically the same strength as before, ½ grain having been added to 87 grains to make the solution 1 p.c.

Dose.—2 to 8 minims.

Larger doses are given in chorea.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Swed., Swiss, and U.S., 1 Arsenious Acid in 100; Span., 1 in 90.

Description.—A reddish liquid, alkaline to test-papers, and having the odour of Lavender.

Test.—25 c.c., neutralised with Hydrochloric Acid, and diluted with Water, should discharge the colour of 50·8 to 50·9 c.c. of the Volumetric Solution of Iodine, the presence of a slight excess of Sodium Bicarbonate being maintained throughout the operation.

LIQUOR ARSENICI HYDROCHLORICUS. HYDROCHLORIC SOLUTION OF ARSENIC. (MODIFIED.)

Arsenious Anhydride, in powder, 87½ grains; Hydrochloric Acid, 2 drm.; Distilled Water, a sufficient quantity. Heat the Arsenious Anhydride and the Hydrochloric Acid with 10 oz. of Distilled Water in a 20 oz. flask until a clear solution is obtained; cool; add sufficient Distilled Water to produce 20 oz. of the solution.

The metric quantities are respectively 10 grammes, 12·5 c.c., to make 1000 c.c. of the solution.

=(1 grain of Arsenious Anhydride in 110 minims, or 1 gramme in 100 c.c.).

This preparation is practically the same strength as before, ½ grain having been added to 87 grains to make the solution 1 p.c.

Same strength as the Liquor Arsenicalis.

Dose.—2 to 8 minims.

(U.S. 1 of Arsenious Acid in 100.)

Description.—A colourless liquid, having an acid reaction.

Test.—25 c.c. diluted with Water should discharge the colour of 50·8 to 50·9 c.c. of the Volumetric Solution of Iodine, the presence of a slight excess of Sodium Bicarbonate being maintained throughout the operation.

LIQUOR ARSENII ET HYDRARGYRI IODIDI.—*See* ARSENII IODIDUM.

ARSENAS FERRI.—*See* FERRI ARSENAS.

ARSENAS SODII.—*See* SODII ARSENAS.

ARSENATIS SODII LIQUOR.—*See* LIQUOR SODII ARSENATIS.

Not Official.

LIQUOR AMMONII ARSENITIS is made of the same strength as Liquor Arsenicalis; Ammonium Carbonate being substituted for Potassium Carbonate.

PILULA ASIATICA.—Arsenious Acid, $\frac{1}{12}$ grain; Black Pepper, $\frac{1}{2}$ grain; Extract of Gentian, 1 grain, for one pill.

Used as a specific in various chronic skin eruptions.

SOLUTIO SOLVENTIS MINERALIS of Dr. De Valangin (the Liquor Arsenici Chloridi of the London Pharmacopœia) contains 30 grains of Arsenic dissolved by 90 minims of Hydrochloric Acid in 20 ounces of Water; is about one-third of the strength of the British Pharmacopœia preparation.

Dose.—3 minims three times a day, increasing to 10 minims for chorea.

ARSENICAL PASTE for Dentists.—Arsenious Acid, 2; Morphine Sulphate, 1; Creosote to make a stiff paste. A quantity of the size of a pin's head is ample for one application. It should be spread on cotton-wool and placed in the tooth. It will thus destroy the sensibility of a carious tooth, and in a few hours the tooth will be ready for stopping. Cocaine if applied before the arsenical paste prevents the pain.

ARSENICAL PASTE (Frères Come's), for cancer, applied after the surface has been laid bare by the application of caustic potash. Arsenic, 1; Charcoal, 1; Red Sulphide of Mercury, 4; Water, *q. s.*

ARSENICAL CAUSTIC POWDERS each contain from $\frac{1}{12}$ grain to $\frac{1}{8}$ grain of Arsenious Acid to 1 grain of Calomel, Vermilion, or Sulphide of Antimony, or of any combination of them.

ACIDUM BENZOICUM.

BENZOIC ACID.

C_6H_5. COOH, eq. 121·13.

It is obtained from Benzoin by sublimation. It may also be obtained from Toluene, from Hippuric Acid, and from other organic compounds.

It would appear from the above that the authorities give a preference to the resin-sublimed Acid, but their description conveys an impression just the reverse of this.

Solubility.—1 in 390 of Water; 1 in 12 of boiling Water; 1 in $2\frac{3}{4}$ of Alcohol (90 p.c.); 1 in $2\frac{3}{4}$ of Ether; nearly 1 in 6 of Chloroform; 1 in 12 of Benzol; about 1 in 30 of Glycerin. Borax increases its solubility in Water; 1 of Borax and 1 of Acid are soluble in 100 of Water; Sodium Phosphate also aids its solution. Soluble in aqueous solutions of the Caustic Alkalis and in hot Milk of Lime, forming Benzoates, from which it is precipitated on the addition of Hydrochloric Acid unless the solutions are very dilute.

Medicinal Properties.—Stimulant, expectorant, diuretic; given for chronic or subacute inflammation of the bladder, with alkaline urine, frequently at first, afterwards at longer intervals and in diminished doses; given in chronic bronchitis where there is much secretion.

The Sodium and Ammonium salts are preferable, as they are less irritating to the alimentary canal.

It possesses antipyretic and antiseptic properties; a saturated solution in Water delays decomposition of animal fluids; it is also useful in preventing fats from becoming rancid.

As a **lotion** one grain in an ounce of water, or a stronger solution in Alcohol to be diluted as required.

Is a valuable remedy in acute rheumatism when Salicylic Acid or its Sodium salt either cannot be borne, or fails to produce any effect.—*L.M.R.* '80, 94.

It has been used with advantage in the treatment of gout.—*B.M.J.* '86, i. 734.

It has been supposed that Benzoic Acid converts Uric Acid into Hippuric Acid in the animal organism, and so assists its elimination in cases of gout and rheumatism. It would appear, however, that it is the Benzoic Acid itself which is converted into Hippuric Acid, and as this happens in the kidneys and not at all in the blood, any benefit arising from the use of Benzoates in these diseases cannot be attributed to the above reaction.—*Brunton.*

Stimulates the liver, but its action is less rapid and less powerful than that of its salts. —*Dr. Rutherford.*

Dose.—5 to 15 grains.

Prescribing Notes.—Given in **cachets**, or in **pills** made up with a mixture of equal parts Treacle and liquid Glucose or in the form of Sodii Benzoas.

Official Preparation.—Trochiscus Acidi Benzoici, ½ grain in each. Contained in Tinctura Camphoræ Composita, 2 grains in each ounce; Tinctura Opii Ammoniata, 9 grains in each ounce. Used in the preparation of Ammonii Benzoas and Sodii Benzoas.

Not Official.—Vapor Acidi Benzoici, Benzoic Gauze.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss, and U.S.

Description.—In light, feathery, crystalline plates and needles, which are flexible, nearly colourless, and odourless when quite pure; but when obtained from Benzoin, possess an agreeable aromatic odour, due to traces of other substances.

The Commercial Varieties of this Acid are:—

1. **Resin Sublimed Acid.**—Characterised by its strong empyreumatic odour, colour (varying from a pale yellow to light brown), and reducing action on both Permanganate solution and Ammoniacal Silver Nitrate; it may or may not contain Cinnamic Acid, according to the variety of the Benzoin from which it is made.

2. **Resin Precipitated Acid.**—This is prepared from Benzoin by one of the 'wet processes,' such as boiling with Milk of Lime to form a soluble Benzoate, which is afterwards decomposed by an Acid with separation of the slightly soluble Acid Benzoic. It is practically a pure chemical; has no empyreumatic odour; and has no reducing action either on Permanganate or Ammoniacal Silver solution. This is the variety commonly sold as B.P. and is that intended to be used in the U.S., the latter however will pass a sufficiently purified Acid, from whatever source derived.

3. **Hippuric Benzoic Acid.**—When imperfectly purified this Acid retains a distinct urinous odour, and is guarded against in most foreign Pharmacopœias, but it has been shown (*P.J.* (3) xiv. 463) that Acid from this source, after resublimation, will pass the purity tests of any Pharmacopœia, so that its use is mainly a question of price.

4. **Toluene Benzoic Acid.**—This is manufactured in very large quantities, principally for conversion into Alkaline Benzoates, but partly for sale as Benzoic Acid. In the latter case it is frequently said to be sublimed over a little Gum Benzoin to give it something of the aromatic odour of the Natural Acid. This Artificial Acid conforms with most tests, but is practically certain to be contaminated with Chlorine compounds, easily detected by mixing ½ gramme of the Acid with slaked Lime (free from Chlorine), damping with water, igniting, dissolving

the residue in Nitric Acid and adding Silver Nitrate. A turbidity or precipitate is practical proof of the Toluene source of the Acid.

Tests.—It volatilises in the vapour of water. Pure Benzoic Acid melts at 250·5° F. (121·4° C.), and boils at 480·2° F. (249° C.); but when obtained from Benzoin, it melts at about 248° F. (120° C.), forming a yellowish liquid, which becomes brownish but not red as the temperature rises (absence of Hippuric Acid), and boils at about 462° F. (238·9° C.). When heated to the last-named temperature, it passes off in vapour, which burns with a bright-yellow flame, and leaves only a slight residue. When ·5 gramme is heated in a closed crucible with twice its weight of Calcium Carbonate, the mass dissolved in Diluted Nitric Acid, and Solution of Silver Nitrate added, only the slightest cloudiness should result (absence of Chlorobenzoic Acid). It should yield no characteristic reaction with the tests for Oxalates. It should not develop the odour of Benzaldehyde when warmed with its own weight of Potassium Permanganate and ten times its weight of Diluted Sulphuric Acid (absence of Cinnamic Acid). ·2 gramme suspended in 10 c.c. of Water should not immediately discharge the colour of two drops of Solution of Potassium Permanganate (absence of Hippuric and Cinnamic Acids).

Preparation.

TROCHISCUS ACIDI BENZOICI. Benzoic Acid Lozenge. (Altered.)

Benzoic Acid, made into a lozenge with Fruit Basis. Each lozenge contains half a grain of Benzoic Acid.

Now made with Fruit Basis.

Dose.—Not given in B.P.; 1 to 5 lozenges.

Not Official.

VAPOR ACIDI BENZOICI (*T.H.*).—Benzoic Acid, 3 grains; Kaolin, 12 grains; rub together and add Water, ½ oz; Tincture of Tolu, 18 minims; shake and make up with Water to 1 oz.

Extremely serviceable in sub-acute affections of the air passages.

BENZOIC GAUZE.—Contains 4 p.c. of Benzoic Acid.

ACIDUM BORICUM.

BORIC ACID.

B.P.Syns.—Boracic Acid; Hydrogen Borate.

H_3BO_3, eq. 61·49.

A weak Acid obtained by the interaction of Sulphuric Acid and Borax; and by the purification of native Boric Acid.

Solubility.—1 in 25 of cold Water; 1 in 3 of boiling Water; 1 in 4 of Glycerin; 1 in 28 of Alcohol (90 p.c.).

Medicinal Properties.—Antiseptic and desiccant; it is used as a **dressing** for granulating and suppurating surfaces in general; as an **eye-wash**, 2 to 5 grains in an ounce of Water; as a **lotion, douche,** or as a **mouth-wash**, 10 to 15 grains to an ounce of Water;

as a **paint** for the throat, 1 in 5 of Glycerin; as a **pessary**, 10 or 20 grains with Gelatin Mass or Oil of Theobroma.

Given in cystitis associated with decomposing urine.

Used as a **dusting powder** it prevents fetid perspiration.

Dose.—5 to 15 grains.

Prescribing Notes.—May be given in **mixture, powders,** or **cachets.**

Official Preparations.—Glycerinum Acidi Borici, and Unguentum Acidi Borici.

Not Official.—Boric Acid dressings, Lanolinum Acidi Borici, Mistura Acidi Borici, Pastillus Acidi Borici, Boro-Glyceride and Liquor Magnesii Boratis.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss, and U.S.

Description.—Colourless, pearly, lamellar crystals or irregular masses of crystals; unctuous to the touch; taste feebly acid and bitter, leaving a sweetish after flavour in the mouth.

It volatilises in vapour of water at 100° C. (212° F.), which prevents its direct determination by evaporation.

Tests.—It changes the colour of Litmus to wine-red in the cold, a hot saturated solution giving a bright red colour; Turmeric Paper moistened with an aqueous solution even when slightly acidulated with Hydrochloric Acid, becomes brownish-red on gently drying, and this colour changes to a greenish-black if Solution of Potassium Hydroxide be added. The solution in Alcohol burns with a flame tinged with green, especially when the solution is acidulated with Sulphuric Acid. Boric Acid liquefies when warmed, and on careful heating loses 43·6 p.c. of its weight, the product solidifying, on cooling, to a brittle glass-like mass. It should yield no characteristic reaction with the tests for Lead or Copper, and only the slightest reactions with the tests for Iron, Calcium, Magnesium, Potassium, Sodium, Ammonium, Chlorides, and Sulphates.

Under ordinary circumstances Boric Acid in solution cannot be titrated with the usual indicators; but in 30 p.c. Glycerin Solution, the end reaction is quite definite with Phenol-phthalein.

Preparations.

GLYCERINUM ACIDI BORICI.—Glycerin of Boric Acid. (New.)

Boric Acid, in fine powder, 6; Glycerin, a sufficient quantity. Heat 9 (by weight) of Glycerin, in a weighed porcelain dish, to a temperature not exceeding 302° F. (150° C.), and add the Boric Acid in portions, constantly stirring. When all is dissolved maintain the temperature of the liquid, frequently stirring and breaking up the film which forms on the surface, until the mixture has been reduced to the weight of 10; then add 10 of Glycerin; mix thoroughly. The product should weigh 20.

Foreign Pharmacopœias.—Official in U.S. (Glyceritum Boroglycerini) 31 p.c.; Mex. (Glicerina Borica) 5 p.c.; not in the others.

UNGUENTUM ACIDI BORICI. Boric Acid Ointment. (Altered.)

Boric Acid, in very fine powder, carefully sifted, 1; Paraffin Ointment, white, 9; Mix. =(1 in 10).

Now 1 in 10, in place of 1 in 7.

The commercial 'Pulv. Subtil' contains so many coarse particles that for use it should be passed through a fine lawn sieve.

Foreign Pharmacopœias.—Official in Dan., Dutch and Swiss, 1 in 10; not in the others.

Not Official.

LANOLINUM ACIDI BORICI (*G.H.*)—Lanoline of Boric Acid. Boric Acid, 20 grains; Hydrous Wool Fat, 1 oz.

LINTEUM ACIDI BORICI.—Lint dipped in a hot saturated aqueous solution of Boric Acid and then dried. Should contain 50 p. c. of Boric Acid, and not be scaly. It is sometimes coloured pink.

Used as an antiseptic dressing for wounds and ulcers.

Boric Gauze, 20 p.c.; **Boric Wool**, 25—50 p.c.

MISTURA ACIDI BORICI.—Boric Acid, 10 grains; Dilute Nitro-Hydrochloric Acid, 10 minims; Compound Tincture of Gentian, 1 drm.; Water to 1 oz.—*Lock Hospital.*

PASTILLUS ACIDI BORICI (*T.H.*).—2 grains in each pastil.

BORO-GLYCERIDE.—A patent preparation for preserving different kinds of food. A combination of Boric Acid and Glycerin.

A **solution,** 1 in 20 of Water, has been used as an antiseptic in operative surgery. Used as a **paint** in throat affections, 1 in 2 of Glycerin; as a **tampon** in dysmenorrhœa.

LIQUOR MAGNESII BORATIS.—*Light* Magnesium Carbonate, 4; Boric Acid, 27; Water, 128; boil and filter. Dissolves almost completely, but crystallises out within 48 hours. Half the quantity of Light Calcined Magnesia can be used in the place of the Carbonate.

ACIDUM CARBOLICUM.

PHENOL.

C_6H_5OH, eq. 93·34.

Phenol, commonly termed Carbolic Acid, is obtained from Coal-tar Oil by fractional distillation.

Carbolic Acid, or Phenol, is prepared in a crude state by treating certain oils, heavier than water, obtained in the distillation of Coal Gas Tar, with a dilute solution of caustic Soda, and by subsequently separating the crude Carbolic Acid from the alkaline solution by the addition thereto of a mineral Acid (usually Sulphuric). The crude Carbolic Acid thus obtained is submitted to fractional distillation and crystallisation, with other purification processes, having for their object the entire removal of the last traces of Cresylic and other Tar Acids and Bases, Sulphur compounds, &c.

A Synthetic Acid has also been prepared, and is supplied commercially of very good quality.

Solubility.—1 in 13 (or a little less) of Water; 1 in 2 of Olive Oil; 3½ in 1 of Glycerin; 3 in 1 of Chloroform; 4 in 1 of Ether; 6 in 1 of Alcohol (90 p.c.); 2¼ in 1 of Benzol; 2½ in 1 of Carbon Bisulphide; freely in Liquor Potassæ, Liquor Sodæ, and freely in Volatile Oils.

Medicinal Properties.—Antiseptic, disinfectant, and local anæsthetic. Given as an intestinal and gastric antiseptic in flatulence;

and in dilated stomach with fermentative change; it is most efficacious in typhoid in the form of 1½ grain pills. It relieves the itching of psoriasis. It has been used with advantage in phthisis, bronchitis, gangrene of the lung and whooping cough, internally, but more especially as a disinfectant, sprinkled about the room; internally in puerperal fever; as a prophylactic in scarlet fever. Placed in a carious tooth or cautiously applied to the gum, relieves tooth-ache. Used as a **paint** for the throat (30 grains to 1 oz. of Glycerin); as a **gargle** (2 grains to 1 oz.) for sore throat attended with fetid breath; if used with a **spray apparatus,** 3 grains in an oz. of Water; or for **inhalations,** 20 grains dissolved in a pint of hot Water; as an **injection** (1 grain to 1 oz. of Water) for the vagina or the bladder, to correct putrescence. Externally, used alone is a powerful caustic; as a **lotion** (15 to 30 grains to 1 oz.) for foul or syphilitic ulcers, carbuncles, scabies, ringworm and other parasitic skin diseases; (5 grains to 1 oz.) excellent for eczema and eruptions attended with itching; or as the official **ointment**. For a **mouth-wash**, *see* Phenate de Soude, p. 23.

Carbolised Oil, 1 or 2 in 40 of Olive Oil; used for dressing scalds and burns.

Carbolised Solution, 1 or 2 in 40 of Water; used in surgery as an antiseptic.

2 p.c. solutions have been used for **hypodermic injection.**

Deep hypodermic injections (½ grain to 20 minims Water) have been found most successful in erysipelas, poisoned wounds and deep-seated inflammations.—*Whitla.*

As solutions of Carbolic Acid in strong Alcohol or concentrated Glycerin are not caustic, but become so when diluted with Water, it is suggested that in cases of burning with concentrated Carbolic Acid it would be better to remove the Acid with strong Alcohol rather than with Water.—*P.J.* (3) xix. 783.

Actual contact would appear to be necessary for Carbolic Acid to act as a germicide. A few inches from the surface of pure Carbolic Acid in a bottle (open to the air) putrefaction and fermentation goes on as rapidly as in the open air.—*P.J.* (3) ii. 545.

As an ointment or plaster (1 in 15 or 20) in lupus.—*M.A.* '94, 416.

Carbolic Acid mixed with 5 to 10 p.c. of Glycerin injected for hydrocele.—*B.M.J.* '86, i. 1164, 1214.

Two p.c. spray for erysipelas.—*B.M.J.* '86, ii. 947.

Injection of a 5 p.c. solution for anthrax.—*B.M.J.* '86, ii. 601; *L.* '87, ii. 1186; *L.M.R.* '89, 422; *M.A.* '94, 79.

One grain in 1 oz. of water every four hours for vomiting in pregnancy.—*L.* '89, i. 1121.

Twenty-three cases of enteric fever treated with Carbolic Acid at Poona.—*B.M.J.* '97, i. 1344.

Keratin-coated pills in acute diarrhœa, *L.* '93, ii. 1305.

Dose.—1 to 3 grains.

Ph. Ger. maximum single dose, 1½ grains; maximum daily dose, 7½ grains.

Prescribing Notes.—Best given in the form of a **pill.** 12 grains of Carbolic Acid makes a good pill mass with 24 grains of Liquorice Powder; another good formula is, Carbolic Acid 12 grains, Liquorice Powder 18 grains, Compound Tragacanth Powder 6 grains.

Compressed Tablets are supplied for extemporaneously preparing a solution.

The addition of free Ammonia to solution of Carbolic Acid slowly turns the colour blue, which darkens on keeping.—*P.J.* (3) xxi. 593.

Official Preparations.—Acidum Carbolicum Liquefactum, Glycerinum Acidi Carbolici, Suppositorium Acidi Carbolici, Trochiscus Acidi Carbolici, Unguentum Acidi Carbolici. Used in the preparation of Salol, Sodii Sulphocarbolas and Zinci Sulphocarbolas. Contained in Injectio Ergotæ Hypodermica and Liquor Thyroidei.

Not Official.—Acidum Carbolicum Crudum, Lotio Acidi Carbolici, Mistura Acidi Carbolici, Oil for Catheters, Pastillus Acidi Carbolici, Trochisci Acidi Carbolici (*T.H.*), Vapor Acidi Carbolici, Antiseptic dressings, Liquor Natri Carbolici, Parachlorophenol, Phenol Camphor, Phenol Iodatum, Solution de Phenate de Soude, Sulphocarbolic Acid, Sulphocarbolates, Tribromphenol and Trichlorphenol.

Antidotes.—Stomach-pump, Emetics. Albumen, Saccharated Solution of Lime, soluble Sulphates (Magnesium or Sodium); Olive or Castor Oil; stimulants to counteract narcotism; warmth to the extremities. Hypodermic injection of Atropine Sulphate $\frac{1}{60}$ grain. Inhalations of Amyl Nitrite.

Case of Carbolic Acid poisoning by absorption treated successfully with 1 grain doses of Camphor dissolved in Syrup every hour for 4 times.—*L.M.R.* '84, 217. Recovery after swallowing 3 oz. Carbolic Acid, treated by hypodermic injection of $\frac{1}{10}$ grain Apomorphine, Olive Oil and Lime Water being given freely.—*B.M.J.* '88, i. 1336; Soap.—*L.* '89, ii. 445. Vinegar neutralises the effects of Carbolic Acid on the skin and mucous membrane, and is useful when Carbolic Acid has been swallowed.—*L.* '96, i. 255; *Pr.* lvii. 220; *B.M.J.* '97, ii. 595.

Description.—In small, colourless, deliquescent crystals having a peculiar odour and sweetish, pungent taste; it has a caustic action on the skin and mucous membrane. Exposed to moist air it may acquire a pinkish tinge. At 60° F. (15·5° C.) 100 parts of Phenol should be liquefied by the addition of 10 parts of Water, should form a clear liquid with 30 to 40 of Water, and should be completely dissolved by 1200 of Water. The aqueous solution should be clear and colourless.

When 1 or 2 parts of melted Carbolic Acid are mixed with 1 of Water, the Acid separates on cooling in oil-like globules; but when 3, 4, 5, 6, 7, 8, and even 9 of Acid to 1 of Water are mixed, the solution is perfect at ordinary temperatures; when, however, the temperature sinks to 40° F. or under, the 8 and the 9 will crystallise out again.

Pure Carbolic Acid readily absorbs Water from the air, and combines with it to form a definite crystalline Hydrate $2C_6H_6O.H_2O$, containing 8·74 p.c. of Water and melting at 63° F. (17·2° C.)—*Allen.*

Melting Point.—Should not be lower than 102° F. (38·8° C.).—*B.P.*

The melting point 91·5° F. (33° C.) given in B.P. 1885, was lower than that of any other Pharmacopœia; it has very properly been raised to a minimum of 102° F.

It is possible with special precautions to raise the melting point of Carbolic Acid to 108° F., but the highest melting point now commercially obtainable appears to be about 106° F., and no exception can be taken to a melting point of 104° F.

Melting Point (Centigrade) compared with foreign Pharmacopœias:

Austr. and Swed., 37°—40°; Belg., 41°; Brit., 38·8°; Port. and Span., 35°; Dan. and Jap., 38°; Dutch, 39°—42°; Fr. and Swiss, 42°; Hung., 35°—44°; Ital. (Fenolo Crystallizzato), 40°; Mex. (Acido Fenico), 40°; Norw., 40°; Ger., and Russ, 40°—42°; U.S. not lower than 35°.

Boiling Point. — Should not be higher than 359·6° F. (182° C.).—*B.P.*

Boiling Point (Centigrade) compared with foreign Pharmacopœias:

Austr., 182°—184°; Belg. and Ital., 182°; Brit., not higher than 182° C.; Dan., 178°—180°; Dutch, Port., and Swed., **b.p.** not given; Fr., 187°—188°; Ger., Norw., and Russ., 178°—182°; Hung., 180°—184°; Jap., 180°; Span., 186°; Swiss, 183°; U.S., not higher than 188°.

Melting Point and **Boiling Point** are influenced by presence of Water or Cresylic Acid, so that to eliminate the first, it should be boiled for a few seconds and cooled.

Starting with an Acid melting at 104° F., one p.c. of added Water reduced the Melting Point to 98° F., 3 p.c. to 86° F., and 5 p.c. to 74° F.

Lunge has shown that the addition of 1·3 p. c. of Cresylic Acid to pure Phenol reduces the Melting Point from 40·5° C. to 32·5° C.—*P.J.* (3) xxii. 593.

The *lower* the Melting Point and the *higher* the Boiling Point, the more impure is the Acid. The pure Acid melts at 42° C. and boils at 182° C.

Tests.—Sp. gr. at the melting point 1·060 to 1·066. Phenol does not immediately redden Blue Litmus paper. It does not rotate the plane of a ray of polarised light. It coagulates Solution of Albumen and Collodion, and liquefies Camphor. Test-solution of Ferric Chloride strikes a deep purple colour, and excess of Solution of Bromine gives a white precipitate, with a cold aqueous solution of Phenol. An aqueous solution of Phenol mixed with one-fourth of its volume of Solution of Ammonia, and then with a few drops of Solution of Chlorinated Soda, becomes blue after a time or immediately on gently heating. 1 volume of Phenol, liquefied by the addition of 10 p.c. of Water, forms with 1 volume of Glycerin a clear liquid which is not rendered turbid by the addition of 3 volumes of Water (absence of Cresol).

The principal tests for the quality of Carbolic Acid are the odour, which is characteristic, the melting point, boiling point, and the solubility in water.

A modification of Koppeschaar's process for the determination of Phenol.—*P.J.* '98. i. 177.

Preparations.

ACIDUM CARBOLICUM LIQUEFACTUM. Liquefied Phenol.

Phenol to which Distilled Water has been added in the proportion of 10 parts by weight of the water to 100 parts by weight of the Phenol. It is commonly termed Liquefied Carbolic Acid.

Dose.—1 to 3 minims.

Foreign Pharmacopœias.—Official in Austr., Ger., and Hung., Carbolic Acid, 100; Water, 10. Dan., Norw. and Swiss, Carbolic Acid, 90; Water, 10; Dutch, Carbolic Acid, 100; Water, 20; not in the others.

Description.—A liquid at first colourless, but usually acquiring a pinkish hue.

Tests.—It forms a clear solution on the addition of 18 to 27 p.c. of Water at 60° F. (15·5° C.). Sp. gr. 1·064—1·069 at 60° F. (15·5° C.). Boiling point gradually rising to a temperature not higher than 359·6° F. (182° C.).

When a small quantity of solution—say 2 fluid-drachms in a test-tube, with

a thermometer dipping into the solution—is cooled to about 50° F. an gently stirred, it becomes a mass of crystals, which will entirely disappear when the temperature rises to 58° F.

GLYCERINUM ACIDI CARBOLICI. Glycerin of Phenol.

Phenol, 1; Glycerin, sufficient to produce 5. Triturate the Phenol with the Glycerin until solution is effected. (= 1 in 5.)

Mixed with an equal bulk of water, may be applied to the tonsils when turgid, or when there is a diseased state of mucous surface producing fœtor of breath; also in diphtheria, assisted by a nutritious diet.

Foreign Pharmacopœias.—Official in U.S., 1 in 5; Port., 1 in 100; Span., 1 in 120; not in the others.

SUPPOSITORIA ACIDI CARBOLICI. Phenol Suppositories. (New.)

Phenol, 12 grains; White Beeswax, 24 grains; Oil of Theobroma, melted, a sufficient quantity to form, with the Phenol and Beeswax, a mixture which will fill twelve suitable moulds, each capable of holding 15 to 16 grains of Oil of Theobroma. Dissolve the Phenol in the Oil of Theobroma and Beeswax previously melted together at a low temperature, and pour the mixture into the moulds; or let the mixture cool and then divide it into twelve equal parts of a conical or other convenient form for a suppository.

Each of these Suppositories contains 1 grain of Phenol.

(Not in the other Pharmacopœias.)

TROCHISCUS ACIDI CARBOLICI. Phenol Lozenge. (New.)

Phenol, 1 grain. Mix with the Tolu Basis to form a Lozenge.

Dose.—Not given in B.P.; 1 to 3 lozenges.

UNGUENTUM ACIDI CARBOLICI. Phenol Ointment. Ointment of Carbolic Acid.—*B.P.* '85. (Altered.)

Phenol, 1; Glycerin (by weight), 3; Paraffin Ointment, white, 21. Dissolve the Phenol in the Glycerin; add the Paraffin Ointment; mix. =(1 in 25.)

Now 1 in 25 instead of 1 in 19.

In *B.P.* '85 ointment, part of the Phenol crystallised on keeping, and acted as a caustic. To avoid this the Phenol is now dissolved in Glycerin.

Foreign Pharmacopœias.—Official in Mex., Carbolic Acid 10, Vaseline 90. U.S., Carbolic Acid, 1; Ointment, 19. The latter is made with 4 parts of Lard and 1 of Yellow Wax; not in the others.

Not Official.

ACIDUM CARBOLICUM CRUDUM.—A yellowish, yellowish brown, or reddish brown liquid, having a strongly empyreumatic and disagreeable odour. It consists chiefly of **Cresylic Acid** (*see* p. 28), and is largely used for disinfecting drains, &c.

Foreign Pharmacopœias.—Official in Belg., Hung., Ital., Jap., Mex., Russ., Swed. and U.S.; not in the others.

LOTIO ACIDI CARBOLICI.—Carbolic Acid, 30 grains.; Water, 8 oz. This lotion applied to mosquito bites relieves the itching, pain, and swelling. If mixed with a little Glycerin and sponged over the face and hands before retiring to rest, the mosquitoes will not bite until the Acid be thoroughly evaporated by the heat of the skin.—*L.* '78, ii. 280.

Foreign Pharmacopœias.—Fr. (Soluté d'Acide Phenique), and Port. (Agua Phenica), 1 in 100, also 1 in 1000; Austr. and Ger. (Aqua Carbolisata), 1 in 33; Hung. (Aqua Carbolata), Mex. (Solucione de Acido Phenoco), and Russ. (Acidum Carbolicum Solutum), 1 in 100; Dan. and Norw. (Solutio Acidi Carbolici) and Swed. (Solutio Acidi Phenylici), 1 in 50; Span. (Agua Fenicada), 1 in 250; not in the others.

MISTURA ACIDI CARBOLICI (Rothe).—Pure Carbolic Acid, 12 minims; Tincture of Iodine, 16 minims; Tincture of Orange, 90 minims; Syrup, 3 drms.; Water to 8 oz. Recommended for use in typhoid fever; 1 oz. every four hours.—*L.* '88, i. 1244.

OIL FOR CATHETERS (Lund's Oil modified).—Pure Carbolic Acid or Phenol, 1; Castor Oil, 4; Almond Oil, 15.

A solution of Carbolic Acid in Oil is frequently used to lubricate and at the same time disinfect catheters; but Koch's experiments show that such a solution has no antiseptic power, and they ought to be first disinfected with an aqueous solution, and afterwards oiled.—*Brunton.*

PASTILLUS ACIDI CARBOLICI (*T.H.*)—Carbolic Acid ½ grain, Glyco-gelatin, 18 grains in each.

TROCHISCI ACIDI CARBOLICI (*T. H.*)—1 grain Carbolic Acid in each lozenge. One for a dose four or five times daily as an antiseptic and stimulant.

CARBOLIC ANTISEPTIC DRESSINGS.—Absorbent **Wool** and **Lint** containing 5 and 10 p.c. of Absolute Phenol; **Gauze,** 5 p.c.; **Tow,** 5 p.c.; **Ligatures,** 16 p.c.; **Protective** Oiled Skin, 5 p.c.; Silk **Sutures,** 5 p.c.

SOLUTION DE PHENATE DE SOUDE.—(Fr. and Span.).—Phenol, 70; Solution of Caustic Soda (sp. gr. 1·332), 100; Water to measure, 1000. All by weight.

One part of this solution to 30 of Water makes a good **antiseptic mouth-wash.**

The following formula is given (*A.J.P.* '90, 169) as representing the proprietary article sold under the name 'Phenol Sodique':—Coal-tar, 2 troy ounces; Soda, 120 grains; Water sufficient to make one **pint.**

LIQUOR NATRI CARBOLICI.—(Russ.).—Carbolic Acid, 5; Caustic Soda, 1; Distilled Water, 4. Sp. gr. 1·060—1·065.

VAPOR ACIDI CARBOLICI (*T.H.*)—Pure Carbolic Acid 420 grains, Water 1 drm. Dissolve. 20 drops in a pint of Water at 140° F. for each inhalation. Antiseptic, very serviceable in syphilitic and carcinomatous ulcerations.

PHENOL-CAMPHOR.—Carbolic Acid and Camphor will form a liquid in any proportion between Camphor 3, Carbolic Acid 1—and Camphor 1, Carbolic Acid 3; but most authorities appear to use an excess of Camphor. The formula $C_8H_{11}O$, attributed to this compound, corresponds with molecular weights of each, Carbolic Acid and Camphor (Carbolic Acid 2 parts and Camphor 3 parts).

A colourless refractive liquid with an odour of Camphor. Soluble in Alcohol (90 p.c.), Ether, Chloroform, and Oils. Insoluble in Glycerin and in Water.

Used as a local anæsthetic for toothache.—*T.G.* '85, 269; *L.* '89, ii. 867.

It is not so caustic as Carbolic Acid.

Carbolic Acid, 1, Camphor, 3, has been applied to false membranes in diphtheria, &c., either pure or mixed with an equal volume of Oil of Almonds.

It may be used at first every two hours, and afterwards three or four times a day —*Bulletin de Thérapeutique*; also *B.M.J.* '88, i. 490.

Subcutaneous and intrapulmonary injections in phthisis.—*L.M.R.* '88, 518.

PHENOL IODATUM (Iodized Phenol).—Iodine, 40 grains; Liquefied Carbolic Acid, 1 oz.—*Hosp. Women.*

Applied on a dressed sound or forceps in chronic endometritis and endocervicitis,

with or without a previous curetting. A fluid drachm diluted with 20 oz. of Water is used as a vaginal douche in midwifery.—*L.* '88, ii. 862.

PARACHLOROPHENOL.—Occurs in crystalline needles. Soluble in Alcohol, Ether, and Fixed Oils, but practically insoluble in Water. It possesses a stronger microbicidal power than Phenol, but its employment requires careful watching.—*B.M.J.E.* '95, i. 11; *P.J.* '95, ii. 551; '98, i. 61; *C.D.* '95, i. 224.

TRIBROMPHENOL. *Syn.* BROMOL.—White crystalline powder, with a slightly aromatic odour. A sample tested melted at 185° F. (85° C.).

Solubility.—1 in 2 of Alcohol (90 p.c.); 1 in 1 of Ether; 1 in 2 of Chloroform; almost insoluble in Water, but dissolves in Caustic Alkaline Solutions; 1 in 260 of Glycerin; 1 in 7½ of Olive Oil.

It possesses considerable antiseptic properties.

TRICHLORPHENOL.—White crystalline powder, with a pungent, somewhat tarry odour.

Solubility.—1 in 1 of Alcohol (90 p.c.); 2 in 1 of Ether; 1 in 1¼ of Chloroform; 1 in 1000 of Water; 1 in 9 of Glycerin; 1 in 3 of Olive Oil.

It forms salts with Ammonium, Potassium, Magnesium, Calcium, and Lead.

It is stated to be an antiseptic and deodorant twenty-five times stronger than Carbolic Acid.

SULPHOCARBOLIC ACID ($H.C_6H_5SO_4$) is formed by the action of Sulphuric Acid upon Carbolic Acid.—Gmelin's 'Chemistry,' vol. xii. 1857. *P.J.* (3), i. 52.

A few years ago it was revived under the name **ASEPTOL**, a syrupy liquid, mixing in all proportions with Water, Alcohol, and Glycerin.

AMMONIUM, MAGNESIUM, POTASSIUM, and **SODIUM SULPHOCARBOLATES** all crystallise in tufts of acicular crystals more or less white; **COPPER SULPHOCARBOLATE,** in transparent light blue interlacing prisms; the **IRON** salt, in small brown micaceous crystals; the **ZINC** salt, in tabular crystals.

The Sodium and Zinc Sulphocarbolates are official. *See* SODII SULPHOCARBOLAS AND ZINCI SULPHOCARBOLAS.

ACIDUM CHROMICUM.

CHROMIC ANHYDRIDE.

CrO_3, eq. 99·38.

Chromic Anhydride, commonly termed Chromic Acid, is produced by the interaction of Sulphuric Acid and Potassium Bichromate.

Solubility.—About 2 in 1 of Water; Alcohol decomposes it.

It is a powerful oxidising agent, and is liable to cause sudden combustion or *explosion* in contact with strong Alcohol, Ether, Glycerin, and some other organic matters.

Medicinal Properties.—Disinfectant, Antiseptic, Deodorant. It is a powerful caustic (1 in 1 of Water), and is used by means of a pointed glass rod, great care being taken to protect the adjacent parts by plaster or ointment, having moist lint ready to absorb any superfluous Acid; 100 grains to 1 oz. Water is used to remove warts, lupus, and condylomata; 1 in 40 of Water may be applied to ulcers of mouth or pharynx, and 1 in 2000, or even 4000, is used as a lotion for putrid sores, leucorrhœa and ozæna.

It is of great importance for its use as a caustic that Chromic Acid should be free from Sulphuric Acid.

A warm concentrated solution rapidly dissolves all animal tissues.

5 p. c. Solution of Chromic Acid applied with a brush to the feet after bathing gave excellent results in the German Army as a remedy for excessive perspiration.—*P.J.* (3) xx. 504.

The pure Acid fused on the point of a probe has been applied with success to nasal mucous membrane in cases of hay fever and paroxysmal sneezing.—*M.A.* '94, 317.

Official Preparation.—Liquor Acidi Chromici.

Not Official.—Gargarisma Acidi Chromici and Pigmentum Acidi Chromici.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Ger., Hung., Jap., Mex. (Acido Cromico), Port., Russ., Span., Swiss, and U.S. Not in Dutch, Ital., Norw., or Swed.

Description.—In crimson acicular crystals, very deliquescent, inodorous, acting corrosively on the skin.

Tests.—At a temperature of 377·6° F. (192° C.), it melts, and at a still higher temperature decomposes, with the evolution of Oxygen Gas, leaving a greenish-black residue, which should yield little or nothing to Water (limit of Sulphates). Warmed with Hydrochloric Acid, Chlorine is evolved. Mixed with cold Alcohol (90 p.c.) Aldehyde is produced, and a green residue remains. If placed in contact with relatively small proportions of either Alcohol (90 p.c.), Ether, Glycerin, or some other organic matters, sudden combustion or explosion may ensue. 1 gramme dissolved in 50 c.c. of Water and acidulated with Hydrochloric Acid should afford only a slight opalescence with Solution of Barium Chloride (absence of more than traces of Sulphates).

In the Belgian Pharmacopœia the Chromic Acid is first reduced to a green Chromic salt, by boiling with Hydrochloric Acid and a little Alcohol, before adding the Barium Solution.

Preparation.

LIQUOR ACIDI CHROMICI. Solution of Chromic Acid.

An aqueous solution containing the equivalent of 25 p.c. of Chromic Anhydride, CrO_3; or 29·5 p.c. of Chromic Acid regarded as H_2CrO_4. Chromic Anhydride 1; Distilled Water, 3. Dissolve. =(1 in 3½.)

Foreign Pharmacopœias.—Official in Belg., Fr., and Span.—Chromic Acid, 1; Distilled Water, 1; dissolve. Sp. gr. 1·470.

Description.—An orange red, inodorous, caustic, strongly acid liquid.

Tests.—Sp. gr. 1·185. It should respond to the tests described under 'Acidum Chromicum.'

Not Official.

GARGARISMA ACIDI CHROMICI (*T.H.*).—Chromic Acid 1 grain, Water to 1 oz.—Also *Lock Hospital.*

PIGMENTUM ACIDI CHROMICI (*T.H.*).—Chromic Acid 10 grains, Water to 1 oz. In chronic superficial glossitis and secondary syphillis.

ACIDUM CHRYSOPHANICUM. *See* CHRYSAROBINUM.

ACIDUM CITRICUM.

CITRIC ACID.

$C_3H_4{\cdot}OH{\cdot}(COOH)_3,H_2O$, eq. 208·50.

Citric Acid or Hydrogen Citrate may be obtained from the juice of the fruit of various species of *Citrus*.

Solubility.—10 in 6 of Water; 1 in 2 of Glycerin; 10 in 15 of Alcohol (90 p.c.); 1 in 50 of Ether; almost insoluble in Benzol and Chloroform.

It is stated in B.P. that the crystals are soluble in half their weight of boiling water.

The Melting Point of Citric Acid is rather a variable figure. The fully hydrated Acid melts at about 70° C., and the anhydrous Acid at 153° C., but the crystals and more particularly the powder begin to dehydrate even below 70° C., so that intermediate figures will be obtained according to the manner in which it is heated.—*P.J.* (3), xxi. 1051.

Medicinal Properties.—Refrigerant and sialagogue; relieves thirst in fevers. Efficacious in scurvy, for which it is also prophylactic.

Citric Acid, 1, dissolved in Distilled Water, 12½ (or 35 grains in 1 oz.), is a substitute for Lemon Juice, but does not keep long without spoiling.

17 grains of Citric Acid { neutralise / about } { 24¼ grains Potassium Bicarbonate. / 20 ,, Potassium Carbonate. / 20½ ,, Sodium Bicarbonate. / 34¾ ,, Sodium Carbonate. / 12¾ ,, Ammonium Carbonate. / 11¾ ,, Magnesium Carbonate. }

Dose.—5 to 20 grains.

Prescribing Notes.—Usually given in powders to be taken with each dose of an alkaline mixture during effervescence; or in solution, directing the quantity to be taken with the alkaline mixture.

Incompatibles.—Potassium Tartrate, alkaline Carbonates, Acetates, and Sulphurets.

Official Preparations.—Used in the preparation of Liquor Ammonii Citratis, Liquor Bismuthi et Ammonii Citratis, Caffeinæ Citras, Ferri et Ammonii Citras, Ferri et Quininæ Citras, Lithii Citras, Potassii Citras, Sodii Citro-Tartras Effervescens, and in all the granular effervescing Citrates.

Not Official.—Syrupus Acidi Citrici.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—In large colourless prisms belonging to the trimetric system. The aqueous solution made by dissolving 35 grains of the Acid in 1 oz. (or 1 gramme in 12½ c.c.) of Water resembles, in acidity, an average specimen of Lemon Juice.

Tests.—Citric Acid, when neutralised, yields the reactions characteristic of Citrates. Each gramme dissolved in Water should require for neutralisation 14·3 c.c. of the Volumetric Solution of Sodium Hydroxide. It should yield no characteristic reaction with the tests

for Copper or Iron, and only very slight reactions with those for Calcium or Sulphates. Its solution should not contain any metallic particles. 10 grammes dissolved in 20 c.c. of Water, neutralised with Solution of Ammonia, and sufficient of a saturated aqueous solution of Hydrogen Sulphide added to produce 100 c.c. of liquid, no darkening of colour should result after 5 minutes (absence of Lead). One drop of Solution of Ferrous Sulphate, then a few drops of Solution of Hydrogen Peroxide, and finally an excess of Solution of Potassium Hydroxide, added to an aqueous solution of the Acid, no purple or even light violet colouration should result (absence of Tartaric Acid). Or 1 gramme placed in a test-tube with 5 c.c. of Solution of Ammonium Molybdate, 2 or 3 drops of Solution of Hydrogen Peroxide being added, should not afford a bluish colouration after the tube has been shaken and placed in boiling water for ten minutes (absence of Tartaric Acid; but the presence of any metallic particles gives rise to a similar colouration). On incineration with free access of air, it should not yield more than ·05 p.c. of Ash.

The test for 'absence of Lead' has given rise to severe criticism.

Mr. Warrington states 'The errors of the Pharmacopœia test are obvious. Its authors have departed from the perfectly safe process of testing Lead in a strongly acid solution, and they have directed to make the test in a neutralised solution without strictly limiting the quantity of Sulphide to be employed.'—*C.D.* '98, i. 923.

A method recommended by Dr. F. L. Teed, consists in adding a little Potassium Cyanide to the solution of Tartaric or Citric Acid made alkaline with Ammonia, and then heating the liquid to near boiling; the iron then becomes a Ferrocyanide, and ceases to give a black colour with Ammonium Sulphydrate. The use of the Cyanide has the further advantage of preventing Copper, if present, from taking any part in the final reaction.—*C. D.* '98, i. 923.

The U.S.P. test reads: On mixing 10 c.c. of a 10 p.c. aqueous solution of the Acid with a quantity of Ammonia water insufficient to neutralise it completely, and adding to one-half of this liquid a few c.c. of Hydrogen Sulphide T.S., it should not deposit a coloured precipitate, nor acquire more than a faintly brownish-yellow tint (limit of metallic impurities).

When Lead is present in the Acid, it is sure to be found in the Liquor Ammonii Citratis made from it; if the Acid be dissolved in Water, and filtered before adding the Ammonia, the Lead present as metal is removed.

23 grains dissolved in 1 oz. hot water will dissolve 15 grains of Magnesium Carbonate, but not 16 grains.—*Proctor.*

Not Official.

SYRUPUS ACIDI CITRICI.—*Syn.* Syrupus Citri.

Belg.—Citric Acid, 20; Syrup, 960; Water, 20; Spirit of Lemon, 1.

Fr.—Citric Acid, 10; Syrup, 980; Water, 10.

Hung.—Citric Acid, 2; Sugar, 100; Water, 50.

Mex.—Citric Acid, 10; Simple Syrup, 970; Water, 20.

Port.—Citric Acid, 1; Syrup of Lemons, 98; Water, 1.

Russ.—Citric Acid, 3; Syrup, 150; Elæosacchari Citri, 1.

Swed.—Citric Acid, 1; Syrup, 19.

Swiss.—Citric Acid, 2; Sugar, 64; Spirit of Lemon, 1·5; Water, 33.

U.S.—Citric Acid, 10; Water, 10; Spirit of Lemon, 10; Syrup to make 1000.

All by weight except U.S.

Not Official.

ACIDUM CRESYLICUM.

CRESYLIC ACID. CRESOL.

C_7H_8O eq. 107·25.

There are three isomeric Cresols, but the principal constituent of the 'crude Carbolic Acid' of Commerce (the source of commercial Cresylic Acid) is the Para-Cresylic Acid, with more or less of its isomers.—*Allen*.

Solubility.—1 in 80 of Water, and mixes in all proportions with Alcohol (90 p.c.), Ether, Chloroform, Glycerin and Olive Oil.

Medicinal Properties.—Disinfectant and Antiseptic. Used as an **inhalation** in whooping cough.

Antiseptic and slightly caustic; superior to Carbolic Acid and much less poisonous.—*L.M.R.* '88, 447.

Description.—A colourless or slightly yellow liquid, with a tarry odour.

A mixture of the three was introduced as an antiseptic under the name of **Trikresol.**

By the same process which yields Salicylic Acid from Phenol, the three isomeric Cresols yield three corresponding Cresotic or Cresotinic Acids, the Sodium salts of which have been used in Medicine. *See also* Acidum Salicylicum.

Tests.—Sp. gr. 1·048. It boils when pure, at 203° C., but a good commercial sample may boil 10° lower. It does not crystallise at the freezing-point of Water. Its aqueous solution gives a *transient* blue colour with Solution of Ferric Chloride.

The following is understood to be the composition of the various proprietary preparations of which Cresol is the basis:—

JEYE'S FLUID and **JEYE'S CREOLIN.**—This is also sold on the Continent and in America as **PEARSON'S CREOLIN.** Tar Oils, consisting largely of Cresols, saponified with Resin and Alkali. It forms an opaque emulsion with Water.

Used in 1 or 2 p.c. solution, and for the same purposes as Carbolised Solutions. An injection of 1 in 400 is excellent in gonorrhœa and ozæna, as ointment in erysipelas, and in obstetric practice on account of its hæmostatic as well as its antiseptic properties.

ARTMANN'S CREOLIN.—A solution of tar hydrocarbons in Sulpho-cresylic Acid. It forms a turbid liquid with Water.

LYSOL.—Sp. gr. 1·047. A transparent brown syrupy liquid, which forms a clear solution with water. It is a solution in neutral Soap, of Tar Oils which distil between 187° and 200° C., and are present to the extent of about 47 p.c.

SAPROL.—Tar Oils dissolved in large excess of Hydrocarbons. Inflammable.

SOLUTOL.—Sodium Cresylate in excess of Cresol, powerfully disinfectant but caustic, and not intended for surgical purposes.

SOLVEOL.—Cresols in Sodium Cresotate, soluble in Water. Non-caustic and used for surgical purposes.

ACIDUM GALLICUM.

GALLIC ACID.

$C_6H_2(OH)_3COOH, H_2O$, eq. 186·65.

A Trihydroxybenzoic Acid. It may be prepared by the action of diluted Sulphuric Acid on Tannic Acid.

Solubility.—1 in 100 of cold Water; 1 in 3 of boiling Water; 1 in 8

of Alcohol (90 p.c.); 1 in 50 of Ether; 1 in 6 of Glycerin with heat; Gallic Acid, 1; Potassium Citrate, 1; dissolve in 30 of Water.

Medicinal Properties.—Given to stop hæmorrhage in cases where the bleeding vessels must be reached through the circulation; but some authorities state it is useless in internal hæmorrhage. It is given to diminish the night sweats of phthisis, checks chronic discharges and excessive secretions as in diarrhœa and dysentery.

Dose.—5 to 15 grains.

Prescribing Notes.—With twice its weight of Sugar, may be taken three times a day in Water, in **powders,** or in **cachets**. It is also given in **pills:** 30 grains of Acid and 3 minims of Glycerin will make 6 pills.

Incompatibles.—Spiritus Ætheris Nitrosi, metallic salts.

Not Official.—Gallanol.

Foreign Pharmacopœias.—Official in Belg., Dan., Fr., Ital., Mex., Port., Span. (Acido Agallico), Swiss and U.S.; not in the others.

Description.—Acicular prisms or silky needles, sometimes nearly white, but generally of a slight brownish tinge; odourless, of a faintly acid taste.

Prepared from Galls by the hydration of the Tannic Acid contained in them. B.P. 1867 effected this by the influence of a ferment during six weeks, but now the process is completed in half an hour, by boiling with Diluted Sulphuric Acid.

Tests.—It yields a bluish-black precipitate with Test-solution of Ferric Chloride. The crystalline Acid loses 9·5 p.c. of its weight when dried at 212° F. (100° C.). It should yield no characteristic reaction with the tests for Sulphates. Its aqueous solution is not precipitated by Solutions of Isinglass, Albumen, alkaloids, or Tartarated Antimony (absence of Tannic Acid). It leaves no residue when burned with free access of air (freedom from mineral matter).

There are several colour-tests for Gallic Acid, but the best is Young's (*C.N.* xlviii, 31, and *Y.B.P.* '84, 153). The addition of Potassium Cyanide gives an intense red colour, which fades on standing, but is reproduced by shaking energetically in a half-full test-tube, so as to aërate the liquid. Most commercial samples of Tannic Acid may be shown to contain small quantities of Gallic Acid, and in some the quantity is fairly large.

Not Official.

GALLANOL (Gallic Acid Anilide).—Colourless crystals, melting at 205° C., sparingly soluble in Water. Introduced as a substitute for Chrysophanic Acid in psoriasis.—*B.M.J.E.* '93, ii. 99; '94, i. 12; ii. 44. In eczema.—*M.A.* '95, 226.

Not Official.

ACIDUM HYDRIODICUM.

This Acid is best prepared and kept in the form of a 20 p.c. solution (sp. g. 1·17), by passing Hydrogen Sulphide through four parts of Water containing one part of Iodine. The action is rather slow at first, but becomes more rapid as more Iodine is dissolved by the Hydriodic Acid formed, till the absorption becomes very rapid. When the solution is colourless, the excess of Hydrogen Sulphide may be boiled off and the liquid filtered from separated Sulphur.

The Acid, though colourless when first made, rapidly decomposes, even in diffused

light, with liberation of Iodine, bu may be readily decolourised by warming with a small proportion of Hypophosphorous Acid; 60 minims to 4 oz. is usually sufficient even for a highly coloured Acid.

Preparation.

SYRUPUS ACIDI HYDRIODICI.—Colourless Hydriodic Acid (20 p.c.), 3½ oz.; Distilled Water, 8 oz.; Simple Syrup, sufficient to make up the measure to 80 oz.

An acid syrupy liquid, colourless, or of a pale straw tint. Sp. gr. 1·300.

Contains 1 p.c. of absolute Hydriodic Acid, HI.

Dose.—20 to 40 minims, well diluted.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

ACIDUM HYDROBROMICUM DILUTUM.

DILUTED HYDROBROMIC ACID.

HBr, eq. 80·35.

An aqueous solution containing 10 p.c. by weight of Hydrogen Bromide. It may be obtained by the distillation of Potassium Bromide with concentrated Phosphoric Acid.

Medicinal Properties. — Sedative and hypnotic, but not so reliable as the Bromides, though producing less depression. When a large dose or continued use is indicated, the acid can be used to supplement or replace the Bromides. It is stated to be less likely to produce acne.

Dr. Fothergill stated that it prevents headache after taking Quinine or Iron, and may be given with Quinine (which it readily dissolves) for nervous exhaustion.

It is said to prevent the after-effects of Morphine if given with that drug.

Dose.—15 to 60 minims.

Prescribing Notes.—Larger doses may be given, 2 to 4 fluid drachms, well diluted with water, or syrup and water.

60 minims = 8⅔ grains of Potassium Bromide in the quantity of Bromine.

Foreign Pharmacopœias.—Official in Fr., Swiss and U.S. 10 p.c.; sp. gr. 1·077; Ger. has 25 p.c.; sp. gr. 1·208: not in the others.

Description.—A clear, colourless, inodorous liquid.

Most commercial samples become coloured on keeping.

Tests.—Sp. gr. 1·077. When neutralised it yields the reactions characteristic of Bromides. 4 grammes should require for neutralisation 5 (more exactly 4·98) c.c. of the Volumetric Solution of Sodium Hydroxide, or, for complete precipitation, 50 (more exactly 49·8) c.c. of the Volumetric Solution of Silver Nitrate. It should yield no characteristic reaction with the tests for Arsenium, Barium, Chlorides, Phosphates, Sulphates, or Sulphites. It should yield no residue on evaporation to dryness.

Acid of the gravity 1·250 seems the highest concentration to which really reliable acid can be raised, acids of higher gravity, although water-white when first sent out, rapidly change colour, and frequently contain silica.—*P.J.* '96, ii. 94.

The presence of Barium as an impurity (*C. D.* '96, i. 695); Sulphates in American Acid (*A.J.P.* '95, 13).

1 fl. oz. should form a clear solution with 27, but not with 29 grains of Magnesium Carbonate.—*Proctor.*

ACIDUM HYDROCHLORICUM.

HYDROCHLORIC ACID.

A liquid containing 31·79 p.c. by weight of Hydrogen Chloride (**HCl**, eq. 36·19), and 68·21 p.c. of water. Obtained by dissolving in water the gas produced by the interaction of Sulphuric Acid and Sodium Chloride.

Now contains 31·79 p.c. in place of 32 p.c.

Medicinal Properties.—A powerful escharotic. When diluted it is given internally, *see* Acidum Hydrochloricum Dilutum.

Incompatibles.—Salts of Silver and Lead, Tartar Emetic, Alkalis, and their Carbonates.

Official Preparations.—Acidum Hydrochloricum Dilutum. Used in the preparation of Acidum Nitro-hydrochloricum Dilutum, Apomorphinæ Hydrochloridum, Cocainæ Hydrochloridum, Glycerinum Pepsinæ, Liquor Arsenici Hydrochloricus, Liquor Ferri Perchloridi Fortis, Liquor Zinci Chloridi, and Podophylli Resina.

Antidotes.—In cases of poisoning by Hydrochloric Acid, the antidotes are Chalk, Magnesia, Potassium Bicarbonate, with White of Egg, Carron Oil, or Soap-suds, followed by Enemata of Beef Tea and Brandy, with Tincture of Opium to prevent collapse; and emollient drinks.

Foreign Pharmacopœias.—Official in Austr., 23·86 p.c., sp. gr. 1·120; Belg., Port., and Span., sp. gr. 1·180; Dutch, 25 p.c., sp. gr. 1·126; Fr., 34·4 p.c., sp. gr. 1·171; Dan., Jap. 30 p.c., sp. gr. 1·15; Mex. 1·17; Norw. 20 p.c., sp. gr. 1·127; Ger., Hung., Russ., Swed. and Swiss, 25 p.c., sp. gr. 1·124; Ital., 35·7 p.c., sp. gr. 1·18; U.S. 31·9 p.c., sp. gr. 1·163.

Description.—A colourless and strongly acid liquid, emitting white pungent fumes.

Tests.—Sp. gr. 1·160. It yields, when neutralised, the reactions characteristic of Chlorides. Each gramme, diluted with Water, should require for neutralisation 8·7 c.c. of the Volumetric Solution of Sodium Hydroxide, and 0·1 gramme should require, for complete precipitation, 8·7 c.c. of the Volumetric Solution of Silver Nitrate. It leaves no residue on evaporation, and when diluted with Water should yield no characteristic reaction with the tests for Arsenium, Lead, Copper, Iron, Aluminium, Bromides, Iodides, Sulphates, or Sulphites. Diluted with much Water and Solution of Potassium Iodide added, no blue colour is produced on the addition of Mucilage of Starch (absence of free Chlorine).

The Crude Acid made with Pyrites Vitriol is generally yellow, and contains considerable traces of Iron and Arsenic. Even the best Brimstone Vitriol does not yield an Acid perfectly free from Arsenic, so that for delicate testing, as in toxicological cases, a specially purified Acid must be used. If 100 parts of Hydrochloric Acid be distilled with Ferrous Chloride, the whole of the Arsenic will pass over in the first 30 parts of distillate, and the subsequent distillate will be Arsenic free.—*C.D.*, '84, 628.

Preparation.

ACIDUM HYDROCHLORICUM DILUTUM. DILUTED HYDROCHLORIC ACID.

Introduce into a glass flask (the capacity of which to a mark on the

neck is 20 fl. oz.) 6 fl. oz. or 3063 grains of Hydrochloric Acid and add Distilled Water until the mixture, after it has been shaken, measures 20 fl. oz. at 60° F. (15·5° C.); or by a similar method dilute 301·8 c.c. or 350·1 grammes of the Acid to 1000 c.c.

100 parts by weight should contain 10·58 parts of Hydrogen Chloride, **HCl**.

Medicinal Properties.—Stimulant, sialagogue, tonic, cholagogue. Externally and diluted it is refrigerant. Given after meals in dyspepsia, thus increasing the acidity of the gastric juice and thereby aiding digestion; given internally also to diminish night sweating; if given before meals it checks excessive secretion of acid and promotes appetite. As a gargle in ulcerated throat.

Dose.—5 to 20 minims.

Prescribing Notes.—Usually given with aromatic or bitter infusions; for children, 1½ to 2 minims; 1 drm. in 8 oz. of Infusion of Roses or Decoction of Cinchona as a gargle for ulcerated sore throat and thrush.

Official Preparations.—Used in the preparation of Extractum Ergotæ, Injectio Apomorphinæ Hypodermica, Liquor Morphinæ Hydrochloridi and Liquor Strychninæ Hydrochloridi.

Foreign Pharmacopœias.—Austr. and Dutch, 12·4 p.c., sp. gr. 1·062; Belg. sp. gr. 1·040; Dan., Hung., Norw., Swed., Swiss and U.S., 10 p.c., about sp. gr. 1·049; Jap. 10 p.c., sp. gr. 1·050; Norw. 10 p.c., sp. gr. 1·050—1·052; Ger, 12·5 p.c., sp. gr. 1·061; Ital., 7·3 p.c., sp. gr. 1·036; Russ., 8·2 p.c., sp. gr. 1·040; Mex., Acid 1, Water 3; not in the others.

Tests.—Sp. gr. 1·052. It yields, when neutralised, the reactions characteristic of Chlorides. Each gramme should require for neutralisation 2·9 c.c. of the Volumetric Solution of Sodium Hydroxide. It should be free from the impurities mentioned under Acidum Hydrochloricum.

Three and a third minims contain about 1 minim strong Acid.

ACIDUM HYDROCYANICUM DILUTUM.

DILUTED HYDROCYANIC ACID.

An aqueous solution containing 2 p.c. by weight of Hydrogen Cyanide, **HCN**, eq. 26·85. It may be prepared by the interaction of diluted Sulphuric Acid and Potassium Ferrocyanide. Diluted Hydrocyanic Acid should be stored in a dark place, in small stoppered bottles of amber-coloured glass, the stoppers being tied over with impervious tissue and the bottles inverted.

Medicinal Properties.—As this Acid is a dangerous poison, it should never be prescribed undiluted. Moreover a diluted solution retains its strength better than a strong one.

It is sedative, antispasmodic, allays vomiting, is useful in gastrodynia, in visceral neuralgias, in dyspeptic palpitations, but chiefly valuable in the dry resultless cough of asthma, phthisis and whooping cough, and prevents the vomiting brought on by food in phthisis. Used externally to allay itching in urticaria, lichen, etc., if the skin be unbroken; as a **lotion** 2 drm. to 8 oz. of Rose Water and

Glycerin; as an **ointment** from ½ drm. to 1 drm. to each oz. of Zinc Ointment.

The vapour is sometimes applied to the eye, but it is more generally used as a sedative inhalation in the cough of laryngeal phthisis and in some spasmodic affections.

Dose.—2 to 6 minims.

Prescribing Notes.—Given in Almond Emulsion for cough, and with Sodium Bicarbonate, Bismuth Carbonate, and Peppermint Water for dyspepsia.

Incompatibles.—Silver, Copper, and Iron salts, and Mercuric Oxide.

Official Preparations.—Used in the preparation of Tinctura Chloroformi et Morphinæ Composita.

Not Official.—Acidum Hydrocyanicum (*Scheele*).

Antidotes.—In cases of poisoning, the antidotes are fresh air and artificial respiration, with cold affusion; the recent precipitate obtained by swallowing 10 grains of Ferrous Sulphate, with a drm. of Tincture of Ferric Chloride in 1 oz. of Water, followed by 20 grains of Potassium Carbonate dissolved in 1 oz. of Water. This will render insoluble 110 minims of B.P. Acid. Stimulants Ammonia and Brandy; Hypodermic injection of Atropine, $\frac{1}{30}$ grain.

Foreign Pharmacopœias.—Official in Belg., 2·5 p.c.; Fr., Acide Cyanhydrique Dissous, 1 p.c.; Norw., 2 p.c.; Port., strength not given; Mex. Acido cianhidrico medicinal; U.S., 2 p.c.; Span., 10 p.c.; not in the others. *See also* Aqua Amygdalæ Amaræ.

Description.—A colourless liquid with a peculiar odour.

When only a small quantity is wanted occasionally, it may be convenient to prepare it extemporaneously from dry Silver Cyanide, as in U.S.P. Silver Cyanide, 6 parts; Diluted Hydrochloric Acid (B.P.), 15 fluid parts; Distilled Water, 45 parts. Shake for a short time and filter. The product should contain 2 p.c. HCN.

Tests.—Sp. gr. ·997. It only slightly reddens Litmus. It yields, when neutralised, the reactions characteristic of Cyanides. Each gramme of Diluted Hydrocyanic Acid, rendered alkaline by the addition of Solution of Sodium Hydroxide, and maintained faintly alkaline throughout the operation, should require the addition of 3·7 c.c. of the Volumetric Solution of Silver Nitrate before a permanent precipitate begins to form. 5 c.c. evaporated in a platinum dish should leave no residue. It should yield only the slightest reaction with the tests for Sulphates or Chlorides.

We understand that manufacturers purposely add a trace of Hydrochloric Acid to retard decomposition.

A very useful method for determining the strength of Diluted Hydrocyanic Acid is:—Place 10 c.c. of Solution of Ammonia B.P. in a beaker; add 40 c.c. of Water and ·2 gramme of Potassium Iodide and 5 c.c. of the acid to be tested; titrate with Volumetric Solution of Silver Nitrate, of which 18·7 c.c. will be required for a 2 p.c. acid. Presence of Hydrochloric Acid will not affect the results of this test, and the end reaction is very definite.

U.S.P. volumetric process of estimation with Magnesia, Potassium Chromate, and Silver Nitrate, reckons as Cyanide any Chloride which may be present.

Not Official.

ACIDUM HYDROCYANICUM (Scheele) *B.P.C.*—A colourless liquid. Sp. gr. ·994. It should contain 4 p.c. HCN, when estimated by volumetric solution of Silver Nitrate; should give no precipitate with Barium Chloride, but with Silver Nitrate a white precipitate entirely soluble in boiling concentrated Nitric Acid.

Dose.—1 to 4 minims.

The only practical use for a double strength acid is to poison dogs or cats.

Not Official.

ACIDUM HYDROFLUORICUM.

Medicinal Properties.—Inhalations have been tried in phthisis.—*L.* '86, ii. 1046; '88, i. 1224; '89, i. 496; *B.M.J.* '88, i. 758, 933.

Great caution must be used in handling this Acid, as contact with the liquid or gas may result in sores difficult to heal, or permanent destruction of tissue; no pain is felt until the injury is beyond remedy.

Description.—An aqueous solution of Hydrofluoric Acid Gas obtained by passing into Water the gas produced by the action of Sulphuric Acid on Fluor Spar.

The commercial acid thus obtained is redistilled for therapeutic use.

The redistilled acid contains about 30 p.c. of the gas; it is usually stored in gutta-percha bottles, owing to its action on glass.

Preparation of pure Hydrofluoric Acid for the analysis of Silicates, by A. H. Allen.—*A.* '96, 87.

In experiments made to determine the most suitable indicator for the titration of Hydrofluoric Acid, Phenol-phthalein answered well with Potash or Soda; Rosolic Acid was equally useful and had the additional advantage of being able to be used with Ammonia. Cochineal and Brazil Wood answered fairly well, but Methyl-orange was useless. With Litmus the colour change is somewhat complicated.—*P.J.* (3) xxv. 701.

Not Official.

ACIDUM HYPOPHOSPHOROSUM.

H_3PO_2, eq. 65.56.

Dissolve 8 oz. of Barium Hypophosphite (containing not less than 95 p.c. $Ba\,2(PH_2O_2)\,H_2O$) in 36 fluid ounces of hot distilled water. Add slowly to the solution 17 fluid oz. of Diluted Sulphuric Acid, after which continue the addition, drop by drop, until no further turbidity is produced. Set aside in a warm place, and pass the clear liquid through a filter. Wash the precipitate by decantation with successive portions of hot distilled water, until the washings have no longer an acid reaction. Filter, unite the filtrates, and evaporate the liquid in a water-bath to the prescribed density. The product will weigh about 11½ oz.

Sp. gr. 1·1367. Colourless. Its strength as determined by Volumetric Solution of Soda, corresponds to 30 p.c. of Hypophosphorous Acid. Its aqueous solution is not precipitated by Diluted Sulphuric Acid, nor by an excess of Ammonia, nor by Ammonium Oxalate after neutralisation, and gives not more than a faint opalescence with Barium Chloride. If Solution of Magnesium Ammonio-Sulphate be added after an excess of Ammonia, no precipitate is produced. Calcium Chloride added to a neutralised Solution yields no precipitate.

The above process, characters and tests are taken from B.P.C. The process is better than that previously given, viz., the treatment of Calcium Hypophosphite

with Oxalic Acid. But still a pure Hypophosphorous Acid is a commercial desideratum.

Tyrer compares the Barium and Calcium methods, and decides in favour of Barium.—*P.J.* '96, ii. 94.

Heated with excess of Solution of Mercuric Chloride and a little Hydrochloric Acid to 100° C. (212° F.), Calomel is precipitated, from the weight of which the percentage of Hypophosphorous Acid may be calculated.—*P.J.*, xvii. 773.

As the reaction follows the equation $H_3PO_2 + 4HgCl_2 + 2H_2O = H_3PO_4 + 4HgCl + 4HCl$, 100 parts of Calomel produced are equivalent to 7 parts of Anhydrous Acid.

Used in the manufacture of the Solution and Syrup of Hypophosphite of Iron, &c.

ACIDUM LACTICUM.

LACTIC ACID.

A liquid containing 75 p.c. of Hydrogen Lactate, $CH_3 \cdot CHOH \cdot COOH$ (eq. 89·37), with 25 p.c. of water. It may be produced by the fermentation of Lactose.

Solubility.—It is miscible in all proportions with Water, Alcohol (90 p.c.) and Ether. It dissolves, but is not dissolved by Chloroform.

Medicinal Properties.—It is used as a **spray** in diphtheria, 1 part to 16 parts of Water; in the more concentrated form it has been used by 'swabbing.' A solution (50 to 75 p.c.) has been used successfully for pharyngeal and laryngeal tubercle and for lupus after scraping.

50 p.c. solution applied to corneal ulcers.—*L.* '95, i. 1452.

Official Preparation.—Syrupus Calcii Lactophosphatis.

Foreign Pharmacopœias.—Official in Belg., Fr., Port., and Span., sp. gr. 1·215; Austr., Dan., Ger., Norw., Russ., and Swiss, sp. gr. 1·21—1·22; U.S. (75 p.c.) sp. gr. 1·213; Mex., sp. gr. 1·315; not in the others.

Description.—A colourless, syrupy, hygroscopic liquid, inodorous, with a very sour taste, and acid reaction on Litmus.

It titrates much better with Phenol-phthalein than with Litmus.

Tests.—Sp. gr. 1·21. When heated to above 300° F. (148·9° C.) it vaporises, and on the temperature approaching 350° F. (176·7 °C.) inflammable gases are given off; on ignition these burn with a flame which is blue at first, but becomes more luminous as the temperature rises. When nearly all the Acid is dissipated the residue becomes charred, and on continuing the heat not more than ·5 p.c. of solid matter remains. Warmed with Potassium Permanganate it gives the odour of Aldehyde. Each gramme should require for neutralisation 8·3 c.c. of the Volumetric Solution of Sodium Hydroxide. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Chlorides, Citrates, Oxalates, Phosphates, Sulphates, or Tartrates. The Acid when diluted with Water gives no precipitate with Solution of Copper Sulphate (absence of Sarcolactic Acid), and none, or only the slightest traces, with excess of Solution of Potassio-cupric Tartrate, even after prolonged boiling (absence of more than traces of Grape, Cane, and Milk Sugar).

The mixture obtained by heating Lactic Acid with excess of Zinc Carbonate and evaporating to dryness should not, when exhausted with Absolute Alcohol and the latter evaporated, yield any sweet residue (absence of Glycerin). Gently warmed, there should be no rancid odour (absence of fatty acids). Carefully poured upon an equal volume of Sulphuric Acid contained in a clean test-tube, little or no darkening in colour should take place (absence of organic impurities). No turbidity, either permanent or transient, should be produced when the acid is added drop by drop to twice its volume of Ether (absence of gum, Sugar, Mannite, Calcium Phosphate). It should give no precipitate with Solution of Lead Subacetate (absence of Malic and Sulphuric Acids).

Preparation.

SYRUPUS CALCII LACTOPHOSPHATIS.—Syrup of Calcium Lactophosphate. (New.)

Precipitated Calcium Carbonate, 2½ oz.; Concentrated Phosphoric Acid, 4 oz. and 262 minims; Lactic Acid, 6 fl. oz.; Refined Sugar, 70 oz.; Orange-flower Water of commerce, undiluted, 2½ fl. oz.; Distilled Water, a sufficient quantity. Add the Calcium Carbonate gradually to the Lactic Acid, diluted with four times its volume of Distilled Water. When solution is complete, add the Concentrated Phosphoric Acid, and triturate until the precipitate which at first forms is dissolved. Dilute with a little Distilled Water; add the undiluted Orange-flower water; filter; dissolve the Refined Sugar in the mixture without the aid of heat; strain; add sufficient Distilled Water to make 100 fl. oz. of the Syrup.

Dose.—30 to 60 minims.

This formula closely resembles that given in U.S.P. 1894.

Foreign Pharmacopœias.—Fr. Codex; contains 1·25 p.c. by weight of Bicalcic Phosphate. U.S.; contains about 2·5 grammes of Tricalcic Phosphate in 100 c.c. of the Syrup.

ACIDUM NITRICUM.

NITRIC ACID.

A liquid containing 70 p.c. by weight of Hydrogen Nitrate, HNO_3 (eq. 62·58), and 30 p.c. of Water, prepared by the interaction of Sulphuric Acid and Potassium or Sodium Nitrate.

Medicinal Properties.—It is strongly corrosive, and is applied as a caustic to warts, phagedænic sores and chancres, fissured anus and condylomata, by means of a pointed glass rod. When diluted it is refrigerant, a stomachic tonic and cholagogue, and if very much diluted forms a drink in febrile diseases, and is used also as an injection to dissolve phosphatic calculi when of small size.

Incompatibles.—Alcohol, Alkalis, Carbonates and Sulphurets, Ferrous Sulphate, Lead Acetate.

Official Preparations.—Acidum Nitricum Dilutum and Acidum Nitrohydrochloricum Dilutum. Used in the preparation of Acidum Phosphoricum Concentratum, Argenti Nitras, Liquor Ferri Perchloridi Fortis, Liquor Ferri Pernitratis, Liquor Ferri Persulphatis, Liquor Hydrargyri Nitratis Acidus, Spiritus Ætheris Nitrosi, Unguentum Hydrargyri Nitratis.

Antidotes.—In case of poisoning by Nitric Acid, the antidotes are Chalk, Magnesia, or Carbonated Alkalis, with White of Egg, Carron Oil, or Soap-suds, followed by Enemata of Beef Tea and Brandy with Tincture of Opium to prevent collapse; emollient drinks.

Foreign Pharmacopœias.—Official in Austr., sp. gr. 1·300; Belg., sp. gr. 1·330; Dan., Norw., and Swed., sp. gr. 1·180; Dan. also Acidum Nitrico-nitrosum, sp. gr. 1·48—1·50; Dutch and Jap., sp. gr. 1·317; Fr., sp. gr. 1·390; Ger. and Swiss, sp. gr. 1·153; Hung., sp. gr. 1·310; Ital., sp. gr. 1·400; Mex., sp. gr. 1·42; Port., sp. gr. 1·300—1·330; Russ., sp. gr. 1·200; Span., sp. gr. 1·321; Swiss, also Acidum Nitricum Fumans, sp. gr. 1·45—1·5; U.S., sp. gr. 1·414.

Description.—A clear, colourless liquid, emitting corrosive fumes.

5 measures of Anhydrous Acid, HNO_3, sp. gr. 1·500, and 2 of Water mixed, condense into $6\frac{1}{2}$ measures of the Hydrate $2HNO_3, 3H_2O$, sp. gr. 1·420.

Tests.—Sp. gr. 1·42. It yields, when neutralised, the reactions characteristic of Nitrates. The liquid boils constantly at 250° F. (121° C.). When distilled, the product continues uniform throughout the process. Each gramme diluted with Water should require for neutralisation 11·1 c.c. of the Volumetric Solution of Sodium Hydroxide. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Chlorides, Bromates, Iodates, Sulphates. It should yield no residue or not more than ·005 p.c. on evaporation to dryness.

A delicate and useful reaction for the detection and estimation of small quantities of Nitric Acid, applicable to Water analysis, is described *P.J.* (3) xxi. 1176.

Preparations.

ACIDUM NITRICUM DILUTUM. Diluted Nitric Acid.

Introduce into a glass flask (the capacity of which to a mark on the neck is 20 fl. oz.) 3 fl. oz. and 7 fl. drm. or 2400 grains of Nitric Acid and add Distilled Water until the mixture at 60° F. (15·5° C.) measures 20 fl. oz.; or by a similar method dilute 193·2 c.c. or 274·3 grammes of the Acid to 1000 c.c.

100 parts by weight should contain 17·44 parts of Hydrogen Nitrate, HNO_3.

Dose.—5 to 20 minims.

5 minims contain about 1 minim of strong Acid.

Prescribing Notes.—Usually diluted with Water or with bitter infusions and Tincture of Orange.

Foreign Pharmacopœias.—Official in Austr., sp. gr. 1·129; Belg. and Dutch, sp. gr. 1·12; Hung., sp. gr. 1·067; Ital. sp. gr. 1·077; Russ., sp. gr. 1·096; Swiss, sp. gr., 1·056; U.S. sp. gr., 1·057; Jap., 1·059; not in the others. Dan., Norw. and Swed., *see* Acidum Nitricum.

Test.—Sp. gr. 1·101. Each gramme should require for neutralisation 2·7 c.c. of the Volumetric Solution of Sodium Hydroxide.

ACIDUM NITRO-HYDROCHLORICUM DILUTUM. Diluted Nitro-Hydrochloric Acid.

An aqueous solution of free Chlorine, Hydrochloric, Nitric, and Nitrous Acids.

Nitric Acid, 3; Hydrochloric Acid, 4; Distilled Water, 25. Mix the Acids with the Distilled Water and keep the mixture in a glass-stoppered bottle for fourteen days before it is used.

Scarcely any action takes place between the diluted acids, free Chlorine and Nitrous Acid existing only in *traces*.

The strong acids mixed and diluted after three days, liberated about fifty times as much Iodine from Potassium Iodide as the B.P. preparation.

Medicinal Properties.—Cholagogue and gastric tonic. Externally as a **lotion** or **bath,** as well as by stomach administration for tropical enlargement and chronic congestion of the liver. Internally also in biliousness, in oxaluria, and in torpid conditions of stomach, intestinal glands and liver; and in catarrhal jaundice.

Is an hepatic stimulant of considerable power.—Dr. Rutherford.

Dose.—5 to 20 minims.

Prescribing Notes.—Usually diluted with Water and given with Tincture of Gentian or Tincture of Orange.

16 minims equal 1½ minim of Nitric Acid and 2 minims of Hydrochloric Acid.

Directions for Preparing and Using the Bath.

Mix 8 ounces by measure of Diluted Nitro-hydrochloric Acid with 1 gallon of Water, temperature 96° or 98° F. Let a flannel roller* of ten or twelve inches wide, and sufficient to encircle the body twice, be soaked in the fluid and then wrung, so as to remain only damp. Apply this instantly to the body, covering it with a piece of oiled silk to avoid damping the dress. It should be worn constantly, but should be changed, soaked, and wrung, morning and evening. Glass, glazed earthenware, or wooden vessels should be used. Sponges and towels to be kept in Water to prevent them corroding.

Incompatibles.—Alkalis, Carbonates, Sulphurets, salts of Silver and Lead.

Antidotes.—*See* Acidum Nitricum.

Foreign Pharmacopœias.—U.S., orders the undiluted—Nitric Acid, 18; Hydrochloric Acid, 82; also the diluted—Nitric Acid, 4; Hydrochloric Acid, 18; Water, 78.

Russ., and Swiss, Nitric Acid, 1; Hydrochloric Acid, 3. By weight.

Fr., Eau Regale—Nitric Acid, 8; Water, 2; Hydrochloric Acid, 30. By weight.

Dublin Pharmacopœia was—Nitric Acid, 1; Muriatic Acid, 2. (Not in the other Pharmacopœias.).

Description.—Colourless, with a pungent acid taste and odour.

Test.—Sp. gr. 1·07. 4 grammes should require for neutralisation about 10 c.c. of the Volumetric Solution of Sodium Hydroxide.

ACIDUM OLEICUM.

OLEIC ACID.

Oleic Acid, $CH_3(CH_2)_7CH:CH(CH_2)_7COOH$ (eq. 280·14), or Hydrogen Oleate, is obtained by the saponifying action of alkalis and subsequent action of acids, or by the action of superheated steam, upon the olein of fats. Usually not quite pure.

* These, with the oiled silk attached, can be had of the chemists ready-made.

Solubility.—Mixes in all proportions with Alcohol, Chloroform, Ether, Benzol, Oil of Turpentine, and fixed oils. Insoluble in Water.

Medicinal Properties.—Used in pharmacy for dissolving various metallic oxides and the alkaloids Morphine, Aconitine, Atropine, Cocaine, and Veratrine; the oleates thus formed are more readily absorbed than ointments made with fats, oils, or paraffins.

Official Preparation.—Hydrargyri Oleas. Used in the preparation of Unguentum Aconitinæ, Unguentum Atropinæ, Unguentum Cocainæ, and Unguentum Veratrinæ. Of **Mercuric Oleate**, Unguentum Hydrargyri Oleatis.

Foreign Pharmacopœias.—Official in Mex. (Acido Oleico); U.S., sp. gr. ·900. Not in the others.

Description.—Oleic Acid is a straw-coloured liquid, occasionally with a faintly rancid smell, and with not more than a slight acid reaction. It becomes brown and more acid when exposed to the air.

Tests.—Sp. gr. ·890—·910. At 40° to 41° F. (4·5° to 5° C.), it becomes semi-solid, melting again at 56° to 60° F. (13·3° to 15·5° C.). Dissolve about 1 gramme of the Acid in fifteen to twenty times its volume of Alcohol (90 p.c.); add two drops of Solution of Phenol-phthalein and, drop by drop, a 25 p.c. aqueous solution of Sodium Hydroxide until the liquid, after shaking, remains slightly red and the acid is completely neutralised; then drop in Diluted Acetic Acid until, after shaking, the red tint just disappears; filter the liquid, and mix about 10 c.c. of it with an equal volume of Purified Ether and 1 c.c. of a 10 p.c. aqueous solution of Lead Acetate; only a slight turbidity should result (absence of more than traces of Stearic or Palmitic Acid).

A typical sample recently examined became semi-solid at 45° to 47° F. and melted again to a bright clear fluid at 53° F.

The U.S.P. test for fixed oils (equal volumes of Acid and Alcohol) will not detect an admixture wth 20 p.c. of Olive Oil.

Not Official.

ACIDUM OSMICUM.

OSMIC ACID.

OsO_4.

Prepared by the oxidation of Osmium.

Solubility.—Readily dissolves in Water. Should not be dissolved in Alcohol or Ether, as decomposition ensues.

Medicinal Properties.—4 to 6 minims of a 1 p.c. **aqueous solution** of Osmic Acid or Potassium Osmate have been injected hypodermically for sciatica and other forms of neuralgia.—*L.M.R.* '85, 414.

Chiefly used as 1 p.c. **aqueous solution** for fixing and staining in histological work. Fat and nerve substances are blackened by it. The solution should be carefully preserved from dust, as it is readily reduced (blackened) by small quantities of organic matter.

Description.—A pale yellow crystalline substance giving off an excessively irritating vapour, which attacks the eyes and nostrils.

Not Official.

ACIDUM OXALICUM.

$H_2C_2O_4$, $2H_2O$, eq. 125·10.

This is noticed here rather as a poison than a medicine, although it has been used medicinally in America in the treatment of amenorrhœa, and as a sedative in acute cystitis (*T.G.* '91, 164) in ½ grain doses every four hours. It is used in households for cleaning brass, and removing ink-stains, iron-moulds, &c. It has been mistaken for Epsom Salts, which it somewhat resembles. Murrell states that death has occurred from two drachms, but recovery from half an ounce.

Antidotes.—Chalk, Lime, or Whitening are given freely in Water. Saccharated Solution of Lime may be given in drm. doses frequently repeated; also emollient and stimulant drinks.

ACIDUM PHOSPHORICUM CONCENTRATUM.

CONCENTRATED PHOSPHORIC ACID.

A liquid containing 66·3 p.c. of Hydrogen Orthophosphate, H_3PO_4, eq. 97·32, with 33·7 p.c. of Water. It may be prepared by treating, with Water and Nitric Acid, the residue left after burning Phosphorus in air.

Medicinal Properties.—Only given internally in the diluted form. *See* Acidum Phosphoricum Dilutum. This concentrated acid is used in making phosphatic preparations.

Official Preparations.—Acidum Phosphoricum Dilutum. Used in the preparation of Acidum Hydrobromicum Dilutum, Ammonii Phosphas, Syrupus Calcii Lactophosphatis, Syrupus Ferri Phosphatis, and Syrupus Ferri Phosphatis cum Quinina et Strychnina.

Foreign Pharmacopœias.—Official in Austr., sp. gr. 1·094 (16·66 p.c.); Belg., Fr. and Ital., sp. gr. 1·35 (50 p.c.); Dutch, sp. gr. 1·153 (25 p.c.); Ger. and Russ., sp. gr. 1·154 (25 p.c.); Jap., Hung., sp. gr. 1·120 (20 p.c.); Mex., 1·34; Port., sp. gr. 1·880; Span., sp. gr. 1·454; U.S., sp. gr. not below 1·710 (85 p.c.); not in the others.

Description.—A colourless syrupy liquid, with an acid taste and reaction.

It is convenient to remember that one part by volume of B.P. Acid is practically equal to one part by weight of H_3PO_4.

The strongest commercial Acid has a sp. gr. 1·75, but it may be concentrated to 1·85 without formation of Metaphosphoric or Pyrophosphoric Acids; from Acid of the latter strength, crystals of pure Phosphoric Acid H_3PO_4 may readily be obtained.—*P.J.* (3) xii. 371.

Tests.—Sp. gr. 1·5. Evaporated, it leaves a residue which melts at a low red heat, and when cold forms a glass-like mass. The Acid yields, when neutralised, the reactions characteristic of Phosphates. Each gramme of it mixed with 2·5 grammes of Lead Oxide in fine powder should leave on evaporation a residue which, after it has been

heated to dull redness, weighs 2·98 grammes. It should yield, when diluted with Water, no characteristic reaction with the tests for Lead, Copper, Arsenium, Calcium, Potassium, Sodium, Ammonium, Chlorides, Nitrates, and only slight traces of Iron or Sulphates. Diluted with five or six times its bulk of Water, it is not precipitated by Solution of Albumen (absence of Metaphosphoric Acid), nor on adding Tincture of Ferric Chloride and setting the mixture aside for several hours (absence of Metaphosphoric and Pyrophosphoric Acids). Diluted with Water and the mixture set aside, no precipitate occurs (absence of Silica). Diluted and mixed with an equal volume of Test-solution of Mercuric Chloride and heated, no precipitate is formed (absence of Phosphorous Acid).

The percentage acidity of Phosphoric Acid is conveniently determined by titration with standard alkali, using Phenol-phthalein as an indicator; the change of colour takes place when two-thirds of the Hydrogen is replaced by Alkali-metal. With Methyl-orange as the indicator, neutrality is reached with half this quantity of Alkali. With Litmus the end reaction is too indefinite.

When made alkaline with Ammonia it should not give (even after long standing) a crystalline precipitate of Ammonio-Magnesium Phosphate (indicating absence of Magnesium, which is present to a considerable extent in some commercial samples).

Preparation.

ACIDUM PHOSPHORICUM DILUTUM. Diluted Phosphoric Acid.

Dilute 3 fl. oz. (or 4·5 oz. by weight) of Concentrated Phosphoric Acid with sufficient Distilled Water to form at 60° F. (15·5° C.) 20 fl. oz. of Diluted Phosphoric Acid; or dilute 150 c.c. or 225 grammes of the Concentrated Acid to form 1000 c.c.

Medicinal Properties.—Tonic and refrigerant, hæmatinic and anhidrotic; diuretic in the phosphatic diathesis. Given with Calcium Phosphate in rickets. Quenches the craving for fluids in diabetes.

Used as a partial substitute for organic acids in cooling drinks and acidulated waters.

Dose.—5 to 20 minims.

Prescribing Notes.—Usually largely diluted with Water and given with some bitter and aromatic tinctures and syrups: should not be mixed with the Syrup of Pyrophosphate of Iron as the mixture becomes solid.

Incompatibles.—Lime Water, and all alkalis.

Foreign Pharmacopœias.—Official in Dan., Norw., Port., and Swed., sp. gr. 1·080 (14 p.c.); Norw., sp. gr. 1·080 (13·8 p.c.); Russ., (12·5 p.c.); Jap., Mex., Swiss and U.S., sp. gr. 1·057 (10 p.c.); not in the others.

Description.—A colourless liquid containing by weight, 13·8 parts of Hydrogen Orthophosphate, H_3PO_4, and 86·2 parts of Water.

Tests.—Sp. gr. 1·08. It should respond to the qualitative tests given under 'Acidum Phosphoricum Concentratum.'

Each gramme of it mixed with ·5 gramme of Lead Oxide in fine powder should leave on evaporation a residue which after it has been heated to dull redness weighs ·6 gramme.

Not Official.

ACIDUM PHOSPHORICUM GLACIALE.

METAPHOSPHORIC ACID.

HPO_3, eq. 79·44.

Colourless, transparent, glass-like masses, which absorb moisture from the air, and become liquid; the solution is slowly converted into Orthophosphoric Acid in the cold, and rapidly on boiling. It is soluble in Water and the solution coagulates albumen and gives a white precipitate with a salt of Barium.

Commercial Acid contains large quantities of Ammonia, equal in some cases to 40 p.c. of Ammonium Phosphate. Re-investigated (*P.J.* (3) xxii. 217), with the result that no commercial sample could be found which did not contain such quantities of alkali (Ammonia, Soda, or both) that even the best sample did not contain more than half its weight of free Metaphosphoric Acid HPO_3. It is an obsolete preparation and of no use pharmaceutically.

(Not in the other Pharmacopœias.)

Not Official.

ACIDUM PICRICUM.

$HOC_6H_2(NO_2)_3$, eq. 227·44.

PICRIC ACID. CARBAZOTIC ACID. TRINITROPHENOL.

Prepared by the action of hot Nitric Acid on Phenol-sulphonic Acid.

The excise have imposed restrictions as to its sale and storage.

Solubility.—1 in 75 of Water; 1 in 10 of Alcohol (90 p.c.).

Medicinal Properties.—A solution of Picric Acid has been recommended as an application to scalds and burns, and also in acute eczema.

Foreign Pharmacopœias.—Official in Fr. and Mex.; not in the others.

Description.—Pale yellow crystalline scales.

With Ammonia, Potash and Soda it forms crystallisable salts which are explosive.

Solution of Picric Acid.—90 grains of Picric Acid dissolved in 3 oz. of Alcohol (90 p.c.) and then diluted with 40 oz. of Distilled Water; applied by means of absorbent cotton or gauze to burns and scalds.—*B.M.J.* '96, ii. 651 and 1826. A local application in acute eczema associated with burning.—*B.M.J.* '96, ii. 1826; '97. i. 331 and 457.

A saturated aqueous Solution is a delicate test for the presence of Albumen in fluids; even in very dilute Solutions a white cloud is formed at the junction of the two liquids, and in stronger solutions the Albumen is precipitated. Used in histological work.

Not Official.

ACIDUM PYROGALLICUM.

PYROGALLIC ACID. PYROGALLOL.

$C_6H_3(OH)_3$, eq. 125·1.

Usually prepared by heating Gallic Acid to 185°—200° C.

Solubility.—1 in 2 of Water, and measures 2½; 9 in 10 of Alcohol (90 p.c.).

Medicinal Properties.—Escharotic, antiseptic, and disinfectant. Its use requires care.

Used in the form of a 10 p.c. **salve**, and applied with a brush twice a day, it proved very useful in Hebra's wards in the treatment of psoriasis. The parts were then covered with cotton wadding or linen, and when very extensive were covered with flannel.—*Pr.* xxv. 377.

Not more than 15 to 25 grains should be used in the 24 hours, as violent toxic symptoms may result from its absorption.—*T.G.* '85, 59.

An **ointment**, Pyrogallic Acid, 40; Starch, 40; Vaseline, 120; also a **powder**, Pyrogallic Acid 20, Starch 80, have been used for venereal ulcers.—*L.M.R.* '82, 228; '84, 68.

Mixed with Collodium Flexile, 40 grains to the ounce for psoriasis.—*T.G.* '86, 181.

Largely used in photography. It has also been used for blackening the hair. 1 in 16 of Water is used with a solution of Silver Nitrate (1 in 30 of Water).

To remove stains of Pyrogallic Acid rub a little Ammonium Persulphate on the fingers and rinse with water.—*P.J.* '98, i. 504a.

Foreign Pharmacopœias.—Official in Austr., Dutch, Fr., Hung., Mex., Russ. and Swiss; not in the others.

Description.—White flaky crystals, which blacken by exposure to light.

Tests.—It colours Ferrous salts an intense blue, and Ferric salts a brownish red; with alkalis it becomes brown very quickly on exposure to air.

Preparations.

UNGUENTUM ACIDI PYROGALLICI (*B.S.H.*), Jarisch's Ointment.—Pyrogallic Acid, 60 grains; Lard, 1 oz.: mix.

UNNA'S PYROGALLIC PLASTER MULL.—Contains 40 p.c. of the Acid, equal to ½ grain in each square inch of surface.

Not Official.

ACIDUM PYROLIGNEOSUM CRUDUM.

A brown liquid having an odour of Tar and Acetic Acid, and containing about 6 p.c. of the latter. Deposits a tarry substance on standing for some time.

Medicinal Properties.—A good antiseptic.

Foreign Pharmacopœias.—Official in Dan., Ger. and Russ.; not in the others.

ACIDUM SALICYLICUM.

SALICYLIC ACID.

$C_6H_4 \cdot OH \cdot COOH$, eq. 137·01.

A crystalline acid obtained from natural Salicylates such as the Oils of Wintergreen (*Gaultheria procumbens*) and sweet birch (*Betula lenta*), or by the interaction of Sodium Carbolate and Carbonic Anhydride.

Solubility.—About 1 in 550 of Water; 1 in 9 of boiling Water; 1 in 3½ of Alcohol (90 p.c.); 1 in 2 of Ether; 1 in 55 of Chloroform; 1 in 120 of Olive Oil; 1 in 195 of Glycerin; 1 in 8 of Lard (at 180° F). 20 grains Salicylic Acid are rendered soluble in a fluid ounce of Water by the addition of 25 grains of Borax, or 40 grains of Potassium Citrate; but it is better to use Sodium Salicylate.

Medicinal Properties.—Antiseptic and powerfully antipyretic; specific in acute rheumatism, but generally given in the form of

Sodium Salicylate, as this salt is more soluble in water and less irritating to the stomach; also given in combination with Bismuth and with Lithium.

A good **preservative** of medicated solutions, such as Cocaine salts and Boric Acid, otherwise liable to fungoid growths; 1 in 1000 is sufficient for the purpose, but in the eye, causes temporary smarting.

Used as a **lotion** (4 p.c.) in pruritus and urticaria, and some forms of eczema; as an **injection** (1 in 300) in the dysenteric diarrhœa of children; as an **ointment** (1 in 6) for pruritus (*Ringer*). With Zinc Oxide and Starch it is used as a **'dusting powder'** for infants.

In **collodion** form it is very useful when applied to hard and soft corns.

The collodion is recommended in lupus.—*Pr.* lii. '96; *T.G.* '94.

The injection of Salicylic Acid in case of uterine cancer, recommended as a palliative method when the disease is too far advanced to admit of surgical extirpation.—*P.J.* (3) xxv. 1219.

Dose.—5 to 20 grains.

Incompatibles.—Spirit of Nitrous Ether, Iron salts.

Official Preparations.—Sodii Salicylas, Unguentum Acidi Salicylici. Used in the preparation of Injectio Cocainæ Hypodermica, Liquor Atropinæ Sulphatis, and Salol. *See also* Bismuthi Salicylas.

Not Official.—Collodium Salicylicum, Salicylic dressings, Glycerinum Acidi Salicylici, Pulvis Salicylicus cum Talco, Salicylic and Creosote Plaster Mulls, Salicylic Acid Suet, Unguentum Acidi Salicylici, Salacetol, Agathin, and Salitannal.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.

Description.—Distinct, prismatic, colourless crystals. Taste at first sweetish, then acid, leaving a burning sensation in the throat.

Prepared by passing Carbonic Acid Gas into a mixture of Carbolic Acid and Sodium Hydroxide at a high temperature, and decomposing the Sodium Salicylate with a mineral Acid, and subsequent purification; or by treating Oil of Winter Green (*Gaultheria procumbens*), which is mainly composed of Methyl Salicylate, also Oil of Sweet Birch (*Betula lenta*) and *Andromeda leschenaultii* (a native of India), with a solution of Potassium Hydroxide, and distilling it, decomposing the residue with Hydrochloric Acid, and purifying the Salicylic Acid by recrystallisation.

Salicylic Acid may be sublimed, but there is almost certain to be some slight decomposition with liberation of Phenol.

Tests.—The crystals melt at 312·8°—314·6° F. (156°—157° C.), and below 392° F. (200° C.) volatilise without decomposition. Test-solution of Ferric Chloride gives with the aqueous solution a violet colour, or, if the solution be largely diluted, a reddish-violet colour. Shaken up with a small proportion of Water, the mixture filtered, and the solution evaporated, there remains a white residue, having no buff-tinted fringe (absence of Iron, organic impurities, and colouring matter). Salicylic Acid dissolves in cold Sulphuric Acid, imparting to the liquid no colour in 15 minutes (absence of organic impurities). When 1 gramme of the Acid is dissolved in an excess of cold Solution of Sodium Carbonate,

the liquid agitated with an equal volume of Ether, and the ethereal solution allowed to evaporate spontaneously, the residue, if any, should be free from the odour of Phenol (absence of Phenol). Dissolves in Solutions of Ammonium Citrate, Ammonium Acetate, Sodium Phosphate, and in solution of Borax, also in solutions of alkaline Hydroxides and Carbonates, Salicylates being produced; such solutions of Salicylates, if not weaker than 1 p.c., afford a yellowish-brown precipitate with Solution of Uranium Nitrate (distinction from Carbolates and Sulphocarbolates).

Artificial Salicylic Acid is liable to two forms of impurity: (1) Isomers of Salicylic Acid, from overheating during the process of manufacture: (2) Homologues of Salicylic Acid (Cresotates) from the presence of Cresol in the Phenol from which it is made. The latter series alone need be taken into account.

(*a*) There are three Isomeric Cresols—Ortho, Para, and Meta—giving rise to corresponding Acids—Ortho, Para, and Meta-cresotic (or Cresotinic as they are sometimes called) Acids. These much resemble Salicylic Acid but vary principally in their melting-point and physiological action. Their presence also in Salicylic Acid modifies its properties in a greater degree than might be expected from numerical proportion.

(*b*) Formerly when Salicylic Acid was very impure, the foreign elements were principally Ortho- and Meta-cresotic Acids. Now the only likely impurity is a small quantity of the Para-cresotic Acid.

(*c*) When this impurity is present in fairly large quantity (say 5 p.c.), it is found impossible to produce fine large crystals, but 2 p.c. of the impurity does not materially interfere with crystallisation.

The most definite test is the melting point. Pure Salicylic Acid melts sharply at 156·85° C., and Para-cresotic Acid at 151° C.; but even small percentages of the latter materially reduce the melting point of the Salicylic Acid. It also reduces the *sharpness* of the m. p., causing it to soften at a lower temperature than is required to actually liquefy it.

(*d*) By fractional precipitation of the Sodium salt by Silver Nitrate and regeneration of the Acid by decomposing the precipitated Silver Salicylate with Hydrochloric Acid, the impurities are all concentrated in the last precipitated portion, so that it is possible in this way to detect very small quantities.

(*e*) One can now obtain commercially an Acid **physiologically pure**, even the last fraction of which has a melting point of 156·85° C.; commercial **crystals** with m. p. of 156·5° to 156·75° C., containing about $\frac{1}{20}$ p.c. impurity, the last 10 p.c. giving a m. p. $\frac{1}{2}$° C. below the maximum; commercial **powder** with an initial melting point of 156·4° C. rising to 156·75° containing about $\frac{1}{10}$ p.c. impurity, the last 10 p.c. giving a m. p. 1° C. below the maximum.

(*f*) **Meta-cresotic Acid** is practically devoid of physiological action.

Ortho-cresotic Acid is unquestionably poisonous.

Para-cresotic Acid. To this considerable doubt still attaches. Several German physicians, and also one or two in this country, have given large doses of Sodium Para-cresotate with success in many diseases and find it less poisonous than Salicylic Acid itself.

Dr. Charteris, of Glasgow (whose experiments started the question), found that, when injected into the circulation of rabbits, the lethal dose per kilo of body weight was very much less than that of Salicylic Acid, and markedly so when given in combination with the latter; hence the importance of its absence from Salicylic Acid intended for internal use.

The **natural acid** is preferable to the artificial for internal use.—*B.M.J.* '81, ii. 934; '86, i. 735; '89, ii. 1208. Although this was no doubt true at the dates then given, it is now very open to question whether the same statement will apply to an artificial Acid, which when fractionated has the melting point above attached to the 'physiologically pure acid.'

Preparations.

UNGUENTUM ACIDI SALICYLICI. Salicylic Acid Ointment. (Altered.)

Salicylic Acid, in powder, 10; Paraffin Ointment, white, 490. Mix. =(1 in 50).

Now 1 in 50 instead of 1 in 28, and White Paraffin Ointment used in place of Hard and Soft Paraffin.

Foreign Pharmacopœias.—Official in Mex. (Pomada de Acido Salicilico), Acid 1, Alcohol 2, Vaseline 9; not in the others.

SODIUM SALICYLATE.—*See* SODII SALICYLAS.

Not Official.

COLLODIUM SALICYLICUM.—Salicylic Acid, 30; Extract of Indian Hemp, 5; Flexible Collodion, 240: dissolve.

SALICYLIC DRESSINGS.—**Gauze, Lint,** and **Wool,** 4 p.c.; **Jute,** 4 and 10 p.c.

GLYCERINUM ACIDI SALICYLICI (Salicylic Cream) (*G.H.*).—Salicylic Acid 1 part, Glycerin 1 part. Also called Pasta Acidi Salicylici (*L.H.*).

PULVIS SALICYLICUS CUM TALCO, Ger. and Russ.—Salicylic Acid, 3; Wheat Starch, 10; Talc, 87: mix to a fine powder. Used in the German Army as a preventive against perspiring and sore feet. It is applied dry, on a march daily, or in garrison every two or three days. U.S.N.F. substitutes Boric Acid in the place of Wheat Starch.

(Same as Dan., Pulvis Salicylicus Compositus.)

SALICYLIC AND CREOSOTE PLASTER MULLS (Unna).—Contain ½ grain of Salicylic Acid and 1 grain of Creosote to the square inch; also twice this strength. Possess a solvent power on horny epidermis, the Creosote acting as an anæsthetic. Also used in the treatment of lupus.—*L.* '86, ii. 574; *B.M.J.* '87, ii. 451.

Salicylic Acid and Creosote can also be applied as an **ointment** with Lard and Wax.

SALICYLIC ACID SUET.—Salicylic Acid, 2; Mutton Suet, 100: used in the German Army for sweaty feet and soreness from riding.—*B.M.J.* '85, ii. 219.

UNGUENTUM ACIDI SALICYLICI (*B.S.H.*).—Salicylic Acid, 30 grains; Benzoated Lard, 1 oz.; melt over a water-bath and stir till cold.

Used for eczema, psoriasis, ringworm, and for foul ulcers.

SALACETOL.—Is obtained by the action of Monochloro-acetone on Sodium Salicylate. Crystallises in long needles, melting at 71° C., insoluble in Water, sparingly soluble in Alcohol. It is unaffected by dilute acids, but decomposed by weak alkali with liberation of Salicylic Acid. Introduced as an intestinal disinfectant resembling Salol in its action.—*B.M.J.E.* '96, i. 92; *L.* '96, ii. 1821.

Dose.—15 to 30 grains for adults, 4 to 8 grains for children.

AGATHIN.—A compound of Salicylic Aldehyde with Methylphenylhydrazine. Pale greenish crystals, insoluble in Water, soluble in Alcohol (90 p.c.) and Ether. Has been recommended as an analgesic in sciatica, rheumatic and neuralgic affections.—*M.A.* '95, 8, 603; *Y.B.T.* '94, 463; unreliable and dangerous.—*B.M.J.* '98, ii. 1055.

Dose.—5 to 10 grains.

SALITANNAL.—A condensation product from Salicylic Acid and Gallic Acid. Introduced as an antiseptic application for wounds.

ACIDUM SULPHURICUM.

SULPHURIC ACID.

An acid produced by the combustion of Sulphur or Pyrites and the oxidation and hydration of the resulting Sulphurous Anhydride by means of nitrous and aqueous vapours. It should contain about 98 p.c. by weight of Hydrogen Sulphate, H_2SO_4, eq. 97·34.

Medicinal Properties.—A powerful **caustic**, and when so used it is made into a paste with an equal quantity of charcoal; when **diluted** it is tonic, refrigerant, exciting the appetite and promoting digestion; it is a valuable intestinal astringent; given with very doubtful success in hæmatemesis, hæmaturia and hæmoptysis; it is useful in controlling diarrhœa; it diminishes night sweating, more particularly when given with Zinc Sulphate; useful in treating chronic lead poisoning.

Incompatibles.—Alkalis and their Carbonates, salts of Calcium and Lead.

Official Preparations.—Acidum Sulphuricum Aromaticum, and Acidum Sulphuricum Dilutum. Used in the preparation of Acidum Hydrochloricum, Acidum Nitricum, Acidum Sulphurosum, Æther, Æther Aceticus, Cupri Sulphas, Ferri Sulphas, Liquor Ferri Persulphatis, Magnesii Sulphas, Potassii Sulphas, Sodii Sulphas, Sodii Sulphocarbolas, Spiritus Ætheris Compositus, Spiritus Ætheris Nitrosi, Zinci Sulphas and Zinci Sulphocarbolas. **Aromatic Sulphuric Acid** is contained in Infusum Cinchonæ Acidum. **Dilute Sulphuric Acid** is contained in Infusum Rosæ Acidum. Used in the preparation of Acidum Hydrocyanicum Dilutum, Antimonium Sulphuratum and Atropinæ Sulphas.

Not Official.—Mynsicht's Elixir of Vitriol, and Liquor Acidus Halleri.

Antidotes.—In case of poisoning by Sulphuric Acid, Magnesia is preferred to Chalk. For other antidotes *see* Hydrochloric and Nitric Acids.

Foreign Pharmacopœias.—Official in all the Pharmacopœias, ranging from sp. gr. 1·835 to 1·845.

Description.—A colourless, corrosive, intensely acid liquid of oily consistence, evolving much heat on the addition of Water.

Sulphuric Acid exists in two other states: a solid crystalline form, resembling Asbestos, and Nordhausen Acid, a fuming liquid, both of which are used in the arts; the latter has also been employed in the treatment of cancer.

Tests.—Sp. gr. 1·843. It yields, when neutralised, the reactions characteristic of Sulphates. Each gramme diluted with 20 or 30 c.c. of Water should require for neutralisation 20·1 c.c. of the Volumetric Solution of Sodium Hydroxide. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Ammonium, Chlorides, Nitrates, Nitrites, or Sulphites. It should yield no appreciable residue on evaporation. Hydrochloric Acid containing Sodium Sulphite, when poured carefully upon an equal volume of Sulphuric Acid contained in a test-tube, should not cause a red colouration at the junction of the two liquids, and no red precipitate should form on warming the tube (absence of Selenium).

How should 'Hydrochloric Acid containing *Sodium Sulphite*' be prepared?

Preparations.

ACIDUM SULPHURICUM AROMATICUM. Aromatic Sulphuric Acid. *B.P. Syn.*—Elixir of Vitriol. (Modified.)

Sulphuric Acid, 3; Alcohol (90 p.c.), 29½; Tincture of Ginger, 10; Spirit of Cinnamon, ½; mix the Sulphuric Acid gradually with the Alcohol; add the Spirit of Cinnamon and Tincture of Ginger.

By the metric system the quantities are Sulphuric Acid, 75 c.c. or 138·2 grammes; Alcohol (90 p.c.), 737·5 c.c.; Spirit of Cinnamon, 12·5 c.c.; Tincture of Ginger, 250 c.c.

Now made with Alcohol (90 p.c.) instead of Rectified Spirit and the form modified generally, but the resulting product is nearly the same as before.

Dose.—5 to 20 minims.

Foreign Pharmacopœias.—Jap. (Tinctura Acida Aromatica).—Cort. Cinnamoni 5, Rad. Zingib. 5, Acidi Sulfurici 10, Spiritus Diluti 90; Mex. (Acido Sulfurico Aromatico).—Sulphuric Acid 10, Tincture of Ginger 5, Tincture of Cinnamon 5, Alcohol 80; U.S. (Acidum Sulphuricum Aromaticum).—Sulphuric Acid, 100; Tincture of Ginger, 50; Oil of Cinnamon, 1; Alcohol sufficient to measure 1000: add the Sulphuric Acid gradually and with great caution to 700 of Alcohol and allow it to cool, then add to it the Tincture of Ginger and Oil of Cinnamon, and finally enough Alcohol to make the product measure 1000.

See also below Liquor Acidus Halleri.

Tests.—Sp. gr. ·922—·926. The neutralising power of 100 grammes should be equivalent to that of 13·8 grammes of Hydrogen Sulphate, H_2SO_4.

ACIDUM SULPHURICUM DILUTUM. Diluted Sulphuric Acid.

Dilute, as follows, 1 fl. oz. and 5¼ fl. drm., more exactly 1·65 fl. oz. or 1333 grains, of Sulphuric Acid to 20 fl. oz.; half fill with Distilled Water a glass flask, the capacity of which to a mark on the neck is 20 fl. oz.; then introduce the Sulphuric Acid, and add very gradually Distilled Water until the mixture, after it has been shaken and cooled to 60° F. (15·5° C.), measures 20 fl. oz.

By the metric system the quantities are Sulphuric Acid 82·7 c.c., or 152·4 grammes, diluted with Distilled Water to make 1000 c.c.

100 parts by weight should contain 13·65 parts of Hydrogen Sulphate, H_2SO_4.

As great heat is developed in mixing strong Sulphuric Acid and Water, it is always safer to add the Acid to the Water than the Water to the Acid. With Acid 1, Water 1, the temperature rises to 270° F.

12 minims contain 1 minim of strong Sulphuric Acid.

Dose.—5 to 20 minims.

Prescribing Notes.—Prescribed much diluted, in mixtures; or in cough linctuses, with Squill, Poppies, and Syrup of Mulberries; also to dissolve Quinine.

Foreign Pharmacopœias.—Official in Austr., Acid 1, Water 4·76, sp. gr. 1·12; Ital., Acid 1, Water 4, sp. gr. 1·134; Belg., Dutch, Ger. and Russ., Acid 1, Water 5, sp. gr. 1·110—1·117; Dan., Norw., and Swed., Acid 1, Water 7, sp. gr. 1·081—1·085; Fr., Hung. and Port., Acid 1, Water 9; Span., Acid 1, Water 8; Swiss and U.S., 10 p.c., sp. gr. about 1·070; all by weight.

Test.—Sp. gr. 1·094. Each gramme should require for neutralisation 2·8 c.c. of the Volumetric Solution of Sodium Hydroxide.

Not Official.

LIQUOR ACIDUS HALLERI.—*Syn.* ACIDUM SULPHURICUM ALCOHOLISATUM, MISTURA SULPHURICA ACIDA, AQUA RABELI.

Austr., Belg., Ger., Hung., Mex., Port., Russ., Span. and Swiss.—Sulphuric Acid, 1; Alcohol (90 p. c.), 3.

Fr.—Sulphuric Acid, 1; Alcohol (90 p. c.), 3; Poppy Petals, ·04.

Dan., Dutch, Ital., Norw. and Swed.—Sulphuric Acid, 1; Alcohol, 1.

All by weight.

MYNSICHT'S ELIXIR OF VITRIOL.—Cinnamon, Ginger, and Cloves, of each 3; Calamus Aromaticus, 8; Galangal, 12; Sage, 4; Peppermint, 4; Cubebs, 2; Nutmeg, 2; Aloes Wood, 1; Lemon Peel, 1; Sugar Candy, 32; Alcohol (90 p.c)., by weight, 144; Sulphuric Acid, by weight, 96. Digest for three weeks.

Dose.—5 to 10 minims.

ACIDUM SULPHUROSUM.

SULPHUROUS ACID.

An aqueous solution containing 6·4 p.c. of Hydrogen Sulphite, H_2SO_3 (eq. 81·46), corresponding to 5 p.c. by weight of Sulphurous Anhydride, SO_2 (eq. 63·58). The Sulphurous Anhydride may be prepared by burning Sulphur in air or Oxygen, or by boiling Sulphuric Acid with Carbon, Mercury, or Copper.

Medicinal Properties.—It is a powerful deoxidizing agent, disinfectant and antiseptic; in 1 drm. doses, freely diluted, it is valuable in vomiting depending on fermentation in the stomach; and as an intestinal antiseptic in enteric fever. Diluted with 1 or 2 parts of Water it is used as a **spray** in diphtheria and ulcerated sore-throat; mixed with equal parts of Glycerin, as an **application** in erysipelas, ringworm and other parasitic skin diseases; also for chapped hands and chilblains; when mixed with equal parts of Glycerin is very effectual in chapped nipples; as a **lotion**, 1 or 2 drm. to 1 oz. of Water, for wounds, cuts, ulcers, and bed-sores; as an **inhalation** in nasal catarrh and influenza, 60 minims in 20 oz. of Water at 60° to 100° F.

Pfeiffer found that ·5 to 1 p.c. aqueous solution caused excessive and extensive gastritis. Even 20 minims largely diluted caused irritation of the digestive organs (*A.J.P.* '90, 626); Brunton, however, strongly recommends 1 drm. doses thoroughly diluted, in gastric fermentation.

Dose.—½ to 1 drm.

Foreign Pharmacopœias.—Official in Port., Soluto de Gaz Sulfuroso; U.S. sp. gr. not less than 1·035 (6·4 p.c.); not in the others.

Description.—A colourless liquid with a pungent sulphurous odour.

The percentage of SO_2 in any solution of the gas corresponds almost exactly with the decimal figures in the sp. gr. divided by 5.—*P.J.* (3) xvi. 211.

Liquid Sulphurous Acid, equal to 500 times its volume of gas, is now readily obtainable in glass syphons with tap to regulate outflow of gas; one pound of the liquefied gas is equal to 5½ cubic feet of SO_2, which dissolved in Water equals 2 gallons of the B.P. 5 p.c. solution.

Tests.—Sp. gr. 1·025. It yields, when neutralised, the reactions

characteristic of Sulphites. It gives but a slight precipitate with Solution of Barium Chloride (absence of excess of Sulphates), but a copious precipitate if Solution of Chlorine also be added. When evaporated it leaves no residue. Mixed with 100 times its volume of recently boiled and cooled Water, and a little Mucilage of Starch, it should not acquire a permanent blue colour with the Volumetric Solution of Iodine until, for each gramme of the acid, 15·7 c.c. of the Volumetric Solution of Iodine have been added.

More correct titration is obtained by adding the Sulphurous Acid to a measured excess of Iodine Solution and titrating back with standard Solution of Sodium Thiosulphate.—*Sutton.*

Sulphurous Acid may be expected to contain heavy traces of Sulphuric Acid.—*P.J.* (3) xix. 497.

30 minims of the Acid shaken with ½ fl. oz. of Tincture of Iodine should be about colourless.—*Proctor.*

For the Sodium salt *see* SODII SULPHIS.

ACIDUM TANNICUM.

TANNIC ACID.

B.P.Syn.—TANNIN.

$C_{14}H_{10}O_9$, $2H_2O$, eq. 355·42.

It may be extracted by water-saturated Ether from Galls which have been subjected to a special fermentation.

Solubility.—10 in 5 of Water; 10 in 6 of Alcohol (90 p.c.); 3 in 1 of Absolute Alcohol; 1 in 3 of Glycerin, or if warmed, 1 in 1; sparingly in Olive Oil; almost insoluble in Benzol and Chloroform.

These solubilities were made with Tannic Acid which was very soluble, but different samples vary in solubility.

Commercial Tannic Acid frequently contains some proportion of Gallic Acid, which when dissolving in Water is the last portion to go into solution.

For the solubility of Tannic Acid in Ether *see P.J.* (3) xx. 351.

Medicinal Properties.—Styptic and local astringent. 60 grains in 10 oz. of Rose Water is used as a **spray** for relaxed sore-throat; the same strength is also used as an **injection** in leucorrhœa and in chronic gonorrhœa with advantage; 3 grains to the ounce is used as a **nasal douche**; 40 grains to the ounce as an **ointment**; the powder has been used as a **snuff** in epistaxis. Internally for gastric and intestinal hæmorrhage, acting as a direct styptic. A dose of 1 drm. is often successful in hæmorrhage from gastric ulcer. For **suppositories** and **pessaries** *see* pp. 51-52. The **glycerin** is used as a **paint** in relaxed throat, and for nasal discharges; also locally as a styptic.

30 to 60 grains daily given successfully in fifty cases of acute tuberculosis.—*L.* '86, ii. 1003.

As an injection into nasal polypi.—*L.* '87, i. 543.

Warm Tannin **enemata** were given with success in the cholera at Naples.—*L.* '85, i. 352.

Does not affect the secretion of the bile.—Dr. Rutherford.

Dose.—2 to 5 grains.

Prescribing Notes.—Prescribed in Water, and may be combined with the Ferrous (but not with the Ferric) salts of Iron. Can be given in **cachets** or Compressed Tablets. 4 grains with ½ minim of Glycerin make a nice **pill**. 60 grains to 1 oz. of Chalk with 30 grains of Powdered Soap makes an astringent **dentifrice**.

Incompatibles.—Mineral Acids, Alkalis, salts of Antimony, Lead, and Silver, Ferric salts, the vegetable alkaloids, and Gelatin.

Official Preparations.—Glycerinum Acidi Tannici, Suppositoria Acidi Tannici, and Trochiscus Acidi Tannici.

Not Official.—Suppositoria Acidi Tannici c. Opio, Pessary or Vaginal Suppository, Schuster's Pastilles, Crayons de Tannin (Fr.), Unguentum Acidi Tannici c. Opio, Tannic Wool, Tannalbin, Tannigen, Tannoform, and Tannone.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss, and U.S.

Description.—A light brownish powder consisting of thin glistening scales, with a characteristic odour, a strongly astringent taste, and an acid reaction. It is precipitated from its aqueous solution and loses its astringency in the presence of many mineral salts and acids.

Tests.—The Aqueous Solution precipitates Solutions of Isinglass, Albumen, alkaloids, and Tartarated Antimony, and gives with Test-solution of Ferric Chloride a bluish-black colour. It should leave no appreciable residue when incinerated with free access of air.

For the detection of Gallic Acid, the red colour produced by Potassium Cyanide is the best reaction.

Preparations.

GLYCERINUM ACIDI TANNICI. Glycerin of Tannic Acid. (Altered.)

Tannic Acid, 1; Glycerin, sufficient to produce 5. Triturate the Tannic Acid with the Glycerin until solution is effected. =(1 in 5).

Now 1 in 5 instead of 1 in 4½.

Foreign Pharmacopœias.—Official in Dutch, 1 and 5; Port., 1 and 9; U.S., 1 and 4; Belg., Fr., and Mex., 1 and 5 of Glycerin of Starch; not in the others.

SUPPOSITORIA ACIDI TANNICI. Tannic Acid Suppositories.

Tannic Acid, 36 grains; Oil of Theobroma, a sufficient quantity to form with the Tannic Acid a mixture which will fill twelve suitable moulds, each capable of holding 15 to 16 grains of Oil of Theobroma. Melt the Oil of Theobroma; triturate the Tannic Acid intimately with a little of the Oil, and add to the remainder; stir well; as the mixture begins to thicken pour it into the moulds; or let the mixture cool and then divide it into 12 equal parts of a conical or other convenient form for a suppository.

Each suppository will contain 3 grains of Tannic Acid.

TROCHISCUS ACIDI TANNICI. Tannic Acid Lozenge. (Altered.)

Each lozenge contains half a grain of Tannic Acid, and is made with the Fruit Basis.

Now made with Fruit Basis.

Dose.—Not given in B.P.; 1 to 6 lozenges.

Foreign Pharmacopœias.—Official in Jap. ¾ grain each, U.S. about 1 grain each.

Not Official.

SUPPOSITORIUM ACIDI TANNICI C. OPIO.—Tannic Acid, 3 grains; Powdered Opium, 1 grain; Stearin, or Oil of Theobroma, 11 grains: mix.

PESSARY OR VAGINAL SUPPOSITORY.—Tannic Acid, 10 grains; Stearin sufficient to make 2 drm. For one pessary; used in leucorrhœa.

SCHUSTER'S PASTILLES.—Tannic Acid, 30 grains; Opium, 1 grain; Glycerin, q.s. to form suitable cylinders for the male urethra.

CRAYONS DE TANNIN (Fr.).—Tannin, 20; Gum Acacia, 1 (both in powder): mix and make into a mass of pilular consistence by means of equal parts Glycerin and Water, then roll into cylinders of the size required.

UNGUENTUM ACIDI TANNICI C. OPIO, (*B.S.H.*).—Tannic Acid, 30 grains; Powdered Opium, 30 grains; Lard, 1 oz.

TANNIC WOOL.—Dissolve 2 of Tannic Acid in 60 of Water, and with it thoroughly moisten 3 of Absorbent Cotton Wool, press so as to remove 30 of the fluid, then dry the wool in a warm chamber. When dry remove any discoloured portion. This is sold as **Wool for cigarettes.**

TANNALBIN.—A combination of Tannic Acid with albumin, which by a special treatment has been so altered that it is insoluble in the gastric juice, ordinary Albumin Tannate being readily soluble. It has been introduced as an intestinal astringent. A light brown tasteless powder, insoluble in water. Adult Dose.—15 grains given at intervals of one or two hours.

TANNIGEN (Di-acetyl Tannin).—A greyish-white tasteless powder. Practically insoluble in water, but readily in alkaline solutions. Recommended in diarrhœa, principally of children, but also in that of adults. It passes through the stomach unchanged, but on entering the alkaline intestinal tract it breaks up and acts as an astringent. Dose.—1 to 3 grains for children, and 5 to 10 grains for adults. Small doses can be mixed with an equal quantity of Milk Sugar, and larger doses for adults can be taken in **cachets.**

TANNOFORM.—A light powder, greyish-yellow in colour, having neither taste nor smell. A product of Tannic Acid and Formic Aldehyde. It is claimed to possess the astringent effects of Tannin with the antiseptic and drying properties of Formaldehyde. Used as an application in skin diseases either alone or mixed with Starch, or diluted 1 to 4 with French chalk for a dusting powder.

TANNONE.—A condensation product of Tannic Acid and Urotropine. A light brown tasteless powder, almost insoluble in water and weak acids, and dissolves slowly in weak alkalis. Adult Dose.—15 grains.

ACIDUM TARTARICUM.

TARTARIC ACID.

Tartaric Acid, or Dextro-rotatory Hydrogen Tartrate, $C_4H_6O_6$, eq. 148·92, prepared from Acid Potassium Tartrate. In constitution it may be regarded as Dioxysuccinic Acid, or Dihydroxysuccinic Acid,

$$\begin{array}{l} CH\cdot OH\cdot COOH \\ | \\ CH\cdot OH\cdot COOH. \end{array}$$

Solubility.—10 in 8 of Water; 1 in $2\frac{1}{2}$ of Alcohol (90 p.c.); 1 in $4\frac{1}{2}$

of Glycerin; 1 in 40 of Ether; 1 in 5 of Absolute Alcohol; nearly insoluble in Benzol and Chloroform.

Medicinal Properties.—The same as Citric Acid, for which it was formerly substituted in saline mixtures.

Dose.—5 to 20 grains.

Incompatibles.—Salts of Potassium, Calcium, Mercury, and Lead, Alkaline Carbonates, and the vegetable astringents.

Official Preparations.—Used in the preparation of Pulvis Sodæ Tartaratæ Effervescens, Sodii Citro-Tartras Effervescens, and the other granular effervescing preparations.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed., Swiss, and U.S.

Description.—In colourless, monoclinic prisms. It has a strongly acid taste, and is readily soluble in less than its own weight of Water and in less than three times its weight of Alcohol (90 p.c.).

Tests.—Neutralised, it affords the reactions characteristic of Tartrates. An aqueous solution rotates the plane of a ray of polarised light to the right. Each gramme of Tartaric Acid dissolved in Water should require for neutralisation 13·3 c.c. of the Volumetric Solution of Sodium Hydroxide. It should yield no characteristic reaction with the tests for Copper, Arsenium, Iron, Potassium, Sodium, or Oxalates, only the slightest reactions with the tests for Calcium or Sulphates, and no reaction for Lead by the test described under 'Acidum Citricum.' On incineration with free access of air, it should not yield more than ·05 p.c. of Ash.

The remarks on the reaction for Lead given under 'Citric Acid' are equally applicable to Tartaric Acid, and, further, if the test be conducted on a quantity of 10 grammes as directed in the B.P., crystallisation will take place before the point of neutrality is reached, but disappears as soon as excess of Ammonia is added.

Tartaric Acid may also be distinguished from Citric Acid and detected in the latter: (1) By its power of decolorising a weak Solution of Potassium Chromate, upon which Citric Acid has no action (Alcohol and other reducing agents must be absent); (2) By Pusch's test (*P.J.* (3) xv. 693), with Sulphuric Acid at 212° F., which easily detects 1 p.c. of Tartaric Acid in Citric Acid.

The Resorcin-Sulphuric test (*C D.* '91, i. 6), is also a delicate test for Tartaric Acid, but in presence of a large proportion of Citric Acid, the red colour is rather obscured, and in that case it offers no advantage over Pusch's test.

25 grains of Tartaric Acid in 1 oz. hot Water dissolves 16 but not 17 grains of Magnesium Carbonate.—*Proctor.*

Not Official.

ACONITI FOLIA.

ACONITE LEAVES.

The fresh leaves and flowering tops of *Aconitum Napellus*, gathered when about one-third of the flowers are expanded, from plants cultivated in Britain.

This plant and the Extract from the fresh herb were formerly official, but are now omitted.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Mex., Norw., Port., Russ., Span., and Swiss; not in the others.

ACONITI RADIX.

ACONITE ROOT.

The root of *Aconitum Napellus*, collected in the autumn from plants cultivated in Britain, and dried.

Medicinal Properties.—Anodyne, antiphlogistic, antipyretic, diaphoretic and diuretic. Externally it relieves the pain of acute and chronic rheumatism, facial neuralgia, and of itching, as in erythema. Given internally it lessens the frequency and tension of the pulse, relieves pain and high temperature, and is thus useful in all acute local inflammations (not advanced), such as those of pneumonia, eruptive fevers, erysipelas, tonsillitis, peritonitis, and painful neuralgic affections; contra-indicated when valvular disease of heart is present.

Antidotes.—In case of poisoning by Aconite, use emetics, Apomorphine $\frac{1}{10}$ grain, alcoholic stimulants; Atropine or Belladonna, Digitalis, Amyl Nitrite.

Atropine is antagonistic to the action of Aconitine on the heart.—*L.* '81, i. 74.

Official Preparations.—Linimentum Aconiti and Tinctura Aconiti. Used in the preparation of Aconitina.

Not Official.—Extractum Aconiti Radicis Alcoholicum, Chloroformum Aconiti, Linimentum Aconiti Compositum and Trochisci Aconiti.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr., Ger., Hung., Ital., Mex., Port., Russ., Span., Swed., Swiss and U.S.; not in the others. Austr., Ger., Hung., Swed. and U.S. use the root *only*.

Description.—Aconite Root varies usually from two to four inches (five to ten centimetres) in length, and from one-half to three-quarters of an inch (twelve to eighteen millimetres) in diameter at the upper extremity, gradually tapering below. Dark brown in colour, marked with the scars and bases of broken rootlets and crowned with the remains of an undeveloped bud. Fracture short. Internally the Root is whitish and starchy. It should not be hollow or spongy, and should not retain any portions of the stem. The transverse section exhibits a thick parenchymatous cortex and a large stellate pith with about seven projecting angles; the groups of vessels are small and few in number, the parenchymatous tissue is largely developed. No marked odour, taste at first slight, followed by a persistent sensation of tingling and numbness in the mouth.

This description excludes Japanese and German roots, and confines the drug to properly matured roots.

The root is annual, and is in perfection in the autumn. It deteriorates during the development of the stem and flowers in the spring and summer; but coincident with this another root forms which arrives at maturity in the following autumn.—*P.J.* (3), xix. 645.

Preparations.

LINIMENTUM ACONITI. Liniment of Aconite. (Modified.)

Aconite Root, in No. 40 powder, 20; Camphor, 1; Alcohol (90 p.c.) a sufficient quantity. Mix the powdered Aconite Root with 20 of the Alcohol; set aside in a closed vessel for three days, agitating occasionally; transfer to a percolator, when the liquid ceases to pass, continue the percolation with more of the Alcohol, allowing the liquid

to drop into a receiver containing the Camphor until 30 of the Liniment are produced. =(1 in 1½).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

It was not the intention of Peter Squire who introduced this preparation that the whole of the alkaloids should necessarily be extracted, but rather that a very strong liniment should be made, and this object is somewhat frustrated by the dilution in 1885 of the 1864 and 1867 Liniment.

Applied with a camel's-hair pencil, alone, or mixed in equal proportions with Soap Liniment or Ammoniated Camphor Liniment, and rubbed on the part (but not upon an abraded surface), relieves acute neuralgia.

Foreign Pharmacopœias.—U.S. **fluid extract**, 1 in 1; not in the others.

TINCTURA ACONITI. TINCTURE OF ACONITE. (ALTERED.)

Aconite Root, in No. 40 powder, 2; Alcohol (70 p.c.) a sufficient quantity. Moisten the powder with 1 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 40. =(1 in 20).

Alcohol (70 p.c.) now used in place of Rectified Spirit as recommended in *P.J.* (3) xxi. 1037.

Dose.—5 to 15 minims; if very frequently repeated, 2 to 5 minims.

This preparation is made with two-fifths the proportion of Aconite Root ordered for the Tincture of Aconite of the British Pharmacopœia of 1885.

P.G. maximum single dose (·5 gramme); maximum daily dose (2 grammes); of the Tincture, 1 in 10.

It is better given in small doses and very frequently, ½ to 1 minim every ten minutes or quarter of an hour for two hours, then hourly.—*Ringer.*

Five minims given every three or four hours, increasing the dose to 20 minims, succeeded in curing a case of neuralgia in the face, when every other remedy tried had failed.

Foreign Pharmacopœias.—Official in Austr. and Swiss, 1 **Root** in 10 Spirit; Mex. and Hung., 1 **Root** and 5; Belg., 1 dried **Leaves** and 5; Belg. and Swiss, also 1 fresh **Herb** and 1; Norw., 1 dried **Herb** and 10; Fr., 1 dried **Leaves** and 5; Alcoolature 1 fresh **Leaves** and 1; also 1 fresh **Root** and 1; Ger. and Ital., 1 **Root** and 10; Port., 1 dried **Leaves** and 5; also 1 **Root** and 5; and 1 fresh **Leaves** and 1; Russ., 1 **Root** and 12; Span., 1 fresh **Leaves** and 1; also the same with Spirit of Ether; all by weight. U.S. **Root**, 35; Alcohol to measure 100.

Dr. Fleming's Tincture of Aconite was made the same strength as the present Liniment, 1 in 1½, but without the Camphor.

Not Official.

EXTRACTUM ACONITI RADICIS ALCOHOLICUM.—Aconite Root in powder, percolated with Alcohol (90 p.c.) and the product evaporated to a pilular consistence.

Dose.—⅙ to ½ grain.

Ger. maximum single dose, ⅓ grain; maximum daily dose, 1½ grains.

Foreign Pharmacopœias.—Official in Austr., Hung. and Russ., use 70 p.c. Alcohol; Fr., Ital., and Mex., 60 p.c. Alcohol; Swed., 65 p.c. Alcohol; Swiss; U.S., 94 p.c. Alcohol.

CHLOROFORMUM ACONITI.—Powdered Root, 20; Chloroform to percolate, 20. Painted on with a camel's-hair brush, relieves neuralgia in almost every form.

LINIMENTUM ACONITI COMPOSITUM.—Chloroform of Aconite 1, Liniment of Aconite 7, sprinkled on impermeable piline and applied for neuralgia.

TROCHISCI ACONITI (*T.H.*).—Each lozenge contains $\frac{1}{2}$ a minim Tincture of Aconite. Dose, one lozenge every half-hour or hour in tonsillitis and febrile affections of the throat.

ACONITINA.

ACONITINE.

An Alkaloid obtained from Aconite Root, and having the formula $C_{33}H_{45}NO_{12}$, eq. 642·53.

Cash and Dunstan find that the extraordinary toxic power of Aconitine is mainly dependent on the presence of the Acetyl radical in the molecule; but they add 'that neither the composition nor constitution of Aconitine can yet be regarded as settled.'—*Proc. Royal Soc.* ('98), lxii. 338; *B.M.J.* '98, ii. 1041.

Solubility.—1 in 35 of Alcohol (90 p.c.); 1 in 45 of Ether; 1 in 1 of Chloroform. Almost insoluble in Water.

Medicinal Properties.—It relieves acute nervous pain when rubbed on the part in the form of **ointment**, producing a tingling sensation, followed by numbness. Care must be taken that it does not come in contact with a mucous surface, such as the conjunctiva, or with abraded skin.

It has been applied with marked benefit in trigeminal neuralgia, and to relieve the pain of *acute* rheumatism and gout.

Dose.—Not given in B.P. As a pure crystalline Aconitine would probably be fatal to an adult in a dose of 3 milligrammes ($\frac{1}{20}$ grain), the maximum dose should not exceed $\frac{1}{10}$ milligramme ($\frac{1}{200}$ grain) pro dosi, or $\frac{3}{10}$ milligramme ($\frac{1}{150}$ grain) per diem, and the commencing dose should be smaller.

Solutions of the alkaloid are prone to decomposition; aqueous or alcoholic solutions should therefore be slightly acidified with **Hydrochloric Acid**, or crystallised **Aconitine Nitrate** should be used.—*P.J.* (3) xvi. 802.

Official Preparation.—Unguentum Aconitinæ.

Not Official.—Oleatum Aconitinæ.

Foreign Pharmacopœias.—Official in Fr., Duquesnel process; Span., similar; Mex.; all are crystalline products; Belg.; Hung. specifies 'German Aconitine'; Port., indefinite, must obviously contain Aconines.

Description.—Colourless hexagonal prisms of the rhombic system.

Tests.—Melting point 372·2° to 374° F. (189° to 190° C.). Slightly above this temperature it yields Acetic Acid. An Alcoholic solution of the alkaloid turns the plane of a ray of polarised light to the right. A drop of even an extremely dilute solution (not more than one-tenth p.c.) when placed on the tongue produces a persistent tingling sensation. The salts of Aconitine are crystalline. The Hydrochloride melts at 300·2° F. (149° C.) and the Hydrobromide at 327·2° F. (164° C.). A dilute solution of the alkaloid, even 1 part in 4000 parts of Water, faintly acidulated with Acetic Acid, deposits a red crystalline precipitate on the addition of a few drops of Solution of Potassium Permanganate.

Pseudaconitine.—A highly toxic crystalline alkaloid obtained from Aconitum ferox, only slightly soluble in Water, but readily in Alcohol and Chloroform, less readily in Ether. Dunstan gives m. p. as 201° C.—*J.C.S. Trans.* '97, 353.

It can be distinguished from Aconitine by the beautiful purple red colour produced on adding a solution of Potassium Hydroxide in Absolute Alcohol to the yellow residue obtained by evaporating a small quantity of the alkaloid with a few drops of fuming Nitric Acid. It can also be recognised by other tests dependent upon the formation of Veratric Acid derivatives—which Aconitine does not yield.

Preparation.

UNGUENTUM ACONITINÆ. ACONITINE OINTMENT. (ALTERED.)

Aconitine, 10; Oleic Acid (by weight), 80; Lard, 410. Rub the Aconitine with the Oleic Acid, and gently warm the mixture until dissolved; add the Lard; mix. =(1 in 50).

Now 1 in 50 instead of 1 in 60, Oleic Acid and Lard used in place of Rectified Spirit and Benzoated Lard.

Foreign Pharmacopœias.—Official in Span., Pomada de Aconitina—Aconitine 1, Olive Oil 2, Lard 40; not in the others.

Not Official.

OLEATUM ACONITINÆ.—Aconitine, 2 grains; Oleic Acid, 98 grains: dissolve.

Dr. Shoemaker states that this has a slight local action, and it can be used in mild cases of neuralgia.—*B.M.J.* '84, ii. 750.

ACTÆA RACEMOSA.

See CIMICIFUGÆ RHIZOMA.

ADEPS.

LARD.

The purified fat of the Hog, *Sus scrofa*.

Solubility.—1 in 22 of Ether and 1 in 16 of Oil of Turpentine.

Medicinal Properties.—Emollient. Added to poultices to prevent them drying and sticking to the skin.

Official Preparation.—Adeps Benzoatus. Used in the preparation of Emplastrum Cantharidis, Pilula Phosphori, and the following Ointments:—Aconitine, Atropine, Cocaine, Iodine, Mercury, Mercuric Nitrate, Resin, and Veratrine.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., (Axonge), Ger., Hung., Ital. (Grasso Suino), Jap. (Adeps Suillus), Norw. (Axungia), Mex. (Manteca de Cerdo), Port. (Banha), Russ., Span. (Grasa de Cerdo), Swed., Swiss and U.S.

O.M.P.—From the perfectly fresh fat of the abdomen of the hog remove as much of the external membranes as possible; suspend the fat so that it shall be freely exposed to the air for some hours; cut it into small pieces, reduce these to a uniform mass, in which the membranous vesicles are completely broken, by beating in a mortar or by some similar process; put the mass thus produced into a vessel surrounded by warm water; heat to a temperature not exceeding

135° F. (57·2° C.), until the fat has melted and separated from the membranous matter; strain.

Process slightly altered.

Description.—A soft, white, fatty substance, fusing at about 100° F. (37·8° C.), and forming a clear liquid at a somewhat higher temperature.

It is apt to grow rancid by keeping, and mouldy if it contains water.

Rancidity is the result of oxidation, which takes place rapidly in strong daylight, and but slowly or not at all in the dark.

Melting Point is given in B.P. at about 100° F. (37·8° C.); we found that a sample began to melt at 95° F. (35° C.), but was not clear below 117° F. (47·2° C). Dieterich gave it as 36° to 38° C. (*C.D.* '87, i. 770); and 43° to 44° C. (*C.D.* '89, i. 575).

Tests.—Has no rancid odour; is neutral to Litmus; dissolves entirely in Ether. It should yield no reaction with the tests for Sodium, Chlorides, or Starch. If a solution of ·05 gramme of Silver Nitrate in 5 c.c. of Alcohol (90 p.c.), to which a drop of Nitric Acid has been added, be heated with 5 c.c. of melted Lard on a water-bath for 5 minutes and then vigorously shaken, the fatty layer which separates on standing should not darken in colour (absence of Cotton-seed Oil). 10 grammes of Lard dissolved in a mixture of equal volumes of Chloroform and Alcohol (90 p.c.), two drops of Solution of Phenol-phthalein being added, should not require more than ·2 c.c. of the Volumetric Solution of Sodium Hydroxide to produce a permanent red colour (limit of acidity).

If free from Water it will dissolve bright in Chloroform and with a very slight turbidity in Carbon Bisulphide.

With regard to the Silver test for Cotton Seed Oil, it is preferably performed on the fatty acids and not on the Lard direct.

E. J. Bevan points out (*Analyst*, '94, 88) that Becchi's Silver test is not sufficient to prove the presence of Cotton Seed Oil as an adulterant. Lard which has been exposed to the air will give the same reaction. He informs us that he has recently been using a new process, which has the very great advantage of giving no reaction with Lard that has been exposed to the air. It consists in heating 3 c.c. of the Lard in a salt bath for about half-an-hour with 1 c.c. of Amylic Alcohol and 1 c.c. of a 1 p.c. solution of Sulphur in Carbon Bisulphide. Even 1 p.c. of Cotton Seed Oil gives a decided pink reaction.

Preparation.

ADEPS BENZOATUS. Benzoated Lard. (Altered)

Prepared Lard, 16 oz.; Benzoin, in powder, 210 grains. Melt the Lard on a Water-bath; add the Benzoin; continue the application of heat for two hours, frequently stirring; remove the residue of the Benzoin by straining; stir the Benzoated Lard until cold.

The quantity of Benzoin has been increased 50 p.c.

The use of Lard deprived of a portion of its oil by pressure (Indurated Lard) is permitted in India and the Colonies. *See* 'Appendix.'

Balsam of Tolu and Storax have also been recommended. Ph. Ger. orders 1 p.c. of Benzoic Acid.

The proportion of Siam Benzoin soluble in Lard is exceedingly variable; we have seen samples yielding as low as 20 p.c. and as high as 88 p.c. of residue.

It has been suggested to use the following liquid in the preparation of Benzoated Lard:—Benzoin, 20 grammes; Ether, 40 c.c.; Castor Oil, a sufficient quantity to make 15 grammes. Macerate the Benzoin in the Ether for twelve hours; filter with proper precautions to avoid loss of solvent; dissolve the Castor Oil in the filtrate, and distil off the Ether carefully.—*A.J.P.* '98, 9.

Benzoated Lard is irritating and should not be used for **eye ointments.**

Official Preparations.—Used for making the following Ointments:—Belladonna, Cantharides, Chrysarobin, Galls, Mercuric Iodide, Mercuric Oleate, Mercurous Chloride, Potassium Iodide, Stavesacre, Sulphur, Sulphur Iodide, and Zinc.

Foreign Pharmacopœias.—Official in Dan., Ital. (Grasso con Benzoino), Norw., Russ., Swed., Swiss and U.S., Benzoin 2, Lard 100; Mex. (Pomeda Benzoada), Tincture of Benzoin 5, Lard 100; Span., 3 and 100; Austr. and Belg., 4 and 100; Fr., 5 Tincture in 1000; Ger., 1 Acid. Benz. in 100; not in the others.

Not Official.

UNNA'S SALVE MULLS.—The bases of these are hog's lard and beef suet (singly or combined), with which are incorporated various medicaments, and spread on muslin. —*L.M.R.* '81, 452.

ADEPS LANÆ.

WOOL FAT.

The purified cholesterin-fat of sheep's wool.

Solubility.—Readily soluble in Chloroform and Ether, but only partially so in Alcohol (90 p.c.). Will incorporate its own weight of Water.

Medicinal Properties.—Emollient; is very readily absorbed by the skin, and thus promotes the action of remedies combined with it.

Official Preparation.—Adeps Lanæ Hydrosus.

Description.—A yellowish, tenacious, unctuous substance; almost inodorous.

Tests.—Melting point varies from 104° to 112° F. (40° to 44·4° C.); 1 gramme should dissolve almost completely in 75 c.c. of boiling Alcohol (90 p.c.), the greater part separating in flocks on cooling. When incinerated with free access of air, it leaves not more than ·3 p.c. of Ash, which should not be alkaline to Litmus. 10 grammes dissolved in 25 c.c. of Ether, two drops of Solution of Phenol-phthalein being added, should not require more than ·1 c.c. of Volumetric Solution of Sodium Hydroxide to produce a permanent red coloration (limit of acidity). The solution in Chloroform poured gently over the surface of Sulphuric Acid acquires a purple-red colour. Heated with Solution of Sodium Hydroxide, no ammoniacal odour should be evolved (absence of Nitrogenous animal matter).

Helbing's saponification test is effected by heating 5 grammes of the sample in a strong stoppered bottle to 100° C. for two hours with 20 c.c. of 10 p.c. Alcoholic Potash; diluting to a litre, and titrating the uncombined alkali with standard Acid and Phenol-phthalein.

A thoroughly purified Wool Fat will combine with about 8½ per cent. of KOH; Glycerin Fats give much higher figures (Lard 20 p.c.; Olive Oil 18 p.c.; Cocoa Nut Fat 26 p.c.), while Petroleum bases being unsaponifiable do not consume any.

Preparation.

ADEPS LANÆ HYDROSUS. HYDROUS WOOL FAT.

Wool Fat, 7; Distilled Water, 3; place the Wool Fat in a warm mortar; add the Distilled Water gradually and with constant trituration.

Medicinal Properties.—Used as a basis for ointments. It does not become rancid. Mixes with about half its weight of water. It is better for ointments when mixed with an equal weight of Soft Paraffin.

Official Preparations.—Used in the preparation of Unguentum Conii, and Unguentum Hamamelidis.

Foreign Pharmacopœias.—Official in Austr., Dan., and Norw., Lanolinum; Ital. and Mex., Lanolina; Russ. and Swiss, Adeps Lanæ; U.S.; not in the others.

Description.—Yellowish white; free from rancid odour. When heated, it separates into an upper oily and a lower aqueous layer.

Test.—10 grammes heated on a water-bath, with stirring, until the weight is constant, should yield not less than 7 grammes of residue, which should answer to the tests for Wool Fat.

An approximate estimation may be made by dissolving 10 grammes of the sample in 10 c.c. of Chloroform and measuring the separated Water.

The maximum proportion of Water which can be incorporated with Anhydrous Wool Fat is 1¼ times its weight.

Not Official.

ADONIS.

The leaves and stalks of *Adonis vernalis*.

Medicinal Properties.—A cardiac tonic.

Useful in mitral and aortic regurgitation, relieving intracardiac pressure and præcordial pain.—*L.* '88, ii. 1012.

A useful adjunct to bromides in epilepsy.—*L.* '94, ii. 1288; *B.M.J.E.* '95, i. 12, and '98, i. 44.

Dose.—2 to 6 grains in **powder**, or as an **infusion** or **tincture.**

Foreign Pharmacopœias.—Official in Ital.; not in the others.

ADONIDIN.—A glucoside, very deliquescent, soluble in Water and Alcohol.

Dose.—$\frac{1}{10}$ to $\frac{1}{5}$ grain three times per diem. Generally given in **pill.**

ÆTHER.

ETHER.

A volatile liquid prepared from Ethylic Alcohol by interaction with Sulphuric Acid. It contains not less than 92 p.c. by volume of Ethyl Oxide $(C_2H_5)_2O$, eq. 73·52. It was formerly termed Sulphuric Ether.

Solubility.—1 in 10 of Water; mixes in all proportions with Alcohol (90 p.c.).

B.P. states that it is miscible in all proportions with Chloroform, but the mixture forms a turbid liquid, owing to the presence of Water in the Ether.

Water dissolves a tenth of its volume of Ether, and reciprocally Ether takes up about the same proportion of Water. It evaporates speedily in the open air, with the production of considerable cold. When good, it evaporates from the hand without leaving a disagreeable odour. It boils below 105° F. (40·5° C.), and its vapour is very heavy and very inflammable. It dissolves Corrosive Sublimate, Red Mercuric Iodide, Iodine and Bromine freely, Sulphur and Phosphorus sparingly. It is also a solvent of the volatile and fixed oils, many resins and balsams, caoutchouc, and most of the organic vegetable alkaloids.

It does not dissolve Potassium or Sodium Hydroxides, in which respect it differs from Alcohol.

Medicinal Properties.—It is a powerful diffusible stimulant, antispasmodic and carminative, and is of great use in syncope or heart-failure from any cause, dyspnœa, gastralgia, flatulence, spasmodic asthma and angina pectoris. It excites secretion from the mucous surfaces of the alimentary tract, and, as it stimulates the pancreas, it is sometimes given with Cod Liver Oil.

As an anæsthetic, *see* Æther Purificatus and Æther Methylatus.

Dose.—10 to 30 minims, for repeated administration; for a single administration, 40 to 60 minims.

When used **hypodermically** for heart failure the dose is 15 to 30 minims.

Prescribing Notes.—Best prescribed as Spirit of Ether, which mixes readily with Water. '**Perles**' are prepared.

Official Preparations.—Æther Purificatus, Spiritus Ætheris, Spiritus Ætheris Compositus. Used in the preparation of Collodium, Extractum Filicis Liquidum. **Æther Purificatus** is used in the preparation of Extractum Strophanthi, and **Spiritus Ætheris** in Tinctura Lobeliæ Ætherea.

Not Official.—Æther Methylatus and Spiritus Ætheris Muriaticus.

Foreign Pharmacopœias.—Official in Austr., Norw., and Swed., sp. gr. ·725; Belg., Dan., Fr., Ger. and Russ. sp. gr. ·720; Dutch, sp. gr. ·722—·725; Fr., also sp. gr. ·724; Hung. sp. gr. ·724—·728; Ital. (Etere), sp. gr. ·720—·722; Jap. and Port. sp. gr. ·728; Span. (Eter), sp. gr. ·758; Norw. and Swiss, sp. gr. ·720—·722; U.S., sp. gr. ·725—·728. Mex. (Eter Sulfurico), sp. gr. ·720.

Description.—A colourless very volatile and inflammable liquid, having a strong and characteristic odour. Its vapour is heavy and highly inflammable, forming an explosive mixture with air.

Tests.—Sp. gr. ·735. 100 volumes agitated with an equal volume of Water should not be reduced to less than 90 (absence of excess of Ethylic Alcohol). It should boil below 105° F. (40·5° C.). It evaporates without residue. It should have no action on Solution of Litmus. It should dissolve without coloration when introduced drop by drop into Sulphuric Acid kept cool during the test (absence of organic impurities).

Preparations.

ÆTHER PURIFICATUS. Purified Ether.

Ether from which most of the Ethylic Alcohol has been removed by washing with Distilled Water, and most of the Water by subsequent

distillation in the presence of Calcium Chloride and recently prepared Lime.

Medicinal Properties.—General and local anæsthetic. Ether was first used as an anæsthetic for capital operations in 1846, and Purified Ether is preferred by some to Chloroform, as it has a less depressing effect upon the heart, vessels, and respiratory centre. It is used also in conjunction with Nitrous Oxide for minor operations in dentistry and surgery.

It has been used as a **spray** for obtaining local anæsthesia in minor surgery, and to relieve severe neuralgic pain. The lower the boiling point of the Ether the more complete is the anæsthesia; therefore Methylated Ether, sp. gr. ·717, is preferable.

Official Preparation.—Used in the preparation of Extractum Strophanthi.

Foreign Pharmacopœias.—Official in Span., sp. gr. ·720; Hung., sp. gr. ·724—·728: *see* also under Æther.

Tests.—Sp. gr. not exceeding ·722 and not below ·720. 5 c.c. on spontaneous evaporation should not afford any abnormal odour and should not leave any residue. Its vapour is heavy and highly inflammable. It should dissolve in an equal volume of Carbon Bisulphide (absence of excess of Water). Heated, it begins to distil at a temperature not under 94·1° F. (34·5° C.) (absence of Methylic Ether). No effect should be produced by the addition of Potassium Hydroxide (absence of Aldehyde). No alteration in colour is produced on moistened Blue Litmus Paper after twenty-four hours' contact (absence of acid). On shaking with half its bulk of dilute Solution of Potassium Bichromate acidulated with Sulphuric Acid, and setting aside, the supernatant Ether should have no blue colour (absence of Hydrogen Peroxide). Filter-paper moistened with Purified Ether should remain odourless when the liquid has evaporated.

SPIRITUS ÆTHERIS. Spirit of Ether. (Modified.) The Hoffmann's Anodyne of the Continental Pharmacopœias.

Ether, 1; Alcohol (90 p.c.), 2. =(1 in 3).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—20 to 40 minims, for repeated administration; for a single administration, 60 to 90 minims.

Foreign Pharmacopœias.—Official in Austr., Dan., Ger., Hung., Jap., Norw., Swed. and Swiss, 1 and 3; Belg., Æther Sulphuricus Alcoholicus, 468 in 1000, sp. gr. ·791—·795; Dutch, Æther cum Spiritu, 1 and 1, sp. gr. ·775—·782; Fr. Ether Officinal Alcoolisé, 1 and 1, sp. gr. ·783; Ital., Etere con Alcool, 1 and 1; Mex. (Licor de Hoffmann), Æther 1, Alcohol 90 p.c. 1; Port., Ether Alcoolisado, 7 and 3; Russ., 1 and 2, sp. gr. ·800; Span., Eter Sulfurico Alcoholizado, 4 and 1; U.S., $3\frac{1}{4}$ in 10. All by weight except U.S.

Test.—Sp. gr. ·806 to ·811.

SPIRITUS ÆTHERIS COMPOSITUS. Compound Spirit of Ether. *B.P. Syn.*—Hoffmann's Anodyne. (Modified.)

Gradually mix 36 of Sulphuric Acid with 40 of Alcohol (90 p.c.): let the mixture stand twenty-four hours. Then distil slowly until a

thermometer, the bulb of which is within the liquid, indicates a temperature of 341° F. (171·6° C.). Pour the distillate into a separator, and, after separation is complete, remove the lower layer. Add 1½ of Distilled Water to the upper layer, and also, gradually, Sodium Bicarbonate, until, after agitation, the liquid is nearly neutral to Litmus Paper. Separate the ethereal liquid, and add to it 5½ of Ether and 38 of Alcohol (90 p.c.). Filter.

Several modifications have been introduced in the process.

Dose.—20 to 40 minims, for repeated administration; for a single administration, 60 to 90 minims.

Foreign Pharmacopœias.—Official in U.S., Ether, 325; Alcohol, 650; Ethereal Oil, 25; not in the others.

Description.—A colourless mobile liquid with characteristic ethereal odour and taste.

Tests.—Sp. gr. ·808 to ·812. It gives an opalescent solution when mixed with twice its volume of Water. 2 or 3 c.c. evaporated spontaneously on a watch-glass should not yield a residue having an unpleasant odour (absence of empyreumatic impurities.)

Not Official.

ÆTHER METHYLATUS.—Sp. gr. ·717. Prepared from Methylated Spirit. It can be purified to such an extent by washing and redistillation as to be scarcely distinguishable from that made from Pure Spirit. The Methylic Ether being so extremely volatile is almost wholly lost during the purification.

An Ether, sp. gr. ·715, can be obtained in limited quantity by careful working; occasionally samples are drawn over at ·713, in cold weather.

Medicinal Properties.—It is largely employed as a **spray** for local anæsthesia, as well as for **inhalation**. As in the case of 'Methylated Chloroform,' the impurities from the Wood Spirit employed in the manufacture can be completely eliminated.

Methylated Ether, sp. gr. ·720, is *not* so suitable as the above, for the **spray** because it volatilises less rapidly, nor for **inhalation** because it is not sufficiently purified. Methylated Ether can be made more volatile for use with the **spray** by the addition of 20 per cent. of a light Petroleum Ether.

SPIRITUS ÆTHERIS MURIATICUS.—*Syn.* Sp. Salis Dulcis; Clutton's Febrifuge Spirit.

A colourless liquid. Sp. gr. ·860.

A very old preparation, and is still prescribed for feverish symptoms.

Dose.—30 to 60 minims.

Foreign Pharmacopœias.—Official in Dan. and Norw., Æther Chloratus Spirituosus, and Swiss, Spiritus Ætheris Chlorati, sp. gr. ·838—·842.

ÆTHER ACETICUS.

ACETIC ETHER.

An ethereal liquid consisting of Ethyl Acetate, $CH_3 \cdot COO(C_2H_5)$, eq. 87·4, together with unimportant amounts of Ethylic Alcohol or other substances, obtained by distillation from a mixture of Ethylic Alcohol, Sulphuric Acid, and dried Sodium Acetate, digestion of the

distillate with dried Potassium Carbonate, and subsequent separation, by distillation, of the portion boiling between 165° and 172° F. (73·9° and 77·8° C.).

Solubility.—About 1 in 9 of Water. Miscible in all proportions with Alcohol (90 p.c.) and with Ether.

Medicinal Properties.—Antispasmodic, stimulant, and carminative. It is also used as a sedative **inhalation** in irritation of the larynx, 30 minims in a pint of Water.

Dose.—20 to 40 minims, for repeated administration; for a single administration, 60 to 90 minims.

Official Preparation.—Used in the preparation of Liquor Epispasticus.

Foreign Pharmacopœias.—Official in Austr., Hung. and Russ., sp. gr. ·900; Belg., sp. gr. ·890; Dan., Dutch, Ger., Norw. and Swed., sp. gr. ·900—·904; Fr. sp. gr. ·915; Ital. (Etere Acetico), sp. gr. ·906; Mex. (Eter Acetico), sp. gr. ·920; Port., sp. gr. ·920; Span., sp. gr. ·916; Swiss, sp. gr. ·904; U.S., sp. gr. ·893—·895.

Description.—A colourless liquid with a fragrant odour. Soluble in all proportions in Alcohol (90 p.c.), Ether, or Chloroform.

Acetic Ether of B.P. specific gravity, is not soluble in all proportions in Chloroform, but if such Ether be dehydrated over Calcium Chloride or Potassium Carbonate it will then mix with Chloroform in all proportions, but the purified product has a specific gravity of ·895.

A good commercial specimen should contain over 90 p.c. of Acetic Ether.

Tests.—Sp. gr. ·900 to ·905. 1 part by weight dissolves in not less than 10 parts of cold Water. It should have no action on Solution of Litmus. It is not coloured when mixed with an equal volume of Sulphuric Acid (absence of organic impurities). Filter-paper moistened with Acetic Ether should remain odourless when the liquid has evaporated.

10 c.c. of Pure Acetic Ether shaken with 10 c.c. of saturated solution of Calcium Chloride will lose ·2 c.c.; each additional loss of ·1 c.c. indicates 1 p.c. of impurity.—*P.J.* (3) xiii. 781.

In six samples examined we found 6·0, 6·5, 11·5, 15·0, 60·0 and 63·0 p.c. of impurity.

When 10 c.c. are agitated with an equal volume of Water in a graduated test-tube, the upper, ethereal layer, after its separation, should measure not less than 7 c.c.—*Squibb.*

U.S. and Ger. allow only a loss of 10 p.c. by this test.

ÆTHERIS NITROSI SPIRITUS.

See SPIRITUS ÆTHERIS NITROSI.

Not Official.

ÆTHYL BROMIDUM.

BROMIDE OF ETHYL. HYDROBROMIC ETHER.

C_2H_5Br., eq. 108·17.

It is best prepared by acting upon Potassium Bromide with Sulphuric Acid in the presence of Alcohol, as described in the French Codex.

Its liability to decomposition may be prevented by the addition of Alcohol, and by exclusion of light and air.

Solubility.—1 in 1 of Water, but will vary with sp. gr. of sample; it mixes in all proportions with Alcohol (90 p.c.) and Ether.

Medicinal Properties.—It is a local and general anæsthetic, more rapid in its action than Chloroform, and occasionally used in conjunction with it. It is useful in minor surgery, also in obstetric practice and in dental operations.

It should be administered in the same manner as Ether, it is very prompt in its action. It should not be given in prolonged operations or in renal disease. Has been used as a **spray** to produce local anæsthesia.—*L.M.R.* '80, 213; '87, 327; *T.G.* '85, 383; '86, 833; '87, 860; '91, 123; '92, 365, 399; *L.* '90, ii. 414; '92, ii. 103; *B.M.J.E.* '93, ii. 62; '94, i. 40.

Strongly recommended in dental operations.—*L.* '89, i. 848.

A **solution,** 1 in 200 of Water, in angina pectoris, dose ½ to 2 oz., *M.A.* '87, 24.

Foreign Pharmacopœias.—Fr., Éther Brômhydrique; Ger. and Swiss, Æther Bromatus; Mex. (Eter Bromhidrico); Russ., Æthylum Bromatum; not in the others.

Description.—A volatile, colourless liquid, which is not readily inflammable.

Tests.—It should give no reaction with pure Sulphuric Acid, or no more than a yellow colour after an hour. When evaporated should leave no residue. Its vapour should have a pleasant ethereal odour.

Sp. gr. is given in French Codex 1·47, and in German Ph. 1·45. The former figure is probably the correct one, a very pure sample sold as containing 1 p.c. of Alcohol had sp. gr. 1·461, but ordinary samples may run as low as 1·34.

Boiling point of a sample sp. gr. 1·45 was 38·5° C. (101° F.), and dissolved in 120 parts of Water.

Not Official.

ÆTHYL CHLORIDUM.

A colourless, ethereal, inflammable liquid, which boils at 12° C. (53·6° F.). It is supplied in glass capsules which are closed by a screw cap.

Medicinal Properties.—Used for producing local anæsthesia in minor surgery and dentistry, and as an analgesic in neuralgic and rheumatic pains.—*T.G.* '93, 387; '94, 119. *See* also Methyl Chloride.

Not Official.

ÆTHYL IODIDUM.

IODIDE OF ETHYL. HYDRIODIC ETHER.

C_2H_5I. eq. 154·72.

Prepared by acting upon Alcohol with Iodine and Amorphous Phosphorus.

Solubility.—1 in 440 of Water; mixes in all proportions with Alcohol (90 p.c.).

Medicinal Properties.—Antispasmodic. It is used as an **inhalation**; 15 to 20 drops inhaled through the nose from a wide-mouthed bottle is more accurate and economical than dropping it on a handkerchief. It is said not to weaken the digestive organs but rather to have a tonic effect. It has been inhaled with success to relieve the dyspnœa in chronic bronchitis and asthma; also in secondary and tertiary syphilis as an adjunct to the administration of Potassium Iodide, the Iodine being very rapidly absorbed into the system from this substance.—*Squibb; B.M.J.* '89, ii. 1216; *P.J.* (3) xix. 46.

It is also used as a vesicant and as an application to the uterus.—*L.* '85, ii. 755.

Prescribing Note.—Can be obtained in **glass capsules**, 5 minims in each.

Foreign Pharmacopœias.—Fr., Éther Iodhydrique; Mex., Eter Yodhidrico; not in the others.

Description.—A colourless, volatile, heavy, and non-inflammable liquid.

Has an agreeable ethereal odour and pungent taste.

It soon acquires a reddish brown colour on exposure to light; but if no deeper than a pale wine colour it may be disregarded.—*Squibb.*

The change of colour can be prevented by putting in the bottle a globule of Mercury, also by adding to each ounce vial, 5 c.c. $\frac{1}{2}$N. solution of Soda, which will absorb any free Iodine which may be formed.

Sp. gr. 1·943. Boils at 79° C. (175° F.).

Not Official.

AGARICUS ALBUS.

AGARIC OF THE LARCH. WHITE OR PURGING AGARIC.

A species of mushroom found growing on old Larches in Southern and Central Europe. As found in commerce, it is deprived of its outer coat, and is a light white spongy mass, easily rubbed to a powder on a sieve.

Medicinal Properties.—Has been used with success in night sweating of phthisis, checking cough and promoting sleep; also in hæmoptysis. It has a strong cathartic action.—*Pr.* xxix. 321; *M.T.* '81, ii. 442; *T.G.* '88, 41, 371.

Dose.—5 to 30 grains of the powder, given in jam.

Foreign Pharmacopœias—Official in Belg., Fr., Ital. (Agarico Bianco), Mex. (Agarico blanco), Port. (Agarico Brancho), Russ., Span. and Swiss; not in the others.

AGARICIN (Agaricic Acid). The active principle. A white crystalline powder. Melts at 138° C. (280·4° F.). Generally given with Dover's powder in a pill.

Solubility.—1 in 140 of Alcohol (90 p.c.); practically insoluble in Water and in weak Alcohol.

Dose.—$\frac{1}{4}$ to 1 grain.

It should not be given hypodermically.—*L.M.R.* '84, 118.

In pill form $\frac{1}{12}$ grain very successful in night sweats of phthisis.—*T.G.* '94, 627.

Foreign Pharmacopœias.—Official in Dan., Ger., Mex., Norw. and Russ.; not in the others.

ALCOHOL ABSOLUTUM.

ABSOLUTE ALCOHOL.

Ethyl Hydroxide, C_2H_5OH, eq. 45·70, with not more than 1 p.c., by weight, of Water; obtained by the removal of Water from less strong Ethylic Alcohol (90 p.c.), and subsequent distillation.

Foreign Pharmacopœias—Official in Belg., Ital. and Span., sp. gr. ·794; Jap., sp. gr. ·830—·834; Dan., sp. gr. ·831—·834; Fr., sp. gr. ·816; Swiss, sp. gr. not higher than ·800; Mex., Alcohol Vinico, sp. gr. ·790; U.S., sp. gr. not higher than ·797; not in the others.

Official Preparations.—Used in the preparation of Chloroform, Liquor Ethyl Nitritis, and Liquor Sodii Ethylatis.

Description.—It is very volatile and hygroscopic at common temperatures.

Tests.—Sp. gr. from ·794 (equivalent to 99·95 p.c. of Ethyl Hydroxide by volume and by weight) to ·7969 (equivalent to 99·4 p.c. of Ethyl Hydroxide by volume or 99 p.c. by weight). Mixed with 1 to 2 p.c. of anhydrous Copper Sulphate in a well-closed bottle, and the mixture set aside for two or three hours and occasionally well shaken, the salt does not become of a decidedly blue colour (absence of excess of Water). Absolute Alcohol should be free from the impurities mentioned under 'Alcohol (90 p.c.),' and in other general characters should resemble it.

A note on the Cupric Sulphate and other tests.—*C.D.* '93, ii. 118.

When added to five times its volume of Carbon Bisulphide, it will remain clear till cooled below 45° F.

The estimation of Aldehyde in Alcohol by means of a solution of Magenta decolourised by Sulphurous Acid. *J.C.S.Abs.* '97, ii. 235.

Not Official.

ALCOHOL METHYLICUM.

METHYLIC ALCOHOL.

Syn.—Rectified Pyroxylic Spirit.

A product of the destructive distillation of wood, which has been submitted to various processes of rectification.

Solubility.—It mixes readily with Water, Ethylic Alcohol, Chloroform, and Ether. It dissolves Fats and Volatile Oils.

Medicinal Properties.—Narcotic, sedative, and anti-emetic. It palliates the cough and lessens the febrile excitement of phthisis. It has been mixed with Chloroform for use as an anæsthetic (Regnauld's Anæsthetic Mixture). *See* Chloroform.

Dose.—5 to 10 minims.

Description.—A colourless liquid with a peculiar odour.

Wood Spirit, Wood Naphtha, Pyroxylic Spirit are names applied to the crude article of commerce, which may contain from 75 to 90 p.c. of real Methylic Alcohol.

Tests.—Sp. gr. about ·803. It is without action on Litmus; is not rendered turbid by admixture with water; free from smoky taste.

Methylated Spirit.—*See* Spiritus Methylatus.

Methylic Ether.—It is gaseous at ordinary temperatures, but is condensed by cold and pressure to a liquid boiling at —20° C. (—4° F.). A solution of this in Ethylic Ether is useful for producing local anæsthesia.

ALOES.

Both Aloe Barbadensis and Aloe Socotrina are official. *See below.*

Medicinal Properties.—Bitter tonic, purgative, acting chiefly on the large intestine; the slowest of purgatives, taking ten to fifteen hours before acting. Stomachic bitter in very small doses. Emmenagogue; a tonic cathartic in the constipation associated with amenorrhœa and anæmia. Should not be given during advanced pregnancy nor in inflammatory conditions of the pelvic organs. Small

doses relieve, large doses aggravate hæmorrhoids. Used as an **enema** it is anthelmintic.

It is found by experiment that the aqueous extract is far more active than is the resinous portion of Aloes; the Barbados Aloes containing a larger amount of this than the Socotrine, is perhaps the reason why the Barbados is the more purgative; thus, 2 grains are equal to 3 grains of Socotrine.

The Socotrine variety is similar to the Barbados. 1 grain with $\frac{1}{2}$ grain Extract of Nux Vomica, is an excellent pill to obtain the stomachic effect, and to relieve habitual constipation. The Pilula Aloes et Ferri and Pilula Aloes et Myrrhæ are given in amenorrhœa associated with chronic dyspepsia and constipation.

Socotrine Aloes in very large doses is a powerful hepatic stimulant. It renders the bile more watery, but at the same time increases the secretion of the biliary matter by the liver.—Dr. Rutherford.

Prescribing Notes.—Can be made into pills with a small quantity of diluted Alcohol; rarely prescribed alone.

Official Preparations.—Of **Barbados Aloes**, Extractum Aloes Barbadensis, Pilula Aloes Barbadensis, Pilula Aloes et Ferri. Contained in Pilula Cambogiæ Composita, Pilula Colocynthidis Composita, and Pilula Colocynthidis et Hyoscyami. Used in the preparation of Aloinum. Of the **Extract**, Decoctum Aloes Compositum, Extractum Colocynthidis Compositum, Tinctura Aloes. Of **Socotrine Aloes**, Pilula Aloes et Asafetidæ, Pilula Aloes et Myrrhæ, Pilula Aloes Socotrinæ. Contained in Pilula Rhei Composita, Tinctura Benzoini Composita. Also used in the preparation of Aloinum.

Not Official.—Aloe Capensis, Natal Aloes, Decoctum Aloes Compositum 'Squire,' Pilula Aloes Diluta, and Tinctura Aloes Composita.

ALOE BARBADENSIS. Barbados Aloes.

The juice that flows from the transversely cut leaves of *Aloe vera*, *Aloe chinensis*, and probably other species, evaporated to dryness. Imported from the West Indian Islands, and known in commerce as Barbados and Curaçao Aloes.

Solubility.—Water dissolves 75 p.c. Almost entirely soluble in Alcohol (60 p.c.).

Dose.—2 to 5 grains.

Foreign Pharmacopœias.—Official in Belg., Fr., Port. and U.S.; Mex., Acibar; not in the others.

Description.—In hard masses varying in colour from yellowish or reddish-brown to chocolate-brown or almost black. Fracture either dull and waxy, in which case small splinters are opaque; or smooth and glassy, in which case the splinters are transparent; the opaque variety examined under the microscope exhibits numerous minute crystals embedded in a transparent mass. Odour disagreeable, taste nauseous and bitter.

Although Aloe vulgaris (Lam.), also known as Aloe vera (Linn.) and A. Barbadensis (Miller), has been credited as the source of all West Indian Aloes, the species grown in Curaçao is really A. Chinensis, but of late years very little real Barbados Aloes has come to market, its place and name being taken by Aloes from

Curaçao and other Dutch West India Islands. An Aloes is imported from Jamaica, but this variety is not included in the B.P. description.

Tests—The powder imparts a crimson colour to Nitric Acid and when treated with Sulphuric Acid and the vapour of Nitric Acid should yield only a slight bluish-green but not a bright blue colour (absence of Natal Aloes). Barbados Aloes is almost entirely soluble in Alcohol (90 p.c.) diluted with half its volume of Water. Not more than 30 p.c. should be insoluble in cold Water.

1. **Borntrager's test.**—Shake out with Benzene, and treat separated Benzene with Ammonia; pink colour on standing. Superseded by No. 5.

2. **Klunge's test.**—Warm with Copper Sulphate and a little Sodium Chloride; yellow colour, changing to red or violet. Fair test for West Indian Aloes, but not much good for the other varieties.

3. **Fluckiger's test.**—Sulphuric Acid and Nitric Acid Vapour; deep blue colour. Specific test for Natal Aloes.

4. **Bainbridge's test.**—Nitric Acid; red colour, changing to green. Distinctive of Cape Aloes.

5. **Cripp's and Dymond's test.**—Triturate 1 grain of sample with 16 drops Sulphuric Acid, add 4 drops Nitric Acid and dilute with an ounce of Water. A deep orange to crimson colour is developed, intensified by the addition of Ammonia. This appears to be the best general test for Aloes.—*P.J.* (3) xv. 633. The reaction is also given by all bodies containing or yielding Chrysophanic Acid, but these yield a pink colour with Ammonia alone, while Aloes only gives a pale yellow.

Preparations.

DECOCTUM ALOES COMPOSITUM. Compound Decoction of Aloes. Altered.)

Extract of Barbados Aloes, 1; Myrrh, ½; Saffron, ½; Potassium Carbonate, ½; Extract of Liquorice, 4; Compound Tincture of Cardamoms, 30; Distilled Water, a sufficient quantity. Reduce the Extract of Barbados Aloes and the Myrrh to coarse powder, and boil them and the Potassium Carbonate and the Extract of Liquorice with 40 of Distilled Water in a covered vessel for five minutes; add the Saffron; when the liquid is cool add the Tincture of Cardamoms; set aside in a covered vessel for two hours; strain through flannel; pass sufficient Distilled Water through the strainer to make 100 of the Compound Decoction of Aloes. =(1 of Extract in 100).

Extract of Barbados Aloes now used in place of Extract of Socotrine Aloes.

Dose.—½ to 2 fl. oz.

Decoctum Aloes Compositum 'Squire.' Made with Socotrine Aloes and the Fluid Extract of Liquorice.

The fluid extract is much better than the solid extract for covering the taste of Aloes; there is a marked difference in the taste of the two preparations, even when they practically contain the same amount of Liquorice. This suggestion has been adopted in B.P. in the case of Tincture of Aloes, but not in that of the Compound Decoction where it is of more importance.

EXTRACTUM ALOES BARBADENSIS. Extract of Barbados Aloes.

Add 1 of Barbados Aloes to 10 of Distilled Water and stir well until they are thoroughly mixed; set aside the mixture for 24 hours;

decant; strain; evaporate the strained liquid to dryness at a temperature not exceeding 140° F. (60° C.).

Dose.—1 to 4 grains.

(100 parts of Aloes yield 75 parts of extract.)

Foreign Pharmacopœias.—Extract of Aloes is Official in Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Norw., Russ., Swed., Swiss, and U.S.; not in the others.

PILULA ALOES BARBADENSIS. Pill of Barbados Aloes.

Barbados Aloes, in powder, 2; Hard Soap, in powder, 1; Oil of Caraway, ⅛; Confection of Roses, 1, or a sufficient quantity. Mix to form a mass. =(1 in 2).

Dose.—4 to 8 grains.

PILULA ALOES ET FERRI. Pill of Aloes and Iron. (Altered.)

Exsiccated Ferrous Sulphate, 1; Barbados Aloes, in powder, 2; Compound Powder of Cinnamon, 3; Syrup of Glucose, 3 (by weight), or a sufficient quantity. Mix to form a mass. =(about 1 in 9).

Exsiccated Ferrous Sulphate used instead of Sulphate, and Syrup of Glucose in place of Confection of Roses.

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in U.S., Purified Socotrine Aloes 1, Dried Sulphate of Iron 1, Aromatic Powder 1, Confection of Roses q. s.; Ger., Cape Aloes 1, Dried Sulphate of Iron 1, Alcohol q. s.; Jap., Aloes 3, Sulphate of Iron 5, Spirit q. s.; Swiss, Aloes 5, Sulphate of Iron 5, Soap 1, Glycerin q.s.; not in the others.

TINCTURA ALOES. Tincture of Aloes. (Altered.)

Extract of Barbados Aloes, 1; Liquid Extract of Liquorice, 6; Alcohol (45 p.c.), a sufficient quantity. Place the Extract of Barbados Aloes in a closed vessel with 32 of the Alcohol; set aside for forty-eight hours, occasionally shaking until dissolved; add the Liquid Extract of Liquorice; filter; pass sufficient of the Alcohol through the filter to produce 40 of the Tincture.

Now made with Alcohol (45 p.c.) in place of Rectified Spirit. Socotrine Aloes is replaced by Extract of Barbados Aloes, and the Extract of Liquorice by the Liquid Extract.

Dose.—½ to 1 fl. drm., for repeated administration; for a single administration, 1½ to 2 fl. drm.

Foreign Pharmacopœias.—Official in Belg., 1 in 5; Dutch, Fr., Ger., Russ., Span. and Swiss, 1 and 5; Hung. and Port., 15 in 100; Swed. and U.S., 1 in 10; all are by weight except U.S.

Not Official.

DECOCTUM ALOES COMPOSITUM 'SQUIRE,' *see* p. 69.

PILULA ALOES DILUTA.—Marshall Hall's Pill. Take of Barbados Aloes 4 oz., dissolve in water and strain, then add Extract of Liquorice 4, Treacle 4, thinly sliced Hard Soap 4; mix and evaporate to a pilular consistence.

Dose.—3 or 4 grains.

ALOE CAPENSIS (Cape Aloes).—A translucent variety, now the only one officially recognised in the German Pharmacopœia (*A. Ferox* and *A. Africana*).

Foreign Pharmacopœias.—Official in all.

Test.—It is distinguished from all others by giving with Nitric Acid a red coloration changing to a permanent green.

This variety was attributed mainly to A. Ferox, but the above colour reaction points rather to A. Africana and A. Platylepis as the source of the drug.

NATAL ALOES.—Another hepatic variety apparently derived from *A. Succotrina* and characterised by giving a deep blue colour with Sulphuric Acid followed by Nitric Acid Vapour (Fluckiger's test).

ALOE SOCOTRINA. Socotrine Aloes.

The juice that flows from the transversely cut leaves of *Aloe Perryi*, and probably other species of Aloe, evaporated to dryness. Imported principally by way of Bombay, and known in commerce as Socotrine and Zanzibar Aloes.

The real garnet-coloured, translucent Socotrine Aloes from *A. Perryi*, grown in Socotra, now seems to exist only as museum specimens. The only forms of Aloes now in commerce that represent the Socotrine Aloes of the B.P. are the opaque Hepatic Aloes and the sometimes slightly translucent Zanzibar Aloes. A very inferior nearly black Aloes with a rancid butyraceous odour is sold under the name of Socotrine, but is unfit for use in pharmacy. These all give a brown, not crimson, colour, with Nitric Acid. A blackish Aloes slightly resembling Curaçao Aloes in odour, and giving a crimson colour with Nitric Acid, is also sold as Socotrine, but is really referable to some variety of Aloe vera. It comes *via* Aden, and is obviously not the product of the plant that yields Hepatic and Zanzibar Aloes, and should not be employed as Socotrine Aloes.

Solubility.—Water dissolves 50 p.c.; the residue is pretty well inert; almost entirely soluble in Alcohol (60 p.c.).

Medicinal Properties.—*See* 'Aloes.'

Dose.—2 to 5 grains.

Extractum Aloes Socotrina is now omitted and Decoctum Aloes Compositum, formerly made with that extract, is now made with Extract of Barbados Aloes, as is also Tinctura Aloes.

Foreign Pharmacopœias.—Official in Belg., Mex., Port., Span. (Acibar) and U.S.; U.S. has also Aloe Purificata, which is Socotrine Aloes dissolved in Alcohol and evaporated to dryness. Cape Aloes is Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed. and Swiss.

Description.—Socotrine Aloes, as imported, is usually more or less viscid and brownish-yellow, but forms, when dried, hard dark-brown, or nearly black masses, which break with a dull and waxy, uneven fracture. Odour strong but not disagreeable, taste nauseous and bitter.

Zanzibar Aloes is usually imported in liver-brown masses. Fracture dull and waxy, but nearly smooth and even. It has a characteristic odour and a nauseous and bitter taste.

Both varieties are opaque even in small splinters, exhibit when examined under the microscope numerous minute crystals embedded in a transparent mass, and impart to Nitric Acid a reddish or yellowish-brown colour.

Tests.—If the vapour of Nitric Acid is blown over the powder

previously mixed with Sulphuric Acid no blue coloration is produced (absence of Barbados and Natal Aloes).

Socotrine and Zanzibar Aloes are almost entirely soluble in Alcohol (90 p.c.) diluted with half its volume of Water; and about 50 p.c. should be soluble in Water.

Although the B.P. permits the use of nearly black Aloes, the amount of soluble matter required and the Nitric Acid test prevent the use of inferior qualities of the drug.

Preparations.

PILULA ALOES SOCOTRINÆ. Pill of Socotrine Aloes.

Socotrine Aloes in powder, 2; Hard Soap in powder, 1; Oil of Nutmeg, ½; Confection of Roses, 1 or a sufficient quantity. Mix to form a mass. =(about 1 in 2).

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in Belg., Fr., Jap. and U.S., Aloes and Soap only, 1 in 2; Mex. Aloes 10, Soap 2; Swiss, Aloes 10, Soap 1, Glycerin q.s.; not in the others.

PILULA ALOES ET ASAFETIDÆ. Pill of Aloes and Asafetida.

Socotrine Aloes in powder, 1; Asafetida, in powder, 1; Powdered Hard Soap, 1; Confection of Roses, 1, or a sufficiency. Mix to form a mass. =(1 in 4).

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in U.S., 1 in 3; Belg. and Span., Pilulæ Fulleri, made with Aloes, Asafetida, and other ingredients; not in the others.

PILULA ALOES ET MYRRHÆ. Pill of Aloes and Myrrh. (Altered.)

Socotrine Aloes, 2, in powder; Myrrh, 1, in powder; Syrup of Glucose, 1½ (by weight), or a sufficient quantity. Mix to form a mass. =(about 1 in 2¼).

Saffron is omitted and Syrup of Glucose used instead of Treacle and Glycerin.

Dose.—4 to 8 grains.

The formula for Pil. Rufi in 1557 was Aloes, 2; Myrrh, 1; Saffron, 1; White Wine, a sufficiency.

Foreign Pharmacopœias.—Official in Austr., Belg., Port. and Swed., U.S., with Aromatic Powder in place of Saffron; not in the others.

TINCTURA ALOES.

This is now made from Extract of Barbados Aloes.

Not Official.

TINCTURA ALOES COMPOSITA (Elixir ad longam vitam).

Belg.—Aloes, 20; Agaric, 3; Gentian, 3; Rhubarb, 3; Zedoary, 3; Saffron, 2; Electuarium Theriacale, 3; Alcohol (50 p. c.), 1000.

Fr.—Aloes, 20; Agaric, 2·5; Gentian, 2·5; Rhubarb, 2·5; Zedoary, 2·5; Saffron, 2·5; Electuarium Theriacale, 2·5; Alcohol (60 p. c.), 1000.

Ger.—Aloes, 30; Gentian, 5; Rhubarb, 5; Zedoary, 5; Saffron, 5; Alcohol (68 p. c.), 1000.

Russ.—Aloes, 45; Agaric, 5; Gentian, 5; Rhubarb, 5; Zedoary, 5; Saffron, 5; Alcohol (70 p. c.) 1000.

Span.—Aloes, 35; Agaric, 4; Gentian, 4; Rhubarb, 4; Zedoary, 4; Saffron, 4; Electuarium Theriacale, 4; Alcohol (60 p. c.), 1730.

Swiss.—Aloes, 6; Agaric, 1; Gentian, 1; Rhubarb, 1; Zedoary, 1; Saffron, 1; Myrrh, 1; Alcohol (70 p. c.), 200.

Mex.—Cape Aloes, 4; Gentian, ½; Rhubarb, ½; Agaric, ½; Saffron, ½; Treacle, ½; Alcohol (60 p.c.), 200.

All are by weight.

ALOINUM.

ALOIN.

Aloin is extracted from Barbados or Socotrine Aloes by solvents and purified by recrystallisation. The products from the different varieties of Aloes possess similar properties. The Aloin extracted from Barbados Aloes has the formula $C_{16}H_{16}O_7$, $3H_2O$, eq. 371·36.

Solubility.—1 in 400 of Water; 1 in 18 of Alcohol (90 p.c.); freely soluble in hot Water; nearly insoluble in Ether.

Medicinal Properties.—Similar to those described under 'Aloes.'

Dose.—½ to 2 grains.

Prescribing Note.—Generally given in **pill** or in **cachets** with other ingredients.

Not Official.—Pilula Aloini Composita.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Description.—Usually n tufts of acicular crystals, yellow, inodorous, and having the taste of Aloes. Sparingly soluble in cold Water, more soluble in Alcohol (90 p.c.), freely soluble in the hot liquids. Nearly insoluble in Ether. Not readily altered in acidulated or neutral solutions; rapidly altered in alkaline liquids.

Determination of Aloin in Aloes by forming an Aloin-calcium Compound, and subsequent treatment with Hydrochloric Acid. 15 to 30 p.c. of well-crystallised, light yellow Aloin was obtained from various kinds of commercial Aloes.—*P.J.* '97, i. 287.

A summary of the literature on the subject of Aloin will be found *C.D.* '90, i. 331. It would appear that the Aloins may be classified as follows:—

BARBALOINS.—Yielding on oxidation Chrysammic, Aloetic, and Picric Acids.

α-barbaloin, which gives a red colour with *cold* Nitric Acid (1·42), obtained from Barbados and Curaçao Aloes.

β-barbaloin, which requires either fuming Nitric Acid, or a *hot* Acid of ordinary strength to give the *red* coloration. This variety is yielded by Jafferabad, and by some varieties of Socotrine and Zanzibar Aloes, *see* p. 71.

NATALOIN.—Yields on oxidation Picric but not Chrysammic Acid. This is a distinct species, from Natal Aloes only, having a formula $C_{21}H_{26}O_{10}$. H_2O. Softens at 180° C., and melts at 210° C.

It may be assumed that commercial 'Aloin' is α-barbaloin, and it is to this variety only that the name should be applied. Its general characters are described above. Its formula is $C_{16}H_{16}O_7$, with about three molecules of water of crystallisation, and its melting point when anhydrous 147° C.

NATALOIN, although effective with cats and dogs, is found to have no action on man, except in cases where an exclusively animal diet had been used for some days previously.

Not Official.

PILULA ALOINI COMPOSITA.—Aloini, Extracti Nucis Vomicæ, Ferri Sulphatis, Pulv. Myrrhæ, Saponis, ana ½ grain.—*L.* '87, i. 2.

Not Official.

ALTHÆÆ RADIX.

MARSHMALLOW ROOT.

The root of *Althæa officinalis*, which is very mucilaginous. When decorticated and dried it is much used as a powder in the preparation of lozenges and pill masses.

Medicinal Properties.—It is much employed on the Continent as a demulcent in irritation and inflammation of the mucous membranes of the mouth and pharynx.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Guimauve), Ger., Hung., Jap., Norw., Port., Russ., Mex. and Span. (Altea), Swed., Swiss and U.S.

The two substances Asparagin and Betain have been extracted from Althæa root. —*P.J.* '98, i. 116.

Preparations.

DECOCTUM ALTHÆÆ.—Althæa Root 1, Water 30. Boil to 20.

SYRUPUS ALTHÆÆ.—Macerate 3 of Althæa Root in 40 of Water for twelve hours: strain, press, and filter until 32 have passed through; to this add 64 of Sugar, dissolve warm, and heat the Syrup to boiling; when cold, skim and strain through flannel.

Foreign Pharmacopœias.—Official in all, but they differ somewhat in the proportion of Root employed and in manipulation.

TROCHISCI ALTHÆÆ (*T.H.*).—About 1 grain in each lozenge. Demulcent. Valuable after excision of tonsils or uvula.

Foreign Pharmacopœias.—Official in Austr. and Fr.; Mex., Pastillas de Altea; not in the others.

Not Official.

ALUMINIUM.

ALUMINIUM.

Al, eq. 26·9.

A silver-white metal, sonorous, and lighter than glass, having sp. gr. 2·560.

Indicated by Sir Humphrey Davy in 1808; made by Wöhler, by decomposing its chloride with Sodium in 1828, and first produced in ingots by M. Deville in 1854. It resists the action of cold concentrated Nitric and Sulphuric Acids, but is readily attacked by Hydrochloric Acid. Its oxide forms an impermeable crust on the surface of the metal, and protects it from further action of the air. On account of its extreme lightness and tenacity, this metal has attracted considerable attention for many years. At one time it was very expensive, but, owing to improved methods of extraction, the cost has been much reduced, and it is now possible to employ it for many articles in common use where lightness is required. It is only one-third the weight of Iron.

Not Official.

CIMOLITE is composed of Alumina, 23; Silica, 63; Ferric Oxide, 1·25; Water, 12.

FULLER'S EARTH is composed of Alumina, 10; Silica, 53; Lime, ·5; Magnesia, 1·25; Ferric Oxide, 9·5; Water, 24.

SOAPSTONE, CRETA GALLICA, is a Silicate of Aluminium and Magnesium. Is used in prurigo and as a dusting powder for infants, alone or mixed with equal parts of Zinc Oxide or Calamine.

ALUMINIUM ACETATE SOLUTION (Ph. Ger.)—A clear colourless liquid, obtained by double decomposition between Aluminium Sulphate and Calcium Acetate, with an acid reaction and a faint odour of Acetic Acid. Sp. gr. 1·044—1·046.

A good antiseptic, preferred by some to Carbolic Acid for dressing lacerated wounds. —*T.G.* '85, 727; '86, 573.

ALUMINIUM ACETO-TARTRATE.—Crystals soluble in their own weight of water.

A powerful, non-poisonous antiseptic; also an astringent caustic.

30 to 60 grains in a pint of water makes a useful **gargle** or **douche.**—*L.M.R.* '86, 433; *L.* '88, i. 339.

ALUMINIUM CHLORIDE SOLUTION.—Obtained by dissolving Aluminium Hydrate in Hydrochloric Acid. A pale yellow liquid. Sp. gr. 1·250. **Gargle,** 12 minims to 1 oz. of water; **Spray,** 3 minims to 1 oz.; **Paint,** 15 minims to 1 oz. Astringent and antiseptic.

A solution (sp. gr. 1·15) has been used largely as a disinfectant under the name **Chloralum.**

ALUMINIUM NITRATE.—A **solution** (4 or 6 grains in 1 oz. of Water) has been used with success in pruritus vulvæ.

ALUMINIUM NAPHTHOL-SULPHONATE (**Alumnol**).—A whitish powder, readily soluble in water, introduced as a new antiseptic.—*P.J.* (3) xxiii., 605; *C.D.* '93, i. 94.

ALUMINIUM OLEATE.—A powder. Mixed with equal parts of Lard, is used as a styptic and antiseptic, in checking the muco-purulent discharges in eczema.—*L.* '84, ii. 123.

ALUMEN.

ALUM.

$Al_2(SO_4)_3$, K_2SO_4, $24H_2O$, eq. 941·94.

$Al_2(SO_4)_3$, $(NH_4)_2SO_4$, $24H_2O$, eq. 900·16.

Aluminium and Potassium Sulphate (Potassium Alum), or Aluminium and Ammonium Sulphate (Ammonium Alum), produced by the combination of Aluminium Sulphate with Potassium Sulphate or with Ammonium Sulphate.

Solubility.—1 in 11 of Water; 3 in 1 of boiling Water; Potash Alum, 1 in 3 of Glycerin; Ammonia Alum, 1 in 1¼ of Glycerin. Insoluble in Alcohol (90 p.c.).

Alum when heated melts in its own water of crystallisation.

Medicinal Properties.—Astringent, used as a **gargle** or **spray** for relaxed throat, 10 grains in 1 oz. of Water; as an **injection** in leucorrhœa and gonorrhœa, 60 grains in a pint of Water; as a **nasal**

douche, 4 grains in 1 oz. of Water; as a **snuff** in epistaxis, 3 grains mixed with ½ grain of Starch; as a **lotion** in purulent ophthalmia, 2 to 6 grains in 1 oz. of Water; 10 to 15 grains three times a day has been given for internal hæmorrhage, such as that of typhoid or gastric ulcer, also for menorrhagia, and in cases of lead poisoning; arrests excessive secretion in dysentery, diarrhœa and night sweats; vomiting caused by the cough of phthisis is sometimes checked by 6 to 10 grain doses of Alum. A **saturated solution** in Water forms an excellent styptic for hæmorrhage, leech bites, bleeding hæmorrhoids, epistaxis, &c.; the **glycerin** of alum is used in inflamed tonsils. 60 grains have been recommended as an emetic in croup. Dried Alum is escharotic, used for warty growths and to stimulate indolent ulcers, to destroy exuberant granulations and to remove nævi.

Dose.—5 to 10 grains.

Incompatibles.—Alkalis and their Carbonates, and Tannic Acid.

Official Preparations.—Glycerinum Aluminis, Alumen Exsiccatum.

Not Official.—Alum Cataplasm, Alum Gargle, Alum Whey, Gossypium Aluminis, and Ferri et Ammonii Sulphas.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Allume), Jap., Mex. (Sulfato de Aluminio y Potassio), Norw., Port., Russ., Span. (Alumbre), Swed., Swiss, and U.S. use Potash Alum only.

Description.—In colourless transparent crystalline masses, exhibiting the faces of the regular octahedron, and having a sweetish astringent taste.

Although Potassium and Ammonium Alum are both Official, the Potassium salt only is used commercially, Potassium salts as a rule being cheaper than those of Ammonium. About the year 1880 the reverse was the case, Ammonium Alum was then the commercial salt, and between 1867 and 1885 was the only one Official.

In **Sodium Alum** the Potassium is replaced by Sodium in the formula, but in **Chrome Alum** and **Iron Alum** it is the Aluminium (not the Alkali) which is replaced by Chromium or Iron respectively.

Tests.—It affords the reactions characteristic of Aluminium, of Potassium or Ammonium, and of Sulphates. It should yield no characteristic reaction with the tests for Copper, Lead, Zinc, Calcium, or Sodium, and only the slightest reactions with the tests for Iron.

Potassium Alum is distinguished from Ammonium Alum by the latter giving off Ammonia when its aqueous solution is heated with Potassium or Sodium Hydroxide.

Preparations.

GLYCERINUM ALUMINIS. Glycerin of Alum. (Modified.)

Alum, in powder, 1 oz.; Distilled Water, 3 fl. drm.; Glycerin, sufficient to produce 6 fl. oz. Triturate until solution is effected, warming slightly if necessary; set aside; pour off the clear liquid from any deposited matter that may be present. The metric quantities are respectively 20 grammes; 7·5 c.c., and 120 c.c.

Water is now added.

Pure Alum should and does dissolve clear in Glycerin, but commercial Pulv. Aluminis as a general rule will not dissolve without residue except after prolonged boiling.

A powerful local astringent. When diluted with Water it forms a useful gargle.

ALUMEN EXSICCATUM. Exsiccated Alum.

Potassium Alum, 4. Heat the Potassium Alum in a porcelain dish or other suitable vessel till it liquefies, then increase and continue the application of heat until aqueous vapour ceases to be disengaged, and the salt has lost between 45 and 46 p.c. of its weight.

Description.—A white powder slowly and completely soluble in twenty times its weight of cold Water or three-fourths its weight of boiling Water. It absorbs moisture on exposure to air.

As a rule commercial samples are not completely soluble: four samples gave 2 to 8 p.c. insoluble in Water.

Potassium Alum is here specified, but Ammonium Alum at 400° F. loses nothing but Water, and was ordered in 1867 B.P.; it would appear (*P.J.* (3) xiii. 838) that in 1882 the commercial article was made from Potassium Alum, in spite of the fact that none but Ammonium Alum was Official.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Norw., Port., Russ., Span., Swed., Swiss, and U.S.

Not Official.

ALUM CATAPLASM, or **POULTICE.**—Alum, 60 grains; the whites of two eggs. For chilblains; also a good application to black bruises.

ALUM GARGLE.—Broken rose petals, 3 drm.; Diluted Sulphuric Acid, 3 fl. drm.; cold Distilled Water, 10 fl. oz.; digest for two hours, and strain 8 fl. oz.; then add Alum, 2 drm.; Sugar, 4 drm.; Alcohol (90 p.c.), 4 fl. drm.; dissolve. This kept well for seven years.

When used, to be mixed with an equal bulk of Water.

Several formulæ for Alum gargle will be found in Squire's *Pharmacopœias of the London Hospitals.*

ALUM WHEY.—Alum, 120 grains boiled in a pint of Milk. **Dose.**—A wineglassful.

GOSSYPIUM ALUMINIS (*T.H.*).—Contains about 30 p.c. of Alum.

FERRI ET AMMONII SULPHAS (U.S.P.).—Ammonio-Ferric Alum.

Iron Alum is an Alum in which Iron takes the place of Aluminium. It is especially useful in bleeding from the kidneys; it arrests the hæmorrhage and the anæmia that accompanies it; it is considered more astringent than Alum.

The aqueous solution will, even after filtration, deposit unless slightly acidified with Diluted Sulphuric Acid.

Dose.—5 to 10 grains.

AMMONIACUM.

AMMONIACUM.

A gum-resin exuded from the flowering and fruiting stem of *Dorema ammoniacum*, and probably other species.

It is collected in Persia.

Solubility.—Sparingly in Water, but forms with it a nearly white emulsion; when 50 grains are digested in 2 oz. of Alcohol (90 p.c.), 40 grains are dissolved; with Alcohol (60 p.c.) 30 grains are dissolved.

Medicinal Properties.—Antispasmodic, stimulant, expectorant; useful in chronic bronchitis and asthma of old people, either in mixture or in pill; as a **plaster** to promote absorption in chronic synovitis and glandular swellings.

Dose.—5 to 15 grains.

Prescribing Notes.—Generally given as Mistura Ammoniaci; may be combined with Tincture of Squill, or Fetid Spirit of Ammonia.

Official Preparations.—Emplastrum Ammoniaci cum Hydrargyro and Mistura Ammoniaci. Contained also in Emplastrum Galbani, in Pilula Scillæ Composita, and Pilula Ipecacuanhæ cum Scilla.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Jap., Mex. (Goma-resina Ammoniaco), Norw., Port., Russ., Span., Swed., Swiss, and U.S.; Fr., purified by 60 p.c. Alcohol.

Description.—In small, dull pale yellowish or brownish tears, or in nodular masses varying in size from a quarter of an inch to an inch (about 6 to 26 millimetres) in diameter. It is hard and brittle when cold, the freshly fractured surface having a waxy lustre; it softens when warmed. Internally, it is opaque, and varies in colour from milky white to pale brownish-yellow. It has a faint, characteristic, but not alliaceous odour and a bitter acrid taste.

Tests.—Triturated with Water it forms a white emulsion. The freshly fractured surface is coloured yellow by Solution of Potassium Hydroxide and dark red or orange by Solution of Chlorinated Soda. If a small fragment be strongly heated in a dry test-tube, the contents of the tube, after cooling, yield with boiling Water a solution which, when largely diluted with Water and made alkaline with Solution of Ammonia, does not exhibit a blue fluorescence (distinction from Asafetida and Galbanum).

Dieterich states:—The value of this test depends greatly upon the manner in which the gum-resin is heated. A much more scientific test, and one capable of detecting 2 p.c. of Galbanum with certainty, is that proposed by me, to treat the substance with strong Hydrochloric Acid, whereby umbelliferone is split off from its natural ester, the liquid is then filtered, and the filtrate (which contains the umbelliferone) is supersaturated with Ammonia, when an intense and characteristic blue fluorescence is produced. The same method may be used for the identification of Asafetida and Galbanum. Besides this umbelliferone reaction the Pharmacopœia should prescribe the limit of matter in Ammoniacum which is insoluble in Alcohol, and also limit the amount of ash. He considers 10 p.c. of ash to be the maximum, and the residue left after treatment with Alcohol and drying at 100° C. should not be more than 50 p.c.—*C.D.* '98, ii. 131.

Preparations.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO. *See* HYDRARGYRUM.

As the value of this preparation depends chiefly upon the Mercury it contains, the formula is given under Hydrargyrum.

MISTURA AMMONIACI. AMMONIACUM MIXTURE. (ALTERED.)

Ammoniacum, in coarse powder, ½ oz.; Syrup of Tolu, 4 fl. drm.;

Distilled Water, 7½ fl. oz. Triturate the Ammoniacum thoroughly with a little of the Distilled Water so as to form a thin paste; gradually add the remainder of the Distilled Water and the Syrup of Tolu, triturating until the mixture assumes a uniform milky appearance. Strain through muslin. The metric quantities are 5 grammes, 10 c.c., and 150 c.c., respectively. = (1 in 32).

Now contains Syrup of Tolu.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias—Official in Span. (Emulsion), 1 in 36 with White Wine; U.S. (Emulsum Am.) 1 in 25; not in the others.

Not Official.

AMMONIUM.

AMMONIUM.

NH_4, eq. 17·94.

According to Roscoe, Ammonium has been isolated, but it does not seem to be able to exist in an uncombined state, unless under high pressure and at a low temperature; it is a dark blue liquid possessing a metallic lustre, and very readily decomposes into Ammonia and Hydrogen.

AMMONIA.

AMMONIA.

This important compound is chiefly produced artificially, but it exists in some volcanic products, and is discoverable in sea-water. It is found also in putrid urine and in the salts produced by the decomposition of animal matter.

This salt was manufactured in very early times from soot afforded by the combustion of camels' dung, from which it was obtained by sublimation. The process was chiefly conducted in the neighbourhood of the temple of Jupiter Ammon in Egypt, and to this circumstance it owes its name.

The chief source at present is the liquor from gas-works and from Paraffin Shale, also from iron smelting furnaces; but the Ammonia produced in this way is apt to contain impurities, particularly the organic bases known as 'the compound Ammonias.'

The purest form of Ammonia is that obtained as a by-product in the manufacture of Borax. The Boracic Acid of Tuscany, when saturated with Soda, evolves very considerable quantities of pure Ammonia, and the Liquor Ammoniæ and Ammonium Carbonate, produced in this way, are sold under the name of 'Volcanic Ammonia,' but they are scarce at the present time. This has led to the better purification of the Ammonias from Coal, which can now be obtained sufficiently pure for all pharmaceutical purposes.

The Official tests for the presence of Ammonium will be found in the Appendix.

AMMONIÆ LIQUOR FORTIS.

STRONG SOLUTION OF AMMONIA.

An aqueous solution containing 32·5 p.c. by weight of Ammonia, NH_3, eq. 16·94. It may be obtained by heating a mixture of Ammo-

nium Chloride and slaked Lime, and passing the resulting Ammonia into Distilled Water.

Medicinal Properties.—Usually given in the more diluted form of Liquor Ammoniæ; *see below*.

Official Preparations.—Of **Liquor Ammoniæ Fortis**, Liquor Ammoniæ, Spiritus Ammoniæ Fetidus. Contained in Linimentum Camphoræ Ammoniatum, Linimentum Hydrargyri and Tinctura Guaiaci Ammoniata. Used in the preparation of Ammonii Benzoas, Ammonii Bromidum, Ammonii Phosphas, Spiritus Ammoniæ Aromaticus, and Spiritus Ammoniæ Fetidus. Of the **Liquor Ammoniæ**, Linimentum Ammoniæ. Contained in Tinctura Ergotæ Ammoniata, Tinctura Opii Ammoniata, Tinctura Quininæ Ammoniata, Tinctura Valerianæ Ammoniata. Used in the preparation of Liquor Bismuthi et Ammonii Citratis, and the scale preparations of Iron.

Not Official.—Alcohol Ammonia, Lotio Crinalis and Tinct. Ammon. Comp. (Eau de Luce).

Antidotes.—Acetic Acid or Vinegar well diluted with Water; demulcent drinks.

Foreign Pharmacopœias.—Official in Belg. (Ammonia Liquida), sp. gr. ·935, 17 p.c.; Fr. (Ammoniaque Liquide), sp. gr. ·925; Ital. (Ammoniaca), sp. gr. ·925, 20 p.c.; Mex. (Ammonioco), sp. gr. ·920; Port. (Ammonia Liquida), sp. gr. ·916; Span. (Amoniaco Liquido), sp. gr. ·923; U.S., sp. gr. ·901, 28 p.c.; *see also* Liquor Ammoniæ.

Description.—A colourless liquid, with a characteristic, very pungent odour. It is very strongly alkaline.

Tests.—Sp. gr. ·891. When mixed with an equal volume of Water, with the addition of a slight excess of Hydrochloric Acid, no colour or odour should be developed (absence of tarry matters). It should not yield any characteristic reaction with the tests for Arsenium, Lead, Iron, Aluminium, Zinc, Calcium, Magnesium, Potassium, Sodium, Carbonates, Sulphates, or Sulphides, and only the slightest reactions with the tests for Chlorides. Each gramme should require for neutralisation 19·1 c.c. of the Volumetric Solution of Sulphuric Acid.

In commerce Liquor Ammoniæ Fortis is generally sold as of sp. gr. ·880.

Preparations.

LIQUOR AMMONIÆ. Solution of Ammonia.

An aqueous solution containing 10 p.c. by weight of Ammonia, NH_3.

Strong Solution of Ammonia, 1; Distilled Water, 2; mix.

Medicinal Properties.—Stimulant, antacid, and antispasmodic; relieves nervous headache, and is useful in pneumonia, bronchitis, and dyspepsia. Stimulant in exhausted states of the system, as in 'typhoid' forms of fever. Externally (applied to the nostrils) in syncope; an excellent application to the sting of a wasp or the bite of an adder. On the skin it is a powerful rubefacient, and in embrocations it is used as a counter-irritant for pains and stiffness of joints, &c.

Official Preparations.—Linimentum Ammoniæ. Used in the preparation of Ammonii Benzoas, Ferri et Ammonii Citras, Ferri et Quininæ Citras, Ferrum Tartaratum, Liquor Bismuthi et Ammonii Citratis, Tinctura Opii Ammoniata, Tinctura Quininæ Ammoniata.

Foreign Pharmacopœias.—Official in Austr., Dan., Ger., Hung., Ital., Jap., Norw., Russ., Swed., Swiss and U.S. (10 p.c.) sp. gr. ·960; Dutch, sp. gr. ·958—·960; Belg., Fr., Ital., Port., Span. and U.S., *see* Ammon. Liq. Fort.

Tests.—Sp. gr. ·959. Each gramme should require for neutralisation, 5·9 c.c. of the Volumetric Solution of Sulphuric Acid. It should respond, qualitatively, to the characters and tests described under 'Liquor Ammoniæ Fortis.'

LINIMENTUM AMMONIÆ. Liniment of Ammonia. (Altered.)

Solution of Ammonia, 1; Almond Oil, 1; Olive Oil, 2: shake together. =(1 in 4).

One of Olive Oil replaced by one of Almond Oil.

Cotton Seed, Sesame and Nut Oils have each been recommended, but Cotton Seed is the only Oil which makes a satisfactory and permanent emulsion.

A counter-irritant.

Foreign Pharmacopœias.—Official in Austr., Dutch and Ital., 1 and 4 Olive Oil; Belg. and Fr., 1 and 9 Almond Oil; Ger., Liq. Am. 1, Olive Oil 3, Poppy Oil 1; Hung. and Jap., 1 and 4 Sesame Oil; Mex., 1, Sesame Oil 9; also 1, Sesame Oil 4; Port., 1 and 4 Almond Oil; Russ., Liq. Am. 1, Olive Oil 3, Sesame Oil 1; Span., 1 and 7½ Olive Oil; Swed., 1 and 3 Olive Oil; Swiss, 1 and 3 Poppy or Sesame Oil; U.S., Am. 35, Alcohol 5, Cotton Seed Oil 60; not in Norw. All are by weight except U.S.

SPIRITUS AMMONIÆ AROMATICUS. *See* Ammonii Carbonas.

SPIRITUS AMMONIÆ FETIDUS. Fetid Spirit of Ammonia. (Modified.)

Asafetida 1½; strong Solution of Ammonia, 2; Alcohol (90 p.c.), a sufficiency; break the Asafetida into small pieces, and macerate it in a closed vessel in 15 of the Alcohol for twenty-four hours; distil until Alcoholic vapours cease to be condensed; mix the distillate with the Strong Solution of Ammonia, and add sufficient Alcohol to make 20.

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Nervine stimulant and antispasmodic, useful in the treatment of hysteria.

Dose.—20 to 40 minims, for repeated administration; for a single administration 60 to 90 minims.

(Not in the other Pharmacopœias.)

Test.—25 c.c. should require for neutralisation at least 42·5 c.c. of the Volumetric Solution of Sulphuric Acid, corresponding to at least 2·88 grammes of Ammonia (NH_3) in 100 c.c.

Not Official.

ALCOHOL AMMONIA.—Absolute Alcohol saturated with Ammonia Gas. It contains about 14 p.c. of NH_3. Sp. gr. ·858.

It is used in filling and renovating Smelling Salt bottles.

LOTIO CRINALIS.—Ol. Amygdal. 1 fl. oz.; Liq. Ammon. Fort. 1 fl. oz.; Sp. Rosmar. 4 fl. oz.; Aq. Mellis, 2 fl. oz.; mix.

TINCT. AMMON. COMP.—EAU DE LUCE.—Mastic, 2 drm.; Alcohol (90 p.c.) 9 fl. drm.; Ol. Lavand. 14 minims; Liquor Ammoniæ Fortis, 20 fl. oz.: dissolve.

Stimulant, antispasmodic. Used in tropical countries as an application to snake bites.

Dose.—5 to 10 minims in Water.

AMMONII BENZOAS.

AMMONIUM BENZOATE.

$C_6H_5 \cdot COONH_4$, eq. 138·07.

This salt is produced by neutralising Benzoic Acid with Solution of Ammonia.

Solubility.—1 in 6 of Water; 1 in 22 of Alcohol (90 p.c.); 1 in 8 of Glycerin.

Medicinal Properties.—Diuretic, antiseptic, antipyretic, and expectorant. Employed in dropsy, in gout and in cases of uric acid deposit. It is more soluble than Benzoic Acid, and therefore should be preferred, and is less irritant to the alimentary canal. Is valuable in chronic vesical catarrh with alkaline urine, phosphatic deposit, and in chronic bronchial catarrh with much secretion.

An intestinal antiseptic in Typhoid.—*M.A.* '94, 555.

Stimulates the liver, but not quite so powerfully as Sodium Benzoate; neither of them stimulates the intestinal glands.—Dr. Rutherford.

Dose.—5 to 15 grains.

Prescribing Note.—Usually given in solution.

Incompatibles.—Acids, Liquor Potassæ, and Ferric salts.

Foreign Pharmacopœias.—Official in Fr., Mex. (Benzoato de Amonio), Port., Russ., Swiss and U.S.; not in the others.

Description.—In colourless lamellar crystals.

Tests.—It affords the reactions characteristic of Ammonium salts. An aqueous solution yields a yellowish or flesh-coloured precipitate when mixed with Test-solution of Ferric Chloride. A strong aqueous solution to which a little Sulphuric Acid is added affords a crystalline precipitate of Benzoic Acid. It should yield no residue on heating to redness, and no characteristic reaction with the tests for Chlorides or Sulphates. Its cold aqueous solution does not at once redden Solution of Litmus (absence of Acid); on boiling the solution it slowly dissociates into Benzoic Acid and Ammonia and affords an acid reaction.

Not Official.

AMMONII BORAS.

A crystalline salt, with an alkaline reaction.

Solubility.—1 in 15 of Water.

Medicinal Properties.—Has been used with success in renal and vesical calculi. For renal colic, 20 grains every two hours until free passage of urine takes place, then 15 grains three times a day.—*T.G.* '87, 623.

AMMONII BROMIDUM.

AMMONIUM BROMIDE.

NH_4Br, eq. 97·29.

This salt is formed by neutralising Hydrobromic Acid with Solution of Ammonia.

Solubility.—1 in 1½ of Water; 1 in 15 of Alcohol (90 p.c.).

Medicinal Properties.—An excellent nervine sedative and depressant, hypnotic, and anaphrodisiac, especially useful for sleeplessness, the result of worry or mental anxiety and fatigue; in epilepsy, in acute alcoholism, in acute mania and nymphomania and in many other conditions in which the Potassium salt is used. Not so apt to produce Bromism as the Potassium salt, and less depressing. Relieves headache and neuralgic pain. Sedative in pharyngeal and laryngeal irritation; especially useful in whooping cough and asthma.

Dose.—5 to 30 grains.

Incompatible.—Spirit of Nitrous Æther.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Fr., Ger., Ital., Jap., Mex. (Bromuro de Amonio), Norw., Russ., Swiss and U.S.; not in the others.

Description.—In small colourless crystals. Has a somewhat pungent saline taste. May be sublimed unchanged by the application of heat.

Tests.—It affords the reactions characteristic of Ammonium salts and of Bromides. ·5 gramme of the dry salt dissolved in Water should require not more than 51·8 and not less than 51·1 c.c. of the Volumetric Solution of Silver Nitrate for complete precipitation (limit of impurities). It should yield no residue on being heated to redness, no characteristic reaction with the tests for Lead, Iron, Bromates, Iodides, or Nitrates, and not more than the slightest reactions with the tests for Sulphates or Chlorides.

A low figure indicates Iodide, moisture, or some other impurity not indicated by Silver Nitrate; a high figure indicates presence of Chloride.

Not Official.

LOZENGES, containing 2 grains of Ammonium Bromide in each. Dose, 1 to 3 lozenges. Useful in whooping cough.

AMMONII CARBONAS.

AMMONIUM CARBONATE.

A variable mixture of Ammonium Hydrogen Carbonate, NH_4HCO_3, with Ammonium Carbamate $NH_4NH_2CO_2$, produced on heating Ammonium Sulphate or Chloride with Calcium Carbonate.

Solubility.—1 in 4 of Water; 1 in 200 of Alcohol (90 p.c.); 1 in 5 of Glycerin.

Medicinal Properties.—Stimulant, antacid, diaphoretic, antispasmodic and expectorant. Frequently combined with Ipecacuanha in acute and chronic bronchitis when the phlegm is tough and scanty. Employed in all those conditions described under Liquor Ammoniæ, much used as a general stimulant. Rarely as an emetic in ½ drm. doses.

Has been recommended in full and continuous doses in cholera, in the place of alcoholic stimulants.—*B.M.J.* '85, ii. 380.

Dose.—3 to 10 grains.

Prescribing Note.—15 grains dissolved in water are taken with 17 grains of Citric Acid to form a saline draught.

Incompatibles.—Acids, Acid salts, Iron salts, Lime Water, and salts of the alkaline earths, and of the alkaloids.

Official Preparations.—Used in the preparation of Ammonium Chloridum, Bismuthi Carbonas, Ferri Carbonas Saccharatus, Liquor Ammonii Acetatis, Liquor Ammonii Citratis, and Spiritus Ammoniæ Aromaticus.

Not Official.—Spiritus or Liquor Ammonii Anisatus, Liquor Volatilis Cornu Cervi or Spirit of Hartshorn, and Hartshorn and Oil.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—In translucent crystalline masses, with an Ammoniacal odour and an alkaline reaction.

Tests.—Exposed to the air it becomes covered with a white efflorescence which should be only superficial; this should be scraped off before the salt is used for dispensing purposes. It affords the reactions characteristic of Ammonium salts and of Carbonates. Each gramme dissolved in 40 c.c. of Water should require for neutralisation at least 18·7 c.c. of the Volumetric Solution of Sulphuric Acid. It should yield no residue on being heated to redness, and not more than the slightest reactions with the tests for Chlorides or Sulphates. When its aqueous solution is neutralised with an Acid and evaporated to dryness, the residue should be colourless and odourless (absence of tarry matters).

We have not found a sample which gives the full amount of Ammonia required by the volumetric test; different samples gave 91—96 p.c. of the prescribed amount, which must be taken into account in all preparations made from it.

Preparations.

SPIRITUS AMMONIÆ AROMATICUS. Aromatic Spirit of Ammonia. *B.P.Syn.*—Spiritus Ammoniæ Compositus. Spirit of Sal Volatile. (Modified.)

Ammonium Carbonate, 4 oz.; Strong Solution of Ammonia, 8 fl. oz.; Oil of Nutmeg, 4½ fl. drm.; Oil of Lemon, 6½ fl. drm.; Alcohol (90 p.c.), 120 fl. oz.; Distilled Water, 60 fl. oz.

Place the Oil of Lemon, Oil of Nutmeg and Alcohol with the Distilled Water in a retort; distil 140 fl. oz.; then distil and separately collect an additional 9 fl. oz. Place the latter, together with the Ammonium Carbonate and the Strong Solution of Ammonia, in a bottle holding rather more than 20 fl. oz.; securely cork the bottle, and gently warm it in a water-bath to 140° F. (60° C.), shaking from time to time until all the salt has dissolved. Filter the resulting solution when cold through cotton wool, and gradually mix the filtrate with the portion first distilled.

Now made with Alcohol (90 p.c.) instead of Rectified Spirit.

It is much better to dissolve the Ammonium Carbonate and Ammonia in 9 fl. oz. of Water while the distillation is proceeding, and not to carry it past 140 fl. oz.

Medicinal Properties.—Similar to those mentioned under

Ammonium Carbonate. A domestic remedy for nervous headache, more useful when combined with Ammonium Bromide.

Dose.—20 to 40 minims, for repeated administration; for a single administration, 60 to 90 minims.

Foreign Pharmacopœias.—Official in Jap., and U.S., a *mixture*, Fr. (Alcoolat Aromatique Ammoniacal) and Port., *distilled*; all contain Carbonate, but differ considerably. Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Norw., Russ., Span., Swed. and Swiss have Liquor or Spiritus Ammonii Anisatus, a mixture of Oil of Anise, Spirit, and Liq. Ammon., but in slightly different proportions. *See* under 'Not Official.'

Description.—A transparent liquid having a pungent ammoniacal odour and flavour; nearly colourless when first prepared, but liable to darken slightly.

Tests.—Sp. gr. ·888 to ·893. 20 c.c. require for neutralisation 25·5 c.c. of the Volumetric Solution of Sulphuric Acid, corresponding to about 2·4 p.c. of Ammonia (NH_3), or 2·16 grammes in 100 c.c. 20 c.c., after the addition of 16 c.c. of Solution of Barium Chloride, should yield a precipitate which becomes more copious on heating to 160° F. (71° C.), and after filtering, the filtrate should yield a further precipitate when more of the reagent is added and the liquid is again heated.

LIQUOR AMMONII ACETATIS. Solution of Ammonium Acetate. (Modified.)

Ammonium Carbonate, 1; Acetic Acid, Distilled Water, of each a sufficient quantity. Dissolve the Ammonium Carbonate in ten times its weight of Distilled Water; neutralise with Acetic Acid; add sufficient Distilled Water to produce one pint of the Solution.

Now made direct from Ammonium Carbonate and Acetic Acid instead of the Liquor Ammonii Acetatis Fortior, which is now deleted.

Solution of Ammonium Acetate should be preserved in a green glass bottle.

This preparation is very indefinite, and no test of strength is given. It would have been better to start with a definite quantity of Acetic Acid, or to have made the Liquor to a sp. gr.

Medicinal Properties.—Diaphoretic and slightly antipyretic. Much used in febrile disease. Given in full doses for Alcoholism. A mixture of this medicine with Spirit of Nitrous Ether forms one of the oldest remedies for fever, and there being no risk of its producing collapse, one of the safest.

Dose.—2 to 6 fl. drm.

Incompatibles.—Potassium and Sodium Hydroxides, and alkaline Carbonates.

Foreign Pharmacopœias.—Official in Austr. and Ital., sp. gr. 1·030; Belg. and Port., sp. gr. 1·029; Fr. and Span., sp. gr. 1·036; Mex., and U.S.: all made with Carbonate. Jap., 1·033; Dan. and Norw., sp. gr. 1·035-1·040; Swed. (20 p.c.), sp. gr. 1·038 to 1·042; Dutch, Ger., Hung., Russ. and Swiss., sp. gr. 1·032 to 1·034; all made with Caustic Ammonia.

Test.—A little of the Solution, heated in a test-tube to expel Carbonic Anhydride, should be neutral or only slightly acid to test-papers.

LIQUOR AMMONII CITRATIS. Solution of Ammonium Citrate. (Altered.)

Ammonium Carbonate, 1¾, or a sufficient quantity; Citric Acid, 2½; Distilled Water, a sufficient quantity: Dissolve the Citric Acid in five times its weight of Distilled Water; neutralise with Ammonium Carbonate; add sufficient Distilled Water to produce 20 of the Solution.

Solution of Ammonium Citrate should be preserved in a green glass bottle.

Now made with Ammonium Carbonate and Citric Acid instead of Strong Solution of Ammonium Citrate, which is deleted.

Medicinal Properties.—Similar to Liquor Ammonii Acetatis.

Dose.—2 to 6 fl. drm.

(Not in the other Pharmacopœias.)

Test.—A little of the Solution, heated in a test tube to expel Carbonic Anhydride, should be neutral or only slightly acid to test-papers.

Not Official.

SPIRITUS or LIQUOR AMMONII ANISATUS.

Austr., Ger., Ital. and Span.—Oil of Anise, 1; Alcohol, 24; Solution of Ammonia, 5.

Belg., Hung. and Russ.—Oil of Anise, 1; Alcohol, 24; Solution of Ammonia, 6.

Dan., Norw. and Swed.—Oil of Anise, 1; Alcohol, 32; Solution of Ammonia, 7.

Dutch.—Oil of Anise, 1; Alcohol, 19; Solution of Ammonia, 5.

Swiss.—Oil of Anise, 3; Alcohol, 77; Solution of Ammonia, 20.

All by weight.

LIQUOR VOLATILIS CORNU CERVI, or SPIRIT OF HARTSHORN.—Solution of Carbonate of Ammonia of the old Pharmacopœias, distilled from Hartshorn; but is now more generally represented by Liquor Ammoniæ *B.P.*

HARTSHORN AND OIL.—1 of Sp. Hartshorn and 3 of Oil of Almonds: mix.

AMMONII CHLORIDUM.

AMMONIUM CHLORIDE.

NH_4Cl, eq. 53·13.

This salt may be formed by neutralising crude Solution of Ammonia or Ammonium Carbonate with Hydrochloric Acid, and purifying the product.

Solubility.— 1 in 3 of Water; 1 in 55 of Alcohol (90 p.c.).

Medicinal Properties.—Stimulating expectorant in bronchitis, internally or by inhalation; is a hepatic, gastric, intestinal, and nervous stimulant, diaphoretic, diuretic, and alterative. Efficacious in sciatica, gout and chronic rheumatism; useful in acute and chronic congestion of the liver; said to counteract the tendency to albuminoid degeneration. In neuralgia, lumbago, and migraine, in doses of 30 grains three times a day, it frequently relieves after four or five doses; if not, it is of no use to continue it.

Recommended in advanced cases of pulmonary phthisis to facilitate expectoration —*L.* '95, ii. 1524.

Stimulates the intestinal glands, but not the liver.—Dr. Rutherford.

Dose.—5 to 20 grains.

Prescribing Notes.—Generally taken in solution; can be dispensed in the form of **mixtures**, **powders**, or Compressed Tablets.

10 grains in a claret-glassful (3 fl. oz.) of cold Water, frequently sipped, allays distressing fits of coughing in bronchitis. 10 minims Sp. Chloroform and 30 minims of Syrup render it palatable.

The **vapour** is also largely employed in naso-pharyngeal and eustachian catarrh; various kinds of inhalers have been introduced for mixing the vapours of Hydrochloric Acid and Ammonia. In the absence of such an inhaler, heat a small quantity of the solid salt in any convenient dish over a spirit lamp and inhale the fumes. In this way there is no possibility of having free Hydrochloric Acid or free Ammonia present in the vapour.

Incompatibles.—Alkalis and their Carbonates; alkaline earths; Lead and Silver salts.

Official Peparation.—Used in the preparation of Liquor Ammoniæ Fortis.

Not Official.—Draught, Lotion and Lozenges.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ. and Swiss, Ammonium Chloratum; Dan., Dutch, Norw. and Swed., Chloretum Ammonicum; Fr., Chlorhydrate d'Ammoniaque; Ital., Cloruro di Ammonio; Mex., Cloruro de Amonio; Port., Chloreto de Ammonio; Span., Chloruro Ammonico; U.S., Ammonii Chloridum.

Description.—In colourless inodorous crystals.

Tests.—It affords the reactions characteristic of Ammonium Salts and of Chlorides. It should yield no residue on being heated to redness, and no characteristic reaction with the tests for Lead, Copper, Arsenium, Calcium, Carbonates, or Nitrates, and only the slightest reactions with the tests for Iron, or for Sulphates. Its aqueous solution should not give a blood-red coloration with Test-solution of Ferric Chloride (absence of Thiocyanates).

Not Official.

DRAUGHT.—Ammonii Chloridi, gr. xv; Tinct. Limon., ♏xlv; Sp. Chloroformi, ♏x; Aquæ, ad ℥iss.

LOTION.—1 oz. with 1 fl. oz. Alcohol (90 p.c.) and 10 fl. oz. Water; Vinegar is sometimes added, to be applied as a dressing for bruises.

LOZENGES.—2 or 3 grains in each, are much used for bronchitis.

Dose.—2 to 4 lozenges.

Not Official.

AMMONII IODIDUM.

AMMONIUM IODIDE.

A whitish deliquescent salt, granular or in crystals, which readily becomes yellow on exposure to air.

When deeply coloured it is advisable in dispensing to remove the colour by shaking it in a bottle with a piece of Ammonium Carbonate.

It has been pointed out that the resulting Iodate would be decomposed by the Hydrochloric Acid of the stomach, and result in the re-formation of free Iodine; but as the quantity would generally be very small it may be disregarded.

Solubility.—4 in 3 of Water: 1 in 3 of Alcohol (90 p.c.); 3 in 4 of Glycerin.

Medicinal Properties.—Similar to the Potassium Iodide, but less depressing.

Dose.—2 to 5 grains three times a day; but much larger doses can be given.

Foreign Pharmacopœias.—Official in Fr., Port., Russ., Span., Swiss, and U.S.; not in the others.

Preparation.

UNGUENTUM AMMONII IODIDI.—Ammonium Iodide, 120 grains; Lard, 1 oz.

AMMONII PHOSPHAS.

AMMONIUM PHOSPHATE.

$(NH_4)_2HPO_4$, eq. 131·20.

A salt which may be obtained by neutralising Phosphoric Acid with Solution of Ammonia.

Solubility.—1 in 3 of Water; insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Cholagogue, nervine stimulant, diaphoretic. Given in chronic rheumatism and in the gouty and uric acid diatheses to render the Sodium Biurate more soluble.

Is a powerful stimulant of the liver. It does not stimulate the intestinal glands.—Dr. Rutherford.

Dose.—5 to 20 grains.

Prescribing Notes.—It is given 3 or 4 times a day in Water, but should not be prescribed in too condensed a form when tinctures form part of the mixture, on account of its sparing solubility in spirituous menstrua.

Foreign Pharmacopœias.—Official in Port. and U.S.; not in the others.

Description.—In transparent colourless prisms.

Test.—It affords the reactions characteristic of Ammonium Salts and of Phosphates. When 2 grammes are dissolved in Water, and Solution of Magnesium Ammonio-sulphate is added in excess, a crystalline precipitate should be formed, which, after being well washed upon a filter with Solution of Ammonia diluted with an equal volume of Water, and then dried and heated to redness, weighs 1·68 grammes. Its aqueous solution should yield no characteristic reaction with the tests for Lead, Copper, or Arsenium, and only the slightest reactions with the test for Iron, Chlorides, or Sulphates.

Not Official.

AMMONII PICRAS.

Pale yellow salt, fairly soluble in Water. Should always be made and kept in the liquid form, as when dry it is powerfully explosive.

Has been strongly recommended in the treatment of malarial fevers in India.—*L.* '87, i. 366; *B.M.J.E.* '94, ii. 68.

Dose.—$\frac{1}{8}$ to $1\frac{1}{2}$ grains. Average dose, $\frac{1}{2}$ grain four or five times a day.

AMYGDALA AMARA.

BITTER ALMOND.

The ripe seed of *Prunus amygdalus, var. amara.*

Description.—Resembles the Sweet Almond in general appearance, but is distinguished by being shorter and proportionally broader, by its bitter taste, and by the characteristic odour of its aqueous emulsion.

Introduced only as a source of Almond Oil, of which it yields from 42 to 44 p.c., and from which the commercial product is chiefly obtained.

Foreign Pharmacopœias.—Official in all the foreign Pharmacopœias except Dutch and Jap.; Fr., Amandes Amères; Ital., Mandorle; Port., Amendoas Amargas; Mex. and Span., Almendro Almargo.

Preparation.

OLEUM AMYGDALÆ. ALMOND OIL.

The oil expressed from the Bitter or Sweet Almond.

Solubility.—Only slightly soluble in Alcohol (90 p.c.), entirely soluble 1 in 2½ of Ether and in all proportions of Chloroform.

Medicinal Properties.—Emollient, demulcent and laxative. As as enema in impaction of fæces or obstruction of bowel, 1 to 3 pints.

Dose.—Not given in B.P.; 1 to 4 fl. drm.

Prescribing Notes.—1 fl. oz. of Oil, with ½ fl. oz. Mucilage, ¼ oz. Sugar, and 6 fl. oz. of Distilled Water, makes a nice cough mixture.

A mixture of equal parts of this Oil and Lime Water, with a small proportion of Glycerin, scented with Lemon, has been commonly sold under the title **Glycerin and Lime Juice.**

Official Preparations.—Contained in Linimentum Ammoniæ, Oleum Phosphoratum, Unguentum Aquæ Rosæ, and Unguentum Cetacei.

Used in preference to Olive Oil, as it makes a whiter ointment.

Not Official.—Aqua Amygdalæ Amaræ, Mistura Amygdalæ Amaræ, Oleum Amygdalæ Amaræ Essentiale, and Oleum Amygdalæ Essent. Persic.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Olio di Mandorle Dolci), Jap., Norw., Port., Russ.; Mex., Span. (Aceite de Almendras Dulces), Swed., Swiss and U.S.

Description.—Pale yellow, nearly inodorous, with a bland nutty taste.

Tests.—Sp. gr., ·915 to ·920. It does not congeal until cooled to nearly —4° F. (—20° C.). If 2 c.c. of the Oil be well shaken with 1 c.c. of Fuming Nitric Acid and 1 c.c. of Water, a whitish, not brownish-red, mixture should be formed, which after standing for 6 hours at about 50° F. (10° C.) should separate into a solid white mass and a nearly colourless liquid (absence of Peach-kernel Oil and other Fixed Oils).

The kernels of the Apricot and Peach also yield an Oil much resembling Almond Oil, and known commercially as **Ol. Amygdalæ Persic.**

Not Official.

AQUA AMYGDALÆ AMARÆ.—Prepared by crushing Bitter Almonds and expressing the fixed oil, and then distilling the residual cake with water so that it shall contain the proper quantity of Hydrocyanic Acid ordered in any particular Pharmacopœia.

Foreign Pharmacopœias.—Official in the following, the percentage of Hydrocyanic Acid is also given. Austr. and Dan. (Conc.) ·1 p.c., (Dil.) ·005 p.c.: Ger., Hung., Ital. and Swiss, ·1 p.c.; Norw., ·139 p.c.; Port., not standardised; Russ., ·1 p.c., (Dil.) ·002 p.c.; Span., ·083 p.c.; Swed. (Conc.) ·13—·14 p.c., (Dil.) ·007 p.c.; U.S., not standardised, 1 Volatile Oil in 1000; not in the others.

MISTURA AMYGDALÆ AMARÆ.—Made in the same proportions as Mistura Amygdalæ.

Useful in cough, and as a lotion to allay itching of the skin. It was a favourite vehicle for giving Tartarated Antimony, in doses of $\frac{1}{8}$ grain, as a sedative expectorant in the first stage of acute bronchitis or pneumonia. The mixture contains a variable amonnt of Prussic Acid.

Dose.—$\frac{1}{2}$ to $1\frac{1}{2}$ fl. oz.

OLEUM AMYGDALÆ AMARÆ ESSENTIALE.—A volatile oil obtained from Bitter Almonds by macerating with Water the cake from which the fixed oil has been expressed, and subsequent distillation.

A pale yellowish thin liquid, with a characteristic odour.

Sp. gr. 1·060—1·070 (after removal of Hydrocyanic Acid 1·045—1·050).

Solubility.—Sparingly in Water; mixes in all proportions with Alcohol (90 p.c.) and Ether.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex. (Aceite Volatil de Almendras Amargras), Norw., Port., and U.S.; not in the others.

Chiefly used as a flavouring agent, when the oil 'sine Acido Hydrocyanico' should be employed.

Bitter Almonds contain a nitrogenous body **Amygdalin**, which under the influence of a ferment **Synaptase** or **Emulsin** (present both in Bitter and Sweet Almonds) is resolved into Glucose and Benzaldehyde-cyanhydrin. During the distillation this latter body is in great part decomposed with formation of Benzaldehyde and Prussic Acid, the former, with the undecomposed Benzaldehyde-cyanhydrin, constituting the Essential Oil, while the Prussic Acid dissolves in the watery portion of the distillate.—*P.J.* (3) xviii. 537.

The proportion of the Cyanogen compound still left in the Oil is equivalent to about 6 p.c. of Anhydrous Prussic Acid, which has to be removed by a special process to form the variety 'sine Acid. Prussic' ('S.A.P.'), used for culinary flavouring.

The presence of Cyanogen compounds is readily detected by Vortmann's test.—*Y.B.P.* '87, 124. *P.J.* (3) xxiii. 232. *A.J.P.* '91, 43, 300.

An unmistakable reaction can be obtained with $\frac{1}{2}$ c. c. of an Oil (S.A.P.) to which 10 p.c. of crude Oil has been added.

Essential Oil of Almonds was at one time much liable to adulteration with Nitrobenzol, but this is not now likely to be met with. The common sophistication now is with a synthetic Benzaldehyde prepared from Toluene, which so closely resembles the purified Oil in chemical composition and character as to allow of its wholesale substitution for it. As a flavouring agent it is scarcely inferior, but the absence of the impurities present in the natural Oil causes it to oxidise much more quickly.

Benzaldehyde rapidly absorbs Oxgyen from the air and is converted into Benzoic Acid, causing a crystalline deposit, or even solidification of the oil.

The artificial Oil until now has always been characterised by the presence of Chlorine compounds, introduced with the Toluene Chloride from which it is manufactured, which are invariably absent in the natural Oil.

Schimmel's test for these Chlorine compounds is:—Saturate a piece of folded filter paper with the Oil to be examined, and after placing it in a porcelain dish standing in a larger one, ignite it and cover it over with a large inverted beaker, the sides of which have been wetted with Water. The combustion gases become absorbed on the moist sides of the beaker, from which they are washed on to a filter with a little distilled Water, and the filtrate when treated with Solution of Silver Nitrate should give no turbidity, much less a precipitate of Silver Chloride.

Genuine Essential Oil of Bitter Almonds, distilled in the ordinary way from Almonds or Peach kernels, never gives a chlorine reaction.—*P.J.* (3) xx. 855.

Instead of using a wet beaker, it is a decided improvement to line the beaker with a wet filter paper, taking care of course that this does not contain soluble Chlorides.

Ol. Amydal. Essent. Persic is prepared by a similar process to Bitter Almond Oil, from the kernels of the Apricot and Peach.

AMYGDALA DULCIS.

SWEET ALMOND.

The ripe seed of *Prunus amygdalus, var. dulcis.*

It is known in commerce as the Jordan Almond.

Medicinal Properties.—Demulcent and nutrient. Biscuits are made of Jordan and Valencia Almonds for diabetic patients, as a substitute for bread or starchy food. Almonds do not contain Starch.

The mistura Amygdalæ is a good vehicle for cough medicines.

Official Preparations.—Mistura Amygdalæ and Pulvis Amygdalæ Compositus.

Foreign Pharmacopœias.—Official in all except Dutch; Fr., Amandes Douces; Ital., Mandorle; Mex., Almendra Dulce; Port., Amendoas Doces; Span., Almendro Dulce.

Description.—About an inch (two and a half centimetres) or somewhat more in length, nearly oblong in outline, more or less compressed, pointed at one extremity, rounded at the other. The testa is cinnamon-brown, thin, and rough. The seed is exalbuminous and contains two large plano-convex oily cotyledons. It has a bland taste, and when triturated with Water forms a white emulsion without any marked odour.

Preparations.

MISTURA AMYGDALÆ. ALMOND MIXTURE.

Compound Powder of Almonds, 1; Distilled Water, 8: triturate the Powder with a little of the Distilled Water so as to form a thin paste; gradually add the remainder of the Distilled Water; strain through fine muslin.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official as **Emulsio** in Austr., Belg., Dan., Fr., Ger., Hung., Ital., Norw., Port., Russ., Span., Swed. and Swiss; U.S. Emulsum A.; there is much variation in the proportions. Mex., Emulsion simple. Not in the others.

PULVIS AMYGDALÆ COMPOSITUS. Compound Powder of Almonds.

Sweet Almonds, 8; Refined Sugar, in powder, 4; Gum Acacia, in powder, 1: steep the Almonds in Water until their skins can be easily removed; when thus blanched, dry them as far as possible with a soft cloth, and then thoroughly by exposure in a warm place for twenty-four hours; rub them lightly in a mortar to a smooth consistence; mix the Gum Acacia and the sugar; add this mixture, gradually, to the bruised Almonds; rub the whole to a coarse powder.

The Almonds are directed to be thoroughly dried, as suggested in former edition of the *Companion*.

Dose.—Not given in B.P.; 60 to 120 grains.

(Not in the other Pharmacopœias.)

AMYL NITRIS.

AMYL NITRITE.

A liquid produced by the interaction of Amylic Alcohol which has been distilled between 262° and 270° F. (127·7° to 132·2° C.) and Nitrous Acid. It consists chiefly of Iso-amyl Nitrite, $C_5H_{11}NO_2$, eq. 116·25, but contains also other Nitrites of the homologous series.

Solubility.—Insoluble in Water. Soluble in Alcohol (90 p.c.), Ether, and Chloroform.

Medicinal Properties.—Antispasmodic. Very useful in angina pectoris, aneurismal pain, dyspnœa of bronchitis and spasmodic asthma; has been used with advantage in epilepsy, in trifacial neuralgia, in migraine and sea-sickness and hemicrania, if these conditions be accompanied by facial pallor; also in laryngeal spasm, in hepatic, intestinal and renal colic, in spasmodic forms of dysmenorrhœa and in eclampsia; a restorative in cardiac failure from Chloroform anæsthesia or other cause; has been found useful as an antidote to Strychnine.

As Iso-butyl Nitrite has a much more powerful physiological action than a pure Amyl Nitrite, the pure chemical would have a milder action than that of the B.P. but more prolonged. In angina, where a rapid fall of arterial tension is required, the B.P. article is best, but in other cases, such as Bright's disease, when the effect is required to be prolonged, the pure Nitrite is the more effective.

Employed successfully in cases of sea-sickness.—*L.* '79, i. 650, 687, 759.

In the after-pains of labour.—*L.* '87, i. 606. In traumatic tetanus.—*L.* '87, ii. 1253.

A description of 77 cases of pneumonia treated by the inhalation of large doses.—*B.M.J.E.* '95, ii. 96; *T.G.* '96, 49.

Dose.—For inhalation, the vapour of 2 to 5 minims.

Prescribing Notes.—It can be obtained in small **glass capsules** covered with cotton wool and silk.

In mixtures to be swallowed, dose, ½ to 1 minim; to be used with caution.

Should be handled carefully, as even smelling the liquid from a bottle causes violent flushings.

Not Official.—Iso-Butyl Nitrite, and Tertiary Amyl Nitrite.

Foreign Pharmacopœias.—Official in Austr., sp. gr. ·902, boils at 95°—98° C.; Belg., sp. gr. ·870, boils at 95° C.; Fr., sp. gr. ·877, boils at 95° C.; Mex. (Eter Amilnitroso) sp. gr. ·877, boils at 95° C.; Ger. and Russ., boils at 97°—99° C.; Hung., sp. gr. ·900, boils at 96°—99° C.; Ital. (Etere Isoamilnitroso) sp. gr. ·9025, boils at 95°—96° C.; Jap., sp. gr. ·873, boils at 98° C.; Swiss, sp. gr. ·870—·900, boils at 99° C.; U.S., sp. gr. ·870—·880, boils at 96° to 99° C.

Description.—An ethereal liquid of a yellowish colour, fragrant odour, and not more than the faintest acid reaction.

Various writers have pointed out the importance of purifying the Amylic Alcohol, until it has a constant boiling point 132° C., previous to using it. Also that the impure Amyl Nitrite obtained, should be washed with Caustic Soda solution to remove Prussic Acid and other free Acids, and finally rectified over fused Potassium Carbonate to get rid of the Water, reserving the portion which distils over between 95° and 100° C. (203°—212° F.) for medicinal use.

The Dunstan method of preparation employs Amylic Alcohol, Sodium Nitrite, and Sulphuric Acid (Hare's process improved by Dunstan).

Tests.—Sp. gr. ·870—·880. If it be added drop by drop to fused Potassium Hydroxide, Potassium Iso-valerianate will be formed. Submitted to distillation, about 70 p.c. passes over between 194° and 212° F. (90° and 100° C.), the bulb of the thermometer not dipping below the surface of the residual fluid. A mixture of 5 volumes with sufficient Alcohol (90 p.c.) to form 100 volumes affords a liquid of which a portion tested in a nitrometer, as described under 'Spiritus Ætheris Nitrosi,' should yield not less than six times its bulk of Nitric Oxide Gas. On shaking with an equal volume of Solution of Potassium Hydroxide, the aqueous portion should have only a pale yellow colour (limit of Aldehyde). A small quantity in a test-tube placed in melting ice remains transparent (absence of Water). It deteriorates unless kept in well-stoppered bottles.

Ph. Ger. and U.S. agree that 10 c. c. with 2 c. c. of 1 p.c. Solution of Ammonia (NH_3) should not redden Litmus; according to Ger. it should not blacken Silver Ammonio-nitrate (absence of Valeric Aldehyde).

The total Nitrite is conveniently estimated by Allen's Nitrometer as described under Spiritus Ætheris Nitrosi; the number of c. c. of gas evolved multiplied by 5 (4·98) gives the weight in milligrammes of Amyl Nitrite in the quantity operated upon.

Determination of Amyl Nitrite and Ethyl Nitrite by a new method based on a reaction between Nitrous and Chloric Acids.—*A.J.P.* '98, 281, 282. Editorial on the same.—*C.D.* '98, ii. 59.

Not Official.

ISO-BUTYL NITRITE.—For method of preparation and properties see *P.J.* (3) xix. 487.

TERTIARY AMYL NITRITE (Bertoni's Ether).—Prepared from tertiary Amylic Alcohol (Amylene Hydrate). It possesses all the properties of the Official Nitrite, but it can be taken in larger quantities without danger, and it does not cause flushing of the face.—*P. J.* (3) xix. 161.

Not Official.

AMYLENE HYDRATE.

TERTIARY AMYLIC ALCOHOL. DIMETHYL-ETHYL CARBINOL.

$(CH_3)_2 C_2H_5$, COH, eq. 87·43.

Prepared by treating Trimethylethylene Amylene with Sulphuric Acid, and subsequent decomposition of the Amylene Sulphate with Alkali.

Solubility.—1 in 8 (or rather less) of Water; in all proportions of Alcohol (90 p.c.).

Medicinal Properties.—Hypnotic. Has no unpleasant after-effects, and its taste is less objectionable than that of Paraldehyde. Successful in mania (especially morphinomania *M.A.* '94, 426), delirium tremens, and in severe forms of epilepsy where bromides are found useless.

Recommended where hypnotics are required for a long period.—*Y.B.T.* '94, 74.

Dose.—50 to 70 minims.

Prescribing Notes.—Dissolved in Water or Alcohol (90 p.c.); also given in **capsules**; sometimes given as an enema.

Cannot be employed subcutaneously owing to pain produced.—*B.M.J.E.* '94, ii. 64.

Foreign Pharmacopœias.—Official in Ger. and Russ., Amylenum Hydratum; not in the others.

Description.—A clear, colourless, oily liquid with an odour resembling Paraldehyde.

Ger. and Russ. give the sp. gr. ·815—·820, and boiling point 99° to 103° C.

A sample examined by us had sp. gr. ·812; boiled at 212° F. (100° C.); crystallised at 5° F.

Tests.—1 c. c. dissolved in 20 c. c. of Water should not within ten minutes either decolourise 2 drops of (1 in 1,000) Solution of Potassium Permanganate (absence of Ethyl or Amyl Alcohol) or blacken Solution of Silver Nitrate at 212° F. (absence of Aldehyde).—*Ger.Ph.*

AMYLUM.

STARCH.

The starch procured from the grains of common wheat, *Triticum sativum;* maize, *Zea Mays;* and rice, *Oryza sativa.*

Medicinal Properties.—Protective, absorbent. A good application to the skin when irritable or inflamed, or in trivial burns. It has been given in powder for diarrhœa, and as an antidote for iodine poisoning, followed by an emetic. Mucilage of Starch, 1 in 40, is useful for preparing enemas. In the form of Violet Powder, which is merely perfumed Starch, it is useful to prevent the chafing and excoriation of the skin of infants. **Glycerin** of Starch is a good application for chilblains and chapped hands.

Official Preparations.—Glycerinum Amyli. Used in the preparation of Pulvis Tragacanthæ Compositus.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Ger., Hung., Ital., Jap., Norw., Port., Russ., Span. and Swed.; Fr., Amidon: all Wheat Starch;

Dutch, Potato Starch; Port. allows several other Starches; Swiss, Rice and Wheat Starch; U.S., Maize Starch.

Description.—In fine powder or in irregular angular or columnar masses, which are readily reduced to powder; white, inodorous.

Air-dried Starch always contains 12 to 16 p.c. of moisture; when dried at 212° F. (100° C.) its composition practically corresponds with the formula $C_6H_{10}O_5$.

Tests.—When lightly rubbed in a mortar with a little cold Water, the mixture is neither acid nor alkaline to test-papers. Boiled with Water and cooled, it gives a deep blue colour with Solution of Iodine. Under the microscope the several varieties of Starch present the following characters:—1. Wheat Starch: A mixture of large and small granules, the former lenticular in shape, and marked with faint concentric striæ surrounding a nearly central hilum. 2. Maize Starch: Granules more uniform in size, frequently polygonal, somewhat smaller than the large granules of Wheat Starch, and having a very distinct hilum but no evident concentric striæ. 3. Rice Starch: Granules extremely minute, nearly uniform in size, polygonal, without evident hilum or striæ. The Starch should be free from granules other than those described.

Neutral Starch is seldom obtained; it is, as a rule, faintly alkaline.

Preparation.

GLYCERINUM AMYLI. Glycerin of Starch. (Modified.)

Starch, 1; Glycerin, 6½; Distilled Water, 1½; mix, heat them together, stirring constantly until a translucent jelly is formed.

Half the water replaced by Glycerin.

The operation should be conducted as quickly as possible, and, to avoid overheating, the use of an oil-bath is to be recommended.

This formula has been altered in each successive edition of B.P. In 1867 the formula was Starch 1, Glycerin 8; in 1885, Starch 1, Glycerin 5, Distilled Water 3; and now is that given above.

A good application for chilblains and chapped hands.

Foreign Pharmacopœias.—Official in Belg., Starch 1, Glycerin 16 (nearly); Dutch, Starch 8, Glycerin 92; Fr. (Glycéré d'Amidon), Starch 1, Glycerin 14; Ital. (Glycerolato di Amido), Starch 7, Water 3, Glycerin 90; Mex. (Glycerado de Almidon), Starch 2·4, Glycerin 30; Port. (Glycerado Commum), Starch 1, Water 2, Glycerin 17; U.S. (Glyceritum Amyli), Starch 1, Water 1, Glycerin 8. The following are called Unguentum Glycerini: Austr. and Norw., Starch 1, Glycerin 15; Dan., Starch 3, Water 3, Glycerin, 14; Ger., Starch 10, Water 15, Glycerin 100, Tragacanth 2, Alcohol 5; Hung., Tragacanth 1, Alcohol 5, Glycerin 50 (no Starch); Jap., Starch 1, Water 1, Glycerin 9; Russ., Starch 1, Water 1, Glycerin 14; Span., Starch 1, Glycerin 15; Swed., Starch 2, Water 1, Glycerin 10; Swiss, Starch 7, Glycerin 93; all by weight.

Not Official.

TEST SOLUTION OF STARCH.—Made with Potato Starch, 1 p.c. is a convenient strength. It can be preserved almost indefinitely, as a sensitive reagent for Iodine, by boiling it in a sterilising flask, both openings being previously plugged with cotton wool.

A solution of this strength in equal parts of Glycerin and Water, after filtration or decantation from the insoluble cell-envelopes, will keep bright for years.

Not Official.

AMYLUM IODATUM.

Iodine, 5; Starch, 95; Distilled Water, q. s. Triturate the Iodine with a little Distilled Water, add the Starch gradually, and continue triturating until the compound assumes a uniform blue colour approaching black. Dry at a temperature not exceeding 40° C. (104° F.) and rub it to a fine powder.

A teaspoonful thrice daily for lupus erythematosus.—*B.M.J.* '80, i. 652.

Not Official.

ANALGEN.

A body similar in chemical composition and properties to Phenacetin, but with the Phenol ring replaced by the Quinoline ring.

Solubility.—Insoluble in Water; sparingly soluble in cold, more so in hot, Alcohol; fairly soluble in Chloroform; almost insoluble in Ether.

Medicinal Properties.—Has been recommended in neuralgia, hemicrania and bronchitic asthma, but it is not without unpleasant effects; the urine is frequently coloured red; toxic action and dangers, *B.M.J.* '98, ii. 1055.

It has given relief in sciatica.—*M.A.* '94, 9; *B.M.J.E.* '93, ii. 87; *M.P.* '94, 621; *L.* '97, i. 1227.

Dose.—7 to 15 grains.

Prescribing Notes.—Usually given in **cachets**, or Compressed Tablets.

Description.—A white crystalline powder, inodorous and tasteless. Melts at 208° C.

Prepared by nitrating a mixture of Ethylic Ether and Orthoxyquinoline with Nitric Acid, treating the mononitro-derivative with Ammonia and Sodium Carbonate and then acetylation. It formerly contained the Acetyl radicle, but has been found to possess greater advantages when the Acetic Acid radicle is replaced by Benzoic Acid.

ANETHI FRUCTUS.

DILL FRUIT.

The dried ripe fruit of the *Peucedanum graveolens*.

Cultivated in Britain or imported from Central and Southern Europe.

Medicinal Properties.—Stimulant, aromatic, and carminative: chiefly given to children in cases of flatulency, or hiccough; sometimes given with Sodium Bicarbonate.

Official Preparations.—Aqua Anethi and Oleum Anethi.

Foreign Pharmacopœias.—Official in Fr. (Aneth); Mex. (Eneldo); Port. (Endro); not in the others.

Description.—The two mericarps of which the fruit is composed are usually separate and freed from the pedicel; each of them is broadly oval, about one-sixth of an inch (four millimetres) long and from one-twelfth to one-eighth of an inch (two or three millimetres) broad. Very strongly compressed dorsally. They are brown in colour; the dorsal ridges are inconspicuous, but the lateral are prolonged into paler brown wings. Odour and taste agreeably aromatic. Each mericarp exhibits, in transverse section, six vittæ.

Preparations.

AQUA ANETHI. DILL WATER.

Dill Fruit, 1; Water, 20; distil, 10. =(1 in 10).

Dose.—Not given in B.P.; ½ to 1 fl. oz.; for children, 60 minims.

(Not in the other Pharmacopœias.)

OLEUM ANETHI. OIL OF DILL.

The Oil distilled from Dill Fruit.

Yield, 2·8 to 3 p.c.

Solubility.—Readily soluble in Alcohol and Ether.

Dose.—½ to 3 minims.

(Not in the other Pharmacopœias.)

Description.—Colour pale yellow, odour that of the fruit, taste sweet and aromatic.

Tests.—Sp. gr. ·905 —·920. It rotates the plane of a ray of polarised light not less than 70° to the right, at 60° F. (15·5° C.) in a tube 100 millimetres long.

Does not contain Anethol but a terpene (Limonene) together with Carvol.

Not Official.

ANILINE.

C_6H_7N, eq. 92·40.

An oily liquid, colourless when freshly distilled, but very prone to become yellow or brown on exposure to air.

Solubility.—1 in 27 of Water; 5 in 4 of Alcohol (60 p.c.); mixes in all proportions with Alcohol (90 p.c.), Ether and Glycerin.

Medicinal Properties.—Has been used in phthisis by Prof. Kremianski: his treatment is, meal powder as nourishment by the stomach or per rectum, Antifebrin to reduce pyrexia, and inhalations of Aniline. A **solution** 1 of Aniline in 7 of Oil of Eucalyptus or Aniseed, or a **mixture** of Aniline 1, Oil of Peppermint 2, Distilled Water 8; which latter was used when the first did not suit the patient.—*B.M.J.* '87, i. 579, *L.* '88, i. 569.

Aniline recommended to be used with a Siegle's Spray.—*L.M.R.* '88, 24.

The treatment reported on unfavourably by a medical committee.—*B.M.J.* '87, i. 789, 842.

Successful use in phthisis.—*L.* '94, ii. 598; unsuccessful.—*L.* 94, ii. 711.

For means of detecting minute traces of Aniline, *see Y.B.P.* '77, 80.

Sp. gr. varies between 1·023 to 1·026.

Ital. gives sp. gr. (at 16° C.) 1·020, and boiling point 183°—184° C.

ANISI FRUCTUS.

ANISE FRUIT.

The dried ripe Fruit of *Pimpinella Anisum*.

Medicinal Properties.—Stimulant, aromatic, and carminative, slightly expectorant; used to relieve flatulence, and to diminish the griping of purgative medicines.

Official Preparations.—Aqua Anisi and Oleum Anisi.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Mex. (Anis Comun), Norw., Port., Russ., Span., Swed., Swiss, and U.S.

Description.—The fruit is ovoid in form, somewhat laterally compressed, and rough from the presence of short, bristly hairs; greyish-brown in colour; about one-fifth of an inch (five millimetres) long and one-twelfth of an inch (two millimetres) broad. The mericarps usually remain united and attached to the pedicel. The primary ridges are pale, slender, and entire. Each mericarp exhibits, in transverse section, numerous vittæ. Odour agreeably aromatic, taste aromatic and sweet.

Preparation.

AQUA ANISI. Anise Water.

Anise Fruit, 1; Water, 20; distil, 10. =(1 in 10).

Foreign Pharmacopœias.—Official in Belg., from Oil and Alcohol; Fr., Port. and Span., from Fruits, Russ. and U.S. from Oil; not in the others.

Dose.—Not given in B.P.; ½ to 1 fl. oz.

ANISI OLEUM.

OIL OF ANISE.

The Oil distilled from Anise Fruit; or from the fruit of the Star-Anise, *Illicium verum*.

Solubility.—1 of Pimpinella Oil in 3 of Alcohol (90 p.c.); 1 of Illicium Oil in 4 of Alcohol (90 p.c.) (a slight rise in temperature greatly increases the solubility in Alcohol (90 p.c.); both oils dissolve in all proportions of Absolute Alcohol; 1 of Pimpinella Oil in 200 of Alcohol (60 p.c.), at which point the Illicium Oil is distinctly turbid.

These variations in solubility seem to arise from the presence in the Illicium Oil of a small proportion of a much less soluble Oil, which is absent in the Pimpinella.

Medicinal Properties.—Same as 'Anisi Fructus.'

Dose.—½ to 3 minims.

Prescribing Note.—May be taken on sugar.

Official Preparation.—Spiritus Anisi. Contained in Tinctura Camphoræ Comp. and Tinctura Opii Ammoniata.

Not Official.—Tinctura Anisi, Anisic Acid, Anisate of Sodium, and Anethol.

Foreign Pharmacopœias.—The following are from **Pimpinella.**—Belg., sp. gr. ·972—·995; Austr., Dan., Dutch, Ger., Russ., Swiss and U.S., sp. gr. ·980—·990; Hung., sp. gr. ·978—·984; Port., sp. gr. ·977—·983, Mex., sp. gr. ·982; Fr., Ital., Norw., Span. and Swed. do not give sp. gr. The following permit the use of both kinds:—Belg., Mex. and Port.

Description.—Colourless, or pale yellow; with the odour of the fruit, and a mildly aromatic taste.

Tests.—It congeals, when stirred, at temperatures between 50° and 59° F. (10° to 15° C.), and should not again become liquid below 59° F. (15° C.). Sp. gr. at 68° F. (20° C.) ·975 —·990. It rotates the plane of a ray of polarised light slightly to the left.

This is an exception to the rule laid down in the preface to B.P. that specific

gravities should be taken at 60° F. (15·5° C.), and compared with water at that temperature.

Both Oils of Anise consist mainly of a stearoptene 'Anethol,' with a smaller proportion of Terpene. The Pimpinella Oil is readily distinguished from that of Star Anise by giving a deep blue colour on the addition of *saturated* solution of Hydrochloric Acid Gas in Alcohol.

Owing to the oxidation of Anethol to Anisic Aldehyde by exposure to air, the characters of the Oil are greatly changed. Rise of sp. gr. and lowering of melting point are the principal indications as to the extent of oxidation. These changes will be found discussed in detail, in our paper, *P.J.* (3), xxiv. 104.

A freshly distilled Oil may be expected to have a **specific gravity** between ·975 and ·990, and a **melting point** between 60° and 68° F.—*P.J.* (3) xxiv., 104.

The bulk of Anise Oil in England has been stated to be obtained from *Illicium*; but on the Continent the Pimpinella Oil is that principally used, and it is Official in all the Pharmacopœias compared in this work; the Illicium is Official in but three of them, Belg., Mex. and Port.

Preparation.

SPIRITUS ANISI. Spirit of Anise. (New.)

Oil of Anise, 1; Alcohol (90 p.c.), a sufficient quantity to form 10 of the Spirit of Anise. =(1 in 10).

Dose.—5 to 20 minims.

This spirit of Anise contains half the proportion of Oil of Anise present in the Essence of Anise of the British Pharmacopœia of 1885.

Foreign Pharmacopœias.—Belg., 1 Oil in 100; Fr., 1 Oil in 50; U.S. Spiritus, 1 Oil in 10; Austr., 1 of fruits in 6; Span., 1 of fruits in 6 (distilled); all by weight except U.S.; not in the others.

Not Official.

TINCTURA ANISI (Fr., Mex. and Russ.)—Anise Fruit, 1; Alcohol (90 p.c.), 5.

ANISIC ACID ($H.C_8H_7O_3$).—It occurs in shining acicular crystals obtained by the oxidation of Oil of Anise or Anethol.

Solubility.—Almost insoluble in cold Water, 1 in 700 boiling Water; 1 in 36 of Alcohol (90 p.c.); 1 in 50 of Ether.

SODIUM ANISATE.—In rhombic crystals, frequently efflorescent, with a slight aromatic odour.

Solubility.—1 in 5 of Water; 1 in 24 of Alcohol (90 p.c.).

Anisic Acid and its Sodium salt have been stated to possess antiseptic and antipyretic properties, similar to Salicylic Acid.

ANETHOL ($C_{10}H_{12}O$).—The Stearoptene separated from either of the Anise Oils. It is said to have a finer flavour than the Oil, being free from the acridity pertaining to the non-freezing portion of the Oil. Sp. gr. ·985 at 25° C.; melting point 21°—22° C. (70° F.); boiling point 234° C.

ANTHEMIDIS FLORES.

CHAMOMILE FLOWERS.

The dried expanded Flower-heads of *Anthemis nobilis*, collected from cultivated plants.

Medicinal Properties.—Tonic, aromatic, and stomachic. In large doses, emetic. The infusion taken early every morning is useful in atonic dyspepsia; externally it is employed as a fomentation for bruises and contusions.

Prescribing Notes.—The Extract or Oil is frequently added to Rhubarb and aperient medicines as a corrective. A little soap added in the case of the Oil makes a good mass.

Official Preparations.—Extractum Anthemidis, and Oleum Anthemidis. The Oil is contained in the Extract.

Not Official.—Aqua Anthemidis, Oleum Chamomillæ Infusum, and Tinctura Anthemidis.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ital., Port., Span. (Manzanilla), Swiss, and U.S.; not in the others; also Matricaria in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Norw., Russ., Span. Manzanilla Comun), Swed., Swiss, and U.S.; Mex. (both varieties).

Description.—About one-half to three-quarters of an inch (twelve to twenty millimetres) in diameter, hemispherical in shape, white or nearly white in colour. The involucre is composed of several rows of oblong bracts with membranous margins; the receptacle is solid, conical, and densely covered with concave, blunt, narrow, scaly bracts; the florets are mostly ligulate and white. Chamomile Flowers have a strong aromatic odour and bitter taste.

The 'German' Chamomile (*Matricaria Chamomilla*) is scarcely if at all bitter. The receptacle is hollow and conical and has no scaly bracts on it.

Preparations.

EXTRACTUM ANTHEMIDIS. Extract of Chamomile.

Chamomile Flowers, 16 oz.; Oil of Chamomile, 15 minims; Distilled Water, 160 fl. oz. Boil the Chamomile Flowers with the Distilled Water until the volume is reduced to one-half; strain; press; filter; evaporate the filtrate to the consistence of a soft extract; add the Oil of Chamomile towards the end of the process.

The double flowers yield about 30 p.c. of Extract.

Dose.—2 to 8 grains.

Foreign Pharmacopœias.—Official in Belg., from Anthemis; Fr., from both; Dan. and Swed., from Matricaria; Mex. (Extracto de Manzanilla); not in the others.

OLEUM ANTHEMIDIS. Oil of Chamomile.

The Oil distilled from Chamomile Flowers.

Solubility.—Sparingly in Water; 10 in 3 of Alcohol (90 p.c.).

Dose.—½ to 3 minims.

Foreign Pharmacopœias.—Official in Span., from Anthemis; Fr., from Anthemis and Matricaria; Belg., Ital., and Swiss, from Matricaria; not in the others.

Description.—Sp. gr., ·905—·915. Pale blue or greenish blue

when freshly distilled, but gradually becoming yellowish brown It should have the aromatic taste and odour of the flowers.

Not Official.

AQUA ANTHEMIDIS.—Flowers 1; Water 20; distil 10. =(1 in 10.

Foreign Pharmacopœias.—Official in Austr. and Dan., 1 in 10; Dan. also Conc., 1 in 1; Belg., 1 in 5; Fr., Port. and Span., 1 in 4; Swed., 1 in 7; all distilled. Belg., Port. and Span., from Anthemis; Austr., Dan., Dutch and Swed., from Matricaria; Fr. from both.

OLEUM CHAMOMILLÆ INFUSUM.—Chamomile Flowers 1; Olive Oil 10; digest in a water-bath for 2 hours, strain, press, and filter.

Foreign Pharmacopœias.—Official in Fr. and Port., 1 in 10; Span., 1 in 8; from Anthemis. Belg., 1 in 10; Ital., 1 in 4; Norw., 1 in 5, from Matricaria.

TINCTURA ANTHEMIDIS.—Single Chamomiles carefully dried, 1; sufficient Alcohol (90 p.c.) to percolate 8: or an equivalent quantity of fresh flowers (about 3), and macerate with 8 of Alcohol (90 p.c.) for 7 days, and press.

The moisture in the fresh flowers reduces the strength of the spirit so that less resin is dissolved, and the tincture is consequently less bitter.

ANTIFEBRIN.

See ACETANILIDUM.

Not Official.

ANTIMONIUM.

ANTIMONY.

Sb, eq. 119.

In older Pharmacopœias and works on Chemistry the combining weight of Antimony was given as 122.

Of a silvery-white colour, brittle and crystalline. Sp. gr. 6·7.

This metal rarely occurs native, but generally as the black Sulphide, the Stibium of the ancients. It was first made known in the metallic state by Basil Valentine towards the end of the fifteenth century. It is prepared on a large scale by roasting the Sulphide (mixed with Charcoal to prevent caking) until it is converted into Oxide, which is then reduced by means of Charcoal and Potassium Carbonate. It is extensively employed in the manufacture of type-metal and the alloy known as Britannia metal. It melts at about 800° F., and as the ingots cool, its surface has a beautiful stellated appearance: the alchemist considered this star as a mysterious guide to the secrets of transmutation. It is volatile at a white heat.

The most characteristic reactions of Antimony are:—(1) The orange-red precipitate with Hydrogen Sulphide; (2) Metallic coating on copper with Reinsch's test, from which no Crystalline sublimate can be obtained. (3) Formation of Antimoniuretted Hydrogen from Zinc and Acid, the spots on cold porcelain being unaffected by Hypochlorite Solution. (4) Non-formation of Antimoniuretted Hydrogen with Zinc and Caustic Alkali.

(Span.; not in the other Pharmacopœias.)

ANTIMONII OXIDUM.

ANTIMONIOUS OXIDE.

Sb_4O_6, eq. 571·28.

It may be prepared by pouring Solution of Antimonious Chloride into Water, and decomposing the precipitated Antimony Oxychloride with Sodium Carbonate.

Solubility.—Insoluble in Water, Alcohol, and Nitric Acid; readily dissolved by Hydrochloric Acid and warm solution of Tartaric Acid.

Medicinal Properties.—Similar to, but less active than the Tartrate, because less soluble.

Dose.—1 to 2 grains.

Prescribing Notes.—The Pulvis Antimonialis is generally given in the form of **powders, pills** or **cachets.**

Official Preparations.—Pulvis Antimonialis. Used in the preparation of Antimonium Tartaratum.

Foreign Pharmacopœias.—Official in Belg., Mex. (Oxido Antimonioso Precipitado), Norw. (Oxydum Stibicum), Port., Span. and U.S.; not in the others.

Description.—A greyish-white powder, fusible at a low red heat.

Tests.—The solution affords the reactions characteristic of Antimony. If ·5 gramme be dissolved in a hot solution of 1 gramme of Acid Potassium Tartrate, and the solution then made alkaline with 3 grammes of Sodium Bicarbonate, the cooled liquid should discharge the colour of 70 c.c. of the Volumetric Solution of Iodine. Antimonious Oxide should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Calcium, Sodium, or Potassium, only slight reactions with the tests for Iron, and only the slightest reactions with the tests for Chlorides or Sulphates. It should dissolve entirely when boiled with an excess of Acid Potassium Tartrate.

If 1 gramme of Antimonious Oxide be dissolved with the aid of 5 grammes of Tartaric Acid in a little water, and the solution be diluted with Water to measure 100 c.c., portions of this solution should not be affected by test-solutions of Silver Nitrate (Chloride), Barium Chloride (Sulphate), or Potassium Ferrocyanide (Iron and other metals).—*U.S.P.*

Preparation.

PULVIS ANTIMONIALIS. Antimonial Powder.

Antimonious Oxide, 1; Calcium Phosphate, 2; mix. =(1 in 3).

Dose.—3 to 6 grains.

Foreign Pharmacopœias.—Official in Belg., Antimonious Oxide 334, Calcium Phosphate 666; Mex., Antimonious Oxide 1, Calcium Phosphate 2; Port., Antimonious Oxide 35, Calcium Phosphate 65; U.S., Antimonious Oxide 33, Precipitated Calcium Phosphate 67; not in the others.

ANTIMONIUM NIGRUM PURIFICATUM.

ANTIMONIOUS SULPHIDE.

Native Antimonious Sulphide, Sb_2S_3, eq. 333·46, from which Siliceous matter has been removed by fusion, reduced to fine powder, and, if any salt of Arsenium be present, purified by digesting with half its weight of Solution of Ammonia for several days, washing and drying.

Official Preparation.—Used to prepare Antimonium Sulphuratum.

Foreign Pharmacopœias.—Official in Austr. (Crude) Belg., Dan., Fr., Ger., Ital., Mex., Norw., Port., Russ., Swed., Swiss and U.S.; not in the others.

Description.—A greyish-black crystalline powder decomposed on boiling with Hydrochloric Acid, an almost clear solution being formed and Hydrogen Sulphide escaping.

Tests.—The solution affords the reactions characteristic of Antimony. It should not yield more than slight characteristic reactions with the tests for Arsenium.

ANTIMONIUM SULPHURATUM.

SULPHURATED ANTIMONY.

A mixture containing Antimony Sulphides and Oxides. Sb_2S_5, Sb_2O_3, Sb_2S_3, Sb_4O_5, and Sulphur.

Solubility.—Insoluble in Water; dissolves readily in Caustic Soda solution, also in hot Hydrochloric Acid.

Medicinal Properties.—Alterative, diaphoretic, and emetic; uncertain in action from its slight solubility, depending on the acidity of the stomach. Usually prescribed with Calomel and Guaiacum, as in Pilula Hydrargyri Subchloridi Composita, as a cholagogue in gout; for secondary syphilis and its cutaneous eruptions; or with Henbane or Hemlock in chronic rheumatism.

Dose.—1 to 2 grains.

Official Preparation.—Contained in Pilula Hydrargyri Subchloridi Composita.

Not Official.—Kermes Mineral.

Foreign Pharmacopœias.—Official in U.S., Antimonium Sulphuratum; Austr., Belg., Hung., Jap., Russ. and Swiss, Stibium Sulphuratum Aurantiacum; Dan., Dutch, Norw., and Swed., Sulphidum Stibicum; Fr., Soufre Doré d'Antimoine; Ger., Stibium Sulfuratum Aurantiacum; Mex., Sulfuro Antimonico; Port., Enxofre Dourado de Antimonio; Span., Sulfuro Antimonico Sulfurado.

O.M.P.—Antimonious Sulphide, 10; Sublimed Sulphur, 10; Caustic Soda, of commerce, 5; Diluted Sulphuric Acid and Distilled Water of each a sufficient quantity.

Dissolve the Caustic Soda in 100 of the Distilled Water; with this solution mix the Antimonious Sulphide and the Sublimed Sulphur; boil for two hours with frequent stirring, adding Distilled Water occasionally to maintain the same volume; then, while the whole is still hot, add 180 of boiling Distilled Water; strain the product through calico; before the strained liquid cools add to it by degrees the Diluted Sulphuric Acid till the latter is in slight excess; collect the precipitate on a calico filter; wash with Distilled Water till the

washings are free from Sulphates; dry at a temperature not exceeding 212° F. (100° C.).

3 commercial samples yielded to Carbon Bisulphide 20, 31, and 40 p.c. of Sulphur, while a specimen prepared by the B.P. process yielded 12 p.c. of Sulphur. The proportion of Oxide present was found to be 2 to 3 p.c. in the commercial samples, but only ·2 p.c. in that prepared according to the B.P.

It is largely used for vulcanising red india-rubber, and on a manufacturing scale the Soda of the B.P. process is replaced by Lime.

Description.—A dull-red powder, readily dissolved by Solution of Sodium Hydroxide, also by hot Hydrochloric Acid with the evolution of Hydrogen Sulphide and the separation of Sulphur.

Tests.—3 grammes moistened and warmed with successive portions of Nitric Acid until red fumes cease to be evolved, and then dried and heated to redness, should leave a white residue weighing about 2 grammes. Sulphurated Antimony should not yield more than the slightest characteristic reactions with the tests for Arsenium.

If 1 gramme of Sulphurated Antimony be shaken with 20 c.c. of hot Water, the filtrate should be neutral to test paper; should not be rendered more than slightly opalescent by test solution of Barium Chloride (limit of Sulphate), or of Silver Nitrate (limit of Chloride), and should not be affected by test solution of Ammonium Oxalate (absence of Calcium).—*U.S.P.*

Not Official.

KERMES MINERAL.—This is still occasionally prescribed and is Official in Belg., Dan., Fr., Hung., Ital., Norw., Port., Span., Swed., Swiss and U.S. Pharmacopœias.

ANTIMONIUM TARTARATUM.

TARTARATED ANTIMONY.

B.P.Syns.—Potassio-Tartrate of Antimony; Tartar Emetic.

Tartarated Antimony, $[K(SbO)C_4H_4O_6]_2H_2O$, eq. 659·14; is prepared by setting aside a mixture of Antimonious Oxide and Acid Potassium Tartrate, made into a paste with a little Water, until combination has taken place, and then purifying by crystallisation from Water.

Solubility.—1 in 17 of cold Water (slowly); 1 in 2 of Boiling Water; sparingly soluble in Alcohol (60 p.c.); insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Diaphoretic, expectorant, alterative, emetic, circulatory and nervous sedative, antispasmodic, and antipyretic. Useful in the head symptoms of acute febrile diseases and in delirium tremens; contra-indicated in asthenic cases; alterative in chronic skin affections and in gout.

As a febrifuge and expectorant, it is given with great effect in the early stage of acute pneumonia and bronchitis.

Externally, in the form of **ointment**, it acts as a powerful counter-irritant to the skin, producing a pustular eruption.

Dose.—As a diaphoretic, $\frac{1}{24}$ to $\frac{1}{8}$ grain; as an emetic, 1 to 2 grains.

Prescribing Notes.—Best prescribed in aqueous solution or as the Vinum. In **pill** well triturated with Milk Sugar and Glucose *q.s.*

Incompatibles.—Tannic Acid, the Alkalis and their Carbonates, and Lead salts, Astringent infusions, as Cinchona, Rhubarb, &c.

Official Preparation.—Vinum Antimoniale.

Antidotes.—Stomach Tube or Emetics, Tannic Acid, Catechu, vegetable astringents, Tea or Coffee, stimulants if much collapse.

Foreign Pharmacopœias.—Official in Austr., Stibium Kalio-Tartaricum; Belg., Tartras Antimonico Potassicus; Dan., Norw. and Swed., Tartras Stibico-Kalicus; Dutch, Tartras Kalico-Stibicus; Fr., Tartrate d'Antimoine et de Potasse; Ger. and Swiss, Tartarus Stibiatus; Hung., Kalium Stibio-Tartaricum; Ital., Tartrato di Antimonio e di Potasio; Mex., Tartrato de Potasio y antimonio; Port., Tartrato de Potassa e de Antimonio; Jap. and Russ., Stibio-Kalium Tartaricum; Span., Tartrato Antimonico Potasico; U.S., Antimonii et Potassii Tartras.

Description.—In colourless transparent crystals, exhibiting triangular facets. Taste sweet and metallic.

The crystals are liable to loss of Water by efflorescence. To obviate this variation Dunstan has proposed to use the Anhydrous salt, prepared by precipitating a strong Aqueous Solution of Tartar Emetic with a large excess of Methylated Spirit, the precipitate collected by decantation or filtration, washed with Methylated Spirit, and quickly dried over a water-bath. 1 of the Anhydrous salt dissolves in 14·53 of Water.

Tests.—It is precipitated from its solutions by Solution of Tannic Acid, and by alkalis and alkaline Carbonates, but not by Gallic Acid. It affords the reactions characteristic of Antimony, of Potassium, and of Tartrates. Each gramme dissolved in Water with 2 or 3 grammes of Sodium Bicarbonate should discharge the colour of not less than 60·2 nor more than 60·7 c.c. of the Volumetric Solution of Iodine quickly introduced from a burette. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Calcium, Sodium, Ammonium, Chlorides, or Sulphates. It should not effervesce with Solution of Sodium Bicarbonate (absence of Acid Potassium Tartrate). 1·66 grammes should dissolve slowly but without residue in 25 c.c. of Water at 60° F. (15·5° C.).

The quantitative test is that proposed by Dunstan. The Alkali must be added not long before the titration, or the Antimony will be precipitated.—*P.J.* (3) xix. 385.

1 c.c. $\frac{N}{10}$ solution of Iodine = ·0166 gramme Tartar Emetic, therefore the quantity required for ·3 gramme will be 18 c.c.

Conversely Iodine may be estimated with standard Tartar Emetic.—*P.J.* (3) xix. 582.

Preparation.

VINUM ANTIMONIALE. Antimonial Wine. (Altered.)

Tartarated Antimony, 40 grains; Distilled Water, boiling, 1 fl. oz.; Sherry, a sufficient quantity. Dissolve the Tartarated Antimony in the Distilled Water; mix the solution with sufficient Sherry to form 20 fl. oz. of the Antimonial Wine. = (1 in 219).

The metric quantities are 4 grammes, and 44 c.c. to form 875 c.c.

Boiling Water is added to dissolve the Tartarated Antimony, as recommended in former editions of the '*Companion*.'

Dose.—10 to 30 minims; as an emetic 2 to 4 fl. drm.

Foreign Pharmacopœias.—Vinum Stibiatum, Dutch, Ger., and Jap., 1 in 250; Ital. (Vino Antimoniale di Huxham), 1 in 250; Mex. (Vino estibiado) 1 in 300; Span. (Vino de Tartrato Antimonico Potasico), 1 in 230; Russ. (Vinum Stibio-Kalii Tartarici), 1 in 250; U.S., (Vinum Antimonii), 1 in 250; all with Sherry. Austr. (Vinum Stibii Kalio-Tartarici), 1 in 250; Hung. (Vinum Stibiato-Tartaricum), 1 in 240; Belg., (Vinum Antimoniatum), 1 in 200; Vinum Stibiatum, Swed. and

Swiss, 1 in 250; all with Malaga Wine. Port. (Vinho Antimonial), 1 in 200 of Port Wine. All by weight, except U.S. Not in Fr. or Norw.

ANTIPYRINE.

See PHENAZONUM.

Not Official.

APIOL.

Obtained from the fruits of *Apium petroselinum* (Parsley).

Medicinal Properties.—It i useful in amenorrhœa and dysmenorrhœa.

Dose.—3 to 5 minims.

Prescribing Note.—Usually given in **capsules**.

Foreign Pharmacopœias.—Official in Belg., Mex., and Port., Apiol; Dan. and Norw., Ætheroleum Petroselini; not in the others.

Description.—An oily liquid, with a peculiar odour and disagreeable taste.

It was described by Messrs. Joret and Homolle, who introduced the substance into medicine, as a yellow, oily, non-volatile liquid, but the Apiol obtained by us from the Homolle capsules, although yellow in colour, was volatile in the vapour of water to the extent of 95 p.c. Witney went into the subject in 1880, and describes Apiol as an impure Essential Oil of Parsley containing minute quantities of soft Resin, and the Apiol of Homolle as the Essential Oil of Parsley Seeds with small traces of a soft resin. The Essential Oil of Parsley is a yellow oily liquid, and as such has been made official in the Danish and Norwegian Pharmacopœias. Apiol is described in the Belgian Pharmacopœia as being yellowish-brown in colour.

A discussion has recently arisen as to what should be the colour of liquid Apiol. it was suggested in *C.D.* '94, ii. 17, that it was simply an alcoholic extract of Parsley Seeds, but this product is green and contains but a small proportion (under 15 p.c.) of the Essential Oil of Parsley.

Not Official.

APOCYNUM U.S.

Syn.—Canadian Hemp.

The root of *Apocynum Cannabinum* is Official in U.S.P.

Medicinal Properties.—It has been used in the United States as a **Decoction**, 1 Root in 60 of Water, boil to 40 (dose ½ to 1 oz.), and given with good effect as a diuretic in dropsy.—*L.* '85, ii. 86; '86, i. 508; *B.M.J.* '87, i. 522; *T.G.* '98, 719, 730. Also as a **fluid extract** (dose 5 to 15 minims) in pleurisy with effusion.—*T.G.* '87, 29.

It also possesses emetic and cathartic properties; but as it is a drastic purgative, it should be given with some caution.

The diuretic action of Apocynum cannabinum, the Canadian Hemp, was favourably considered, although it was admitted that it might produce violent emesis and catharsis. These undesirable results were, however, attributed to the admixture of the bitter fibre of the wood with the bark of the root.—*B.M.J.* '97, ii. 1714.

Preparations.

EXTRACTUM APOCYNI FLUIDUM (*U.S.*).—1 fluid oz. equals 1 oz. of root.

TINCTURA APOCYNI.—Root, 1; Alcohol (60 p.c.), 10.

Dose.—5 to 10 minims, as a cardiac tonic, and diuretic in cardiac dropsy.—*T.G.* '89, 585, '95, 47; *L.* '94, i. 841; *B.M.J.E.* '94, i. 100; '94, ii. 47.

APOMORPHINÆ HYDROCHLORIDUM.

APOMORPHINE HYDROCHLORIDE.

HYDROCHLORATE OF APOMORPHINE, *B.P.* 1885.

$C_{17}H_{17}NO_2$, HCl, eq. 301·36.

The Hydrochloride of an alkaloid obtained by heating Morphine Hydrochloride or Codeine Hydrochloride in sealed tubes with Hydrochloric Acid.

Solubility.—1 in 50 of Alcohol (90 p.c.); nearly insoluble in Chloroform and in Ether; 1 in 100 of Glycerin.

The solubility in Water is given in *B.P.* as 1 in 50; as this cannot be obtained at the ordinary temperature, the following experiments are recorded.

The material used was re-crystallised, air-dried and powdered. It lost 3 p.c. of hygroscopic moisture on heating in a water-bath, which was exactly regained after 12 hours exposure to air. The methods and results were as follows:—

(1) Minimum quantity of Water required for complete solution in 3 days at 60° F. Between 1 in 56 and 1 in 60.

(2) Evaporation of solution digested over excess of salt for 2 days at 60° F. Result 1 in 56.

(3) Dissolved by a gentle heat, 1 in 36 generally crystallised within 24 hours, the length of time increasing with the degree of dilution, till at 1 in 45 no crystallisation was visible after some weeks.

(4) Evaporation of saturated solution, obtained by supersaturation and from which crystals have separated after 24 hours at 60° F. yielded 1 in 43, but after 48 hours 1 in 49.

Its aqueous solution on being gently warmed rapidly turns green, more particularly if rendered faintly alkaline with Potassium Carbonate.

Medicinal Properties.—It is the most reliable emetic, and usually acts promptly (2 or 3 minutes) without the production of much preceding nausea or depression, or unpleasant after effects. As a **hypodermic injection** in cases of poisoning, especially if unable to swallow.

Invaluable as an expectorant in acute and chronic bronchitis with viscid secretion, in bronchial irritation due to inhalation of factory dust and in asthma.

Has been used in bronchial catarrh, *L.M.R.* '81, 148; as an expectorant for children and adults, given with Hydrochloric Acid and Syrup, *L.M.R.* '82, 497; a sedative in nervous affections, *L.* '84, ii. 1166; in croup and bronchitis, *B.M.J.* '85, ii. 748; in coughs, *L.* '87, ii. 497; $\frac{1}{60}$ to $\frac{1}{10}$ grain given as an expectorant to children in capillary bronchitis and croup, *T.G.* '87, 657; as an emetic, *B.M.J.* '89, i. 339, 394, 885.

Dose.—$\frac{1}{30}$ to $\frac{1}{10}$ grain, by hypodermic injection; by the mouth, $\frac{1}{10}$ to $\frac{1}{4}$ grain.

P.G. maximum single dose $\frac{1}{2}$ grain; maximum daily dose $\frac{3}{4}$ grain.

Prescribing Notes.—In solution, should be dispensed in coloured glass bottles. The discs are convenient for hypodermic administration.

Official Preparation.—Injectio Apomorphinæ Hypodermica.

Not Official.—Hypodermic Discs, Syrupus Apomorphinæ Hydrochloratis, and Haustus Apomorphinæ Compositus.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Hung., Jap., Norw., Russ., Swiss and U.S.; Fr., Apomorphine; Mex. (Apomorfina); not in the others.

Description.—Small, greyish-white, shining acicular crystals, turning green on exposure to light and air, inodorous. Soluble in 50 parts of Water and more soluble in Alcohol (90 p.c.), the solutions being decomposed with production of a green colour when they are boiled.

Note.—It should be kept in small well-stoppered vials in a dark place.

Tests.—Neutral or very feebly acid to Solution of Litmus. From solutions, Solution of Sodium Bicarbonate throws down a precipitate which becomes green on standing and then forms a solution which is purple with Ether, violet with Chloroform, and bluish-green with Alcohol (90 p.c.). With dilute test-solution of Ferric Chloride it gives a deep red, and with Nitric Acid a blood-red coloration. If the salt impart an emerald-green colour to 100 parts of Water, after shaking the mixture, it should be rejected.

Preparation.

INJECTIO APOMORPHINÆ HYPODERMICA. Hypodermic Injection of Apomorphine. (Altered.)

Apomorphine Hydrochloride, 1 grain; Diluted Hydrochloric Acid, 1 minim; Distilled Water, 110 minims or a sufficient quantity. Boil the Distilled Water for a few minutes; cool; add the Diluted Hydrochloric Acid; dissolve the Apomorphine Hydrochloride in the resulting liquid; add, if necessary, sufficient recently boiled and cooled Distilled Water to produce 110 minims of the Injection.

This injection should be recently prepared. 110 minims contain 1 grain of Apomorphine Hydrochloride; 100 c.c. contain 1 gramme.

Dose, by subcutaneous injection.—5 to 10 minims (= $\frac{1}{22}$ — $\frac{1}{11}$th grain).

Now 1 grain in 110 minims instead of 2 grains to 100 minims. Distilled Water is used in place of Camphor Water and it is acidulated.

Not Official.

DISCS OF APOMORPHINE.—$\frac{1}{15}$ to $\frac{1}{6}$ grain dissolved in 6 to 10 minims of Distilled Water at the time of using.—*St. Bartholomew's.*

HAUSTUS APOMORPHINÆ COMPOSITUS.—Apomorphine Hydrochloride $\frac{1}{6}$ grain; Syrup of Squills, 60 minims; Oil of Turpentine, 10 minims; Mucilage of Acacia *q.s.*; Spirit of Ether, 10 minims; Distilled Water to 1 fl. oz.—*Middlesex Hospital.*

SYRUPUS APOMORPHINÆ HYDROCHLORATIS (*B.P.C.*).—Apomorphine Hydrochloride, 5 grains; Diluted Hydrochloric Acid, 2 fl. drm.; Rectified Spirit, 7 fl. drm.; Distilled Water, 7 fl. drm.; Syrup, 18 fl. oz.; dissolve the salt in the Spirit and Water mixed, then add the Acid and the Syrup.

Dose.—$\frac{1}{2}$ to 1 fl. drm.

AQUÆ.

WATERS.

The waters of the British Pharmacopœia, all of which are distilled, except Aqua Camphoræ and Aqua Chloroformi, are as follows; the formulæ are given under the names of the substances from which they are prepared.

AQUA ANETHI. From the dried ripe fruit.
AQUA ANISI. From dried ripe Anise fruit.
AQUA AURANTII FLORIS. From the flowers. Imported.
AQUA CAMPHORÆ.
AQUA CARUI. From the dried fruit.
AQUA CHLOROFORMI.
AQUA CINNAMOMI. From the bark.
AQUA DESTILLATA.
AQUA FŒNICULI. From the dried ripe fruit.
AQUA LAUROCERASI. From fresh leaves.
AQUA MENTHÆ PIPERITÆ. With oil and distilled.
AQUA MENTHÆ VIRIDIS. With oil and distilled.
AQUA PIMENTÆ. From the dried unripe fruits.
AQUA ROSÆ. From the fresh flowers.
AQUA SAMBUCI. From the fresh flowers. Imported,

A modified process is permitted for use in India and the Colonies. *See* Appendix.

In preparing distilled aqueous liquids only good natural potable water must be employed, as directed for 'Distilled Water.'

AQUA DESTILLATA.

DISTILLED WATER.

Prepared by distillation from good natural potable water.

Description.—Colourless, tasteless, and odourless.

Tests.—25 c.c. evaporated in a platinum capsule should leave at most a scarcely visible residue (absence of dissolved solids). It should yield no reaction with the tests for the various metals, Chlorides, Nitrates, Nitrites, or Sulphates. It should not affect Litmus Paper (absence of acid or alkaline matter). The liquid obtained on boiling 100 c.c. for three minutes with 1·0 c.c. of Diluted Sulphuric Acid and ·1 c.c. of a mixture of one part of Solution of Potassium Permanganate and two parts of Water, should retain its colour for one hour (absence of more than traces of organic matter). 100 c.c. mixed with 2 c.c. of Solution of Potassio-mercuric Iodide, should not afford a yellow tint more intense than that given by ·25 c.c. of Solution of Ammonium Chloride (Nessler's) diluted with 50,000 c.c. of Ammonia-free Water when viewed, under similar conditions, in a glass tube having a diameter of one inch (25 millimetres) (absence of more than ·005 part of Ammonia per million parts).

ARAROBA.

ARAROBA.

B.P.Syn.—Goa Powder; Crude Chrysarobin.

A substance found in cavities in the trunk of *Andira Araroba*, freed as much as possible from fragments of wood, dried, and powdered.

Official Preparation.—Used to prepare Chrysarobin.

Description.—The powder varies in colour from brownish-yellow to umber-brown.

Test.—It should yield to hot Chloroform not less than 50 p.c. of a substance which, on evaporating the Chloroform from the filtrate, and drying and powdering the residue, should have the characters of Chrysarobin.

Not Official.

ARECA.

The Seed of the Areca Catechu, Linn., the betel-nut tree. Imported from the East Indies.

Medicinal Properties. — Astringent, narcotic, anthelmintic. A remedy for tape-worm. 60 grains of powdered Areca Nut made into a ball with Honey answers well as a vermifuge for a large dog. A paste is made of the powder for a dentifrice.

Areca Nut Charcoal used also as a dentifrice.

Three Alkaloids have been obtained from Areca: Arecoline, an alkaline, colourless, volatile liquid, soluble in Water, Alcohol, Ether, and Chloroform, and forming a crystallisable Hydrobromide; Arecaine, neutral, soluble in Water and dilute Alcohol, but insoluble in Ether, Chloroform and Benzol; and another, in much smaller quantity.—*L.* '89, i. 496.

Foreign Pharmacopœias.—Official in Ger., Semen Arecae.

ARECOLINE HYDROBROMIDE in one p.c. aqueous solution, causes contraction of the pupil.

Not Official.

ARGENTUM.

SILVER.

Ag, eq. 107·11.

A white, malleable, ductile, and tenacious metal, bears a brilliant polish, and is soft when pure. Sp. gr. 10·5; fuses at between 1800° and 1900° F. It was one of the earliest known metals, the Luna or Diana of the alchemists. It occurs native, sometimes arborescent, sometimes in masses; it is seldom, however, pure. The mines of Peru and Mexico are the richest. The mines of Saxony, Bohemia, Swabia, and Kongsberg in Norway, are the richest in Europe. It has been found in Cornwall and Devonshire as a sulphide.

Metallic Silver can be distinguished from other metals resembling it (except Aluminium or Platinum) by not being affected by a solution (10 p.c.) of Nitrate of Silver. The other metals give a black stain.

Silver is readily acted on by Sulphuretted Hydrogen.

Its solutions are distinguished from those of all other metals by giving a white curdy precipitate with Hydrochloric Acid, insoluble in Nitric Acid, but soluble in excess of Ammonia.

ARGENTI NITRAS.

SILVER NITRATE.

B.P.Syn.—Lunar Caustic.

$AgNO_3$, eq. 168·69.

A salt, prepared by the interaction of Nitric Acid and Silver.

Solubility.—100 grains in 50 minims of Water, measuring 80 minims; 1 in 18 of Alcohol (90 p.c.). Insoluble in strong Nitric Acid.

Medicinal Properties.—Astringent, sedative, and antiphlogistic, antispasmodic, tonic. It is useful in hæmatemesis, gastric ulcer, diarrhœa and cholera, as well as in chronic nervous irritability of and pain in the stomach; also in some nervous diseases, as epilepsy, chorea and locomotor ataxy. It is employed in chronic dysenteric ulcers as an **enema,** 60 grains dissolved in 60 ounces of water, after clearing away the contents of lower bowel, and as a **bougie** in chronic gonorrhœa. A dark line on the edges of the gums, removable by a course of Acid Tartrate of Potassium, precedes the indelible discolouration of the skin and mucous membranes (argyria), produced by the long-continued internal administration of this salt. Its administration should be interrupted for fourteen days at the end of two or three months, however small the dose. More than 100 grains per month should not be given.

Externally as a local stimulant to weak and callous ulcers, fistulæ, and aphthous affections of the mouth; as a caustic to poisoned wounds. As a local application to prevent pitting in small-pox, and to relieve the itching in pruritus; it is also applied, under Cocaine, to ulcers of the cornea. 1 to 3 grains to the ounce is employed for **lotions** and **collyria**, in all forms of conjunctivitis and both as a prophylactic and curative in ophthalmia neonatorum, and as an injection in urethritis, cystitis, and vaginitis. For eczema or pityriasis of the ear, a 1 in 20 solution in Sp. Ether Nit. answers well.

Chilblains are sometimes painted with a strong solution of Silver Nitrate.

A weak solution (1 in 500) for obstinate forms of eczema in children.—*L.M.R.* '88, 525.

Strong Solution of Potassium Iodide, or Potassium Cyanide, has been suggested for the removal of the black stains on the skin produced by Silver Nitrate.

Some new compounds of Silver have been recently introduced for the treatment of gonorrhœa. It is claimed that their solutions are not precipitated by Sodium Chloride or Albumens. They contain the following p.c. of Silver:—**Argentamin** 6·35 p.c., **Argonin** 4 p.c., **Protargol** 8·3 p.c. Silver Nitrate contains 63·5 p.c. of Silver. *See* below.

Dose.—$\frac{1}{4}$ to $\frac{1}{2}$ grain.

Prescribing Notes.—Prescribed in **pills** with Massa Kaolin. Solutions should be dispensed in stoppered bottles.

For application to the skin, a **solution** in Spirit of Nitrous Ether has been recommended. This solution throws down a light coloured precipitate, but does not itself become black like a simple spirituous solution. It, however, blackens the skin in a shorter time.

Incompatibles.—The Alkalis and their Carbonates and alkaloids; all Bromides, Chlorides, Iodides and Phosphates; Solutions of Arsenic, and Tannin.

Official Preparations.—Argenti Nitras Induratus, and Argenti Nitras Mitigatus. Used in the preparation of Argenti Oxidum.

Not Official.—Mild Caustic Points, Argenti Iodidum Nascens, Argentamin, Argentol, Argonin, Protargol, Largin, Actol, and Itrol.

Antidotes.—Aqueous solution of common salt; milk or some demulcent drink given freely; Emetic; White of Egg.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S. Also fused Nitrate of Silver in all except Dan., Ger., Ital., Swed. and Swiss.

Description.—In colourless tabular crystals, the primary form of which is the right rhombic prism; soluble in less than its own weight of cold Water, slightly soluble in Alcohol (90 p.c.); soluble in Ether and Glycerin.

Tests.—It affords the reactions characteristic of Silver and of Nitrates. 1 gramme dissolved in 15 c.c. of Water affords with Hydrochloric Acid a precipitate, which, when thoroughly washed and dried, should weigh ·843 gramme. The filtrate, when evaporated to dryness on a Water-bath should leave no residue. Silver Nitrate should yield no characteristic reaction with the tests for Lead, Copper, Iron, Sodium, Potassium, or Sulphates.

Preparations.

ARGENTI NITRAS INDURATUS. Toughened Caustic.

Silver Nitrate 95; Potassium Nitrate 5. Fuse and mix thoroughly in a capsule of platinum or thin porcelain, and pour the melted mass into proper moulds.

Foreign Pharmacopœias.—Ital., Nitrato di Argento Fuso con Nitrato di Potassio; Jap. and Swiss, Argentum Nitricum Fusum; Mex., Lapices de nitrato de Plata.

Description.—White or greyish-white cylindrical rods or cones; freely soluble in Water, but only sparingly so in Alcohol (90 p.c.).

Tests.—It affords the reactions characteristic of Silver, of Potassium, and of Nitrates. 1 gramme, dissolved in 15 c.c. of Water, should yield with Hydrochloric Acid a precipitate which, when washed and dried, should weigh ·8 gramme, and the filtrate when evaporated should leave a white residue.

ARGENTI NITRAS MITIGATUS. Mitigated Caustic.

Silver Nitrate, 1; Potassium Nitrate, 2: fuse and mix thoroughly in a capsule of platinum or thin porcelain, and pour the melted mass into proper moulds. =(1 in 3)

Foreign Pharmacopœias.—Official in Austr., Ger. and Swiss, Argentum Nitricum c. Kalio Nitrico, 1 in 3; Dan. and Swed., Nitras Argenticus bis Mitigatus, 1 in 3; Norw., Nitras Argenticus Mitigatus, 1 in 3; Swed., Nitras Argenticus Mitigatus, 1 in 2; Fr., Crayons d'Azotate d'Argent Mitigé, containing $\frac{1}{10}$, $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$

of Nitrate of Silver; Jap. (Argentum Nitricum cum Kalio Nitrico), 1 in 2; Russ., Argentum Nitricum Mitigatum, 1 in 3; U.S., Argenti Nitras Dilutus, 1 in 3; not in the others.

Mild Caustic Points, made by fusing Potassium Nitrate in various proportions with Silver Nitrate, are used by oculists and others.

Description.—White or greyish-white cylindrical rods or cones; freely soluble in Water, but only sparingly so in Alcohol (90 p.c.).

Tests.—It affords the reactions characteristic of Silver, of Potassium, and of Nitrates. 3 grammes dissolved in 15 c.c. of Water should afford with Hydrochloric Acid a precipitate, which, after washing with hot Water and drying, weighs ·843 gramme.

Not Official.

ARGENTI IODIDUM NASCENS.—Freshly precipitated Silver Iodide has been recommended in conjunctival catarrhs. *See* Warlomont's formula.—*L.M.R.* '86, 498.

ARGENTAMIN.—Silver Phosphate dissolved in Ethylenediamine solution. Antiseptic and astringent. A dilution of 1 to 4000 with water has been recommended for urethral injection in gonorrhœa.—*B.M.J.E.* '95, ii. 20; '96, ii. 64; *L.* '95, ii. 47.

ARGENTOL.—A compound of Silver with Oxychinolin. A sparingly soluble yellowish powder, recommended as an antiseptic application to wounds and ulcers.—*P.J.* '97, i. 369; '98, ii. 342.

ARGONIN.—Is obtained by precipitating Silver Nitrate and Casein-soda with Alcohol. It is a fine white powder which dissolves in water with a neutral reaction. It is recommended as a disinfectant.—*P.J.* (3) xxv. 1193; *J.S.C.I.* '95, 1060; *L.* '95, ii. 47. A 2 p.c. aqueous solution gradually increased to 10 p.c. recommended in the treatment of gonorrhœa.—*B.M.J.E.* '96, ii. 64; *T.G.* '97, 740.

PROTARGOL.—A combination of Silver with Protein. It is a yellow powder readily soluble in Water. A powerful germicide which has been recommended in ¼ to 1 p.c. solution as an unirritating injection in gonorrhœa.—*B.M.J.E.* '97, ii. 96; '98, i. 40; '98, ii. 2; *Pr.* lx. 292 and 311; *L.* '97, ii. 1628; '98, i. 872. In conjunctival affections. *L.* '98, i. 335; *T.G.* '98, 701.

Largin, another albumen-silver compound, is a grey powder soluble 1 in 10 of water. Recommended in gonorrhœa.—*B.M.J.E.* '98, ii. 80.

Itrol (Silver Citrate) and **Actol** (Silver Lactate) have also been introduced as antiseptics.—*P.J.* '96, i. 243; '97, ii. 254; *Pr.* lx. 292.

ARGENTI OXIDUM.

SILVER OXIDE.

Ag_2O, eq. 230·1.

Prepared by mixing solutions of Silver Nitrate and Calcium Hydroxide.

Medicinal Properties.—It has the general therapeutic qualities of the Nitrate, without its escharotic effect. It is more slowly absorbed, and is said to be less liable to discolour the skin.

Dose.—½ to 2 grains.

Prescribing Notes.—Usually given in a **pill**, made with Massa Kaolini.

If prescribed with Creosote or with the Chlorides in pills, the Oxide must be first diffused through some inert powder such as Kaolin, or the heat produced in rapidly reducing the Silver or by the Chlorine combining with it causes the mass to become red-hot, or to explode.

Incompatibles.—Bromides, Chlorides, and Iodides.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Description.—A brown powder, which at a low red heat gives off Oxygen and yields metallic Silver.

Tests.—It dissolves in Nitric Acid without the evolution of any reddish fumes (absence of metallic Silver). Each gramme, dissolved in Nitric Acid, should yield with Hydrochloric Acid a precipitate, which, when thoroughly washed and dried, weighs 1·237 grammes. It should yield no characteristic reaction with the tests for Lead, Copper, or Iron. Silver Oxide is liable to decompose with violence when mixed with Creosote, Phenol, Potassium Permanganate, and many other substances.

Not Official.

ARISTOL.

An Iodine derivative of Thymol, introduced as a substitute for Iodoform, over which it has the advantage of possessing very little odour. A reddish powder, practically insoluble in Water, Glycerin, and Alcohol (90 p.c.), dissolves readily 1 in 10 of Ether or Chloroform, and about 1 in 50 of Liquid Paraffin or fixed Oils. Used successfully as a 10 p.c. **Ointment**, or by dusting the powder on ulcerating lupus, tinea, and syphilitic ulcers; in psoriasis and eczema a 10 p.c. solution in flexible collodion; as a pessary in ulceration of vagina or cervix.

As a dressing for burns.—*Pr.* liv. 192.

ARMORACIÆ RADIX.

HORSERADISH ROOT.

The fresh root of *Cochlearia Armoracia*, collected from cultivated plants.

Most active in the autumn and early spring before the leaves have appeared.

Medicinal Properties.—Sialagogue, stomachic, diuretic, slightly diaphoretic. Used in atonic dyspepsia and as a condiment; also as a sudorific in chronic rheumatism. Externally as a rubefacient. The infusion is used as a **gargle** for aphonia and sore throat.

Official Preparation.—Spiritus Armoraciæ Compositus.

Not Official.—Infusum Armoraciæ Compositum.

Foreign Pharmacopœias.—Official in Belg.; Fr., Raifort; Port., Rabao Rustico; Span. and Mex., Rabano Rusticano; not in the others.

Description.—Nearly cylindrical, except at the crown, where it is somewhat enlarged, and marked with closely approximated semi-amplexicaul leaf-scars. It is from half-an-inch to about an inch (twelve to twenty-five millimetres) in diameter, and commonly a foot (thirty centimetres) or more in length; pale yellowish-white or

brownish-white externally, whitish within. Inodorous when unbroken, but exhaling a characteristic pungent odour when scraped or bruised; taste very pungent.

In the presence of Water or weak Alcohol, decomposition takes place similar to that with a mixture of Black and White Mustard, which results in the formation of an essential Oil.

The root may be kept fresh for some time if buried in sand and in a cool place.

Aconite Root has been mistaken for this root, which seems incredible, unless we reflect that country people are in the habit of putting into the ground again Horseradish that has been scraped until only the crown and a remnant of the root vanishing to a point remain, resembling the tap-root of Aconite.

Preparation.

SPIRITUS ARMORACIÆ COMPOSITUS. COMPOUND SPIRIT OF HORSERADISH. (MODIFIED.)

Horseradish Root scraped, 10; dried Bitter-Orange Peel well bruised, 10; Nutmeg, bruised, ¼; Alcohol (90 p.c.), 50; Distilled Water, 60; mix, and distil 80. =(1 in 8).

Alcohol (90 p.c.) is now used in place of Proof Spirit, but the result is almost the same.

Dose.—1 to 2 fl. drm.

Foreign Pharmacopœias.—Not in the other Pharmacopœias; Belg., Dutch and Port., have a Spiritus; Belg., a compound Syrup; Port., compound Wine; Fr., Teinture de Raifort Comp.; Mex., Alcoholato de coclearia; Span., Alcohol de Cochlearia Comp.; they all differ widely from the above.

Not Official.

INFUSUM ARMORACIÆ COMPOSITUM.—Fresh Root, sliced, 1; Black Mustard Seed, 1; Compound Spirit of Horseradish, 1; boiling Distilled Water, 20: macerate two hours; strain, and add the Spirit.

It is found in practice that a temperature of 150° to 180° F. makes the strongest infusion.

Dose.—1 to 2 fl. oz. as a warm stimulant.

ARNICÆ RHIZOMA.

ARNICA RHIZOME.

B.P.Syn.—ARNICÆ RADIX.

The dried rhizome and roots of *Arnica montana*.

Collected in the mountainous parts of Central and Southern Europe.

Medicinal Properties.—Stimulant to the gastro-intestinal and reflexly to the nervous and circulatory systems, irritant to the stomach and bowels in large doses. Given in adynamic fevers and delirium tremens, but little employed now. The **tincture** is used externally for bruises and wounds, diluted with Water, but eczema or erysipelatous inflammation may be set up; Sir A. Garrod states that equally good results are produced by the application of Spirit and Water.

Official Preparation.—Tinctura Arnicæ.

Not Official.—Arnica Opodeldoc, Extractum Arnicæ Radicis Fluidum.

Antidotes.—Opium, Morphine.

Symptoms of poisoning by Arnica are violent vomiting, intense headache, diarrhœa, colic, feeble pulse.

Foreign Pharmacopœias.—Official in Austr., Ital., Port., Swed. and U.S., **root** and **flowers**; Fr., Hung. and Span., **root, leaves**, and **flowers**; Belg., Dan., Dutch, Ger., Jap., Norw., Russ., and Swiss, **flowers**; Mex., **rhizome, leaves,** and **flowers.**

Description.—The rhizome is cylindrical, horizontal, and dark brown in colour. It usually varies from one to two inches (two and a half to five centimetres) in length, and from a sixth to a quarter of an inch (four to six millimetres) in thickness. It is curved, rough, bears amplexicaul leaf-scars, is beset on its under surface with numerous brittle wiry roots, and is usually terminated by the hairy remains of the stem and leaves. The transverse section exhibits a number of resin-ducts near the inner margin of the cortex. Odour faintly aromatic, taste acrid and bitter.

Preparation.

TINCTURA ARNICÆ. Tincture of Arnica. (Modified.)

Arnica Rhizome, in No. 40 powder, 1; Alcohol (70 p.c.) a sufficient quantity. Moisten the powder with 1 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 20).

Alcohol 70 p.c. now used in place of Rectified Spirit.

Dose.—Not given in B.P.; ½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Fr., Span. and U.S., 1 in 5; Dan., Dutch, Ger., Norw., Jap. 1 and 10, Port., Russ., Swed. and Swiss, 1 in 10, all from **flowers**; Port., 1 in 5, U.S., 1 in 10, from the **root**; Ital., **flowers** 1, **root** 1, Alcohol (60 p.c.) 10; Austr., **root** 4, **flowers** 1, Alcohol (70 p. c.) 25; Hung., **root** 6, **leaves** 3, and **flowers** 1, dilute Alcohol (70 p.c.) 50; Fr. and Swiss, **fresh flowers** 1, Alcohol 1; Mex., **dried leaves** 1 in 5; all are by weight except U.S.

A popular remedy used externally for bruises, mixed with hot water, and applied with lint. It has been suggested that the 'inflammation' which sometimes follows its use, has been due to the larvæ of *Atherix maculatus* when the Tincture has been made from the flowers (*L.M.R.* '80, 227); but it is more probably due to idiosyncrasy.

Not Official.

ARNICA OPODELDOC.—White Soap, 4; Alcohol (90 p.c.), 10; Tincture of Arnica, 5; Camphor, 1. Dissolve by heat, and strain.

EXTRACTUM ARNICÆ RADICIS FLUIDUM (U.S.).—1 in 1, made with Alcohol, 3; Water, 1.

Not Official.

ARSENIUM.

As, eq. 74·50.

A bluish-grey metal, of great brilliancy, quickly tarnishing on exposure. It has a sp. gr. of 5·7 to 5·9, and volatilises at 356° F. (180° C.), its fumes having the odour of garlic.

It is found in most countries, usually combined with other metals. Its oxide is also a natural production, though chiefly found in the flues of furnaces in which various metallic ores are roasted.

See ACIDUM ARSENIOSUM.

Not Official.

ARSENII BROMIDI LIQUOR.

LIQUOR POTASSII ARSENIATIS ET BROMIDI. CLEMENS' SOLUTION.

Arsenious Acid, 73 grains; Potassium Bicarbonate, 73 grains; Bromine, 117 grains; Water, sufficient to measure 16 oz.: boil the Arsenious Acid and Potassium Bicarbonate in 2 oz. of Water till dissolved; when cold add 10 oz. of Water, then the Bromine, and make up with Water to the given volume. Stir occasionally during a few hours, then filter.

This Liquor was originally described by Dr. Clemens as 'a chemical union of Arsenic and Bromine,' but as the action of Bromine on Arsenious Acid results in the formation of Arsenic Acid and Hydrobromic Acid, the above formula has been adjusted (*U.S.N.F.*) to yield these products as Potassium salts.

The Solution contains Arsenic equal to one p.c. of Arsenious Acid.

Recommended in the treatment of diabetes.—*L.M.R.* '83, 86.

ARSENII IODIDUM.

ARSENIOUS IODIDE.

AsI_3, eq. 452·20.

May be obtained by the direct combination of Iodine and Arsenium.

Solubility.—1 in 11 of Water; 1 in 42 of Alcohol (90 p.c.); 1 in 19 of Carbon Bisulphide.

It is gradually decomposed by boiling Water and by boiling Alcohol.

Medicinal Properties.—Has been used in obstinate cutaneous affections of syphilitic and tubercular origin.

Dose.—$\frac{1}{20}$ to $\frac{1}{3}$ of a grain.

Prescribing Notes.—It is generally given as Donovan's Solution, or in a **pill** well triturated with Milk Sugar and massed with Glucose.

Official Preparation.—Liquor Arsenii et Hydrargyri Iodidi.

Foreign Pharmacopœias.—Official in Mex. (Yoduro de Arsenico) and U.S.; not in the others.

Description.—Small orange-coloured crystals, or crystalline masses, soluble in Water and in Alcohol (90 p.c.).

Tests.—Its aqueous solution affords the reactions characteristic of Arsenium and of Iodides, and should not change the colour of Solution of Litmus. Heated in a test-tube it entirely volatilises, violet vapours of Iodine being set free.

Its aqueous solution is neutral when first made, but rapidly decomposes into free Arsenious and Hydriodic Acids.

Preparation.

LIQUOR ARSENII ET HYDRARGYRI IODIDI. SOLUTION OF ARSENIOUS AND MERCURIC IODIDES. (MODIFIED.)

Arsenious Iodide 87½ grains; Mercuric Iodide 87½ grains; Distilled Water, a sufficient quantity. Triturate the Arsenious Iodide and Mercuric Iodide with 3 to 4 fl. oz. of the Distilled Water until nearly all is dissolved; pass through a filter; wash the latter with sufficient Distilled Water to produce 20 fl. oz. of the Solution.

=(1 grain in 110 minims).

The metric quantities are 10 grammes of each Iodide to produce 1000 c.c. of Solution.

It is known as **Donovan's Solution.**

Dose.—5 to 20 minims.

110 minims correspond to 1 grain of Arsenious Iodide, AsI_3, and to 1 grain of Mercuric Iodide, HgI_2; 100 c.c. correspond to 1 gramme of each salt.

Incompatibles.—Acids, the salts of Morphine, and Corrosive Sublimate.

Foreign Pharmacopœias.—Official in U.S., 1 in 100; not in the others.

Description.—A clear pale yellow liquid with a metallic taste.

Tests.—It affords the reactions characteristic of Mercuric salts, Arsenium, and Iodides.

ASAFETIDA.

ASAFETIDA.

A gum-resin obtained by incision from the root of *Ferula fœtida*, and probably other species.

Procured in Afghanistan, and the neighbouring countries. Imported from Bombay.

Medicinal Properties.—Nervine stimulant, expectorant, and laxative. Useful in cases of flatulence, in hysteric paroxysms; also in some forms of chronic bronchitis; very useful as an enema in the flatulent distension of typhoid or peritonitis, and in infantile convulsions.

As a successful preventive against abortion.—*M.A.* '93, 64; *B.M.J.E.* '95, i. 35.

Dose.—5 to 15 grains.

Prescribing Notes.—In **pill** massed with a little dilute Alcohol. They are best varnished, as silver leaf is affected by this drug. The **Tincture** may be prescribed with Aromatic Spirit of Ammonia, or with the Tinctures of Valerian and Hyoscyamus. When diluted with Water to form a **mixture**, it requires the addition of Mucilage of Acacia.

Official Preparations.—Tinctura Asafetidæ. Used in the preparation of Pilula Aloes et Asafetidæ, Pilula Galbani Composita, and Spiritus Ammoniæ Fetidus.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss, and U.S.

Description.—In rounded or flattened tears usually varying in size from half to one inch (twelve to twenty-five millimetres) in diameter, more or less agglutinated. They are dull yellow in colour, and darken on keeping. When fresh the tears are usually tough at ordinary temperatures, but become hard in cold weather. Internally they are yellowish and translucent or milky white and opaque, the freshly exposed surfaces gradually assuming a pink colour which changes to red and finally to reddish-brown. The odour is strong, alliaceous and persistent, the taste bitter, acrid and alliaceous.

Tests.—When triturated with Water, Asafetida forms a white emulsion. The freshly fractured surface of a tear touched with Nitric Acid diluted with an equal volume of Water assumes for a short time a more or less distinct green colour. Asafetida should contain

not less than 65 p.c. of matter soluble in Alcohol (90 p.c.), and should yield not more than 10 p.c. of Ash when incinerated. If a small fragment be strongly heated in a dry test-tube, the contents of the tube, after cooling, yield with boiling Water a solution which when largely diluted and made alkaline with Solution of Ammonia exhibits a blue fluorescence.

For remarks on this test *see* 'Ammoniacum.'

Dieterich considers 65 p.c. of alcohol-soluble matter too high and moreover prefers to estimate matter insoluble in Alcohol on account of the loss of volatile bodies during the evaporation and drying of the alcohol-soluble residue.—*C.D.* '98, ii. 131.

Analyses have been published showing over 50 p.c. of Ash, but more recent examinations (*P.J.* (3) xxii. 394) give 7 to 14 p.c. A Volatile Oil (said to contain 20 to 25 p.c. of Sulphur) is present to the extent of 3 to 10 p.c.

Lloyd states that the average amount of ash left by the ordinary specimen of commercial Asafetida is quite considerable, ranging from 16 to 20 p.c., and in some cases 50 p.c. Selected tears, of which 76 p.c. was soluble in Alcohol, yielded 1·78 to 2·55 p.c. of ash. He says that purified Asafetida should be the only kind official, and that *U.S.P.* should give directions for ascertaining the absence of white turpentine and colophony resin. He also gave a figure for the acidity. The drug yielding at least 60 p.c. to Alcohol (*U.S.P.* standard), is stated to be difficult to obtain in America.—*P.J.*, '96, i. 243.

Preparations.

PILULA ALOES ET ASAFETIDÆ, 1 in 4. *See* ALOES.

PILULA GALBANI COMPOSITA. About 1 in 3½. *See* GALBANUM.

SPIRITUS AMMONIÆ FETIDUS, about 33 grains in 1 oz. *See* AMMONIA.

TINCTURA ASAFETIDÆ. TINCTURE OF ASAFETIDA. (ALTERED.)

Asafetida bruised, 4; Alcohol (70 p.c.) a sufficient quantity. Place the Asafetida in a closed vessel with 15 of the Alcohol; set aside for seven days, with occasional agitation; filter; pass sufficient of the Alcohol through the filter to produce 20 of the Tincture. = (1 in 5).

Formerly 1 in 8, now 1 in 5, and Alcohol (70 p.c.) used in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Dan., Dutch, Fr., Jap., Port., Russ., Span., Mex., Norw., Swed. and Swiss, 1 and 5; Swiss and U.S., 1 in 5; all by weight except U.S.; not in Austr., Ger., Hung. or Ital.

ATROPINA.

ATROPINE.

$C_{17}H_{23}NO_3$, eq. 287·05.

An alkaloid, obtained from Belladonna Leaves or Root.

Solubility.—1 in 500 of Water; 1 in 3 of Alcohol (90 p.c.); 1 in 25 of Ether; 1 in 1 of Chloroform; 1 in 52 of Glycerin; 1 in 15 of Oleic Acid.

Medicinal Properties.—The **Ointment** is used for the relief of

pain arising from muscular spasm, and for neuralgia. *See also* Atropinæ Sulphas and Belladonna.

Has been recommended in hæmoptysis by **hypodermic injection** of $\frac{1}{300}$ to $\frac{1}{150}$ grain.—*B.M.J.* '87, i. 842.

A case of traumatic tetanus cured by hypodermic injection of Atropine (4-minim doses of B.P. Liquor).—*L.* '85, ii. 849.

Dose.—$\frac{1}{200}$ to $\frac{1}{100}$ grain.

Prescribing Note.—Frequently given in pills, in which case it should be well triturated with Milk Sugar and massed with glucose.

Atropine is used as an antidote in poisoning by Physostigmine, Morphine, Aconite, Gelsemine, Hydrocyanic Acid, Muscarine, Nitroglycerin, and Pilocarpine.

Official Preparation.—Unguentum Atropinæ.

Not Official.—Unguentum Atropinæ, Unguentum Atropinæ cum Acido Borico, Unguentum Atropinæ cum Cocaina, and Atropinæ Salicylas.

Antidotes.—In case of poisoning by Atropine, the antidotes are the same as for Belladonna.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Ital., Mex., Port., Span. and U.S.; not in the others.

Description.—In colourless acicular crystals. Its solution in Water has an alkaline reaction, a bitter taste, and when applied to the eye powerfully dilates the pupil.

The bulk of the alkaloid existing in Belladonna is Hyoscyamine, which is isomeric with Atropine, and the former has a constant tendency to change into the latter.

Atropine (uncombined with an acid) easily decomposes when heated. A solution 1 in 200 of Water heated in a basin on a water-bath for two hours was so completely decomposed that it lost its alkaline reaction and ceased to precipitate with Mercuric Chloride; after eight hours the reaction was faintly acid.

Tests.—Melting point, 239° to 240° F.; (115° to 115·5° C.). The Alcoholic Solution, on warming with Test-solution of Mercuric Chloride, yields a yellow precipitate which soon turns red. The aqueous solution yields with Solution of Auric Chloride a citron-yellow precipitate, which when recrystallised from boiling Water acidulated with Hydrochloric Acid has a minutely crystalline character, and when dry a dull pulverulent appearance (distinction from Hyoscyamine). When moistened with Fuming Nitric Acid and evaporated to dryness on a water-bath, the residue gives with freshly prepared alcoholic solution of Potassium Hydroxide a fugitive reddish-violet coloration. It leaves no ash when burnt with free access of air (absence of mineral matter).

Jowett considers the description and tests of the official members of the mydriatic alkaloid group generally unsatisfactory, and in some instances misleading and inaccurate. The properties of Atropine and Hyoscyamine are such as to differentiate them sharply from each other. The optical inactivity of Atropine forms the best and simplest test for determining its freedom from Hyoscyamine and Scopolamine, a test which the new B.P. omits, although the rotation of Aconitine has been noted. The melting point of the Aurichlorides of the mydriatic alkaloids form an easy way of identifying the alkaloid. The B.P. recognizes these salts and gives the m.p. for Scopolamine Aurichloride, but by a strange inconsistency not those of Atropine and Hyoscyamine. The Aurichlorides are best prepared by dissolving the base in excess

of Hydrochloric Acid, then adding Auric Chloride and crystallizing from hot solution. The B.P. however gives an impracticable method of preparing the Atropine salt from an aqueous solution of Atropine. A pure product would be ensured by the following tests:—(1) melting point; (2) formation and m.p. of Aurichloride; (3) optical inactivity; (4) freedom from ash.—*P.J.* '98, ii. 195; *C.D.* '98, ii. 304.

Atropine **melts** when pure at 114° C. according to Ladenburg, or at 115° to 115·5° C. according to Schmidt; but the commercial alkaloid often begins to melt at about 104° and is entirely melted at 113° C.—*Allen.*

Atropine and other solanaceous alkaloids are characterised by—1. Alkaline reaction to Litmus and Phenol-phthalein; 2. Mydriatic action; 3. Reduction of Mercury salts to oxides; 4. Purple colour with Nitric Acid and Alcoholic Potash; 5. Fluorescence with Glacial Acetic and Sulphuric Acids.

The colour reaction No. 4 is very delicate, and although other alkaloids, Pseudaconitine, Veratrine and Strychnine, afford colours somewhat resembling this, there is no difficulty in detecting Atropine in the pure state when unmixed with the other alkaloids.

The distinctions between Atropine and the other mydriatic alkaloids are:—1. Melting point; 2. Melting point of Sulphate; 3. Melting point of double Gold Chloride; 4. Yielding the *red* Oxide of Mercury even with a large excess of the Perchloride. *See also* Belladonna, Homatropine, Hyoscyamine, &c.

Preparation.

UNGUENTUM ATROPINÆ. ATROPINE OINTMENT. (ALTERED.)

Atropine, 10 grains; Oleic Acid, 40 grains; Lard, 450 grains. Rub the Atropine with the Oleic Acid, and gently warm the mixture until dissolved; add the Lard; mix. =(about 1 in 50).

Lard is now ordered in the place of Benzoated Lard, and the strength is slightly increased.

(Mex. (Pomada de Atropina); not in the other Pharmacopœias.)

Not Official.

UNGUENTUM ATROPINÆ (*L.O.H.*).—Atropine, 4 grains; Soft Paraffin, 1 oz.: heat till dissolved, and stir till cold.

UNGUENTUM ATROPINÆ CUM ACIDO BORICO (*L.O.H.*).—Atropine, 4 grains; Powdered Boric Acid, 1 drm.; Soft Paraffin, 1 oz.

UNGUENTUM ATROPINÆ CUM COCAINA (*L.O.H.*).—Atropine, 4 grains: Cocaine, 10 grains; Soft Paraffin, 1 oz.: heat till the alkaloids are dissolved.

ATROPINÆ SALICYLAS.—Introduced as a substitute for the Sulphate, but its aqueous solution does not keep so well as that of the latter.

(Russ.; not in the other Pharmacopœias.)

ATROPINÆ SULPHAS.

ATROPINE SULPHATE.

$(C_{17}H_{23}NO_3)_2H_2SO_4$, eq. 671·44.

May be obtained by neutralising Atropine with Diluted Sulphuric Acid.

Solubility.—10 in 4 of Water; 1 in 4 of Alcohol (90 p.c.). Insoluble in Ether and Chloroform.

Medicinal Properties.—Mydriatic, anhidrotic, antigalactagogue.

Employed locally to dilate the pupil and paralyse the accommodation, in iritis, and before testing refraction or making ophthalmoscopic examination; used also to cause retraction of protruding iris: as it increases intra-ocular tension it does harm in glaucoma. It is frequently combined with Morphine in hypodermic administration to prevent the undesirable effects of the latter. Injected as near the nerve as possible in sciatica, hypodermically also in ovarian and uterine pain. The hypodermic method is also the best to diminish the sweating of phthisis, for which purpose, in doses of not more than $\frac{1}{200}$th of a grain, Atropine is very useful; it at the same time relieves the cough. *See also* Atropine and Belladonna.

In the treatment of Morphinism.—*B.M.J.E.* '94 i. 20.

Dose.—$\frac{1}{200}$ to $\frac{1}{100}$ grain.

Prescribing Notes.—The Sulphate is best adapted for Aqueous Solutions, and the pure Alkaloid for Ointments. Can be given in pill well triturated with Milk Sugar and massed with glucose. Generally given in solution.

Official Preparations.—Lamellæ Atropinæ, and Liquor Atropinæ Sulphatis.

Not Official.—Guttæ Atropinæ Sulphatis, Guttæ Atropinæ Sulphatis Fortiores, Guttæ Atropinæ Sulphatis Mitiores, and Injectio Atropinæ Hypodermica.

Austr., Belg., Dutch, Ger., Ital., Norw., Russ., Swed. and Swiss give the maximum dose as ·001 milligramme = $\frac{1}{60}$ grain.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—A nearly colourless, crystalline substance.

Tests.—Aqueous and alcoholic solutions of Sulphate of Atropine are neutral to Litmus, and which, even when considerably diluted, if applied to the eye will dilate the pupil. Melting point 361·4° F. (183° C.). It yields the characteristic reactions with the tests for Sulphates. A saturated aqueous solution yields with Solution of Sodium Carbonate a white precipitate, which, when separated, responds to the tests described under 'Atropina.' It leaves no ash when burned with free access of air (absence of mineral matter).

B.P. melting point (183° C.) is open to criticism. Will gives 196° C.; U.S.P. 187°; Hesse 180—181°; Merck 189—191° C.; whilst a salt prepared by Jowett from pure Atropine melted at 190°.—*P.J.* '98, ii. 195.

According to Hesse, pure Sulphate of Atropine has the formula $(C_{17}H_{23}NO_3)_2.H_2SO_4.H_2O$ (equivalent to 83·3 p.c. of Atropine), the molecule of Water of crystallisation being easily removed at 100° C.; optical analysis has shown commercial Atropine Sulphate to consist (to the extent of two-thirds) of Hyoscyamine Sulphate. They may be separated as Oxalates, by dissolving the bases in Acetone and the Oxalic Acid in Ether; on mixing, the Atropine salt separates out first. The medicinal action of the two alkaloids is practically identical. **Melting point** of Atropine 115·5° C., Hyoscyamine 108·5° C., Hyoscyamine Sulphate 201° C.—*P.J.* (3) xxiii. 201.

Preparations.

LAMELLÆ ATROPINÆ. Discs of Atropine.

Discs of Gelatin, with some Glycerin, each weighing about $\frac{1}{60}$ grain (1·3 milligrammes) and containing $\frac{1}{6000}$ grain (·013 milligramme) of Atropine Sulphate.

LIQUOR ATROPINÆ SULPHATIS. Solution of Atropine Sulphate. (Altered.)

Atropine Sulphate, 17½ grains; Salicylic Acid, 2 grains; Distilled Water, 4 fl. oz. Dissolve the Atropine Sulphate and Salicylic Acid in sufficient recently boiled and cooled distilled Water to produce 4 fl. oz. of the Solution. =(1 in 100).

Contains 1 grain of Atropine Sulphate in 110 minims, 1 gramme in 100 c.c.

Distilled Water now used in place of Camphor Water, and Salicylic Acid added.

Dose.—½ to 1 minim = $\frac{1}{220}$ to $\frac{1}{110}$ grain of Atropine Sulphate.

Foreign Pharmacopœias.—Official in Port., 1 in 100; not in the others.

Not Official.

GUTTÆ ATROPINÆ SULPHATIS (*L.O.H.*).—Atropine Sulphate, 2 grains; Distilled Water, 1 oz.

GUTTÆ ATROPINÆ SULPHATIS FORTIORES (*L.O.H.*).—Atropine Sulphate, 4 grains; Distilled Water, 1 oz.

GUTTÆ ATROPINÆ SULPHATIS MITIORES (*L.O.H.*).—Atropine Sulphate, 1 grain; Distilled Water, 1 oz.

INJECTIO ATROPINÆ HYPODERMICA.—Atropine Sulphate, 2 grains; Water, 1 oz.

Dose.—2 to 4 minims = $\frac{1}{120}$ to $\frac{1}{60}$ grain of Atropine Sulphate.

INJECTIO ATROPINÆ ET MORPHINÆ HYPODERMICA. *See* Morphinæ Acetas.

AURANTII CORTEX.

Both the fresh and the dried outer part of the pericarp of *Citrus Aurantium, var. Bigaradia*, are official.

Medicinal Properties.—A mild tonic, aromatic and stomachic bitter. The Tincture and Syrup are largely used as flavouring agents.

Prescribing Note.—Preparations of Orange Peel should not be prescribed with Tincture of Perchloride of Iron as the mixture would be blackened.

Official Preparations.—Of the **Fresh Peel,** Tinctura Aurantii and Vinum Aurantii. Of the **Tincture,** Syrupus Aurantii, contained in Tinctura Quininæ, Syrupus Aromaticus and Syrupus Cascaræ Aromaticus. Of the **Dried Peel,** Infusum Aurantii and Infusum Aurantii Compositum; used in the preparation of Infusum Gentianæ Compositum, Spiritus Armoraciæ Compositus, Tinctura Cinchonæ Composita, and Tinctura Gentianæ Composita.

Not Official.—Elixir Adjuvans, Vinum Aurantii Detannatum, Oleum Aurantii Corticis, Elixir Aurantii, Elixir Simplex, Spiritus Aurantii Compositus.

AURANTII CORTEX RECENS.—Fresh Bitter-Orange Peel.

The fresh outer part of the pericarp of *Citrus Aurantium, var. Bigaradia.*

It is most plentiful in the market during February and March.

Description.—Externally deep orange-red or red in colour, and generally rough and glandular. On its inner surface there should only

be a very small amount of the white spongy portion of the pericarp. Odour pleasant and aromatic, taste bitter.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., Port. and Span.; U.S., *Citrus Aurantium*. The following use the unripe fruit: Dan., Ger., Norw., Russ. and Swed.

Preparations.

SYRUPUS AROMATICUS. Aromatic Syrup. (New.)

Tincture of Orange, 5; Cinnamon Water, 5; Syrup, 10. Mix the Tincture of Orange and Cinnamon Water; shake the mixture with a little Powdered Talc; filter; add the Syrup.

Dose.—½ to 1 fl. drm.

SYRUPUS AURANTII. Syrup of Orange. (Altered.)

Tincture of Orange, 1; Syrup, 7. Mix. =(1 in 8).

Now made with Tincture of Orange from Fresh Peel.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Austr. and Hung., peel, weak spirit, sugar, and tincture; Belg., Dutch, Span. and Swed., peel, water, and sugar; Dan., Ital. and U.S., peel, spirit, water, and sugar; Fr., Citric Acid, water, and sugar, with Alcoolature d'Orange; Ger. and Russ., peel, wine, and sugar; Jap., tincture, 3, syrup 17; Norw., tincture 1, syrup 9; Swiss, peel, white wine, and sugar; Mex., Alcoholatura 1, syrup 9. All by weight except U.S.

TINCTURA AURANTII. Tincture of Orange. (Altered.)

Fresh Bitter-Orange Peel, cut small, 5; Alcohol (90 p.c.) 20. Prepare by the maceration process.

Formerly called Tinctura Aurantii Recentis, and 6 of Fresh Peel made 20 of Tincture.

Dose.—30 to 60 minims.

Foreign Pharmacopœias.—Official in Fr. (Alcoolature d'Orange), fresh peel 1, alcohol 2, by weight; U.S. (Tinctura Aurantii Dulcis) from fresh peel, 1 in 5; not in the others.

VINUM AURANTII. Orange Wine.

Wine made by the fermentation of a saccharine solution to which fresh Bitter-Orange Peel has been added.

The Orange Wine of commerce.

Description.—A vinous liquid, having a golden sherry colour, and a taste and aroma derived from the Bitter-Orange Peel. It contains 10 to 12 p.c. by volume of Ethyl Hydroxide.

Tests.—It is but slightly acid to Litmus-paper. When a mixture of 50 c.c. of this Wine and 50 c.c. of Water, acidulated with 5 c.c. of the Volumetric Solution of Sulphuric Acid, is distilled, the distillate, after the rejection of the first 10 c.c., shaken with Ether, and the ethereal liquid separated and its Ether removed by evaporation, the residue should not yield a violet coloration when mixed with Test-solution of Ferric Chloride (absence of Salicylic Acid). It should yield not more than the slightest reactions with the tests for Sulphites.

Salicylic Acid can also be detected by shaking 1 oz. of the Acidified Wine with ½ oz. of Ether, separating the ethereal portion, washing the same with 1 oz. of Water, and applying the Ferric Chloride test.

Not Official.

ELIXIR ADJUVANS (*U.S.N.F.*).—Sweet Orange Peel, fresh, 3 oz.; Wild Cherry Bark, 1 oz.; Liquorice Root, decorticated and dried, 2 oz.; Coriander, ½ oz.; Caraway, ¼ oz.; all troy weight; percolate with a mixture of Alcohol (94 p.c.) 1 and Water 2 to obtain 24 fl. oz. and add Syrup 16 fl. oz.

VINUM AURANTII DETANNATUM (*B.P.C.*).—Orange Wine, 1 gallon; Gelatin, cut small, 2 oz.; macerate for fourteen days, and decant.

OLEUM AURANTII CORTICIS.—A volatile Oil, extracted by mechanical means from Fresh Orange Peel; both varieties of Orange Peel are used; that from Citrus vulgaris is known as *Essence de Bigarade*, and that from Citrus Aurantium as *Essence de Portugal*; the former yields the finest Oil.

Solubility.—Soluble 1 in 7 of Alcohol (90 p.c.), and in all proportions of Absolute Alcohol.

Description.—A pale yellowish liquid, with neutral reaction, having the odour of Orange Peel. It consists principally of a terpene $C_{10}H_{16}$ named Hesperidine, which boils at 178° C. The Oil is strongly dextro-rotary (160°—200°). Sp. gr. ·840—·860.

By keeping, the Oil becomes thicker and acquires a disagreeable terebinthinate taste, which may be prevented by mixing it while fresh with 10 p.c. of Absolute Alcohol.

Foreign Pharmacopœias.—Official in Austr., sp. gr. ·860; Belg., sp. gr. ·835—·844; Dutch, sp. gr. ·850—·870; Fr., Jap., Hung., sp. gr. ·850—·860; Ital., sp. gr. ·851; Port., sp. gr. ·835—·850; Russ., sp. gr. ·830—·835; Mex., sp. gr. ·837; U.S., sp. gr. about ·860; not in Dan., Ger., Norw. or Swed.

ELIXIR AURANTII (formerly *U.S.*, now omitted).—Sprinkle or spray 1 fl. oz. of Oil of Orange over 2 oz. of Cotton Wool: pack it tightly in a percolator and pass through it a mixture (Alcohol 1, Water 3), sp. gr. ·971, till 200 fl. oz. of a clear percolate are obtained, in which dissolve, without heat, Sugar 100 oz.; all by weight.

A better method of disseminating the Oil, is to sprinkle it upon blotting paper, pulp this with the diluted Alcohol, allow it to stand for 24 hours, and filter.

ELIXIR SIMPLEX (*B.P.C.*).—Oil of Bitter Orange, 30 minims; Rectified Spirit, 6 fl. oz.; dissolve and add Distilled Cinnamon Water, 7 fl. oz.; Syrup, 7 fl. oz. Mix. Filter through paper moistened with Proof Spirit and well sprinkled with Kaolin, returning the first portions of filtrate until it passes through bright.

Dose.—20 to 60 minims.

SPIRITUS AURANTII COMPOSITUS (*U.S.N.F.*).—Oil of Orange, 1 fl. oz.; Oil of Lemon, ½ fl. oz.; Oil of Coriander, 40 minims; Oil of Star-Anise, 10 minims; Alcohol (sp. gr. ·820) to make 5 fl. oz.

AURANTII CORTEX SICCATUS. — Dried Bitter-Orange Peel.

The dried outer part of the pericarp of *Citrus aurantium, var. Bigaradia.*

Description.—In thin strips. The outer surface is deep orange-red in colour, rough and glandular. On its inner surface there should only be a very small amount of the white spongy portion of the pericarp. Odour pleasant and aromatic, taste bitter.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Arancio Amaro), Jap., Norw., Port. (Laranjeira Azeda), Russ.,

Span. (Naranjo Agrio), Swed. and Swiss; U.S., Aurantii Amari Cortex, also Aurantii Dulcis Cortex.

Preparations.

INFUSUM AURANTII. Infusion of Orange Peel.

Dried Bitter Orange Peel, cut small, 1; Distilled Water, boiling, 20: infuse in a covered vessel for fifteen minutes; strain. =(1 in 20).

Dose—½ to 1 fl. oz.

(Not in other Pharmacopœias. Fr. (Tisane d'Oranger), Leaves 5, Boiling Water 1000.)

INFUSUM AURANTII COMPOSITUM. Compound Infusion of Orange Peel.

Dried Bitter-Orange Peel, cut small, ½ oz.; Fresh Lemon Peel, cut small, ¼ oz.; Cloves, bruised, ⅛ oz. (55 grains); Distilled Water, boiling, 20 oz.: infuse in a covered vessel for fifteen minutes; strain. =(1 in 40).

Dose.—½ to 1 fl. oz.

(Not in the other Pharmacopœias.)

TINCTURA AURANTII. *See* AURANTII CORTEX RECENS.

There were formerly two tinctures official, one from the fresh peel, and the other from the dried peel; the latter is now omitted.

The following are made with dried peel.—Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Jap., Norw., Russ., Span., Swed., Swiss and U.S., 1 in 5; all by weight except U.S.; not in Ital. or Port.

AURANTII FLORIS AQUA.

ORANGE-FLOWER WATER.

The Orange-flower Water of commerce, prepared by distillation from the Flowers of the Bitter-Orange tree, *Citrus Aurantium*, *var. Bigaradia*, diluted, immediately before use, with twice its volume of Distilled Water.

U.S.P. directs the Triple Extract to be diluted with an equal volume of Distilled Water.

Medicinal Properties.—Both the **Water** and the **Syrup** are used as flavouring agents. About one of the Concentrated Water to eight of Distilled Water; it is also used in eye lotions.

Official Preparation.—Syrupus Aurantii Floris. Contained in Mistura Olei Ricini, and Syrupus Calcii Lactophosphatis.

Not Official.—Oleum Aurantii Florum (Oleum Neroli).

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Eau Distillée de Fleur d'Oranger), Hung., Ital. (Acqua Distillata di Arancio), Jap., Mex. (Agua destilada de corteza de naranja amarga), Port. (Agua de Flores de Laranjeira), Russ., Span. (Agua de Azahar), Swed., Swiss, and U.S.; not in Ger. or Norw.

Description.—Colourless or with a slight greenish-yellow tint; odour very fragrant.

The Orange-flower water of commerce is a saturated solution of the Essential Oil of the fresh flowers.

Test.—It should yield no reaction with the tests for Lead.

Preparation.

SYRUPUS AURANTII FLORIS. Syrup of Orange Flower.

Orange-flower Water of commerce, undiluted, 8; Refined Sugar, 48; Distilled Water, boiling, a sufficient quantity. Add the Refined Sugar to 16 of the boiling Distilled Water; heat until dissolved; add the undiluted Orange-flower Water; make the weight of the product 72 by the addition of recently boiled Distilled Water.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., O.F.W. 345, Sugar 655; Fr. Jap., Mex., and Span., O.F.W. 10, Sugar 18; Russ., O.F.W. 2, Water 2, Sugar 6; Port., O.F.W. 7, Sugar 13; Swiss, O.F.W. 36, Sugar 64; all by weight; U.S., Sugar 85, O.F.W. to measure 100; not in the others.

Not Official.

OLEUM AURANTII FLORUM. (Oleum Neroli).—A volatile Oil, obtained by distilling fresh Orange-flowers with Water. The watery distillate constitutes the Aqua Floris Aurantii Conc. of commerce. The finest Oil is obtained from the Bitter Orange; that from the Portugal or Sweet Orange is not so good. From the **leaves** of both varieties is obtained the commercial **Oil of Petit Grain.**

Solubility.—Soluble in all proportions of Alcohol (90 p.c.) or Absolute Alcohol.

Description.—A yellowish or brownish thin liquid, with neutral reaction, having a powerful odour of Orange-flowers.

If a little Alcohol be poured on the surface of the Oil and the mixture gently undulated, a bright violet fluorescence will be observed.

Foreign Pharmacopœias.—Official in Austr., sp. gr. ·890; Belg., sp. gr. ·860—·870; Mex., sp. gr. ·870—·878; Fr., Span. and Swiss, sp. gr. not given; Ital., sp. gr. ·879; Port., sp. gr. ·874—·878; Jap. and Russ., sp. gr. ·860—·880; U.S., sp. gr. ·875—·890; not in Dan., Dutch, Ger., Hung., Norw. or Swed.

Not Official.

AURI BROMIDUM.

Two Gold Bromides appear to have been used on the Continent for the relief of hysteria and epilepsy. It is stated that the Tribromide is readily soluble, and the Monobromide insoluble, in Water.

The Tribromide obtained from Merck was soluble about 1 in 75 of Water. It appears to be about ten times more active than the more commonly used Bromides, and has been given in ¼ (increased to ½) grain doses in severe cases of hysteria and epilepsy.—*L.* '90, i, 869.

Since the first notices in 1890, not much has been written about it.

Prescribing Notes.—Dispensed in **pills** with Massa Kaolini or in Compressed Tablets.

Not Official.

AURI CHLORIDUM.

Under this heading are arranged the following varieties:—

1. **Pure Chloride of Gold**, $AuCl_3$, containing about 65 p.c. of metallic Gold. Official in Fr. (Chlorure d'Or), Port. (Chloreto de Ouro), and Span. (Cloruro Aurico).

2. **Chloride of Gold and Sodium** (Commercial 'Chloride of Gold'), the crystallised double salt $AuCl_3.NaCl.2H_2O$, containing 50 p.c. of metallic Gold. Official in Belg. (Chloruretum Auri et Sodii), Fr. (Chlorure d'Or et Sodium), Ital. (Cloruro di Oro e di Sodio), and Port. (Chloreto de Ouro e de Sodio).
3. **Commercial Chloride of Gold and Sodium**. Commercial Chloride of Gold and Sodium is the above crystallised salt mixed with an equal weight of Chloride of Sodium, and contains 25 p.c. of metallic Gold.
4. **Auri et Sodii Chloridum U.S.** A mixture composed of equal parts of dry Chloride of Gold and Chloride of Sodium, and which contains about 32 p.c. of pure Gold. This is Official in Dutch (Chloretum Aurico-Natricum et Chloretum Natricum), Ger., Russ. and Swiss (Auro-natrium Chloratum).

Some foreign samples of commercial Chloride of Gold are the double Chloride of Gold and Potassium $AuCl_3.KCl.2\frac{1}{2}H_2O$, corresponding to about 47 p.c. of metal.—*P.J.* (3) xxii. 902.

Medicinal Properties.—It has been given on the Continent for amenorrhœa and secondary syphilis. Chloride of Gold and Sodium has been used successfully in tertiary syphilis, spinal sclerosis, hystero-epilepsy, asthma, chorea, and in uterine affections.

Ph. Ger. maximum single dose, ·05 gramme ($\frac{3}{4}$ grain); maximum daily dose, ·2 gramme (3 grains).

Prescribing Notes.—It may be given in the form of **pills** made with Massa Kaolini; or in watery solution. Its solutions should be protected from white light.

It is also used in photography.

BALSAMUM CANADENSE.

See TEREBINTHINA CANADENSIS.

Not Official.

BALSAMUM DIPTEROCARPI.

GURJUN BALSAM, OR WOOD OIL.

(Pharmacopœia of India.)

A balsamic exudation, obtained from the trunk of *Dipterocarpus lævis* and other species by incision and the application of heat. Imported from the East Indies.

Medicinal Properties.—Similar to those of Copaiba. Useful for leprosy. Dr. Dougall used 1 part Gurjun Balsam with three parts of Lime Water to anoint the body night and morning, cleaning the body before the morning application, first with dry earth and then with water. He also gave 2 drachms of the Balsam internally night and morning, mixed with Lime Water.—*L.* '74, i. 694. Mr. J. D. Hillis, of the Leper Asylum in British Guiana, is greatly in favour of it.—*L.* '80, i. 659; *M.P.* '89, i. 664; *see* also *L.* '90, i. 136. Von Reisnen gives Wood-oil internally, commencing with daily doses of 5 drops, increasing gradually to 70 or more, suspending the treatment when intolerance is shown. Externally the leprous parts are treated with an ointment of Gurjun Balsam, 3 parts; Lanolin, 1 part.—*P.J.* '95, ii. 27.

It is used in India as a substitute for Balsam of Copaiba in gonorrhœa; also as a natural varnish.

Description.—It is an oleo-resin, constituting a transparent liquid of the con-

sistence of Olive Oil, lighter than Water, of a dark brown sherry colour, slightly fluorescent. Heated in a vial to 270° F. (132·2° C.) it becomes turbid and gelatinous. It affords a turbid solution when shaken with an equal volume of Benzol.

Test.—When dissolved in about 20 parts of Carbon Bisulphide and a drop of a cooled mixture of equal parts of Sulphuric and Nitric Acids is added, it takes a splendid violet colour, which lasts several hours. This reaction is not prevented by the presence of Resin or by Copaiba Balsam.—*Fluckiger.*

BALSAMUM PERUVIANUM.

BALSAM OF PERU.

A Balsam exuded from the trunk of *Myroxylon Pereiræ*, after the bark has been beaten and scorched.

From San Salvador, in Central America.

Solubility.—1 in 1 of Alcohol (90 p.c.); when more than 3 of Alcohol is added to 1 of Balsam it becomes turbid; in all proportions of Chloroform; insoluble in Olive Oil.

Medicinal Properties.—Stimulant and disinfectant expectorant. Useful in chronic catarrh, asthma, and other chronic pulmonary complaints, contra-indicated in acute catarrh because of its stimulant action; also to restrain excessive discharges, as gleet, &c.

Externally for chronic indolent ulcers and for sore nipples; for scabies and pediculi and parasitic skin diseases, to relieve itching in urticaria, and prevent or heal bedsores.

Balsam of Peru contains Cinnamic and Benzoic Acids, both of which possess antiseptic properties.

The Balsam contains an Essential Oil, the vapour of which is extremely toxic to the acarus of Itch. The patient is rubbed in the evening for fifteen or twenty minutes with the Balsam; it is not necessary to rub hard as the vapour is sufficient to kill the parasite.—*L.* '96, i. 1101.

Dose.—5 to 15 minims.

Prescribing Notes.—Given as an **emulsion** with mucilage, or sugar and yolk of egg with water.

Not Official.—Unguentum Peruvianum, and Unguentum Peruvianum Resinosum.

Foreign Pharmacopœias.—Official in Austr., sp. gr. 1·14—1·16; Dutch and Belg., sp. gr. 1·14—1·15; Dan.; Fr.; Ger., Hung. and Russ., sp. gr. 1·135—1·145; Norw.; Port., sp. gr. 1·15; Span., sp. gr. 1·15—1·16; Swed. and Swiss; Ital., Jap., Norw., and U.S., sp. gr. 1·135—1·150; Mex. 1·14—1·145.

Description.—A viscid liquid, in bulk nearly black, but in thin layers deep orange-brown or reddish-brown and transparent. It has an agreeable balsamic odour and an acrid taste; when swallowed it leaves a burning sensation in the throat.

Tests.—Sp. gr. between 1·137 and 1·150. 10 drops triturated with ·4 gramme of Lime produce a permanently soft mixture (absence of Copaiba and Resins); and this, on being warmed until all volatile matter is given off and until charring commences gives no fatty odour (absence of Castor Oil and other fatty Oils). It should not diminish in

volume when shaken with an equal bulk of Water (absence of Ethylic Alcohol). About 40 p.c. of resin should separate when one part of the Balsam is treated with three parts of Carbon Bisulphide; and the clear supernatant liquid should be of a pale brown colour with only a slight fluorescence (absence of Gurjun Balsam). If 5 grammes of the Balsam be shaken with 5 c.c. of a solution of Sodium Hydroxide of sp. gr. 1·16, and then washed with three successive quantities, each of 15 c.c. of Purified Ether, and the Ether removed, the residue (after cautious drying until the loss, in two weighings at 5 minutes' interval, does not exceed 1 centigramme), should weigh between 2·85 and 3 grammes. To this weighed residue 20 c.c. of Normal Volumetric Alcoholic Solution of Potassium Hydroxide and 40 c.c. of Alcohol (90 p.c.) are to be added and the whole saponified under a reflux condenser for one hour. Thus treated, the residue above specified should combine with from 11·9 to 12·8 c.c. of the Normal Volumetric Alcoholic Solution of Potassium Hydroxide (presence of a sufficient proportion of Cinnamein). The amount of uncombined alkali may be determined in the usual way by means of titration with the Volumetric Solution of Sulphuric Acid.

The acid, ester and saponification numbers and the amount of resin-ester as well as Cinnamein might have been included in the tests.—*C.D.* '98, ii. 130.

For papers on Tests for the purity of Balsam of Peru, *see P.J.* (3) xii. 45; (3) xiii. 321, 581; (3) xiv. 424; (3) xv. 237; (3) xviii. 1072.

Regarding the methods for testing Peruvian Balsam satisfactorily, Messrs. Gehe & Co. have found the determination of the percentage of Cinnamein and the saponification number a valuable method in testing the article. A series of experiments on some fifty samples show that in genuine Balsams the proportion of Cinnamein lies between 57—60 p.c., the saponification equivalent by their process being from 235—238.—*P.J.* (3) xxv. 1124.

Cinnamein is present to the extent of 62—64 p.c. in the Balsam. In the examination of Peru Balsam the yield should be about 64 p.c. of Cinnamein and 30 p.c. of Resin; should the figures differ considerably from these, a separate examination by saponification of these two important constituents should be made to establish the adulteration.—*A.J.P.* '94, 406.

A comparison of pure Balsam obtained direct from the producer with some commercial samples gave a wide range for the saponification value, and from 65 to 80 p.c. of Cinnamein.—*J.S.C.I.* '98, 268.

A process for determining the acid and saponification number.—*J.S.C.I.* '98, 806.

Not Official.

UNGUENTUM PERUVIANUM.—Balsam, 1; Lard, 7.

An excellent application for sore nipples or cracked lips.

UNGUENTUM PERUVIANUM RESINOSUM.—Balsam, 1; Resin Ointment, 1: mix. Applied upon lint for bed-sores.

BALSAMUM TOLUTANUM.

BALSAM OF TOLU.

A Balsam obtained by making incisions in the trunk of *Myroxylon Toluifera*.

Imported from the northern ports of Columbia, South America.

Solubility.—1 in 1 of Alcohol (90 p.c.); 1 in 3 of Benzol; 2 in 1 of Chloroform; 1 in 1 of Glacial Acetic Acid; insoluble in Petroleum Spirit; nearly insoluble in Carbon Bisulphide.

Medicinal Properties.—Similar to those of the Balsam of Peru, but not used externally.

Dose.—5 to 15 grains.

Prescribing Notes.—Usually given as the **Syrup**, which is useful as a flavouring agent, and as a remedy in cough mixtures. The **Tincture** when mixed with Water requires the use of Mucilage of Acacia.

Official Preparations.—Of the **Balsam**, Syrupus Tolutanus and Tinctura Tolutana; used in the preparation of Tinctura Benzoini Composita. The **Syrup** is contained in Mistura Ammoniaci. The **Tincture** is used in the preparation of Tolu Basis which is contained in Trochiscus Acidi Carbolici, Trochiscus Morphinæ, and Trochiscus Morphinæ et Ipecacuanhæ.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Hung.

Description.—When first imported it is a soft and tenacious solid, which on keeping becomes harder and then, in cold weather, is brittle. In thin films it is transparent and of a yellowish-brown colour. Pressed between pieces of glass with the aid of heat it exhibits, when examined with a lens, an abundance of crystals. Odour highly fragrant, especially when warmed; taste somewhat aromatic and slightly acid. It is soluble in Alcohol (90 p.c.) and the solution has an acid reaction.

We found sp. gr. of two samples to be 1·230 and 1·258.

The resinous portion consists of Tolu-resinotannol in combination with Cinnamic and Benzoic Acids, the latter in small proportion only. In addition the Balsam contains 7·5 p.c. of an acid, aromatic, oily liquid, principally Benzyl Benzoate, with a little Benzyl Cinnamate and ·05 p.c. of Vanillin. Neither Styracin, free Benzyl Alcohol, or Phenyl-propyl Cinnamate could be detected.—*P.J.* (3) xxv. 643.

Tests.—If 5 grammes are gently warmed with two successive portions of 25 and 10 c.c. of Carbon Bisulphide, the solution should yield, when evaporated to dryness, a distinctly crystalline residue which should require not less than one-third of its weight of Potassium Hydroxide for its saponification (presence of a sufficient proportion of Benzoates and Cinnamates).

The above test together with a description of a spurious article, resembling genuine Balsam of Tolu in some respects, is described.—*P.J.* '95, ii. 146; *C.D.* '95, ii. 212; *P.J.* '97, i. 308.

Some of the spurious article was supplied to us in the ordinary course of business; with Carbon Bisulphide it yielded 24 p.c. of residue which absorbed 25·5 p.c. of Potassium Hydroxide, and a portion of the sample mounted on a slide and examined under a lens showed scarcely any crystals.

In addition to the saponification number the acid number might have been given.—*C.D.* '98, ii. 130.

When a few drops of the Carbon Bisulphide solution are evaporated, and the residue covered with Sulphuric Acid, pure Balsam gives an intensely blood-red colour reaction, while mixed colours are indicative of adulteration with Resin.—*P.J.* '97, ii. 446.

Preparations.

SYRUPUS TOLUTANUS. Syrup of Balsam of Tolu.

Balsam of Tolu, 1¼; Refined Sugar, 32; Distilled Water, a sufficient quantity; boil the Balsam of Tolu in 20 of the Distilled Water for half an hour in a lightly covered vessel, stirring frequently. Then remove from the source of heat and add Distilled Water, if necessary, so that the liquid when cold shall measure 16. Filter the solution, add the Refined Sugar, and dissolve by the aid of a water bath. The product should weigh 48. =(about 1 in 29).

A better flavoured Syrup may be made as follows: Balsam of Tolu, 1¼; Sugar, 8; powder the Tolu with the Sugar, macerate in Water 16, for 24 hours, with frequent agitation, filter bright and dissolve in it (cold) Sugar 24.

By the use of a little Spirit a still more strongly-flavoured Syrup may be made: Balsam of Tolu, 1¼; Alcohol (90 p.c.), 1¼; dissolve and add the Solution to Simple Syrup, 34; shake thoroughly and filter.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Fr., Ital., Jap., Norw., Port., Russ., Span., Swiss and U.S.; Dan. and Mex., made with Tincture; not in the others.

TINCTURA TOLUTANA. Tincture of Balsam of Tolu. (Altered.)

Balsam of Tolu, 2; Alcohol (90 p.c.) a sufficient quantity. Place the Balsam of Tolu in 16 of the Alcohol; set aside in a closed vessel; agitate occasionally; when the Balsam is dissolved, filter; pass sufficient of the Alcohol through the filter to produce 20 of the Tincture. =(1 in 10).

Now 1 in 10 instead of 1 in 8, and Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Dan., Fr., Mex., Span. and Swed., 1 in 5; Port., 3 in 20; U.S., 1 in 10: all by weight except U.S.; not in the others.

Not Official.

BAPTISIN.

A powdered extract obtained from *Baptisia tinctoria*.

Medicinal Properties.—In small doses, laxative; in large doses, purgative and emetic.

Dose.—1 to 5 grains. Usually given in **pill**.

Is an hepatic, and also an intestinal stimulant of considerable power.—Dr. Rutherford.

Not Official.

BARII HYPOPHOSPHIS.

This is used in the preparation of Hypophosphorous Acid, *B.P.C.*, and is directed to contain not less than 95 per cent. $Ba.2(PH_2O_2).H_2O$, and from the tests of the Acid when made, it is expected to be free from Lime.

It would appear (*P.J.* (3) xxiii. 235) that commercial Hypophosphite of Barium is anhydrous and generally contains Lime.

Not Official.

BARII SULPHIDUM.

BaS, eq. 168·22.

It is somewhat difficult to obtain in a pure condition, and commercial samples as a rule do not contain more than 50 p.c. BaS.

Medicinal Properties.—The chief use for this is as a **depilatory,** for which purpose it is unequalled, removing hair with less injury to the skin than any other application.

Method of Preparation.—Some commercial samples are obviously prepared by evaporating to dryness a solution obtained by boiling Barium Hydrate and Sulphur together with Water; these evolve Sulphurous Acid on treatment with Hydrochloric Acid, while the pure Sulphide gives nothing but Sulphuretted Hydrogen.

In small quantity it may be prepared by saturating strong Baryta Water with Sulphuretted Hydrogen and evaporating rapidly to complete dryness.

Commercially it is made by exposing to a bright red heat for some time in a closed crucible a mixture of powdered Sulphate of Barium and powdered Charcoal. From the excess of Carbon and undecomposed Sulphate, the Sulphide is extracted by boiling Water.

In presence of air and moisture, Barium Sulphide rapidly deteriorates by oxidation to Sulphate.

Test.—For the estimation of BaS: 1. Make a standard Zinc Solution by dissolving 7·7 grm. Zinc in about 75 c. c. of Diluted Hydrochloric Acid, adding excess of Ammonia and diluting to 1000 c. c.; 2. Make an alkaline Lead Solution by dissolving 1 grm. Lead Acetate in about 20 c. c. of hot Solution of Potash and diluting to 100 c. c.; 3. Heat to boiling 1 grm. of the Barium Sulphide in about 50 c. c. of Water and titrate with the standard Zinc Solution till no black or brown colour is obtained by adding a drop of the Barium Solution to a drop of the Lead indicator, spotted on a porcelain slab. Each c. c. of the Zinc Solution used is equivalent to 2 per cent. of Barium Sulphide in the sample operated upon.

Preparation.

DEPILATORY.—Barium Sulphide (containing 70 p.c. BaS, or an equivalent quantity of any other strength) in fine powder, 2; Starch, 5; Orris Root in powder, 1; mix.

For use make it into a thin paste with Water, apply to the part from which the hair is to be removed: after five minutes scrape off with a blunt knife.

Not Official.

BEBEERINÆ SULPHAS.

SULPHATE OF BEBEERINE.

A preparation made from *Nectandra* or *Bebeeru* Bark (*Nectandra Rodiæi*), containing about 60 p.c. of alkaloids, one half being **Bebeerine,** $C_{19}H_{21}NO_3$, the remainder being other amorphous alkaloids which have not yet been separated in the pure form. It has been official since 1864, but is now omitted.

In dark-brown thin translucent scales, yellow when in powder, with a strong bitter taste.

The so-called **Buxine** from Boxwood (*Buxus sempervirens*) and **Pelosine** from *Cissampelos Pareira* are identical with Bebeerine.—*P.J.* (3) x. 612, and (3) xvi. 300.

Solubility.—Sparingly in Alcohol (90 p.c.); dissolves about 1 in 1 of Water, and the solution can be diluted up to 1 and 8 of Water, but on further dilution it precipitates until about 80 or 100 parts of Water have been added, but samples vary in this respect.

Medicinal Properties.—Aromatic bitter, stomachic tonic, an imperfect substitute for Quinine.

Dose.—1 to 5 grains.

Prescribing Notes.—Given in **solution,** or in **pills** made with 'Dispensing Syrup.'

Not Official.

BELÆ FRUCTUS.

BAEL FRUIT.

The fruit of *Ægle Marmelos*.

The dried half-ripe fruit was formerly Official, but is now omitted.

Medicinal Properties.—The fresh fruit has been much extolled in India for diarrhœa and dysentery, and the Confection prepared in this country appears to have similar properties. The dried fruit is not considered a trustworthy remedy.

Preparation.

CONFECTIO BELÆ RECENTIS.—Prepared from fresh fruits imported from India in the spring months. It retains the odour and flavour of the fresh fruit.

Dose.—A teaspoonful.

BELLADONNA.

BELLADONNA.

The fresh leaves and branches of *Atropa Belladonna*, as well as the dried root, are Official, and are described under Belladonnæ Folia and Belladonna Radix respectively.

Medicinal Properties.—Anodyne, antispasmodic, mydriatic, antigalactagogue, anhydrotic, and diuretic. There is no drug which can compare with it in checking the secretions of milk, sweat, and saliva. It is given for the relief of some nervous and spasmodic disorders, as epilepsy and whooping-cough; in renal colic, dysmenorrhœa and typhlitis; in full and frequent doses for asthma, both as a prophylactic and curative. It relieves cardiac pain, palpitation and aortic regurgitation, and is of service in adynamic fevers. Useful in typhoid with contracted pupil, and in acute bronchitis it stops profuse secretion. In large or continued doses it causes dilatation of the pupil and dryness of the mouth and throat. Dr. Nunnely successfully treated habitual constipation by giving ⅛ to ¼ grain of Extract on rising in the morning, which rarely failed to produce a healthy stool after breakfast; and, by continuing its use for a week or fortnight, it restored the natural action of the bowels. For nocturnal incontinence of urine, dose 5 to 10 minims of the Tincture, with the same dose of Tinct. of Perchloride of Iron three times a day (*L.* '70, Oct. 22; *B.M.J.* '86, i. 291; *L.* '89, ii. 1056; *Pr.* lii. 331). Ringer recommends larger doses of Bella-

donna for this troublesome complaint in children, 10 to 30 minims of the Tincture three times a day; small doses often fail when large doses at once succeed. Useful in loss of tone and irritable state of the generative organs which gives rise to nocturnal emissions, although it has slightly aphrodisiacal properties. The **Extract** in pills, also the **Tincture** and **Succus** are for internal use. The **Suppository** is used in prostatitis, cystitis and chordee. Externally the **Liniment** and **Compound Liniment** sprinkled on piline are very useful in pleurodynia, lumbago and muscular rheumatism, as is also the **Chloroform** preparation alone or mixed with Oil. The **Glycerinum** as a paint, and the **Emplastrum,** are used for sprains, acute synovitis, and to check mammary secretion and prevent inflammation of the breast; the plaster is also an excellent remedyin cardiac pain and palpitation.

Dose.—Will be found under the respective preparations.

Incompatibles.—Caustic Alkalies, Opium, Strychnine.

Official Preparations.—Extractum Belladonnæ Viride, and Succus Belladonnæ from the **fresh leaves** and **branches**. Extractum Belladonnæ Liquidum from the **dried root**. Emplastrum Belladonnæ, Extractum Belladonnæ Alcoholicum, Linimentum Belladonnæ, Tinctura Belladonnæ, and Unguentum Belladonnæ from the **Liquid Extract**. Suppositoria Belladonnæ from the **Alcoholic Extract**. Atropine from **leaves** or **root**.

Not Official.—Chloroform Belladonnæ, Glycerinum Belladonnæ, Linimentum Belladonnæ Composita, and Etherial Tincture of Belladonna.

Antidotes.—In cases of poisoning by Belladonna, use stomach-tube or give one of the following emetics, 10 grains of Copper Sulphate, 20 grains of Zinc Sulphate, 1 oz. of Ipecacuanha Wine, or hypodermic injection of $\frac{1}{10}$th grain Apomorphine; inject Morphine or Pilocarpine. Chloral Hydrat. *L.* '81, i. 74, and ii. 589. Pilocarpine, *B.M.J.* '81, i. 594. Physostigmine, *B.M.J.* '81, i. 918.

BELLADONNÆ FOLIA. Belladonna Leaves.

The fresh leaves and branches of *Atropa Belladonna*, collected when the plant is in flower.

Description.—The leaves have short stalks, are alternate below but in unequal pairs above. They are from three to eight inches (eight to twenty centimetres) long, broadly ovate, acute, entire, and glabrous or nearly so. The corolla is gamopetalous, campanulate, and of a dingy purple colour. The transverse section of the leaf exhibits bi-collateral vascular bundles; the mesophyll contains numerous cells filled with very minute crystals of Calcium Oxalate.

It is now generally recognised that the greater portion of the alkaloid existing in Belladonna (both leaves and root) is Hyoscyamine, rather than Atropine. A good resumé of the literature on the subject is given in *P.J.* (3) xxii. 469, from which it would appear that although Belladonna leaves may be found in the market containing as little as ·1 p.c. of alkaloid, a good well-dried leaf should approximate to ·5 p.c., and specimens may be met with yielding as much as ·9 p.c., showing there existed a necessity for standardising the Tincture; which has now been done.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Ital., Mex., Norw., Russ., Span., Swed., Swiss and U.S., leaves; Dutch, leaves and fresh herb; Fr., leaves and fruit; Ger., leaves and branches; Port., herb; not in Hung. or Jap.

Preparations.

EXTRACTUM BELLADONNÆ VIRIDE. Green Extract of Belladonna.

Bruise the fresh leaves and young branches of *Atropa Belladonna* in a mortar, press out the juice, and heat it to 130° F. (54·4° C.), separate the green colouring matter by a calico filter; heat the strained liquor to 200° F. (93·3° C.); filter. Evaporate the filtrate on a water-bath to the consistence of a thin syrup; add to it the green colouring matter previously separated and passed through a hair sieve, stir the whole together and evaporate at a temperature not exceeding 140° F. (60° C.) to the consistence of a soft extract.

100 lbs. of herb yielde1 56 lbs. of juice, or nearly 4 lbs. Extract.

100 lbs. leaves, when dried, weighed 16 lbs.

An estimation of the alkaloids contained in four samples of Extract of Belladonna, prepared in 1885 by different makers, gave ·94 p. c., 1·17 p.c., 1·11 p. c., ·73 p. c. The following samples in good condition were examined at the same time: 1880—1·26 p. c., 1·22 p. c.; 1881—1·16 p. c., 1·21 p. c.; 1884—1·21 p. c.

A sample of 1892 Extract yielded 1·7 per cent. of Alkaloids.

Naylor and Bryant suggest a process for the assay. They state there is no difficulty in making green extract of Belladonna to contain 1 to 1·25 p.c. of alkaloid and would fix the strength of the extract at 1 p.c. of alkaloid, using when necessary, milk sugar as a diluent.—*P.J.* '98, ii. 165; *C.D.* '98, ii. 289.

Dose.—¼ to 1 grain.

Foreign Pharmacopœias.—Official in Austr. and Mex., alcoholic from the **leaves**; Belg., clarified juice from **leaves** evaporated; Dan., made from **leaves** with weak spirit; Dutch, alcoholic from **fresh herb**; Fr., clarified juice from **leaves** evaporated, also alcoholic from the **seeds**; Ger., made with water and spirit from **leaves** and flowering branches; Hung., alcoholic from **root**; Ital., Norw. and Swed., alcoholic from **leaves**; Port., aqueous from **dried leaves**, alcoholic from **fresh herb** and alcoholic extract purified by alcohol; Russ., made from **leaves** with water and spirit; Span., clarified juice from **leaves** evaporated, and aqueous from **dried leaves**; also alcoholic from **dried leaves**; Swiss, alcoholic, 1=2 of root, also **Fluid Extract** 1 in 1; U.S., an alcoholic extract from the powder of the **leaf**, also **Fluid Extract** of the **root**.

SUCCUS BELLADONNÆ. Juice of Belladonna.

Bruise the fresh leaves and young branches of *Atropa Belladonna*; press out the juice; to every three volumes of juice add one of Alcohol (90 p.c.); set aside for seven days; filter.

Dose.—5 to 15 minims.

Belladonna Juice which would yield an Extract of 1 p.c. Alkaloid would form a Succus of about ·05 p.c.

Not Official.

GLYCERINUM BELLADONNÆ (*B.P.C.*).—Green Extract of Belladonna, 8; Hot Water, 1; Glycerin to 16.

Foreign Pharmacopœias.—Official in Belg., Fr. and Port., 1 Extract in 10; Mex., Extract 1, Glycerin of Starch 10.

Used as a pigment for relieving pain and tension in acutely inflamed parts; also painted on the breasts to suppress secretion of milk.

BELLADONNÆ RADIX. Belladonna Root.

The dried root of *Atropa Belladonna*, collected in the autumn, and dried.

Description.—In nearly cylindrical pieces, entire or longitudinally split, varying in diameter from about three-eighths to three-quarters of an inch (ten to twenty millimetres), and usually from six inches to a foot (fifteen to thirty centimetres) or more in length. Externally it is of a pale greyish-brown colour, and is finely wrinkled longitudinally. The transverse fracture is short, and internally the root is whitish and starchy. Within and mostly near to the cambium ring are numerous scattered groups of vessels and fibres which should not exhibit a prominently radiate arrangement. Most of the parenchymatous cells contain small compound starch grains, and some are filled with numerous very minute crystals of Calcium Oxalate.

As in the case of Belladonna leaves, the alkaloid of the root is almost wholly Hyoscyamine. A good parcel of roots should average ·5 per cent., but occasional bales are found averaging ·7 to ·8 p.c. The best alkaloidal solvent is undoubtedly Ammoniated Spirit. 20 oz. of a particularly rich sample of powder yielded a first percolate of 20 fluid ounces containing ·75 p.c. of alkaloid, followed by a second 20 oz. of percolate of ·018 p.c. By the Dunstan process the same root yielded a total of ·69 p.c.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Hung., Ital., Mex., Port., Russ., Span., Swed., Swiss, and U.S.; not in Dutch, Ger., Jap., or Norw.

Preparations.

EMPLASTRUM BELLADONNÆ. Belladonna Plaster. (Altered.)

Liquid Extract of Belladonna, 4 fl. oz.; Resin Plaster, 5 oz. Evaporate the Liquid Extract of Belladonna on a water-bath until it is reduced in weight to 1 oz.; add the Resin Plaster previously melted; mix.

This Plaster contains ·5 p.c. of the alkaloids of Belladonna Root. = (1 in 6).

Liquid Extract of Belladonna now used instead of the Alcoholic Extract, and Soap Plaster is omitted.

Applied to the breasts to check secretion of milk.

Foreign Pharmacopœias.—Official in Belg., Extract 1 in 8; Fr., Alcoholic Extract 3 in 4; Port., Alcoholic Extract 1, Lead Plaster 9; Span., Extract about 1 in 5; Swiss, Fluid Extract 3 in 10; U.S., Alcoholic Extract of Leaves 1, Resin Plaster 2, Soap Plaster 2; Mex., from the leaves with Alcohol; not in the others.

EXTRACTUM BELLADONNÆ ALCOHOLICUM. Alcoholic Extract of Belladonna. (Altered.)

An Extract containing 1 p.c. of the alkaloids of Belladonna Root.

Evaporate 1 fl. oz. of Liquid Extract of Belladonna, in a counterpoised basin, on a water-bath, to the consistence of a moderately firm extract; weigh. The difference between the weight of the residue and three-quarters of an ounce gives the weight of Milk Sugar to be used as a diluent for each fl. oz. of the Liquid Extract. Evaporate 20 fl. oz. of Liquid Extract of Belladonna to the consistence of a thin

syrup; add to it the required quantity of Milk Sugar determined from the data obtained from the foregoing experiment; continue the evaporation until the extract weighs 15 oz.

Liquid Extract now employed and Milk Sugar added.

Dose.—$\frac{1}{4}$ to 1 grain.

This Alcoholic Extract of Belladonna contains one-third the proportion of alkaloids present in average samples of the Alcoholic Extract of Belladonna of the British Pharmacopœia of 1885.

(Foreign Pharmacopœias compared under Extractum.)

EXTRACTUM BELLADONNÆ LIQUIDUM. Liquid Extract of Belladonna. (New.)

A Liquid Extract containing $\frac{3}{4}$ grain of the alkaloids of Belladonna Root in 110 minims (·75 gramme in 100 c.c.). Moisten 8 of Belladonna Root, in No. 20 powder, with 6 of a mixture of seven volumes of Alcohol (90 p.c.) and one volume of Distilled Water; set aside for six hours; pack firmly in a percolator; pour over the powder 6 of the same Alcoholic menstruum; when the liquid begins to drop, close the lower orifice of the percolator; set aside for twenty-four hours; percolate slowly, adding more of the menstruum as required; collect the percolate in small portions. Moisten a second quantity of 8 of Belladonna Root, in No. 20 powder, with the first 6 of percolate; proceed to extract this portion of the Belladonna Root in the manner directed for the first portion, but use as the menstruum the liquid collected from the first percolator. This method of repercolation is to be carried out through two more quantities each of 8 of Belladonna Root, the third portion being extracted with the liquid from the second percolator, and the fourth portion with the liquid from the third percolator. Collect $12\frac{1}{2}$ of the strong percolate from the fourth percolator.

Determine the portion of alkaloids in the resulting strong percolate by the following analytical process.

Introduce 10 c.c. into a separator, add 10 c.c. of Chloroform, 50 c.c. of Water, and a decided excess of Solution of Ammonia; agitate; set aside; separate the Chloroformic Solution. Twice repeat the agitation with Chloroform and the separation. Shake the mixed Chloroformic Solutions with 5 c.c. of Diluted Sulphuric Acid, mixed with twice its volume of warm Water; separate the Chloroformic liquid and repeat the agitation with acidulated Water. Wash the mixed acid liquids with 3 c.c. of Chloroform; then agitate with 10 c.c. of Chloroform and an excess of Solution of Ammonia. Separate the Chloroformic Solution; twice repeat the agitation with Chloroform and the separation; wash the mixed Chloroformic Solutions with 5 c.c. of Water containing one drop of Solution of Ammonia; draw off the Chloroformic layer into a counterpoised dish, evaporate on a water-bath; dry the residue below 212° F. (100° C.); weigh. Dissolve the residue in 10 c.c. of a decinormal solution of Hydrochloric Acid (3·619 grammes of the acid, HCl, per litre) and add centinormal solution of Soda (·3976 gramme of Sodium Hydroxide, NaOH, per litre) until the liquid is neutral, using Tincture of Cochineal as an indicator. Deduct the measure of the Soda Solution

thus required, from 100 c.c., and multiply the remainder by ·00287; the product will be the weight in grammes of alkaloids present in the quantity of the percolate operated upon.

From this weight calculate the amount of alkaloids in the bulk of strong percolate, and add to the latter sufficient of the Alcoholic menstruum to produce Liquid Extract of Belladonna containing ·75 gramme of alkaloids in 100 c.c., or $\frac{3}{4}$ grain in 110 minims.

The official repercolation process extracts 78 p.c. of the total alkaloid present in the root; a simple process of maceration and percolation, reserving the first portion and evaporating the remainder, extracted 98 p.c.—*C.D.* '98, i. 768.

The following modifications of the method of assay are suggested: (a) mix the strong percolate with an equal portion of Water, acidify with Sulphuric Acid, and evaporate; (b) use equal volumes of Ether and Chloroform in place of Chloroform; (c) omit the washing of Chloroformic solutions with Water containing a trace of Ammonia; (d) that a maximum difference should be fixed for the gravimetric and volumetric results.—*P.J.* '98, i. 450.

An examination of ground Belladonna Root separated by means of sieves, 60, 40 and 20 meshes to the inch, showed that the finer powder gives a darker coloured Alcoholic Tincture, but contains less alkaloid.—*P.J.* '96, ii. 97; *C.D.* '96, ii. 197.

LINIMENTUM BELLADONNÆ. Liniment of Belladonna. (Altered.)

Liquid Extract of Belladonna, 10; Camphor, 1; Distilled Water, 2; Alcohol (90 p.c.), a sufficient quantity. Dissolve the Camphor in 6 of the Alcohol; add the Liquid Extract of Belladonna, the Distilled Water, and sufficient of the Alcohol to produce 20 of the Liniment. Set aside for 24 hours; filter.

Liquid Extract of Belladonna now used instead of dried Root, and Alcohol (90 p.c.) in place of Rectified Spirit.

Prescribing Notes.—Prescribed with equal parts of Soap Liniment or Compound Camphor Liniment. Does not mix readily with fixed oils. When an oily liniment is required, it is better to order the Chloroform of Belladonna mixed with Olive or Almond Oil.

Foreign Pharmacopœias.—Official in U.S., about 1 in 1; Mex. (Aceite de Belladonna), Dried Leaves 1, Sesame Oil, 10; Span. (Aceite de Belladonna), Fresh Leaves 1, Olive Oil 2; not in the others.

SUPPOSITORIA BELLADONNÆ. Belladonna Suppositories. (New.)

Alcoholic Extract of Belladonna, 18 grains; Oil of Theobroma, a sufficient quantity for 12 suppositories. Proceed as directed for Tannic Acid Suppositories.

Each of these suppositories contains, approximately, $\frac{1}{60}$ grain (·001 gramme) of the alkaloids of Belladonna Root.

TINCTURA BELLADONNÆ. Tincture of Belladonna. (Altered.)

Liquid Extract of Belladonna, 2; Alcohol (60 p.c.), a sufficient quantity. To the Liquid Extract of Belladonna, add enough of the Alcohol to form 30 of the Tincture; set aside for 24 hours; filter.

About twice the strength of B.P. '85.

Now made from the Liquid Extract of the Root, instead of Belladonna Leaves, and Alcohol (60 p.c.) is used in place of Proof Spirit. It is standardised.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Austr. and Swiss, 1 in 10; Belg., Fr., Mex., Port. and Span., 1 in 5; U.S. 3 in 20; Russ. 1 in 12, **dried leaves.** Belg., Fr. and Port, 1 in 1, **fresh leaves**; all by weight except U.S.; not in the others.

Test.—On evaporation to a low bulk, and subsequent treatment by the analytical process employed for 'Extractum Belladonnæ Liquidum,' 100 c.c. of the Tincture should yield not less than ·048, nor more than ·052 gramme of alkaloid.

UNGUENTUM BELLADONNÆ. Belladonna Ointment. (Altered).

Liquid Extract of Belladonna, 2; Benzoated Lard, 2¼. Evaporate the Liquid Extract of Belladonna on a water-bath until it is reduced to ¼ (by weight); add the Benzoated Lard; mix.

100 parts of this Ointment should contain ·6 part of the alkaloids of Belladonna Root.

Now made from Liquid Extract instead of Alcoholic Extract, and is slightly stronger.

Foreign Pharmacopœias.—Official in Belg., Extract 1 in 10; Fr. (Pommade) Extract 4 in 30; Mex. (Pomada) Extract 1, Lard 7½; Port. (Pomada) aqueous Extract 1, Lard 9; (Forte) Alcoholic Extract 1, Lard 9; Russ., Extract, 1 in 10; Span. (Pomada) Extract 1, Lard 5; U.S., Alcoholic Extract 1 in 10; not in the others.

Not Official.

ETHEREAL TINCTURE OF BELLADONNA (*Sawyer*).—Substitute Pure Ether for Rectified Spirit in the Liniment of B.P. '85.—*L.* '90, ii. 67.

CHLOROFORMUM BELLADONNÆ.—Belladonna Root in powder, 20: percolate with sufficient Chloroform to produce 20.

Applied with equal parts of Camphor Liniment or Olive Oil, for painful rheumatism.

The lengthy process of B.P.C. might be expected to be a great improvement on the simple method of percolating the powdered root with Chloroform, as introduced in the very first (1864) edition of the '*Companion*,' but as a matter of fact, no more alkaloid is extracted.

It is well known that this preparation only extracts about half of the total alkaloid. By mixing the Root (in No. 40 powder) with Slaked Lime and powdered Ammonium Carbonate four-fifths of the alkaloid will appear in the first 1 in 1 percolate.

LINIMENTUM BELLADONNÆ COMP.—Liniment of Belladonna, 7; Chloroform of Belladonna, 1: mix. For application to the loins in lumbago, it should be sprinkled on impermeable piline (not *spongio piline*), and firmly pressed with the hands on the part for five minutes to insure perfect contact; it should then be kept on for at least 10 or 12 hours.

Peter Squire, who suffered much from lumbago, found this more effectual and much more convenient than Belladonna plasters.

BENZOINUM.

BENZOIN.

A balsamic resin obtained from *Styrax Benzoin* and probably from other species of *Styrax*; known in commerce as Siam and Sumatra Benzoin.

Solubility.—The tears are as a rule wholly soluble 1 in 5 of Alcohol (90 p.c.); 1 in 1 of Ether; and in Solution of Potash. The mass contains impurities, which are left after treating it with Alcohol. The Solution in Alcohol or Ether is acid.

B.P. requires Benzoin to be almost entirely soluble in Alcohol 90 p.c.

Medicinal Properties.—Expectorant, styptic, antiseptic, used in making aromatic fumigating pastilles. The **compound tincture** is given internally for chronic bronchitis; the **vapor** or **spray** is used in chronic laryngeal and bronchial catarrh to check abundant secretion and cough; lint soaked in the compound tincture forms a styptic and antiseptic dressing for wounds.

Dose.—Not given in B.P.; 10 to 30 grains.

Prescribing Note.—If given in the form of **mixture** the Tincture should be emulsified with Mucilage or yolk of Egg.

Official Preparation.—Tinctura Benzoini Composita. Used in the preparation of Acidum Benzoicum, Adeps Benzoatus, and Unguentum Cetacei.

Not Official.—Tinctura Benzoini, Insufflatio Benzoini, Lotio Benzoini, Unguentum Benzoini, Vapor Benzoini.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap. (Benzoë), Norw., Port., Russ., Mex. and Span. (Benjui), Swed., Swiss and U.S.

Description.—In flat or curved tears varying in size, but seldom exceeding two inches (five centimetres) in length and half an inch (twelve millimetres) in thickness, yellowish or reddish-brown externally, milky white internally; or in masses composed of tears more or less closely agglutinated by a reddish-brown translucent, or greyish-brown opaque, resinous intervening substance. It is brittle but softens readily when warmed, and when further heated yields fumes of Benzoic Acid. It has an agreeable odour, recalling that of Vanilla in the case of Siam Benzoin, and of Storax in the case of Sumatra Benzoin. It is almost entirely soluble in Alcohol (90 p.c.) and in Solution of Potassium Hydroxide.

It would appear from the Official description that Sumatra Benzoin is not intended to be used, although distinctly specified, since it is almost impossible to obtain it in commerce with less than 7 to 10 p.c. of residue, which we presume is not covered by the words 'almost entirely soluble in Alcohol (90 p.c.).'

The following are the commercial varieties:—

1. '**Siam**,' the finest and most aromatic; not produced from *Styrax Benzoin*.—*P.J.* (3) xxi. 519.
2. '**Sumatra**,' exported solely from the *west* coast of Sumatra (Padang).
3. '**Penang**' and 4. '**Palembang**,' varieties also produced in Sumatra.

The botanical sources and causes of difference in the three Sumatra Benzoins are still undecided. Holmes is of opinion that 'Penang' (the smell of which so strongly resembles Storax) must be the product of a different species. It is said (*C.D.* '91, ii. 487) that the 'Palembang' is invariably and systematically adulterated before exportation with other gum-resins, which may to some extent mask its individual character.

An examination of the quality of commercial samples of Sumatra Benzoin; the residue left after treatment with Alcohol (90 p.c.) varied from 8 to 30 p.c. of the drug employed.—*P.J.* '97, ii. 140; *C.D.* '97, ii. 278.

The solubility of commercial samples of Benzoin. Siam yielded 1 to 2½ p.c. of residue, good commercial Sumatra from 7 to 10 p.c. The following conclusions were drawn:—

1. That commercial samples of Benzoin contain a large percentage of matter insoluble in spirit.
2. That a standard should be fixed in the B.P. for the amount of matter insoluble in spirit.
3. That the standard for such impurity should not in any case exceed 10 p.c.
4. That Siam Benzoin, which contains the least amount of impurities insoluble in Alcohol, should be used in all the official preparations.—*P.J.* '98 i. 507.

Dieterich (*C.D.* '98, ii. 791) recommends the determination of the amount of ash, of the proportion of matter insoluble in 96 p.c. Alcohol, of the amount of water, and finally the acid, ester, and saponification number, according to his method which is mentioned under Copaiba.—*J.S.C.I.* '98, 806.

Preparation.

TINCTURA BENZOINI COMPOSITA. Compound Tincture of Benzoin. *B.P.Syn.*—Friar's Balsam. *N.O.Syn.*—Traumatic Balsam. (Modified.)

Benzoin, in coarse powder, 8; Prepared Storax, 6; Balsam of Tolu, 2; Socotrine Aloes, 1½ (less $\frac{1}{40}$th);* Alcohol (90 p.c.) a sufficient quantity. Place the Benzoin, Storax, Balsam of Tolu, and Aloes with 64 of the Alcohol in a closed vessel, set aside for two days, frequently agitating; filter; pass sufficient of the Alcohol through the filter to produce 80 of the Tincture. =(1 in 10).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Dan., Mex. (Tintura de benjui compuesta), Norw., Port., Swed. and U.S.; Fr., Teinture Balsamique; the tinctures vary considerably in composition and strength; not in the others.

Not Official.

TINCTURA BENZOINI (*B.P.C.*).—Benzoin in powder, 2; Rectified Spirit, 20: macerate for twenty-four hours with frequent agitation, then filter, and add sufficient Rectified Spirit, if required, to produce 20.

This is the same formula which has appeared in the 'Companion' since '64, with the exception of making up to a volume, which is stated (*P.J.* (3) xviii. 635) to be 21½ without any addition of Spirit. The writer there recommends that the Spirit used for maceration should be reduced to 17 or 18, as has been done in the Official Tinct. Benzoini Comp., and when filtered made up to 20.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S., 1 in 5; all by weight except U.S.

INSUFFLATIO BENZOINI (Vigier).—Tincture of Benzoin, 1; Boracic Acid, 1; Starch Powder, 1. Mix and let the Alcohol evaporate. Used as a snuff in coryza.—*T.G.* '88, 141.

LOTIO BENZOINI.—A nice lotion to protect the face from the heat of the sun is made with Tincture of Benzoin, 1; Rose Water, 40.

* To be exact, 16 grains are to be taken from every 1½ oz. of Aloes.

UNGUENTUM BENZOINI.—Benzoin in fine powder, 1; Adeps 4: mix intimately. Useful application for ulcers of the leg.—*L.* '87, ii. 351.

VAPOR BENZOINI (*T.H.*).—Compound Tincture of Benzoin, 60 minims in a pint of Water at 140° for each inhalation.

A sedative for acute inflammation of the pharynx and larynx.

BENZOL.

BENZOL.

[NEW.]

A mixture of homologous Hydrocarbons obtained from light coal-tar oil. It contains about 70 p.c. of Benzene, C_6H_6, and 20 to 30 p.c. of Toluene, $C_6H_5.CH_3$.

Official Preparations.—Used in the preparation of Charta Sinapis and Liquor Caoutchouc.

Description.—A colourless volatile liquid free from opalescence, with a strong characteristic odour. Sp. gr. from ·880—·888. It should begin to distil at 176° F. (80° C.), and about 90 p.c. of the whole should pass over at a temperature below 212° F. (100° C.). It should wholly distil below 248° F. (120° C.).

Not Official.

BERBERIS.

The Bark of the root of *Berberis vulgaris*.

It contains the alkaloids, **Berberine** $C_{20}H_{17}NO_4$, and **Oxyacanthine** $C_{19}H_{21}NO_3$. Berberine also occurs in Hydrastis Canadensis and Calumba. Its solutions are yellow, very bitter and coloured intensely red by Chlorine Water.

Medicinal Properties.—The **Fluid Extract** and the salts of Berberine have been used with success in intermittent fevers.—*T.G.* '86, 489.

A paper on the pharmacological action of Berberine. It cannot be said to have any very marked action upon the kidneys themselves as a special diuretic, though it undoubtedly does cause, under ordinary conditions, an increase of the urinary eliminative processes.—*B.M.J.* '95, ii. 1551.

Preparations.

EXTRACTUM BERBERIDIS FLUIDUM.—Made with Alcohol (60 p.c.) One fluid ounce of Extract is equal to one ounce of Bark.

Dose.—20 to 60 minims.

BERBERINÆ PHOSPHAS.—This is the most soluble salt of Berberine. Soluble 1 in 15 of Water; 1 in 9 of hot Water, but part separates out on standing; it is also thrown down as a yellow precipitate by excess of Alcohol.

Dose.—1 to 5 grains.

Not Official.

BETULÆ ALBÆ OLEUM.

BIRCH TAR OIL.

Syn.—OLEUM RUSCI.

A bituminous liquid obtained by destructive distillation of the wood of *Betula alba*. Russia leather derives its odour from this Oil.

The Russian variety is so distinct from either German or Dutch that it alone should be used in Pharmacy; it may be distinguished by shaking a few drops of the Oil with an ounce of Water, and filtering through a wet filter; the clear filtrate will give a pink colour with Potassium Cyanide Solution, which is intensified by addition of Ammonia. The German and Dutch Oils do not give this reaction.—*P.J.* (3) xv. 769.

The active constituents of the Rectified Oil are probably Guaiacol and Cresol.—*P.J.* (3) xxi. 661.

Preparation.

UNGUENTUM OLEI BETULÆ, (*B.S.H.*)—Birch Tar, 5 fluid drachms: Yellow Beeswax, 120 grains: melt the Beeswax, add the Oil, and stir till cold.

Used in psoriasis and dry eczema.

Caution.—The use of this Ointment in eczema demands care.

Not Official.

BISMUTHUM.

BISMUTH.

Bi, eq. 207·30.

In its crude state is generally impure.

The official tests for the presence of Bismuth will be found in the Appendix.

BISMUTHUM PURIFICATUM.—A process for the purification of Bismuth was given in *B.P.*, '85, but is now omitted.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Ital., Mex. (Bismuto), Port., Span. and Swed.; not in the others.

BISMUTHI BENZOAS.—Is described in the supplement of the French Codex as a white powder without taste, almost insoluble in Water; on ignition it yields 64 to 65 p.c. of Bismuth Oxide.

An examination of commercial samples obtained in France showed a variation of from 24 to 50 p.c. in the quantity of metallic Bismuth, and contained from traces up to 5 p.c. of Nitric Acid.—*P.J.* '97, i. 82.

BISMUTHI CITRAS. Bismuth Citrate.

A white powder, usually containing 2½ p.c. of absorbed moisture.

Solubility.—Insoluble in water; readily in Solution of Ammonia.

Medicinal Properties.—Similar to the Subnitrate.

Dose.—2 to 5 grains.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

BISMUTHI ET AMMONII CITRAS.—Small shining translucent scales, which yield Ammonia when warmed with solution of a fixed alkali.

Solubility.—1 in 1 of Water; sparingly in Alcohol (90 p.c.).

Dose.—2 to 5 grains.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

BISMUTHI NITRAS ($Bi(NO_3)_3$, eq. 392·04).—In colourless transparent crystals. Decomposed by Water, giving a white precipitate of Subnitrate. Soluble in Glycerin, but is slowly deposited from the solution when Water is added.

A **glycerole** can be made containing 60 grains to the ounce, but as an outward application in skin diseases the strength should in most cases not exceed 10 grains to the ounce.—*M.T.* '76, ii. 646.

The salt should be dissolved without the application of heat.

BISMUTHI OLEAS.—Crystallised Bismuth Nitrate, 280 grains; dissolve cold in

Glycerin 4 oz. by weight; add slowly Solution of Sodium Oleate, 20 fl. oz.: warm gently, wash by decantation, collect, and dry.

It forms a pearly grey soft bland substance.

Medicinal Properties.—It is a reliable application in pustular eruptions and hyperæmia of the skin.—*B.M.J.* '84 ii. 751.

BISMUTH-PHENOL (Bismuth Phenate).—Prepared by adding a solution of Phenol in an alkali, to a solution of Bismuth Oxynitrate. A greyish-brown amorphous powder, insoluble in Water and Alcohol (90 p.c.). Recommended as an intestinal antiseptic.—*P.J.* (3) xxiv. 182; *C.D.* '93, ii. 576.

Dose.—5 to 15 grains.

BISMUTHI SUBGALLAS.—A light yellow insoluble powder, introduced as an odourless substitute for Iodoform, under the name **Dermatol.**

Sometimes causes symptoms of Bismuth poisoning.

Given for gastric ulcer and diarrhœa in doses of 8 to 30 grains twice a day.—*L.* '97, ii. 404.

BISMAL (Methylendigallate of Bismuth).—Introduced as an astringent for internal administration in cases of diarrhœa.

Dose.—1 to 4 grains.

BISMUTH BETA-NAPHTHOLATE (ORPHOL).—A reddish-brown powder, insoluble in Water. Recommended as an intestinal antiseptic and astringent, both for adults and children.

Dose.—5 to 20 grains.

Experiments with Bismuth Subnitrate and Beta-naphthol as intestinal antiseptics.—*B.M.J.* '95, ii. 1483.

BISMUTHI SUBIODIDUM.—A brick-red amorphous powder, insoluble in Water.

Has been recommended as a substitute for Iodoform in the treatment of chancres and foul ulcers.—*T.G.* '87, 612; *Y.B.P.* '87, 286.

BISMUTH OXYIODOGALLATE (AIROL).—A combination of Dermatol with Iodine, introduced as a substitute for Iodoform, has attracted a good deal of attention as an antiseptic dressing. A bulky greyish powder, colourless and tasteless, insoluble in Water and Alcohol. Used as a dusting powder to ulcers, also mixed with Vaseline or Anhydrous Lanolin.

As an application to corneal ulcers.—*B.M.J.* '98, i. 144. Two methods of preparation.—*P.J.* '97, i. 167; *J.S.C.I.* '95, 184.

Sometimes badly tolerated.—*B.M.J.E.* '97, ii. 43.

Comparative experiments with Airol, Dermatol, and Iodoform.—*B.M.J.E.* '97, i. 67.

BISMUTH TRIBROMOPHENOL (XEROFORM).—A yellow powder, recommended as a non-irritating antiseptic.

EUDOXINE.—Is the Bismuth salt of Tetra-iodo-phenolphthalein. A reddish-brown, odourless and tasteless powder, insoluble in Water. Adult dose, 5 grains as an intestinal antiseptic.

BISMUTHI CARBONAS.

BISMUTH OXYCARBONATE.

$(Bi_2O_2CO_3)_2$, H_2O, eq. 1029·7.

May be prepared by the interaction of Bismuth Nitrate and Ammonium Carbonate.

Bismuth Nitrate is not officially described.

Solubility.—Soluble with effervescence in Nitric Acid; insoluble in Water.

Medicinal Properties.—Similar to the Oxynitrate, and often preferred to it.

Dose.—5 to 20 grains.

Prescribing Notes.—The following prescription is a good one for pyrosis: Bismuthi Carbonatis, 2 drms.; Magnes. Carb. Levis, 1 drm.; Pulv. Tragac. Comp. 1 drm.; Aq. Flor. Aurant., Glycerini, āā 2 fl. drms.; Aquæ Chloroformi, 1½ fl. oz.; Aquam ad 6 fl. oz. 3 to 4 teaspoonfuls 3 times a day after meals.

Mucilage of Acacia is not a good vehicle for Bismuth salts. On standing a compact mass forms at the bottom of the bottle, which is difficult to diffuse.

When Sodium Bicarbonate is to be given with a Bismuth salt, the Carbonate of Bismuth should be selected.

Official Preparation.—Trochiscus Bismuthi Compositus.

Description.—A whitish powder, the general chemical characters and reactions of which are similar to those of Bismuth Oxide and Bismuth Oxynitrate. All three compounds are heavy powders insoluble in Water but soluble in Nitric Acid, diluted with half its bulk of Water.

It varies much in density; the lighter variety is most suited for dispensing, being more easily suspended.

Tests.—Each yields the reactions characteristic of Bismuth. When either is dissolved in a little Hydrochloric Acid, the solution diluted with Water slightly acidulated with the same acid, and then excess of Hydrogen Sulphide passed through the liquid, a brownish-black precipitate of Bismuth Sulphide falls. This precipitate, when rapidly washed on a counterpoised filter with Water, and quickly dried at 212° F. (100 C.), serves for the estimation of the amount of Bismuth present in the compound. These Bismuth salts, when suitably treated, should yield no characteristic reaction with the tests for Silver, Lead, Copper, Arsenium, Iron, Zinc, Calcium, Magnesium, Chlorides, or Sulphates, nor with the tests for Selenium or Tellurium.

Are we to understand that Iron, Arsenic, Lead, Tellurium, Selenium, and Magnesium are all equally objectionable?—*C.D.* '98, i. 674.

Bismuth Oxycarbonate affords the reactions characteristic of Carbonates, but not more than the slightest reactions with the tests for Nitrates. Each gramme of it should yield ·99 gramme of Bismuth Sulphide when treated as described above.

The commercial Carbonate invariably contains more than a trace of Nitrate (*P.J.* xiii. (3) 936; (3) xviii. 721, 780), but it can be obtained in commerce free from Nitrate (*C.D.* '98, i. 837).

A delicate test for Tellurium.—Dissolve, without heat, 10 grains of Bismuth Subnitrate, or Bismuth Carbonate, in 60 minims of strong Hydrochloric Acid mixed with 60 minims of Water; add 10 grains of Sodium Hypophosphite. An evolution of Nitrous fumes will take place in the case of Subnitrate, and of Carbonic Acid only if it be Carbonate; but no development of colour or precipitation if the Bismuth salt be pure. If Tellurium be present in very small proportion a black precipitate will fall, and if Arsenium be the impurity the precipitate will be brown.—*C.D.* '97, i. 631.

Foreign Pharmacopœias.—Official in Mex. (Carbonato de Bismuto), Port. and U.S.; not in the others.

Preparation.

TROCHISCUS BISMUTHI COMPOSITUS. COMPOUND BISMUTH LOZENGE. (ALTERED.)

Bismuth Oxycarbonate, 2 grains; Heavy Magnesium Carbonate, 2 grains; Precipitated Calcium Carbonate, 4 grains. Mix with the Rose Basis to form a Lozenge.

This lozenge is now made with the Oxycarbonate instead of the Oxynitrate.

Dose.—Not given in B.P. ; 1 to 6 lozenges.

A modification, known as the **Gastric Antacid Lozenge**, has been recommended by Sir W. Roberts ; the Bismuth is omitted and Sodium Chloride added.—*B.M.J.* '89, ii. 374.

Foreign Pharmacopœias.—Official in Fr. and Port. 1½ grain in each; not in the others.

BISMUTHI OXIDUM.

BISMUTH OXIDE.

Bi_2O_3, eq. 462·24.

May be prepared by boiling Bismuth Oxynitrate with Solution of Sodium Hydroxide.

Solubility.—Insoluble in Water; soluble in Nitric Acid mixed with half its volume of Water.

Medicinal Properties.—Similar to the Subnitrate.

Dose.—5 to 20 grains.

Not Official.—Bismuthi Oxidum Hydratum and Cremor Bismuthi.

Foreign Pharmacopœias.—Official in Fr.; not in the others.

Description.—A slightly brownish-yellow powder.

Tests.—It should answer to the general characters and tests enumerated under 'Bismuth Oxycarbonate.'

Each gramme should yield 1·1 grammes of Bismuth Sulphide. Heated to incipient redness it is scarcely diminished in weight (absence of Bismuth Oxycarbonate, Bismuth Oxynitrate, and moisture).

Not Official.

BISMUTHI OXIDUM HYDRATUM.—A white amorphous powder, soluble in an excess of Hydrochloric Acid and precipitated again on the addition of Water as Oxychloride. It mixes readily with Water to form a cream.

CREMOR BISMUTHI.—Hydrated Bismuth Oxide, 1; Water, 4: rub together till smooth.

BISMUTHI SALICYLAS.

BISMUTH SALICYLATE.

[NEW.]

$C_6H_4 \cdot OH \cdot COO \cdot BiO$ (eq. 359·19).

Bismuth Salicylate, or Oxysalicylate may be prepared by the interaction of Bismuth Nitrate and Sodium Salicylate.

It is recommended to be prepared from crystallised Bismuth Nitrate by precipita-

tion with Ammonia, washing the precipitate till free from Nitrate, and mixing it with a molecular portion of Salicylic Acid.—*J.C.S.Abs.* '94, i. 416.

Solubility.—Insoluble in Water and Alcohol (90 p.c.).

Medicinal Properties.—Intestinal antiseptic and sedative; has been given with success in gastro-intestinal affections, particularly the summer diarrhœa of children.—*L.* '86, ii. 31, 1229; '88, i. 191, 1100; *T.G.* '86, 775; *B.M.J.E.* '92 i. 99.

Dose.—5 to 20 grains.

Prescribing Note.—Given in **cachets**, or in a **mixture** suspended with Mucilage. The salt is dissociated by contact with water, and then effervesces with an alkaline Carbonate; in such cases it is better to prescribe Bismuth Carbonate and Sodium Salicylate.

Foreign Pharmacopœias.—Fr. and Mex., 61 p.c. of Bismuth Oxide; Dan., Ger., Norw. and Russ., 63 p.c.; Dan., 60 p.c.; Norw.; not in the others.

Description.—A white or nearly white amorphous powder.

Tests.—It affords the reactions characteristic of Bismuth. Diluted Test-solution of Ferric Chloride is coloured violet when Bismuth Salicylate is introduced. It should yield only the faintest characteristic reaction with the Copper test for Nitrates. Alcohol (90 p.c.), with which Bismuth Salicylate has been shaken, should not give a violet colour with test-solution of Ferric Chloride (absence of free Salicylic Acid). Decomposed by heating with Solution of Sodium Carbonate, the liquid portion of the resulting mixture, if containing not less than 1 p.c. of Salicylate, affords a yellowish-brown precipitate on the addition of Solution of Uranium Nitrate (distinction from Carbolates and Sulphocarbolates). Each gramme of Bismuth Salicylate should yield ·7 gramme of Bismuth Sulphide. When heated Salicylic Acid volatilises and 62 to 64 p.c. of Bismuth Oxide remains. It should be free from the impurities indicated under 'Bismuth Oxycarbonate.'

There is a slight discrepancy between the figures given for Bismuth Sulphide and Bismuth Oxide. We have not yet seen a sample which would pass the Ferric Chloride test. If made as suggested in B.P. it will probably contain a considerable percentage of Nitrate.

Not Official.

THIOFORM (basic Dithio-salicylate of Bismuth).—Used as a desiccative and topical antiseptic.—*T.G.* '94, 561; *L.* '94, ii. 211; *B.M.J.E.* '96, i. 32.

BISMUTHI SUBNITRAS.

BISMUTH OXYNITRATE.

$BiONO_3$, H_2O, eq. 302·64.

Prepared by the interaction of Bismuth Nitrate and Water.

The formula calculates into 77 p.c. of Oxide, but it always contains 79 to 82 p.c. If the compound $BiONO_3$, H_2O exists, it is so unstable that it could certainly not be kept without decomposition.—*C.D.* '85, 561.

Although Mr. David Howard called attention to the inaccuracy of the formula given in B.P. '85, the error is repeated in B.P. '98. It is also at variance with the official test which requires that it should yield 84 p.c. of Bismuth Sulphide.

An examination of commercial samples of Bismuth Subnitrate in America yielded from 81 to 83·26 p.c. of Bismuth Oxide, and from 14 to 19·68 p.c. of NO_3.—*A.J.P.* '96, 423.

Solubility.—Insoluble in Water.

Medicinal Properties.—Sedative and astringent both internally and externally. It is highly useful in pyrosis, all forms of vomiting and irritative dyspepsia; in gastric ulcer, also in diarrhœa from any cause; usually combined with Soda, Magnesia, Opium, etc.; it renders the fæces leaden-grey in colour. It is recommended to be injected in gonorrhœa and leucorrhœa, 60 grains to the ounce of Water; the Bismuth is mixed with an equal quantity of Glycerin or suspended with Tragacanth. The addition of Bismuth to mixtures for diarrhœa of phthisis controls it better than other ingredients alone.

Externally it is used as a cosmetic, but is more or less blackened by an impure atmosphere; and as lotion, powder, or ointment in burns, eczema and other skin diseases when exudation and itching are present; also as an ingredient of Ferrier's snuff in acute coryza and chronic rhinitis.

Has been recommended as a dressing for wounds.—*L.* '85, ii. 634, and *T.G.* '85, 266.

Dose.—5 to 20 grains.

Prescribing Notes.—When prescribed in a **mixture**, it should be suspended with Compound Powder of Tragacanth, 1 drm. in a 6-oz. mixture. *See* Bismuthi Carbonas.

As Bismuth Oxynitrate in Water slowly parts with its Nitric Acid, the mixture is always acid, and this somewhat interferes with its suspension, and when prescribed with Sodium Bicarbonate it causes a slight but steady evolution of Carbonic Acid, which may cause the bottle to burst; these objections do not apply to the Bismuth Carbonate, which is therefore preferable in mixtures.

Incompatibles.—Effervescence ensues if prescribed in Water with Alkaline Bicarbonates. With Potassium Iodide double decomposition slowly ensues.

Official Preparations.—Used in the preparation of Liquor Bismuthi et Ammonii Citratis, and Bismuthi Oxidum.

Not Official.—Lotio Bismuthi, Unguentum Bismuthi, and Ferrier's Snuff.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—A heavy white inodorous powder consisting of minute crystalline scales, with not more than a slight action on Litmus.

Tests.—It should answer to the general characters and tests enumerated under 'Bismuth Oxycarbonate.' Each gramme should yield ·84 gramme of Bismuth Sulphide. It should afford only the slightest reactions with the tests for Carbonates. If 1 gramme be dissolved in Nitric Acid and the liquid mixed with a solution of about 2 grammes of Citric Acid and sufficient Solution of Ammonia to give decided alkalinity, no precipitate or opalescence should be produced by boiling the mixture while still faintly alkaline (absence of Calcium Phosphate).

E. Merck in a criticism of the B.P. recommends Bismuth to be determined as Oxide and not as Sulphide, the results being more reliable. The determination as Sulphide is apt to be too high owing to co-precipitation of Sulphur which is not

washed out. Bismuth Nitrate has a more basic character than would appear from the formula.—*C.D.* '98, ii. 348.

The best Arsenic test is to dissolve the sample in pure Hydrochloric Acid, add Arsenic-free Zinc, and cover the test-tube with filter-paper moistened with solution of Bichloride of Mercury.—*P.J.* (3) xiv. 424.

A delicate test for Tellurium *see* Bismuthi Carbonas.

It is distinguished from the Carbonate by being soluble without effervescence in diluted Nitric Acid and from the Oxychloride by dissolving in Acetic Acid.

Preparation.

LIQUOR BISMUTHI ET AMMONII CITRATIS. Solution of Bismuth and Ammonium Citrate. *B.P. Syn.*—Liquor Bismuthi. (Altered.)

Bismuth Oxynitrate, 7; Potassium Citrate, 7; Potassium Carbonate, 2; Nitric Acid, 5; Solution of Ammonia, Distilled Water, of each a sufficient quantity. Dissolve the Bismuth Oxynitrate in the Nitric Acid diluted with an equal volume of Distilled Water; add Distilled Water with constant stirring until the liquid is very faintly opalescent; add the Potassium Citrate and Carbonate dissolved in a little Distilled Water; heat the liquid to the boiling-point; cool; separate the precipitate; wash it with Distilled Water until free from Nitrates. Gradually add Solution of Ammonia to the moist precipitate until it is just dissolved; dilute with Distilled Water to 100; filter.

Now made from Bismuth Oxynitrate instead of Bismuth Citrate.

Description.—A colourless solution, with a slightly metallic taste.

Tests.—Sp. gr. 1·070. Slightly alkaline to test-paper; is freely miscible with Water; heated with alkalis evolves Ammonia, and yields a white precipitate. Evaporated to dryness and the product ignited, a residue with a yellow edge results, which when suitably treated, should not yield any reaction characteristic of Silver, Lead, Copper, Arsenium, Iron, Selenium, or Tellurium. A mixture of 10 c.c. of the Solution with 40 c.c. of Water, treated with Hydrogen Sulphide in excess, yields a black precipitate, which, when washed and dried, should weigh at least ·55 gramme.

Dose.—½ to 1 fl. drm.

1 fl. drm. contains an amount of Bismuth equivalent to about 3 grains; or 1 c.c. the equivalent of ·05 gramme, of Bismuth Oxide.

Examinations of commercial samples of Liquor Bismuthi *B.P.* '85.—*C.D.* '97, ii. 118: *P.J.* '97, ii. 157.

Not Official.

LOTIO BISMUTHI (*B.S.H.*).—Bismuth Subnitrate, 10 grains; Water, 1 fl. oz.: mix. Used as a sedative lotion in cases of eczema.

UNGUENTUM BISMUTHI.—Bismuth Subnitrate, 60 grains; Lard, 1 oz.

FERRIER'S SNUFF.—Bismuth Subnitrate, 6 drm.; Hydrochloride of Morphine, 2 grains; Gum Acacia in powder, 2 drm.—*L.* '76, i. 525.

It is described as a speedy and efficacious remedy for a recent cold in the head; each time the nostrils are cleared another pinch should be taken, using it frequently at first. One quarter to one half of this formula may be used in the twenty-four hours.

Glass insufflators are made to blow it up the nostrils.

Not Official.

BOLDO.

The leaves and young twigs of the *Peumus fragrans*, a native of Chili.

The activity is due to a glucoside, Boldine, and a volatile oil (sp. gr. ·918).

Foreign Pharmacopœias.—Official in Fr., Mex. and Span.; not in the others.

Medicinal Properties.—Has been used in liver complaints, and as a stimulant to digestion, also as a hypnotic.

Boldine has been given as a hypnotic in **capsules** containing 3 grains.

Preparation.

TINCTURA BOLDO.—Boldo Leaves, 1; Alcohol (60 p.c.), 10.

Digest seven days and filter.

Dose.—10 to 40 minims.

Foreign Pharmacopœias.—Fr. and Mex., 1 and 5, by weight; not in the others.

Not Official.

BONE MARROW.

See MEDULLA RUBRA.

BORAX.

BORAX.

B. P. Syn.—Biborate of Sodium.

$Na_2B_4O_7, 10H_2O$, eq. 379·12.

This salt, Sodium Pyroborate, occurs native. It is also made artificially by neutralising native Boric Acid with Sodium Carbonate, or by boiling native Calcium Borate with Solution of Sodium Carbonate.

A salt imported in a crude state from India; large quantities are also manufactured from the native Boric Acid of Tuscany, and the native Calcium Borate of Peru.

Solubility.—1 in 25 of Water; 2 in 1 of boiling Water; 2 ounces of Borax are dissolved by 2 fluid ounces of Glycerin, and the solution measures only 3¼ fluid ounces. By the aid of 1 of Glycerin, 1 part of Borax will dissolve in 12 of Water. Insoluble in Alcohol (90 p.c.).

Borax is decomposed by Glycerin, forming a solution which reddens Litmus and effervesces with Sodium Bicarbonate.

Medicinal Properties.—Antiseptic and parasiticide; mildly astringent. A local sedative to inflamed mucous membrane. As a **lotion** 10 grains to the ounce; as a **gargle** (saturated solution) about 20 grains to the ounce and as an **injection** in leucorrhœa and gonorrhœa. The Glycerin of Borax is used as a **paint** for the throat, for cracked nipples, and for erythematous skin eruptions. The Glycerin or Mel is used in aphthous ulceration of the tongue or buccal mucous membrane, and for mercurial salivation.

Internally in epilepsy (*L.* '93, ii. 1586, '95, ii. 755), but is inferior to Bromide and has many inconveniences (*B.M.J.E.* '95, i. 4).

Dose.—5 to 20 grains.

Prescribing Notes.—For internal use it is generally given in solution. Should not be prescribed with salts of Cocaine or other alkaloids.

Incompatibles.—Mineral Acids and most of their metallic salts. Mucilage of Acacia.

Official Preparations.—Glycerinum Boracis and Mel Boracis.

Not Official.—Liquor Boracis, Lotio Boracis, Tinctura Myrrhæ et Boracis, Trochisci Boracis, and Unguentum Boracis.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—Transparent colourless crystals, sometimes slightly effloresced, with a weak alkaline reaction.

Tests.—It turns turmeric-paper brown. It colours flame intensely yellow. A hot saturated solution, when acidulated with any of the mineral Acids, lets fall, as it cools, a scaly crystalline deposit of Boric Acid, the solution of which in Alcohol (90 p.c.) burns with a green flame. Each gramme dissolved in 200 c.c. of Water should require for neutralisation 5·2 c.c. of the Volumetric Solution of Sulphuric Acid, using Methyl Orange as the indicator. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Calcium, Magnesium, Carbonates, Nitrates, or Phosphates, and not more than the slightest characteristic reactions with the tests for Chlorides or Sulphates.

Although Borax is really an acid salt, Boric Acid has so little action upon the usual indicators, that the Soda can be estimated by standard Acid just as if no Boric Acid was present.

Phenol-phthalein is of no use for this titration, and even Litmus gives a rather indefinite end-reaction. The best results are obtained with Methyl-orange and standard Sulphuric Acid.

Preparations.

GLYCERINUM BORACIS. Glycerin of Borax. (Altered.)

Borax, 1; Glycerin, 6. Triturate the Borax with the Glycerin until solution is effected. =(By weight 1 in 8½, measure 1 in 6½).

The water is now omitted as in *B.P.* '67, and being more viscid is better adapted for many purposes.

This is not merely a solution of Borax in Glycerin; the Glycerin splits up the Biborate into free Boric Acid and a more basic Borate with secondary reactions. It reddens Litmus paper, and effervesces on the addition of Bicarbonate of Sodium.

Dose.—Not given in B.P.; ½ to 1½ drm.

20 mins. given in diarrhœa of infants.—*L.* '89, ii. 739.

Foreign Pharmacopœias.—Official in Dutch, 1 and 5; Mex. (Glicerina Boratada), 1 and 19; Norw. (Linctus boracinus), 1 and 9; (all by weight); not in the others.

MEL BORACIS. Borax Honey.

Borax in fine powder, 2; Glycerin (by weight), 1; Clarified Honey (by weight), 16: mix. =(about 1 in 7 by volume).

Foreign Pharmacopœias.—Official in Mex. (Colutorio boratado) Borax 1, Honey 1; Swed. (Linctus), 1 in 10; Swiss, 1 in 10; the ingredients vary slightly; not in the others.

Not Official.

LIQUOR BORACIS (Thompson's Fluid) (*G.H.*).—Borax 1, Glycerin 2, Water 2; dissolve. Half an ounce to be mixed with 4 fl. oz. of warm water before use.

LOTIO BORACIS.—Borax, 1; Rose Water, 24; or Borax 1, Glycerin 1, Rose Water 16.

TINCTURA MYRRHÆ ET BORACIS.—Myrrh, 1; Eau de Cologne, 16; Borax, 1; Water, 3; Syrup, 3.

TROCHISCI BORACIS (*T.H.*).—Each Lozenge contains 3 grains of Borax. Use:—mildly detergent, useful in thrush and muscular weakness of the throat.

UNGUENTUM BORACIS.—Borax, 1; Spermaceti Ointment, 8.
For chilblains or cracked nipples.

Not Official.

BROMUM.

BROMINE.

Br, eq. 79·35.

A liquid non-metallic element, obtained from sea-water and from some saline springs.

Solubility.—In Water, 1 in 30 by weight. Readily soluble in Glycerin, Alcohol (90 p.c.), Ether, Chloroform, and Carbon Bisulphide with gradual decomposition of the solvents.

Medicinal Properties.—Deodoriser and disinfectant. Used medicinally as a sedative in the form of the Bromides and Diluted Hydrobromic Acid.

Official Preparations. — Used to prepare Potassii Bromidum, and Sodii Bromidum.

Foreign Pharmacopœias.—Official in Belg., Fr., Ger., Jap., Mex. (Bromo), Norw., Ital., Port., Russ., Span., Swiss and U.S.; not in Austr., Dan., Dutch, Hung., or Swed.

Description.—A dark brownish-red, very volatile liquid, which gives off red suffocating vapours at the ordinary temperature of the air. Sp. gr. 2·97 to 3·14; boils at 135° to 145° F. (57·2° to 62·8° C.).

Chlorine is the impurity most likely to be present in Bromine; both U.S.P. and Ph. Ger. allow 3 p.c. of Chloride in their alkaline Bromides.

Preparations.

HYPOBROMITE SOLUTION FOR UREA-ESTIMATION.—Prepare a stock Solution of Soda (sp. gr. 1·310) by dissolving 3½ oz. of pure Sodium Hydroxide in 9 fl. oz. of Water. To one fluid ounce of this add 42 minims of Bromine when the Solution is wanted for use.

Glass tubes (hermetically sealed) containing the proper quantity of Bromine are made.

LIQUOR BROMI.—Bromine, 160 minims; Potassium Bromide, 240 grains; Water, 4 fl. oz.: dissolve the Potassium Bromide in the Water in a bottle, add the Bromine and shake till dissolved.

BROMIPIN.—Is a Bromine addition—compound of the fatty acid of Sesame Oil. Introduced for the treatment of epilepsy in doses of one teaspoonful.

BROMOFORM ($CHBr_3$).—A colourless liquid, about twice as heavy as Chloroform, practically insoluble in Water, readily soluble in Alcohol (90 p.c.) and Ether; about 1 in 80 of Glycerin.

It becomes yellow on exposure to sunlight, and should not then be dispensed.

Given for the relief of whooping cough in doses of 2 to 5 drops three or four times a day; in some cases it caused languor and drowsiness, and an over-dose produced toxic symptoms.—*L.* '90, ii. 139; '93, i. 1062; *Pr.* xlv. 47; *T.G.* '90, 694; '91, 214.

BROMETHYLFORMINE (BROMALINE).—Colourless crystals, very soluble in Water. Has been recommended as a nervous sedative in the treatment of epilepsy, and is given in similar doses to those of the metallic Bromides.

Not Official.

BRYONIA.

The root of *Bryonia alba* and of *Bryonia dioica*.

Medicinal Properties.—In large doses it is an active hydragogue cathartic, in small doses it is given in pleurisy. It has also been used as a hæmostatic in menorrhagia.—*L.* '88, ii. 438.

It has been used for many years by the homœopaths in the form of **tincture.**

The active principle is a glucoside.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., Port., Span. and U.S.; not in the others.

Preparation.

TINCTURA BRYONIÆ (*B.P.C.*)—Ascertain the percentage of moisture in the fresh Bryony Root by drying 100 grains over a water-bath. Bruise the remainder, after having calculated the Water it contains, and reckon this as a part of the Water to form, with Rectified Spirit, a mixture equal in strength to Proof Spirit. Produce a tincture, by macerating for seven days, of such a strength that 10 fl. oz. shall represent 1 oz. of the dried root.

Fresh Bryony Root yields on an average 32 to 40 p.c. of dried root.

Dose.—1 to 10 minims.

Foreign Pharmacopœias.—Mex., 1 and 5, **dried root**; U.S., 1 **dried root** in 10; Fr. (Alcoolature), 1 **fresh root** in 1.

Antidotes.—An emetic; stimulants, Brandy or Spirit of Sal Volatile.

BUCHU FOLIA.

BUCHU LEAVES.

N.O.Syn.—Bucco; Diosma.

The dried leaves of *Barosma betulina*.

Medicinal Properties.—Tonic, stomachic, diuretic, and diaphoretic. Given chiefly in complaints of the urinary organs, as an antiseptic in chronic cystitis, and in irritation of the bladder and urethra. Also in dyspepsia, chronic rheumatism, and dropsy.

Dose.—Not given in B.P.; 20 to 40 grains in powder.

Official Preparations.—Infusum Buchu and Tinctura Buchu.

Foreign Pharmacopœias.—Official in Belg. (Diosma), Dan., Dutch, Fr., Mex., Norw., Port., Span., Swed. and U.S.; not in Austr., Ger., Hung., Ital., Russ. or Swiss.

Description.—Usually varying in length from half an inch to three-quarters of an inch (twelve to twenty millimetres), dull yellowish-

green in colour, rhomboid-obovate in outline, rigid, and, when slightly moist, cartilaginous. The surface is glabrous and somewhat warty, the margin usually sharply denticulate, the apex blunt and recurved. Oil-glands are distinctly visible in the leaf, especially near the margin. The transverse section exhibits an epidermis whose cells contain yellow sphero-crystals; the inner walls of these cells are thick and rich in mucilage. Odour and taste strong and characteristic.

Preparations.

INFUSUM BUCHU. Infusion of Buchu.

Buchu leaves freshly broken, 1; Distilled Water, boiling, 20: infuse in a covered vessel for fifteen minutes: strain. =(1 in 20).

Time reduced from thirty minutes to fifteen minutes.

Dose.—1 to 2 fl. oz.

(Not in the other Pharmacopœias.)

TINCTURA BUCHU. Tincture of Buchu. (Altered.)

Buchu leaves, in No. 20 powder, 4; Alcohol (60 p.c.) a sufficient quantity. Moisten the powder with 4 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and made with Alcohol (60 p.c.) in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Fr. and Mex., 1 and 5; both by weight; not in the others.

BUTYL-CHLORAL HYDRAS.

BUTYL-CHLORAL HYDRATE.

$CH_3.CHCl.CCl_2.CH(OH)_2$, eq. 191·97.

Butyl-Chloral Hydrate, or Trichlorbutylidene Glycol is a crystalline hydrate obtained by the addition of Water to the liquid Butyl-Chloral produced by the action of Chlorine Gas on Aldehyde.

Butyl-Chloral Hydrate was formerly known as Croton-Chloral Hydrate.

Solubility.—1 in 44 of Water; 1 in 1 of Glycerin (very slowly); 5 in 3 of Alcohol (90 p.c.); 1 in 20 of Olive Oil; 1 in 2 of Ether; 1 in 20 of Chloroform.

Medicinal Properties.—Analgesic; is an efficient remedy in neuralgia of the face and head, and in tic-douloureux, concentrating its action on the fifth nerve.

Dose.—5 to 20 grains.

Prescribing Notes.—Generally given in the form of pills made with a little Compound Powder of Tragacanth and Syrup.

Not Official.—Mistura Butyl-Chloral, Pilula Butyl-Chloral, Syrupus Butyl-Chloral.

Antidote.—Picrotoxin $\frac{1}{20}$ grain.

Foreign Pharmacopœias.—Official in Dan.; not in the others.

Description.—In pearly-white, trimetric laminæ, having a pungent but not acrid odour, and an acrid nauseous taste.

Some samples are acid, very pungent and acrid. Of these we found that 1 gramme heated in a porcelain capsule over a water-bath for 10 minutes wholly volatilised; but the sample lost its pungency and acridity after having been washed with about twice its weight of water, pressed, and dried by exposure to air, and when heated as above lost less than half its weight.

The slow volatility of a sample may therefore be taken as a test of its purity.

Tests.—It fuses at about 172° F. (77·8° C.) to a transparent liquid, which, in cooling, commences to solidify at about 160° F. (71·1° C.). The aqueous solution is neutral or but slightly acid to Litmus. It does not yield Chloroform when heated with Solution of Potassium Hydroxide or with Milk of Lime (absence of Chloral Hydrate).

As the Hydrate loses Water even at temperatures lower than its melting point, and fuses in consequence more easily, the **melting point** should be taken quickly on a sample which has not been previously heated.—*P.J.* (3) xvii. 797.

An acrid sample by washing and drying had its melting point raised from 165° to 174° F.

Not Official.

MISTURA BUTYL-CHLORAL (*L.H.*).—Butyl-Chloral Hydrate, 4 grains; Glycerin, 15 minims; Chloroform Water, ½ fl. oz.; Water to 1 fl. oz.

PILULA BUTYL-CHLORAL (*L.H.*).—Butyl-Chloral Hydrate, 4 grains; Compound Powder of Tragacanth, 1 grain; Water q. s.; in one pill.

SYRUPUS BUTYL-CHLORAL (*B.P.C.*)—Butyl-Chloral Hydrate, 320 grains; Syrup sufficient to make 20 fl. oz.; dissolve in the Syrup by the aid of heat.

Dose.—1 to 4 drm.

Not Official.

BYNE. MALT.

Good Malted Barley is tolerably uniform in diastase, and the widely differing results published from time to time by different analysts as to the strength of commercial Extracts must arise partly from a destruction of diastase in the manufacture of the Extracts, and partly from an ambiguity attaching to the phrase 'conversion of Starch.' Hence we find it stated on the one hand that one part of Starch requires for conversion 19 of Malt Extract, and on the other hand that one of Malt Extract will convert 30 parts of Starch.

When Starch is boiled with water it forms a semi-gelatinous fluid, which under the influence of Diastase quickly loses this condition and becomes thin and transparent, yet continues to give a blue colour with Iodine. As the action proceeds this 'soluble starch' is converted into Erythro-dextrin, giving a red colour with Iodine, and finally into Achroo-dextrin and Maltose, neither of which is coloured by Iodine. These changes are gradual and merge one into the other, but from an analytical point of view they may be said to be complete when no shade of *red* appears on the addition of a few drops of dilute Iodine Solution, as this is the best defined point in the series of changes.

We have had occasion to examine a number of high-class barley-Malts, both from British and foreign grain. At a temperature of 99°—100° F. the finest sample, when treated with its own weight of Starch ceased to give any *red* colour at the end of three minutes, and the poorest sample in fifteen minutes. A well-

prepared Extract should be but little if at all inferior in diastasic power to the Malt from which it is made.

It has been suggested by Helbing (Dec. '92), as a pharmacopœial standard, that the Starch Solution should not give any *blue* colouration after digestion for fifteen minutes at 104°—107° F. From the results given in the preceding paragraph it will be seen that as a standard this is very low.

Analysis of Malt.—*P.J.* (3) xxv. 193, 233; *J.C.S.A.* '94, ii. 371, 491; *J.S.C.I.* '94, 986; '95, 290, 690.

Preparation.

EXTRACTUM BYNES. *Syn.*—EXTRACTUM MALTI. MALT EXTRACT.

Is made by infusing or mashing ground Malt in Water at a temperature under 160° F., preferably 140° F., filtering and evaporating the solution in vacuo to the consistence of a thick syrup. It is a more convenient preparation for use when it is evaporated only to a thin syrup, but the Extract is more liable to undergo fermentation under these circumstances.

Medicinal Properties.—Malt Extract is prescribed in wasting diseases, and where the digestion is weak. It is also given with Cod Liver Oil.

Dose.—A teaspoonful to a tablespoonful.

In addition to the nutrient value which Malt Extract possesses, as representing a cooked and 'digested' farinaceous food, it has also been valued for its diastasic activity, or power of converting further quantities of starchy material into Dextrin and Maltose. So far as artificial digestion, or conversion previous to the act of feeding, is concerned, it *has* this value; but as the action of Malt-diastase is greatly retarded by a very slight acidity, it is very open to question whether its action can continue in the presence of normal gastric juice, and more especially in the presence of Pepsin.

It is, however, very useful when mixed with baked wheaten flour to form foods for infants and invalids when a certain amount of pre-digestion is required.

Foreign Pharmacopœias.—The U.S.P. 1882, ordered the Malt to be macerated in cold Water for six hours, then digested for an hour at 131° F., strained and evaporated at a temperature not exceeding 131° F. to the consistence of Honey. This contained active Diastase. It was omitted in U.S. 1893.

German Pharmacopœia gave a process for Extractum Malti in 1872, in which the infusion was *boiled* before evaporation. Of course, in this case, the whole of the Diastase was destroyed, and the process was omitted in P.G. 1882.

Test.—For Malt or Malt Extract, three solutions, *A*, *B*, and *C*, are required. (*A*) Infuse 5 grammes of ground Malt in 100 c.c. of Water at 140° F. for one hour; cool to 60° F. and make up to 100 c.c with Water; filter. For testing Malt Extract, dissolve 5 grammes of the Extract in sufficient Water to make 100 c.c. of solution. (*B*) Mix 1 gramme of Potato Starch with 10 c.c. of Water, add to it 90 c.c. of boiling Water; boil the mixture for ten minutes; cool to 60° F. and make up to 100 c.c.; strain through fine muslin. (*C*) Dilute 1 c.c. of B.P. Volumetric Solution of Iodine to 75 c.c. with Water.

METHOD.—Run 2 c.c. of the Iodine Solution into each of one dozen test-tubes. Bring solution *A* and solution *B* to 100° F.; place 50 c.c. of *B* in a beaker immersed in Water at 100° F., and add to it 10 c.c. of *A*; at the end of a minute draw off 2 c.c. of the mixture and add it to the Iodine Solution in one of the test tubes, and at the end of each subsequent minute repeat the operation. If the test-tubes are arranged in the order in which the solution is added, the colour in each test-tube will represent the amount of action in a given time represented by minutes. As it occupies from ten to fifteen seconds to run the Malt Solution from a pipette into

the Starch, we usually start the stop-watch or chronograph when half of the solution has run out of the pipette. When a first-class sample of Malt Extract is used, the contents of the first test-tube will be of a blue colour, the second will be red and the third or fourth yellow, but the changes will be somewhat slower in a sample which is not so good.

Six of the best known brands of Malt Extract examined by this test ceased to produce a red colour at the end of three, four, six, eight, fourteen, and fifteen minutes respectively, showing a variation of from three to fifteen minutes, in the digestion of *their own weight* of Starch. A fluid Malt Extract, containing Alcohol, ceased to give a red colour at the end of thirty-five minutes.

The best sample, when treated with *five times* its weight of Starch, ceased to produce a red colour at the end of fourteen minutes.

It is important that the conditions should be the same in each experiment, for any variation in the quantity of Iodine to the volume of liquid employed will affect the results, but under the conditions given, when the colours are viewed in series, two independent workers should not vary more than 1 minute in the reading.

MALT EXTRACT WITH COD LIVER OIL.—This is supplied under several well-known brands, but can be prepared extemporaneously by thinning ordinary Malt Extract with 10 to 15 p.c. of water, heating the mixture to 120° F., adding the oil and shaking thoroughly until mixed. The commercial product contains from 20 to 30 p.c. of Cod Liver Oil.

Malt Extract with Cod Liver Oil. Examination of commercial samples gave from 20 to 30 p.c. of Oil by volume.—*P.J.* (3), xxv. 162.

Prescribing Note.—Usually given in Milk.

EXTRACTUM MALTI FERRATUM (*G.H.*).—Pyrophosphate of Iron 2 parts, Water 3 parts. Dissolve and add Extract of Malt 95 parts. Mix. Dose.—1 to 4 drm. Each fl. drm. contains about 1 grain Pyrophosphate of iron.

CADINUM OLEUM.

OIL OF CADE.

B.P.Syn.—Juniper Tar Oil.

An empyreumatic oily liquid obtained by the destructive distillation of the woody portions of *Juniperus Oxycedrus*, and some other species.

Solubility.—Mixes in all proportions with Chloroform and Ether; partially soluble in Alcohol (90 p.c.); slightly soluble in Water.

Medicinal Properties.—Used as a stimulant in cases of psoriasis and of chronic eczema.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Hung., Norw., Port., Span. (Aceite de Enebro), Swed., Swiss, and U.S.; not in the others.

Description.—A dark reddish-brown or nearly black, more or less viscid, oily liquid, with a not unpleasant empyreumatic odour and an aromatic bitter and acrid taste.

Tests.—Sp. gr. about ·990. The filtered aqueous solution is almost colourless and possesses an acid reaction.

In a sample examined by us (sp. gr. ·996), the acidity amounted to ·7 p.c. pure Acetic Acid.

The composition of Juniper Tar compared with that of pine, beech, birch, and aspen.—*B.M.J.E.* '97, ii. 83.

CAFFEINA.

CAFFEINE.

B.P.Syn.—THEINE.

COFFEINA in some of the foreign Pharmacopœias.

$C_8H_{10}N_4O_2$, H_2O, eq. 210·68.

An alkaloid, usually obtained from the dried leaves of *Camellia Thea*, or the dried seeds of *Coffea Arabica*. Crystallised from aqueous solution, it contains one molecule of water.

The quantities yielded are about as follows: Tea Leaves 3 p.c., Coffee Seeds 1 p.c., Guarana 5 p.c., Paraguay Tea ·5 p.c., Kola Nut 3 p.c. Some physicians have suspected physiological differences in the alkaloids obtained from the different botanical sources.

Information regarding the extraction of alkaloid from Tea Leaves is contained in a B.P. Conference paper ('52), and the discussion following it.—*P.J.* (3) xxiii. 213.

Solubility.—1 in 68 of Water; 1 in 40 of Alcohol (90 p.c.); 1 in 7 of Chloroform; 1 in 400 of Ether; 1 in 1 of Boiling Water.

Medicinal Properties.—A valuable heart tonic and diuretic, especially in cases of loss of compensation with cardiac dropsy.

Given in 1 grain doses every hour for migraine and hemicrania; also in the form of **Effervescent Caffeine Citrate** containing 1 grain in each drachm.

Its action differs from Digitalis in that it is much more rapid and entirely free of tendency to become cumulative. It should not be taken towards night for fear of causing sleeplessness.—*L.* '85, i. 188, 235, 322.

Specially valuable in spasmodic asthma and allied affections. In 5 grain doses every four hours.—*Pr.* liv. 318.

Dose.—1 to 5 grains.

Ph. Ger. maximum single dose has been raised in latest edition from 3 to 7½ grains.

Prescribing Notes.—Given in **cachets**, in **mixtures**, or in pills made with Glucose; also in the form of **effervescent preparations.** For hypodermic use Discs are prepared, ½ grain in each.

Official Preparations.—Caffeinæ Citras, Caffeinæ Citras Effervescens.

Not Official.—Caffeinæ Hydrobromidum, Caffeinæ Iodides, Caffeinæ Sodio-Salicylas, Caffeinæ Valerianas, Pilula Caffeinæ.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Port., Russ., Span., Swed., Swiss and U.S.; not in Norw.

Description.—Colourless, silky, acicular, inodorous crystals. Soluble in 80 parts of cold Water, the solution having a faintly bitter taste and being neutral to Litmus.

Tests.—It dissolves without colour in Sulphuric and Nitric Acids. At 212° F. (100° C.) the crystals lose 8·49 p.c. of their weight, and at a higher temperature melt and volatilise without decomposition. Treated with a crystal of Potassium Chlorate and a few drops of Hydrochloric Acid, and the mixture evaporated to dryness in a porcelain dish, a reddish residue results, which becomes purple when moistened with Solution of Ammonia. In an aqueous solution of the alkaloid, Tannic Acid gives a white precipitate

soluble in excess of the reagent, but no precipitate is caused by Solution of Potassium Iodide containing Mercuric Iodide (distinction from other official alkaloids).

Although 8·49 is the theoretical percentage of Water, commercial Caffeine generally loses about 7 p.c. on drying. Anhydrous Caffeine melts at about 232° C.

Caffeine may be completely shaken out with Chloroform from a slightly acid or slightly ammoniacal aqueous solution. It gives no alkaloidal reaction with Iodine in Potassium Iodide. When, however, the Wagner's reagent is either followed or preceded by the addition of some dilute mineral Acid, there is at once thrown down a dark-reddish precipitate. Upon this reaction is based a method for the estimation of Caffeine.—*C.N.* '97, 99.

Preparations.

CAFFEINÆ CITRAS. Caffeine Citrate.

An unstable compound, $C_8H_{10}N_4O_2$, $C_6H_8O_7$ (eq. 383·42), prepared from Caffeine and Citric Acid.

Dissolve Citric Acid 1, in Distilled Water 2, and stir Caffeine 1, into the heated solution; evaporate to dryness on a water bath, constantly stirring towards the end of the operation. Reduce to a fine powder.

Solubility.—1 in 32 of Water; 1 in 22 of Alcohol (90 p.c.); 1 in 10 of a mixture of 2 parts Chloroform with 1 part Alcohol (90 p.c.).

Dose.—2 to 10 grains.

Foreign Pharmacopœias.—Official in Hung., Mex., Span., Swiss and U.S.; not in the others.

Description.—A white inodorous powder with an acid and faintly bitter taste and an acid reaction on Litmus.

Lloyd stated (New Remedies '81, 38) that he was unable to obtain from aqueous or alcoholic solutions a Citrate of Caffeine from which the alkaloid could not be dissolved by Chloroform, and it has lately been re-asserted (*P.J.* (3) xxiii. 219) that the B.P. Citrate is only a mixture; but (as stated in a former edition) we find that, on boiling the product of the B.P. process with Chloroform, scarcely anything is extracted. The Citric Acid and Caffeine may therefore be assumed to be in chemical combination; but as, on the addition of Water, the salt is decomposed with liberation of free Caffeine, the solubility of which is scarcely affected by the Citric Acid, the advantage of the combination is not obvious.

Tests.—With 3 parts of Water it forms a clear syrupy solution, but more Water dissociates the salt and affords a white precipitate of Caffeine which redissolves when excess of Water is added. Heated in the air, the salt is charred and then burnt, leaving a mere trace of ash. It affords the reactions mentioned under 'Caffeine,' and also those characteristic of Citrates.

CAFFEINÆ CITRAS EFFERVESCENS. Effervescent Caffeine Citrate. (New.)

Sodium Bicarbonate, in powder, 51; Tartaric Acid, in powder, 27; Citric Acid, in powder, 18; Refined Sugar, in powder, 14; Caffeine Citrate, 4. Mix the Caffeine Citrate, Tartaric Acid, and Citric Acid; with this product thoroughly incorporate the mixed Sodium Bicarbonate and Refined Sugar; place in a dish or pan of suitable form heated to between 200° and 220° F. (93·3° and 104·4° C.). When the mixture,

by aid of careful manipulation, has assumed a granular character, separate it into granules of uniform and convenient size by means of suitable sieves. Dry the granules at a temperature not exceeding 130° F. (54·4° C.). The product should weigh about 100.

Dose.—60 to 120 grains.

Foreign Pharmacopœias.—Official in U.S. containing 1 p.c. of Caffeine.

Not Official.

CAFFEINÆ HYDROBROMIDUM.—The 'commercial article' sold under this name used to be nothing more than Caffeine with about 1 per cent. of Hydrobromic Acid. It can be obtained in translucent masses having the composition $C_8H_{10}N_4O_2HBr\ 2H_2O$, containing 68 p.c. of Hydrated Caffeine. Being a crystallisable salt of definite composition, it has been recommended (*P.J.* (3) xxiii. 220) as superior to the B.P. Citrate, but as it is instantly decomposed into free Caffeine and Hydrobromic Acid on contact with Water, it has obviously no advantage over the Citrate in this respect.

Solubility.—1 in 52 of Water.

Dose.—1 to 4 grains.

Prescribing Notes.—It is also prescribed as **Effervescent Caffeine Hydrobromide** containing 1 grain of the Hydrobromide in each drachm.

CAFFEINE IODIDES.—There are three well-defined compounds containing Iodine and Caffeine. (1) The normal Hydriodate, $C_8H_{10}N_4O_2.HI$, forming almost colourless crystals, decomposed by Water into free Caffeine and Hydriodic Acid. (2) The Hydriodide combined with one atom of Iodine, to form reddish-brown crystals $C_8H_{10}N_4O_2.HI.I$, rapidly decomposed by Water. (3) The compound generally known as **Tri-iodide,** but really **Di-iodo-Hydriodide,** $C_8H_{10}N_4O_2HI.I_2.H_2O$, described *C.D.* '90, i. 636. It forms prismatic crystals, steel-blue by reflected and red by transmitted light. On the addition of Water it is slowly decomposed with liberation of Iodine. Dose.—1 to 3 grs. in **pill,** with Glucose and Pulv. Acaciæ.

Higher compounds of Iodine than these are formed, but their composition is less definite, and the excess of Iodine can be removed with dry Chloroform. Nos. 2 and 3 do not colour Chloroform except in the presence of Water.

CAFFEINÆ SODIO-SALICYLAS.—An amorphous white powder, which is practically a mixture of Caffeine and Sodium Salicylate containing rather more than half its weight of Caffeine.

Solubility.—1 in 1 of Water; 1 in 28 of Alcohol (90 p.c.).

Foreign Pharmacopœias.—Official in Dutch (Salicylas Natricus cum Coffeino), Hung., Norw. (Salicylas Natrico-Coffeicus), and Swiss; not in the others.

Medicinal Properties.—The same as Caffeine, but being much more soluble is more easily absorbed; it is also suitable for **hypodermic injection.** Has been used in sea-sickness.—*B.M.J.* '87, ii. 768.

The solubility of Caffeine in Water is also increased by Sodium Benzoate as well as by Antipyrin.

CAFFEINÆ VALERIANAS.—Theoretically it should contain 32 p.c. of Valerianic Acid. Commercially it varies from 1 p.c. (or less) to 13 p.c., this latter being very exceptional and only found in one or two German samples. The majority are little more than Caffeine scented with Valerianic Acid. The difficulty in forming a true salt is so great that it only exists as a chemical curiosity; but for all purposes of practical dispensing, a product obtained by absorbing 1 of Anhydrous Valerianic Acid by 4 of *Anhydrous* Caffeine is superior to anything commercially obtainable.

CAJUPUTI OLEUM.

OIL OF CAJUPUT.

The Oil distilled from the leaves of *Melaleuca Leucadendron*.

Imported from Batavia and Singapore.

Solubility.—In all proportions of Alcohol (90 p.c.).

Medicinal Properties.—A powerful topical and general stimulant, antispasmodic, and diaphoretic. Efficacious in chronic rheumatism, hysteria, flatulent colic, and other spasmodic and nervous affections, and in debility. Externally, diluted with Olive Oil (1 to 2), used to allay chronic rheumatism and gout pains. Applied on lint for toothache.

Dose.—$\frac{1}{2}$ to three minims.

Prescribing Notes.—Given on Sugar, or in Pill (*see* p. 484), or in the form of Spirit of Cajuput.

Official Preparations.—Spiritus Cajuputi; contained in Linimentum Crotonis.

Foreign Pharmacopœias.—Official in Belg., Dan., Dutch (also Depuratum), Fr., Ital., Jap., Norw., Port., Russ., Span. (Esencia de Cayeput), Swed., Swiss and U.S.; not in Austr. or Hung.

Description.—Bluish-green, with an agreeable penetrating camphoraceous odour, and an aromatic bitterish camphoraceous taste.

Should contain about 55 to 65 p.c. of Cineol (Eucalyptol).

The colour is generally supposed to be due to traces of Copper, this metal being almost invariably found in it.

On shaking 5 c. c. of the Oil with 5 c. c. of Water containing a drop of Diluted Hydrochloric Acid, the Oil loses its green tint and becomes nearly colourless.—*U.S.*

Tests.—Sp. gr. from ·922 to ·930. It should become semi-solid on being stirred, when cold, with a third or half its volume of Phosphoric Acid of commerce of sp. gr. 1·750 (presence of a due proportion of Cineol).

Preparation.

SPIRITUS CAJUPUTI. SPIRIT OF CAJUPUT. (ALTERED.)

Oil of Cajuput, 1; Alcohol (90 p.c.), a sufficient quantity. To the Oil of Cajuput add enough of the Alcohol to form 10 of the Spirit of Cajuput. =(1 in 10).

Now 1 in 10 instead of 1 in 50, and Alcohol (90 p.c.) used in place of Rectified Spirit.

Dose.—5 to 20 minims.

This Spirit of Cajuput contains five times the proportion of Oil of Cajuput present in the Spirit of Cajuput of the British Pharmacopœia of 1885.

(Not in the other Pharmacopœias.)

Not Official.

CALAMINA PRÆPARATA.

PREPARED CALAMINE.

Native Zinc Carbonate, calcined in a covered earthenware crucible at a moderate temperature, powdered and freed from gritty particles by elutriation.

Genuine Calamine has a yellowish-grey colour; the reddish varieties are generally made on a basis of Barium Sulphate.—*P.J.* (3) xvi. 264, 692; (3) xvii. 797; (3) xx. 475; (3) xxii. 744.

Medicinal Properties.—Mildly astringent, used in face lotions and dusting powders.

Foreign Pharmacopœias—Port.; not in the others.

Preparations.

LINIMENTUM CALAMINÆ (*G.H.*).—Prepared Calamine, 20 grains; Zinc Oxide 15 grains; Lime Water, 4 fl. drm.; Olive Oil to 1 fl. oz.

LOTIO ZINCI OXIDI (*B.S.H.*).—Zinc Oxide, 60 grains; Prepared Calamine, 60 grains; Glycerin, 60 minims; Water, 1 fl. oz.

A mild astringent in chronic eczema and acne rosacea.

Not Official.

CALCIUM.

Ca, eq. 39·71.

Calcium, a brilliant white combustible metal, was discovered by Sir Humphrey Davy in 1808. Sp. gr. 1·5.

CALCII CARBONAS. *See* CRETA PRÆPARATA.

CALCII CARBONAS PRÆCIPITATUS.

PRECIPITATED CALCIUM CARBONATE.

B.P. Syn.—PRECIPITATED CHALK.

$CaCO_3$, eq. 99·26.

The precipitate obtained by the interaction of Calcium Chloride and Sodium Carbonate.

Medicinal Properties.—Antacid, astringent, and desiccant. Used in dyspepsia with acidity; valuable in diarrhœa; as a dusting powder in eczema, and for ulcers and burns.

Dose.—10 to 60 grains.

Official Preparation.—Used in the preparation of Trochiscus Bismuthi Compositus.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Swed., Swiss and U.S.; not in Span.

Description.—A white micro-crystalline powder, insoluble in Water.

The crystalline character of good commercial samples is not noticeable even under a magnification of 12 diameters.

Tests.—It affords the reactions characteristic of Calcium and of Carbonates. It should yield no characteristic reaction with the tests for Iron, Aluminium, Phosphates, and Sulphates, and only the slightest reactions with the tests for Magnesium or Chlorides.

Even the best commercial samples may be expected to contain traces of Chlorine. It should not exceed ·5 per cent.

CALCII CHLORIDUM.

CALCIUM CHLORIDE.

The salt, $CaCl_2$, $2H_2O$ (eq. 145·85), formed by neutralising Hydrochloric Acid with Calcium Carbonate, carefully desiccated at a temperature not exceeding 392° F. (200° C.).

Solubility.—1 in 1 of Water; 1 in 3 of Alcohol (90 p.c.).

Medicinal Properties.—Alterative and deobstruent; given in glandular enlargements, especially those of tubercular origin. It increases the coagulability of the blood and is therefore used in gastric and intestinal hemorrhage; internally also for chilblains, 20 grains night and morning.

Given in pneumonia.—*Pr.* l. 263; liii. 343.

20 grains every 4 hours given in hæmophilia.—*L.* '97, ii. 1061.

Dose.—5 to 15 grains.

Incompatibles.—Lime salts and Potassium salts are mutually antagonistic physiologically.—*B.M.J.* '87, ii. 1033.

Official Preparations.—Used in the preparation of Æther Purus.

Foreign Pharmacopœias.—Official in U.S.; Hung., Calcium Chloratum Fusum; Belg., Chloruretum Calcii; Port., Chloreto de Calcio; Fr., Chlorure de Calcium; Ital., Cloruro di Calcio; Mex., Cloruro de Calcio; Span., Cloruro Calcico; not in the others.

Description.—In dry, white, very deliquescent masses.

Tests.—It affords the reactions characteristic of Calcium and of Chlorides. It should yield no characteristic reaction with the tests for Iron, Aluminium, or Carbonates, and only the slightest reactions with the tests for Magnesium. It evolves no Chlorine or Hypochlorous Acid on the addition of Hydrochloric Acid (absence of Hypochlorite).

Most samples are alkaline, probably owing to slight dissociation and loss of Hydrochloric Acid during the drying. One would not expect to find Hypochlorite in a sample dried at the temperature given above.

CALCII HYDRAS.

CALCIUM HYDROXIDE.

B P. Syn.—Slaked Lime.

$Ca(HO)_2$, eq. 73·47.

Calcium Hydroxide, recently prepared by the interaction of Water and Calcium Oxide.

The Pharmacopœia directs that 'it should be recently prepared,' but this is unnecessary if air be excluded.

Solubility.—Sparingly soluble in Water (1 in 900); the solution, on exposure to the air, soon acquires a film of Calcium Carbonate.

Medicinal Properties.—Antacid, astringent, sedative. The **Solution** (Lime Water) is useful in acid and gouty dyspepsia; in vomiting and diarrhœa of children, especially if given with the milk as it renders the curd less dense; in enteric fever it lessens the chances of hæmorrhage; also in the form of diluted **saccharated**

solution to relieve chronic vomiting, and vomiting of pregnancy. The **Liniment** of Lime is applied to burns and scalds, *see also* Carron Oil.

Incompatibles.—Vegetable and mineral Acids, alkaline and metallic salts, Tartar Emetic.

Official Preparations.—Liquor Calcis and Liquor Calcis Saccharatus. Used in the preparation of Calcii Hypophosphis, Chloroformum, Extractum Ipecacuanhæ Liquidum. **Lime Water** is used in the preparation of Argenti Oxidum, Linimentum Calcis, Lotio Hydrargyri Flava and Lotio Hydrargyri Nigra.

Not Official.—Liniment for freckles.

Foreign Pharmacopœias—Official in Fr., Chaux Éteinte; not in the others.

Tests.—It affords the reactions characteristic of Calcium. Strongly heated it loses nearly one-fourth of its weight of Water. It should yield only the slightest characteristic reactions with the tests for Iron, Aluminium, Magnesium, Sodium, Potassium, Carbonates, Chlorides, Phosphates, Sulphates, or Silica.

Preparations.

LINIMENTUM CALCIS. Liniment of Lime.

Solution of Lime, 1; Olive Oil, 1: shake together. =(1 in 2).

Foreign Pharmacopœias.—Official in Belg., Solution of Lime and Almond Oil equal parts; Fr. (Linim. Calcaire) Solution of Lime and Almond Oil equal parts; Ital., Lime Water and Olive Oil equal parts; Jap. and Mex., Lime Water 1, Sesame Oil 1; Port., Lime Water 9, Oil of Almonds, 1; Span., Lime Water 2, Oil of Almonds 1; Norw., Russ., Swed. and Swiss, and U.S., Solution of Lime and Linseed Oil equal parts; all by weight except U.S.; not in the others.

LIQUOR CALCIS. Solution of Lime. *B.P.Syn.*—Lime Water.

Calcium Hydroxide, 1; Distilled Water, a sufficient quantity. Wash the Calcium Hydroxide with Distilled Water until free from Chlorides; then shake it with 80 of Distilled Water in a stoppered green glass bottle for two or three minutes; set aside for twelve hours. The clear Solution may be drawn off with a siphon as it is required for use, and should then be transferred to a green glass bottle.

1 fl. oz. contains the equivalent of about ½ grain, or 1000 c.c. rather more than 1 gramme, of Lime, CaO.

When the Slaked Lime is good, one-fourth of the above quantity is sufficient.

Dose.—1 to 4 fl. oz.

Lime Water is best kept in full bottles and well closed from the air.

So-called aërated 'Lime Water' is sold in syphons, but we understand that it is aërated with Carbonic Acid Gas, and in that case the name is misleading.

Foreign Pharmacopœias.—Official in Austr., Belg., and Hung., Aqua Calcis; Dan., Dutch, Norw., and Swed., Solutio Hydratis Calcici; Fr., Eau de Chaux; Ger. and Jap., Aqua Calcariæ; Mex. and Port., Agua de Cal: Russ., Calcaria Caustica Soluta; Span., Solucion de Cal; Swiss, Calcium Hydricum Solutum; U.S., Liquor Calcis.

Water becomes saturated with much less Lime than ordered in any of the Pharmacopœias therefore Liquor Calcis is of the same strength in all.

Tests.—24 c.c. should require for neutralisation 10 c.c. of the Decinormal Volumetric Solution of Sulphuric Acid. It should yield no characteristic reaction with the tests for Lead or for Chlorides.

1 fl. oz. precipitated with 1 grain of Oxalic Acid should not redden Litmus.—*Proctor.*

Lime Water, if saturated, should precipitate on boiling, owing to the Hydrate being less soluble in hot than in cold Water.

LIQUOR CALCIS SACCHARATUS. Saccharated Solution of Lime.

Calcium Hydroxide, 1; Refined Sugar in powder, 2; Distilled Water, 20: Mix the Calcium Hydroxide with a solution of the Refined Sugar in the Distilled Water. Set aside in a stoppered green glass bottle for a few hours, shaking occasionally; separate the clear solution with a siphon, avoiding unnecessary exposure to air.

=(about 1 in 62).

This Solution contains nearly 2 p.c. by weight of Lime, CaO, or about 8 grains in 1 fl. oz. 1 oz. = about 14 fl. oz. Lime Water.

The Calcium Hydroxide is now mixed with a Solution of Sugar as suggested in our former editions.

Dose.—20 to 60 minims.

Foreign Pharmacopœias.—Official in Hung., Aqua Calcis Saccharata; not in the others.

Tests.—Sp. gr. 1·055. 10 grammes should require for neutralisation 6·3 c.c. of the Volumetric Solution of Sulphuric Acid. It should not afford any characteristic reaction with the tests for Lead.

It has been shown that the colouration on keeping is due to the presence of Iron in the Lime employed, as when this is free from Iron no change takes place.—*P.J.* (3) xix. 849.

Like Lime Water, it precipitates on boiling, but clears again on cooling.

Not Official.

LINIMENT FOR FRECKLES.—Liniment of Lime, 8; Solution of Ammonia, 1: mix.

CALCII HYPOPHOSPHIS.

CALCIUM HYPOPHOSPHITE.

$Ca(PH_2O_2)_2$, eq. 168·83.

It is obtained by the interaction of Phosphorus, Calcium Hydroxide, and Water.

This is sometimes improved by re-crystallisation.

Solubility.—1 in 8 of Water, and scarcely more soluble in boiling Water. Insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Similar to those of Phosphorus but without its unpleasant effects. Given in cases of nervous and general debility; it is by some supposed to be useful in phthisis.

Dose.—3 to 10 grains.

Prescribing Notes.—Usually given in mixtures or in one of the various forms of Syrup.

Not Official.—Glycerola Hypophosphitum, Syrupus Calcii Hypophosphitis (Squire) and Syrupus Calcii Hypophosphitis (B.P.C.).

Foreign Pharmacopœias.—Official in Belg., Hypophosphis Calcii; Dutch and Norw., Hypophosphis Calcicus; Fr., Hypophosphite de Chaux; Mex., Hipofosfito de Calcio; Port., Hypophosphito de Cal; Span., Hipofosfito Calcico; Jap., Russ. and Swiss, Calcium Hypophosphorosum; U.S.; not in the others.

Description.—A white crystalline salt, with a pearly lustre, and a bitter nauseous taste.

Tests.—Heated to redness the crystals ignite, evolving spontaneously inflammable Hydrogen Phosphide and Hydrogen, and leave a reddish-coloured residue. It affords the reactions characteristic of Calcium. Its aqueous solution yields with Test-solution of Mercuric Chloride a white precipitate turning grey. ·25 gramme boiled for ten minutes with a solution of ·6 gramme of Potassium Permanganate should yield, on filtration, a nearly colourless solution. The salt should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Magnesium, Sodium, or Potassium, and only the slightest reactions with the tests for Chlorides or Sulphates. It should afford little or no precipitate with Solution of Lead Acetate (limit of Phosphates and Phosphites).

We do not believe a commercial sample can be found which does not give more or less precipitate or turbidity with Lead Acetate, which, by the way, also precipitates Sulphates and Sulphites.

Tyrer suggests the estimation of Hypophosphites by reduction of Copper Solution, previously eliminating any impurity which is likely to affect the result by treatment with Barium Chloride Solution.—*P.J.* '97, ii. 150. Jowett points out that Barium Phosphite is slightly soluble in water, which would affect results obtained by Tyrer's process, and proposes the following method:—

About ·3 gramme of the dried salt is dissolved in 10 c.c. of water, 3 c.c. of a 10 p.c. solution of Lead Acetate added, and the mixture allowed to stand twelve hours. It is then filtered, the precipitate thoroughly washed, and the washings added to the filtrate, which is acidified with Hydrochloric Acid, and then saturated with Hydrogen Sulphide, boiled, filtered, and the Lead Sulphide thoroughly washed.

The mixed washings and filtrate are then evaporated to a low bulk and 5 c.c. Hydrochloric Acid and 1 gramme Potassium Chlorate added and gently heated for half an hour, then concentrated to about 20 c.c., and the Phosphate finally determined either gravimetrically or volumetrically by the usual method.—*P.J.* '98, ii. 173; *C.D.* '98, ii. 300.

Not Official.

GLYCEROLA HYPOPHOSPHITUM.—Calcium, Potassium, and Sodium Hypophosphites, of each 1; dissolve these in Water 40; filter and add Sugar 40; Orange-flower Water 2; Cherry-laurel Water 2; dissolve and add Glycerin 12, and filter.

Dose.—1 to 2 fl. drms.

(U.S. Syrupus Hypophosphitum, containing these three Hypophosphites.)

SYRUPUS CALCII HYPOPHOSPHITIS (SQUIRE).—Calcium Hypophosphite, 4; Water, 38; Sugar, 59.

Dose.—1 fl. drm., containing 3 grains.

A Syrup of this strength was introduced in the '*Companion*,' 1877.

The following Syrup inserted in *B.P.C.* (taken from Extra Pharmacopœia '90), is

only one-third the strength, necessitating an excessive quantity of Syrup for a full dose of the salt.

SYRUPUS CALCII HYPOPHOSPHITIS (*B.P.C.*).—Calcium Hypophosphite, 160 grains; Distilled Water, 9 fl. oz.: dissolve and filter. To the filtered solution add Refined Sugar in coarse powder, 16 oz.: dissolve with the aid of heat, strain, and after cooling add Hypophosphorous Acid, 20 minims; Distilled Water, sufficient to produce 20 fl. oz.: mix.

Each fl. drm. contains 1 grain of Calcium Hypophosphite.

Dose.—1 to 4 fl. drm.

Not Official.

CALCIUM GLYCERO-PHOSPHAS.

A white crystalline powder, prepared by the action of Milk of Lime on Glycerophosphoric Acid and purified by treatment with Alcohol.

Solubility.—1 in 22 of Water, less soluble in warm Water, and almost insoluble in boiling Water; insoluble in Alcohol.

Medicinal Properties.—It increases the general nutrition of the body in certain forms of neurasthenia.

Dose.—5 to 15 grains dissolved in Water.

Foreign Pharmacopœias.—Official in Mex., Glicerofostao de Calcio.

Tests.—It is distinguished from Calcium Phosphate by its solubility in Water. Its freedom from uncombined Glycerin is ascertained by treatment with Absolute Alcohol and filtration, the Alcohol should leave no residue on evaporation.

For the determination of the Phosphoric Acid a definite weight of the Glycerophosphate is dissolved in water neutralised with decinormal volumetric solution of Sulphuric or Hydrochloric Acid, using Methyl Orange as indicator, and the solution then titrated with a standard solution of alkali and Phenol-phthalein.—*Analyst* '98, 45.

Commercial samples vary considerably in composition.—*P.J.* '98, i. 24; *J.S.C.I.* '98, 66, 266.

CALCII PHOSPHAS.

CALCIUM PHOSPHATE.

May be prepared by dissolving Bone Ash in Dilute Hydrochloric Acid, adding the liquid to dilute Solution of Ammonia, washing the precipitate with cold Water, and drying the washed precipitate at a temperature not exceeding 212° F. (100° C.); or by the interaction of Calcium Chloride and Sodium Phosphate.

Solubility.—Insoluble in Water; soluble in Diluted Hydrochloric Acid or Diluted Nitric Acid.

Medicinal Properties.—For rickets and mollities ossium, and other conditions of malnutrition; said to be useful in scrofulous affections, to promote union of bone fractures, in tardy teething, and in anæmia; given to counteract the draining of phosphates during pregnancy and lactation, and to prevent decay of the teeth and toothache during pregnancy.

Dose.—5 to 15 grains.

Prescribing Notes.—More commonly ordered in smaller doses. Given as a

powder, or in the form of Syrup. Squire's Chemical Food is an elegant and useful form.

Official Preparation.—Contained in Extractum Euonymi Siccum and Pulvis Antimonialis.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Russ. and Swiss, Calcium Phosphoricum; Belg. and Dutch, Phosphas Calcicus; Dan., Phosphas Calcicus Præcipitatus; Fr., Phosphate de Chaux; Ital., Fosfato Bicalcic; Jap., Calcium Phosphoricum Precipitatum; Mex., Fosfato de Calcio; Port., Phosphato de Cal; Span., Fosfato Calcico; U.S., Calcii Phosphas Præcipitatus; not in Norw. or Swed.

Description.—A light white amorphous powder.

Tests.—Insoluble in Water, but soluble in Diluted Hydrochloric Acid or Diluted Nitric Acid; such a solution continues clear when a dilute solution of Sodium Acetate is added in excess (absence of Calcium Oxalate). It affords the reactions characteristic of Calcium and of Phosphates. Of the recently dried powder, 1 gramme dissolved in Diluted Hydrochloric Acid yields, when added to a very slight excess of diluted Solution of Ammonia, a white precipitate weighing when washed with cold Water and dried at 212° F. (100° C.), not less than ·95 gramme. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Magnesium, Carbonates, or Silica, and only the slightest reactions with those for Chlorides.

Not Official.

CALCII SULPHAS.

CALCIUM SULPHATE.

Sulphate of Lime. Calcined Gypsum. Plaster of Paris.

Native Calcium Sulphate ($CaSO_4$, $2H_2O$, eq. 170·81) rendered nearly anhydrous by heat.

Foreign Pharmacopœias.—Official in Austr., Dan., Ger., Hung., Norw., Russ., Swed., Swiss and U.S.; not in the others.

The native salt is used for the preparation of Calx Sulphurata.

Not Official.

CALENDULA.

COMMON MARIGOLD.

The florets of *Calendula officinalis*.

Foreign Pharmacopœias.—Official in Span., flowers; U.S., flowering herb; not in the others.

Preparation.

TINCTURA CALENDULÆ FLORUM.— Marigold flowers, dried, in No. 20 powder, 4; Alcohol (60 p.c.), sufficient to percolate 20.

Medicinal Properties.—Used as an application for sprains and bruises.

Dose.—5 to 20 minims.

Foreign Pharmacopœias.—Official in U.S., 1 in 5; not in the others.

This has been added to the B.P.C. formulary.

CALUMBÆ RADIX.

CALUMBA ROOT.

The dried transversely cut slices of the root of *Jateorhiza Columba*.

From the forests of Eastern Africa between Ibo and the Zambesi. It is easily reduced to powder, which has a greenish tinge; it becomes browner with age, and deepens in colour when it is moistened.

Medicinal Properties.—A bitter stomachic and tonic, useful in atonic dyspepsia, in promoting appetite and removing flatulence. Given in convalescence from acute diseases, combined with alkalis or Bismuth.

Prescribing Notes.—Given in the form of Infusion, Liquor Concentratus, or Tincture with other medicines. It is one of the few bitters that can be given with salts of Iron.

Official Preparations.—Infusum Calumbæ, Liquor Calumbæ Concentratus, and Tinctura Calumbæ.

Not Official.—Extractum Calumbæ.

Foreign Pharmacopœias.—Official in all.

Description.—In irregular flattish circular or somewhat oval slices depressed, towards the centre; from about an inch to two inches (two and a half to five centimetres) or more in diameter, and from one-eighth to half an inch (three to twelve millimetres) or more in thickness; more or less uniformly yellow in colour. The cork is brownish and wrinkled, the cortex thick, marked with radiating lines, and separated by a dark line from the wood, in which the vessels are arranged in narrow radially elongated groups. The parenchymatous tissue is largely developed, and contains numerous starch grains mostly simple with eccentric hilum. The fracture is short, odour feeble, taste bitter.

A fluorescent constituent of Calumba.—*P.J.* '95, ii. 495.

Calumbin crystallises in colourless needles, insoluble in hot or cold water, cold Alcohol, or Ether, but readily soluble in boiling Ether or Alcohol. Calumbin melts at 182° C., is neutral, anhydrous, and has a composition represented by the formula, $C_{21}H_{24}O_7$.—*P.J.* '96, ii. 378.

Preparations.

INFUSUM CALUMBÆ.—Infusion of Calumba. (Modified.)

Calumba Root, thinly sliced, 1; Distilled Water, cold, 20: infuse for half an hour; strain. =(1 in 20).

The Calumba Root is ordered to be thinly sliced, not cut small.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in Span., 1 in 100; not in the others.

Prescribing Notes.—Calumba Root contains starch and mucilage, both of which are dissolved by hot Water; cold Water dissolves the mucilage only.

Physicians prescribing for patients who wish to take with them a supply of their medicines containing Infusion of Calumba will find 1 drachm of Tincture to be of about the same strength as 1 oz. of the Infusion.

LIQUOR CALUMBÆ CONCENTRATUS. Concentrated Solution of Calumba. (New.)

Calumba Root, in No. 5 powder, 10; Alcohol (90 p.c.) 4½; Distilled

Water a sufficient quantity. Macerate the Calumba for 24 hours with 10 of Distilled Water; press strongly; again macerate the residue for 24 hours with 10 of Distilled Water; press strongly. Mix the expressed liquids, and heat for 5 minutes to 180° F. (82·2° C.). When cold add the Alcohol; set aside; decant or filter, adding sufficient Distilled Water to produce 20 of the Concentrated Solution.

Dose.—½ to 1 fl. drm.

TINCTURA CALUMBÆ. TINCTURE OF CALUMBA. (ALTERED.)

Calumba Root, in No. 20 powder, 1; Alcohol (60 p.c.) 10. Prepare by the maceration process. =(1 in 10).

Now 1 in 10 instead of 1 in 8, and Alcohol (60 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., Port., Span. and Swiss 1 in 5; all by weight. U.S., 1 in 10; not in the others.

Not Official.

EXTRACTUM CALUMBÆ.—Calumba Root exhausted with Alcohol (60 p.c.) and the product evaporated to a pill consistence. 16 parts of Root yield 1 to 1½ parts of Extract.

Dose.—½ to 2 grains.

Foreign Pharmacopœias.—Official in Austr. and Hung., made with 70 p.c. Alcohol; Belg., Fr., Ital., Mex. and Span., made with 60 p.c. Alcohol; Dutch, made with 90 p.c. Alcohol; Jap., made with 45 p.c. Alcohol; Port., made with 65 p.c. Alcohol; Swed., made with 50 p.c. Alcohol; U.S., **Fluid Extract** only, made with Dilute Alcohol; not in Dan., Ger., Norw. or Russ.

CALX.

LIME.

Calcium Oxide, CaO, eq. 55·59, obtained by calcining Chalk, Limestone, or Marble.

Solubility.—Decomposed by water forming Calcium Hydrate, under which heading the solubility is given.

Foreign Pharmacopœias.—Official in all.

Description.—In compact masses of a whitish colour, which readily absorb Water, and which, when rather less than their weight of Water is added, swell and fall to powder with the development of much heat.

Tests.—The powder obtained by this process of slaking, when agitated with Water, gives, after filtration, a clear alkaline solution which affords the reactions characteristic of Calcium. It should yield only the slightest characteristic reactions with the tests for Iron, Aluminium, Magnesium, Sodium, Potassium, Carbonates, Chlorides, Phosphates, Sulphates, or Silica.

Preparation.

CALCII HYDRAS. *See* p. 164.

CALX CHLORINATA.

CHLORINATED LIME.

A product obtained by exposing Slaked Lime to the action of Chlorine Gas until absorption ceases.

Solubility.—Partially soluble in Water and in Alcohol (90 p.c.). Decomposed by acids with formation of Hypochlorous Acid, which in the case of Hydrochloric Acid reacts with it to form Chlorine.

Medicinal Properties.—Chiefly used as a disinfectant; *see* also below, Liquor Calcis Chlorinatæ.

Official Preparations.—Liquor Calcis Chlorinatæ. Used in the preparation of Chloroform and Liquor Sodæ Chlorinatæ.

Foreign Pharmacopœias.—Official in Dan., Norw., Swed. and U.S., Calx Chlorata; Austr. and Russ., Calcium Hypochlorosum; Belg., Hypochloris Calcii; Fr., Chlorure de Chaux Sec; Ger., Hung., Jap. and Swiss, Calcaria Chlorata; Ital., Cloruro di Calce; Mex., Hipoclorito de Calcio Impuro; Port., Cal Chlorada; Span., Hipoclorito Calcico Clorurado; Austr., Dan., Hung., Jap., Norw., and Swed., contain 20 p.c. of available Chlorine; Ger., Russ. and Swiss, 25 p.c.; Ital., 28·6 p.c.; Belg., 31·77 p.c.; Fr. and Span., 32 p.c.; U.S., 35 p.c.; Port., not indicated; not in Dutch.

Description.—A dull white powder with a characteristic smell; it becomes moist and gradually decomposes on exposure to air. It is partially soluble in Water.

As it becomes moist and gradually decomposes on exposure to the air, it should be preserved in well-closed vessels in a cool and dry place.

Tests.—The solution affords the reactions characteristic of Calcium and Chlorides, decolourises Solution of Indigo Sulphate, and evolves Chlorine copiously upon the addition of an Acid. ·5 gramme of Chlorinated Lime, mixed with 1·5 gramme of Potassium Iodide dissolved in 200 c.c. of Water, produces, when acidulated with 6 c.c. of Hydrochloric Acid, a reddish solution, which requires for the discharge of its colour at least 46·8 c.c. of the Volumetric Solution of Sodium Thiosulphate, corresponding to 33 p.c. of available Chlorine.

It should be noted that only a good and well-kept sample will yield this percentage of Chlorine.

In this test, the Hydrochloric Acid, acting on the Calcium Hypochlorite, liberates Chlorine, and this reacting on the Potassium Iodide sets free an equivalent quantity of Iodine, which, if the Chlorinated Lime be good, will require the stated quantity of Volumetric solution of Sodium Thiosulphate to convert it into colourless Sodium Iodide and Tetrathionate.

Preparations.

LIQUOR CALCIS CHLORINATÆ. Solution of Chlorinated Lime.

Chlorinated Lime, 1; Distilled Water, 10; mix; transfer the mixture to a stoppered bottle; set aside for three hours, shaking occasionally; filter through calico. =(1 in 10).

Preserve the filtrate in a stoppered bottle in a cool and dark place.

Medicinal Properties.—A powerful disinfecting and bleaching agent. Not much employed internally; externally as a **lotion** to unhealthy ulcers, purulent ophthalmia, fetid cutaneous affections and scabies. As an **injection** in foul nasal and aural and vaginal discharges; as a **gargle** in septic tonsillitis, and diphtheria.

Antidotes.—In case of poisoning by Chlorinated Lime the antidotes are, Emetics, White of Egg, Milk, Flour; *not* Acids.

Foreign Pharmacopœias.—Official in Belg., 2·2 in 100; Fr., 1 in 45; Norw., 2 in 100; Russ (Calcium Hypochlorosum Solutum), 2·5 p.c. of Chlorine; Span. and Swed., 1 in 40; not in the others.

Tests.—Sp. gr. about 1·055. Each gramme mixed with ·5 gramme of Potassium Iodide dissolved in Water, when acidulated with 1 c.c. of Hydrochloric Acid, gives a brownish-red solution, which requires for the discharge of its colour not less than 5·6 c.c. of the Volumetric Solution of Sodium Thiosulphate, corresponding to 2 p.c. of available Chlorine.

The Solution should yield, when fresh, about 3 p.c. of available Chlorine.

CALX SULPHURATA.

SULPHURATED LIME.

A mixture containing not much less than 50 p.c. of Calcium Sulphide, **CaS**., eq. 71·53, with Calcium Sulphate and Carbon. It may be prepared by reducing native Calcium Sulphate by means of Carbon.

Medicinal Properties.—Antisuppurative; useful for boils, pustules and small abscesses; also used as a depilatory.

Daily doses of 1 grain as a prophylactic of influenza.—*B.M.J.* '95, i. 975.

Dose.—$\frac{1}{4}$ to 1 grain.

Prescribing Notes.—Best prescribed in **pill**, made with Glucose. If the total weight of each pill be less than $\frac{1}{2}$ grain it is made up to this weight with Milk Sugar. The pills are coated with Sandarach solution.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Mex. and U.S.; not in the others.

Description.—A greyish-white powder with a smell of Hydrogen Sulphide.

Test.—If ·8 gramme be mixed with a cold solution of 1·4 grammes of Copper Sulphate in 50 c.c. of Water, and, after the addition of a little Hydrochloric Acid the mixture be well stirred and heated to a temperature approaching that of ebullition until all action has ceased, and then filtered, the filtrate should give no red colour with Solution of Potassium Ferrocyanide (presence of a due proportion of Sulphide).

The process described under Barium Sulphide, p. 133, is also applicable to Calcium Sulphide.

CAMBOGIA.

GAMBOGE.

A Gum Resin, obtained from *Garcinia Hanburii*.

It is imported from Siam, and consists of about 75 p.c. of Resin and 15 to 20 of Gum, the Resin being the active ingredient.

Solubility.—About three-fourths is soluble in Alcohol (90 p.c.), the solution is rendered an opaque yellow by Water; three-fourths also soluble in Ether. The solution in Ammoniated Alcohol is not rendered turbid by the addition of Water.

Medicinal Properties.—A powerful hydragogue cathartic; in small doses, diuretic. It is employed in the treatment of dropsy, attended with obstinate constipation; and in cerebral congestion. As it is apt to occasion much sickness and griping, it is best given in small doses, repeated at short intervals, until it operates; but it should never be given to children or very old persons, or in inflamed conditions of the abdominal or pelvic organs.

Stimulates the intestinal glands, but not the liver.—Dr. Rutherford.

Dose.—½ to 2 grains.

Prescribing Notes.—It may be given in pill or emulsion or dissolved in an alkaline solution; the last method has been recommended in dropsical complaints.

Official Preparation.—Pilula Cambogiæ Composita.

Foreign Pharmacopœias.—Official in Belg., Gummi Guttæ; Fr., Gomme Gutte; Ger. and Swiss, Gutti; Ital., Gomma Gotta; Mex., Goma Guta; Port., Gomma-Guta; Russ. Gummi Resina Gutti; Span., Gutagamba; Swed., Gummi-Resina Gutta; U.S., Cambogia; not in the others.

Description.—In cylindrical solid or hollow rolls, longitudinally striated on the surface, either distinct, or more or less agglutinated into masses; breaking with a conchoidal fracture, the fractured surface being dull, smooth, and of a uniform reddish-yellow colour; powder bright yellow; no odour; taste very acrid. When rubbed with Water it forms a yellow emulsion; it is completely dissolved by the successive action of Alcohol (90 p.c.) and Water.

Mode of extracting the Resin from the tree.—*Kew Bulletin*, June and July, '95.

Test.—When Solution of Iodine is added to a cooled aqueous decoction, the colour should not become distinctly green (absence of more than a trace of Starch). When incinerated it should not yield more than 3 p.c. of Ash.

B.P. should require a given standard soluble in Alcohol which might fairly be put at 75 p.c.

It dissolves in Petroleum Spirit (sp. gr. not under ·700) with an intense yellow colour destroyed by alkalis, and if to the solution a few drops of Alcoholic Solution of Ferric Chloride be added, the Alcohol is coloured intensely black.—*C.D.* '86, i. 508.

Preparation.

PILULA CAMBOGIÆ COMPOSITA. Compound Pill of Gamboge. (Modified.)

Gamboge, in powder, 1; Barbados Aloes, in powder, 1; Compound

Powder of Cinnamon, 1; Hard Soap, in powder, 2; Syrup of Glucose (by weight), 1 or a sufficient quantity: mix to form a mass.
=(1 in 6 nearly).

Now made with Syrup of Glucose in place of Syrup.

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in Fr. and Belg. (Pilule Anderson) Aloes, Gamboge, Oil of Anise, and Honey; Port. (Pilulas de Aloes e Gomma Guta), the same with Soap; Fr. has also Pilules de Bontius, containing Ammoniacum and Vinegar instead of Cinnamon and Soap; U.S. (Pil. Cathartice Comp.), contains Gamboge about 1 in 12; not in the others.

CAMPHORA.

CAMPHOR.

A white crystalline substance, obtained from *Cinnamomum Camphora*, purified by sublimation.

It is obtained in the crude state from Formosa and Japan, and is re-sublimed in this country and elsewhere.

Solubility.—1 in 700 of Water; 1 in 1¼ of Alcohol (90 p.c.); or by weight, 1 in 1; 4 in 1 of Chloroform; 12 in 7 of Ether; 1 in 4 of Olive Oil (slowly); 1 in 1½ of Oil of Turpentine; 2 in 1 of Glacial Acetic Acid; insoluble in Alkalis. 3 of Camphor rubbed with 1 of Carbolic Acid crystals form a clear solution. 3 of Camphor and 3 of Hydrate of Chloral rubbed together liquefy.

Medicinal Properties.—A stimulant sedative; antispasmodic, carminative, expectorant, diaphoretic and anaphrodisiac. A feeble antiseptic.

Stimulant in the prostration of febrile diseases; sedative in mania, delirium tremens and chordee, also useful in dysmenorrhœa, spasmodic asthma and chronic bronchitis; in hysteria, nymphomania and spermatorrhœa. Spirit of Camphor mixed with warm Water to bathe the nostrils is highly useful in hay fever, and relieves irritation of the nostrils in common cold; also used as an **inhalation**. The **Compound Tincture** is given with Tincture of Squill to allay spasmodic cough in bronchitis and phthisis. In large doses Camphor tends to cause cardiac depression, convulsions, and possibly collapse.

Externally, it is used as a counter-irritant to relieve pain in chronic rheumatism and neuralgia; also in chronic eczema and other painful skin diseases.

10 grammes of a 10 p.c. solution of Camphor in Olive Oil hypodermically injected for collapse.—*B.M.J.E.* '95, ii. 63; *P.J.* '95, ii. 380.

Dose.—2 to 5 grains.

Prescribing Notes.—An excellent pill can be made by mixing Camphor, 36 grains; Curd Soap, 4 grains; Glycerin of Tragacanth, 10 grains; and dividing into 12 or more pills as required. Its unpleasant taste is covered well by milk. The **Spirit** is given on sugar, also in milk.

Symptoms of poisoning by Camphor: convulsions, lividity of countenance, stupor, arrest of urinary secretion.

Official Preparations.—Aqua Camphoræ, Linimentum Camphoræ, Lini-

mentum Camphoræ Ammoniatum, Spiritus Camphoræ and Tinctura Camphoræ Composita. Contained in Linimentum Aconiti, Linimentum Belladonnæ, Linimentum Opii, Linimentum Saponis, Linimentum Sinapis, Linimentum Terebinthinæ, and Unguentum Hydrargyri Compositum. Of **Linimentum Camphoræ**:—Linimentum Chloroformi, Linimentum Hydrargyri, Linimentum Terebinthniæ Aceticum.

Not Official.—Camphor Monobromata, Camphor Balls, Camphora cum Creta, Ceratum Camphoræ, Essentia Camphoræ, Spiritus Camphoræ Fortior, Essential Oil of Camphor, Camphor Leaf Oil, Oxycamphor, Phenol Camphor, Thymol Camphor, Resorcin Camphor, and Camphoric Acid.

Antidotes.—Stomach-pump or emetics, stimulants freely, and warmth to the extremities.

Foreign Pharmacopœias.—Official in all.

Description.—In solid, colourless, transparent, crystalline pieces of tough consistence; also in rectangular tablets or in pulverulent masses known as 'Flowers of Camphor.' Sp. gr. about ·995. It has a powerful, penetrating odour, and a pungent, somewhat bitter taste, followed by a sensation of cold. It burns readily with a bright smoky flame, volatilises even at ordinary temperatures, and sublimes without residue when heated. It forms a liquid when triturated with Chloral Hydrate, Menthol, Phenol, or Thymol.

Its sp. gr. varies from ·986 to ·996. It evaporates entirely if left exposed to the air. 1 oz. of Powdered Camphor exposed to the air at a temperature of 70° F. (21·1° C.) lost about 37 grains per twenty-four hours. It melts at 347° F. (175° C.), boils at 401° F. (205° C.), and in closed vessels sublimes unchanged.

The Borneo Camphor from the *Dryobalanops aromatica*, though virtually the same as the Official, is valued very much more by the Chinese. Its formula contains H_2 more than ordinary Camphor ($C_{10}H_{16}O$), into which it may be converted by oxidising agents.

Preparations.

AQUA CAMPHORÆ. Camphor Water. (Modified.)

Dissolve 70 grains of Camphor in a sufficient quantity of Alcohol (90 p.c.) to form half an ounce of the solution; add this in successive portions to 1 gallon of Distilled Water, shaking after each addition; finally agitate occasionally until all the Camphor is dissolved.
= (1 in 1000).

The Camphor is now dissolved in Alcohol (90 p.c.).

Dose.—Not given in B.P.; 1 to 2 oz. = $\frac{1}{10}$ to $\frac{2}{3}$ grain of Camphor.

Foreign Pharmacopœias.—Official in Dan., Mistura Camphorata, contains Camphor, Mucilage of Acacia, Syr. Cerasi, and Elderflower Water; Norw., Emulsio Camphoræ; Fr., Eau Camphrée; Port., same as Brit.; Span., Camphor, Elder, Honey, and Melissa Water; U.S., Camphor triturated with Alcohol, Precipitated Calcium Phosphate and Distilled Water; not in the others.

LINIMENTUM CAMPHORÆ. Liniment of Camphor. *B.P.Syn.*—Camphorated Oil. (Modified.)

Camphor, in flowers, 1; Olive Oil, 4: dissolve the Camphor in the Olive Oil. =(about 1 in 5).

Camphor in flowers is now specified in place of Camphor.

Process for the determination of the Camphor.—*Analyst* '98, 281; *C.D.* '98, ii. 826.

Foreign Pharmacopœias.—Official in Austr. (Oleum Camphoratum), 1 and 3; Dan., Norw. and Swed., 1 and 4; Belg., Fr., Ger., Ital., Russ. and Swiss, 1 and 9; Span. (Aceite Alcanforado), 1 and 8; all with Olive Oil; Port., 1 and Almond Oil 9; Mex. (Aceite Alcanforada), 1 and 9; Hung., 1 and 2; both with Sesame Oil; U.S., 1 and Cotton-seed Oil 4; all by weight; not in Dutch or Jap.

LINIMENTUM CAMPHORÆ AMMONIATUM. Ammoniated Liniment of Camphor. *B.P.Syn.*—Compound Liniment of Camphor. *N.O.Syn.*—Linimentum Ammoniatum Camphoratum. (Modified.)

Camphor, 2½; Oil of Lavender, ½; Strong Solution of Ammonia, 5; Alcohol (90 p.c.), a sufficient quantity. Dissolve the Camphor and Oil of Lavender in 12 of the Alcohol; add the Strong Solution of Ammonia gradually, shaking them together until, after adding sufficient of the Alcohol to produce 20 of the Liniment, a clear solution is formed.

=(1 in 8).

Name altered and Alcohol (90 p.c.) used in place of Rectified Spirit.

Stimulating. Most useful in tic-douloureux and chronic rheumatism. Painful neuralgia has been relieved by applying lint previously soaked in the liniment, covering with a dry napkin until redness is produced, then lightly rubbing the part with the Solution of Bimeconate of Morphine (Squire).

Foreign Pharmacopœias.—Official in:

Belg. Liquid Ammonia, 1; Camphorated Oil, 9.
Dan. Solution of Ammonia, 5; Camphor, 1; Rape Oil, 14.
Fr. Solution of Ammonia, 1; Camphorated Oil, 9.
Ger. Solution of Ammonia, 1; Camphorated Oil, 3; Poppy Oil, 1.
Mex., Solution of Ammonia, 1; Camphorated Oil, 9.
Norw. Solution of Ammonia, 2; Camphorated Oil, 1; Rape Oil, 2.
Port. Liquid Ammonia, 1; Camphorated Oil, 4.
Russ. Solution of Ammonia, 1; Camphorated Oil, 3; Sesame Oil, 1.
Swed. and Swiss, Solution of Ammonia, 1; Camphorated Oil, 3.
All by weight; not in the others.

SPIRITUS CAMPHORÆ. Spirit of Camphor. *N.O.Syn.*—Tinctura Camphoræ. (Modified.)

Camphor, 1; Alcohol (90 p.c.), a sufficient quantity. To the Camphor add enough of the Alcohol to form 10 of the Spirit of Camphor.

=(1 in 10).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—5 to 20 minims.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Teinture de Camphre Conc.), Ger., Ital., Jap., Norw., Port., Swed., Swiss and U.S., 1 in 10; Hung., about 1 in 7; Russ., 1 in 13: Mex. (Alcohol Alcanforada), 1 and 19; Span., 1 and 23; all by weight except U.S.

TINCTURA CAMPHORÆ COMPOSITA. Compound Tincture of Camphor. *B.P.Syn.*—Paregoric. Paregoric Elixir. (Modified.)

Tincture of Opium, 585 minims; Benzoic Acid, 40 grains; Camphor, 30 grains; Oil of Anise, ½ fl. drm.; Alcohol (60 p.c.), a sufficient quantity. Dissolve the Benzoic Acid, Camphor, and Oil of Anise in 18 fl. oz. of the Alcohol; add the Tincture of Opium and a sufficient quantity of the Alcohol to produce 20 fl. oz. of the Tincture; filter if necessary.

The 40 grains of Opium has been replaced by the corresponding quantity of Tincture of Opium, 585 minims, as previously suggested in the '*Companion*.'

Dose.—30 to 60 minims.

This compound Tincture of Camphor contains in each fl. drm. a proportion of Tincture of Opium equivalent to $\frac{1}{30}$ grain of Morphine Hydrochloride, or to $\frac{1}{4}$ grain of Opium (containing 10 p.c. of Anhydrous Morphine); or to nearly ·5 milligramme (·00046 gramme) of Anhydrous Morphine in each c.c.

The Pimpinella Oil is preferable as being more soluble in Alcohol (60 p.c.).

Foreign Pharmacopœias.—Official in:

Belg. **Elixirium Paregoricum.**—Opium, 5; Benzoic Acid, 5; Camphor, 3·5; Oil of Anise, 2·5; Alcohol (80 p. c.), 1000.

Dan. and Swed. **Tinctura Thebaiaca Benzoica.**—Opium, 5; Benzoic Acid, 5; Camphor, 3; Oil of Anise, 2; Diluted Alcohol, 1000.

Fr. **Elixir Paregorique.**—Extract of Opium, 3; Benzoic Acid, 3; Camphor, 2; Oil of Anise, 3; Alcohol (60 p. c.), 650.

Ger. and Russ. **Tinctura Opii Benzoica.**—Opium, 1; Benzoic Acid, 4; Camphor, 2; Oil of Anise, 1; Diluted Alcohol, 192.

Jap. **Tinctura Opii Benzoica.**—Opium, 1; Benzoic Acid, 4; Camphor, 2; Oil of Fennel, 1; Diluted Alcohol, 192.

Norw. **Tinctura Opii Benzoica.**—Tincture of Opium, 50; Benzoic Acid, 5; Camphor, 3; Oil of Anise, 2; Diluted Alcohol, 940.

Mex. **Tinctura de Opio Alcanforado.**—Extract of Opium, 3; Benzoic Acid, 3; Camphor, 2; Oil of Anise, 3; Alcohol (60 p.c.), to 600.

Port. **Tinctura de Opio Composta,** and Swiss, **Tinctura Opii Benzoica.**—Opium, 1; Benzoic Acid, 1; Camphor, 1; Oil of Anise, 1; Alcohol (65 p.c.), 196.

U.S. **Tinctura Opii Camphorata.**—Opium, 4; Benzoic Acid, 4; Camphor, 4; Oil of Anise, 4; Glycerin, 40; Diluted Alcohol to 1000.

All by weight, except U.S.

Not Official.

CAMPHOR BALL.—Camphor, 2; White Beeswax, 5; Spermaceti, 3; Oil of Almonds, 3; Tincture of Tolu, $\frac{1}{4}$: melt, and pour into half-ounce gallipots.

CAMPHORA CUM CRETA.—Camphor, 1; Prepared Chalk, 8: powder the Camphor by rubbing it with a few drops of Alcohol (90 p.c.), mix in the Chalk, and pass the whole through a sieve. A dentifrice.

CERATUM CAMPHORÆ.—Camphor, 2; White Beeswax, 3; Lard, 4; Oil of Almonds, 3: melt together and stir till cold.

ESSENTIA CAMPHORÆ.—Camphor, 1; Alcohol (90 p.c.), 20. Given for coryza, 5 minims every hour in water or on sugar.

SPIRITUS CAMPHORÆ FORTIOR (Rubini's Essence).—A saturated solution, in Alcohol (90 p.c.).

ESSENTIAL OIL OF CAMPHOR.—An oily liquid, varying in colour from pale to dark yellow. Sp. gr. different samples examined by us have varied from ·840 to ·980. Optical Rotation Dextrogyre. It has been used as an application in rheumatism.

Camphor Leaf Oil, investigated by David Hooper.—*P.J.* '96, i. 20.

OXYCAMPHOR.—Is the product of the oxidization of Camphor, and may be chemically regarded as that body with one of its Hydrogen atoms replaced by the Hydroxyl radicle. White crystalline powder. Soluble about 1 in 50 Water. Has been recommended in dyspnœa.—*P.J.* '96, ii. 378; '97, i. 254; *L.* '97, ii. 404.

Dose.—7 to 15 grains.

PHENOL-CAMPHOR, THYMOL-CAMPHOR, and **RESORCIN-CAMPHOR** are oily fluids obtained by heating Camphor with equal parts of Phenol, Thymol, and Resorcin respectively.—*P.J.* (3) '96, i. 325.

CAMPHORIC ACID.—Slightly soluble in Water, more readily in Alcohol (90 p.c.). Is a valuable remedy in cases of urinary calculi and of vesical catarrh. A 1 p.c. solution has been recommended in acute and chronic affections of the respiratory passages.—*P.J.* (3) xix. 507.

One gramme given 3 or 4 times a day, or 2 grammes in the evening, checks the night sweating in phthisis.—*L.M.R.* '88, 276.

Not Official.

CAMPHORA MONOBROMATA.

MONOBROMATED CAMPHOR.

$C_{10}H_{15}BrO$, eq. 229·33.

Colourless prismatic needles or scales, with a camphoraceous odour and taste.

Solubility.—Almost insoluble in Water; soluble 1 in 12 of Alcohol (90 p.c.); 10 in 7 of Chloroform; 1 in 2 of Ether; 1 in 8 of Olive Oil; sparingly in Glycerin.

Medicinal Properties.—Hypnotic and sedative. Given in hysteria, epilepsy, chorea, spermatorrhœa, and delirium tremens; but its use requires caution. It has been stated to be an antidote to Strychnine.

Dose.—2 to 5 grains.

Prescribing Notes.—It can be prescribed in pills with a mixture of Glucose and Treacle (equal parts), or can be dissolved in Almond or Olive Oil and emulsified with Mucilage and Water. It is also given with Extract of Belladonna.

Larger doses than 5 grains are sometimes given in delirium tremens.

Foreign Pharmacopœias.—Dutch, Fr., Ital., Jap., Mex. (Alcanfor Monobromado), Port., Span., Swiss and U.S.; not in the others.

Tests.—It melts at 169° F. (76° C.). When boiled with test-solution of Silver Nitrate, it is decomposed and yields Silver Bromide. It is soluble without decomposition in cold concentrated Sulphuric Acid, and will again separate unaltered if the solution be poured into Water.

CANNABIS INDICA.

INDIAN HEMP.

The dried flowering or fruiting tops of the female plant of *Cannabis sativa*, grown in India, from which the resin has not been removed.

O'Shaughnessy introduced Indian Hemp into this country, and Peter Squire made an extract of it for him.

Recent literature.—*P.J.* (3) xxv. 246; *J.C.S. Trans.* '96, 538; *L.* '97, i. 238.

Medicinal Properties.—Sedative, anodyne, hypnotic, and antispasmodic. Has been used with success in migraine and delirium, neuralgia, and pain of last stages of phthisis, and in acute mania; also in menorrhagia and dysmenorrhœa. It is combined with Belladonna in whooping cough, and in infantile convulsions, hepatic and renal colic; in tetanus and hydrophobia.

It does not produce constipation or loss of appetite; on the contrary, it restores the appetite which has been lost by chronic Opium and Chloral drinking.—*L.* '89, i. 625.

Prescribing Notes.—Usually prescribed in the form of Extract or Tincture.

Dose of the Extract ¼ to 1 grain (with a sufficiency of Liquorice powder to form a pill); but as it varies considerably in strength it is better to commence with the smaller dose; toxic symptoms have been produced with 1 grain. Dose of the Tincture 5 to 15 minims, which can be taken on Sugar or diffused in Water by the aid of 1 fl. drm. of Mucilage of Acacia to each fl. oz. of Water; the Mucilage should be diluted with twice its volume of Water before the addition of the Tincture.

Official Preparations.—Extractum Cannabis Indicæ. Of the **Extract**, Tinctura Cannabis Indicæ. The **Tincture** is contained in Tinctura Chloroformi et Morphinæ Composita.

Not Official.—Cannabinæ Tannas, and Cannabinon.

Antidotes.—In case of over-dose, after employing stomach-tube or emetics hot brandy-and-water may be given, vegetable acids, such as lemon juice, vinegar, and the like. Strychnine should be injected and a blister applied to the nape of the neck.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Fr. (Chanvre), Hung., Jap., Norw. (Fructus Cannabis), Dan., Port. (Canhamo), Russ., Mex. and Span. (Canamo), Swed., Swiss and U.S.; not in Ger. or Ital.

Description.—In compressed, rough, dusky-green masses, consisting of the branched upper part of the stem, bearing leaves and pistillate flowers or fruits, matted together by a resinous secretion. The upper leaves of the plant are simple, alternate, 1—3-partite; the lower are opposite and digitate, and consist of five to seven linear-lanceolate leaflets, with distantly serrate margins. The fruit is one-seeded, and supported by an ovate-lanceolate bract. Both leaves and bracts bear external oleo-resin glands and one-celled curved hairs, the bases of which are enlarged, and contain cystoliths.

Preparations.

EXTRACTUM CANNABIS INDICÆ. Extract of Indian Hemp. (Modified.)

Exhaust Indian Hemp, in coarse powder, with Alcohol (90 p.c.) by percolation; evaporate the percolate to the consistence of a soft extract.

Now made by percolation and Alcohol (90 p.c.) instead of maceration in Rectified Spirit.

By prolonged heating even on a water-bath, the extract becomes brown, insoluble in Alcohol (90 p.c.) and soluble in Water.

6 of Indian Hemp yield about 1 of Alcoholic Extract.

Dose.—¼ to 1 grain.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Fr., Hung., Jap., Mex. (Extracto de Marihuana), Norw., Port., Russ., Swed., Swiss and U.S.; not in the others.

TINCTURA CANNABIS INDICÆ. Tincture of Indian Hemp.

Extract of Indian Hemp, 1; Alcohol (90 p.c.) a sufficient quantity. Dissolve the Extract of Indian Hemp in 18 of the Alcohol; filter if necessary; add sufficient of the Alcohol to produce 20 of the Tincture. =(1 in 20).

Now made with Alcohol (90 p.c.) instead of Rectified Spirit.

22 minims contain 1 grain of Extract.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Belg., Ger. and Port., 1 Extract in 20; the following are from Herb: Fr., Hung., Jap., Mex. and Swiss, 1 in 5; Russ., 1 in 10; all by weight; U.S., 15 in 100; not in the others.

Not Official.

CANNABINÆ TANNAS.—An amorphous yellowish powder, sparingly soluble in Water, Alcohol, and Ether. Soluble in acidulated Alcohol.

Dose.—4 to 8 grains, mixed with Sugar and taken as a powder or in a **cachet**.

Was introduced as a hypnotic, but its effects are very uncertain.—*T.G.* '85, 329,379.

It is occasionally prescribed for menorrhagia.

CANNABINON.—A soft resinous substance, generally found as a 10 p. c. trituration with Milk Sugar, also introduced as a hypnotic, but the dose (1½ grains) was followed by excitement, collapse, and cramps.—*T.G.* '85, 286; *L.M.R.* '86, 434.; contra-indicated in cardiac disease, *L*, '87, i. 542.

CANTHARIS.

CANTHARIDES.

The dried beetle, *Cantharis vesicatoria*.

It is collected in Spain, France, Russia, Sicily, and Hungary.

The powder should be dry and kept closely corked, for if at all damp it is apt to acquire a putrid odour. A piece of Camphor kept in it prevents mites.

Medicinal Properties.—Externally its effects are rubefacient and irritant; by continued application it is vesicant. For the latter purpose the Emplastrum or Liquor Epispasticus is used, and is especially effective in inflammation of deep-seated parts, as in pleuritis, pericarditis, pneumonia, sciatica, neuralgia, and over the præcordial region in acute rheumatism; applied to rheumatic joints it removes pain and swelling; applied over the epigastrium it often checks obstinate vomiting and gastric pain. It acts for a longer period, and is less irritating to the patient, than Ammoniacal or Acetic Acid embrocations. Internally in small doses it is diuretic and aphrodisiac. It is given in gleet, in impotence, and incontinence of urine due to paralysis, but it should be given cautiously, for it irritates the kidneys and sometimes produces strangury, and it should never be given to aged people or children, or in cases of nephritis.

The tincture in 5 minim doses three times daily in Water, arrests hæmorrhage from the kidney.—*B.M.J.* '98, ii. 1551.

It is the basis of most of the applications used to increase the growth of hair.

In chronic inflammation of the bladder it should *not* be used as a counter-irritant, on account of its irritating effects on the urinary organs, when absorbed. In such cases a solution of Silver Nitrate (½ drm. to 1 fl. oz. of water) is to be preferred.

Thirty-two cases out of fifty-six of cystitis cured by teaspoonful doses of the following solution: Cantharidin, 1 milligramme, dissolved in 1 gramme of Alcohol, and diluted to 100 grammes with Water.—*B.M.J.E.* '95, ii. 6.

Official Preparations.—Acetum Cantharidis, Emplastrum Calefaciens, Emplastrum Cantharidis, Liquor Epispasticus, Tinctura Cantharidis, and Unguentum Cantharidis. Collodium Vesicans is prepared from Liquor Epispasticus.

Not Official.—Cantharidin, Linimentum Crinale, Liquor Cantharidis Concentratus, Unguentum Stimulans, and Boni's Blister.

Antidotes.—In case of poisoning by Cantharides use Emetics or stomach pump, followed by milk, raw eggs, and stimulants; inject Morphine for pain.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—From about three-quarters of an inch to an inch (eighteen to twenty-five millimetres) long, and a quarter of an inch (six millimetres) broad, with two long elytra or wing-sheaths of a shining green or coppery-green colour, under which are two thin brownish transparent membranous wings; odour strong and disagreeable.

Five samples exhausted by us with Chloroform, evaporated and treated with Carbon Bisulphide to remove Oil, yielded ·38, ·48, ·58, ·60, and ·62 p.c. of well crystallised Cantharidin.

The pharmacy of Cantharides, with a method for the determination of *total* Cantharidin, both free and combined, and the following strengths suggested: Acetum Cantharidis, 1 in 2000; Emplastrum Calefaciens, 1 in 5000; Emplastrum Cantharidis, 1 in 1,000; Liquor Epispasticus, 1 in 300; Tinctura Cantharidis, 1 in 10000; Unguentum Cantharidis, 1 in 3000. The typical sample of drug selected yielded ·68 p.c. of total Cantharidin, ·5075 p.c. being free, and ·1725 p.c. combined. The free Cantharidin is extracted with Chloroform; but in the determination of total Cantharidin the flies in number 40 powder, previous to being exhausted with Chloroform, are treated with a mixture of Glacial Acetic Acid 1 vol., Rectified Spirit, 2 vol., and Chloroform 3 vol. The process of purification is too long to insert here.—*P.J.* '98, i. 258. *C.D.* '98, i. 421.

Preparations.

ACETUM CANTHARIDIS. Vinegar of Cantharides. (Altered.)

Cantharides, bruised, 2; Glacial Acetic Acid and Distilled Water, mixed in equal volumes a sufficient quantity. Macerate the Cantharides in 18 of the mixture of Glacial Acetic Acid and Distilled Water for twenty-four hours; transfer to a percolator; when the liquid ceases to pass, pour sufficient of the menstruum in successive portions over the contents of the percolator to produce 20 of the Vinegar of Cantharides. =(1 in 10).

The menstruum is rather stronger in Acetic Acid and the process is modified.

Foreign Pharmacopœias.—Official in Port., about 1 in 6: not in the others.

COLLODIUM VESICANS. Blistering Collodion. (Altered.)

Blistering Liquid, 20; Pyroxylin, ½: add the Pyroxylin to the Blistering Liquid in a stoppered bottle; shake them together until the Pyroxylin is dissolved.

The quantity of Pyroxylin has been reduced to one-half.

See also Cantharidin, p. 184.

Foreign Pharmacopœias.—Official in Belg., Dan., Ger., Jap. (Collodium Epispasticum), Mex. (Collodión Cantaridado), Norw., Port., Russ., Swiss and U.S.: not in the others.

EMPLASTRUM CALEFACIENS. *B.P.Syn.*—Warming Plaster. (Altered.)

Cantharides, in coarse powder, 1; Yellow Beeswax, 1; Resin, 1; Resin Plaster, 13; Soap Plaster, 8; Distilled Water, boiling, 5. Infuse the Cantharides in the Distilled Water for six hours; squeeze strongly through Calico; evaporate the expressed liquid on a water-

bath till reduced to one-third; add the other ingredients; melt on a water-bath; stir until the ingredients are thoroughly mixed.
=(about 1 in 25).

Expressed Oil of Nutmeg is now omitted.

Foreign Pharmacopœias.—Official in U.S., Emplastrum Picis Cantharidatum, 1 in 40; not in the others.

EMPLASTRUM CANTHARIDIS. CANTHARIDES PLASTER. (MODIFIED.)

Cantharides, in powder, 7; Yellow Beeswax, 4; Lard, 4; Resin, 4; Soap Plaster, 1. Melt the Resin; add the Soap Plaster, and, afterwards, the Yellow Beeswax and Lard. Sprinkle the Cantharides into the melted mixture; stir continuously while the product is cooling.
=(nearly 1 in 3).

The strength remains about the same, but Soap Plaster has been introduced in the place of Suet, and the proportion of other ingredients has been altered.

B.P. directs the Resin to be melted separately, but there is no advantage in this.

Foreign Pharmacopœias.—Official in Austr., Fr. and Mex., 1 in 3; Belg., Dutch, Hung., Ital., Norw., Span. and Swed., about 1 in 3; Dan., Ger., Port., Russ. and Swiss, about 1 in 4; not in U.S.

Emplastrum Cantharidum Perpetuum, Austr., Norw. and Swed., 1 in $7\frac{1}{2}$; Swiss, 3 in 10; Dan., Emp. Canth. cum Euphorbio 1 in $6\frac{2}{3}$; Hung., 1 in $5\frac{1}{2}$; Belg., 1 in 8; Ger. and Russ., 1 in 10; not in the others.

LIQUOR EPISPASTICUS. BLISTERING LIQUID. (ALTERED.)

Mix 10 of Cantharides in No. 20 powder, with 5 of Acetic Ether; pack in a percolator; at the expiration of twenty-four hours pour Acetic Ether over the contents of the percolator; allow the solution to pass slowly through until 20 of the Liquid is obtained. =(1 in 2).

It is now twice the strength of the Blistering Liquid of B.P. '85.

See also CANTHARIDIN, p. 184.

(Not in the other Pharmacopœias.)

TINCTURA CANTHARIDIS. TINCTURE OF CANTHARIDES. (MODIFIED.)

Cantharides, in No. 40 powder, 1; Alcohol (90 p.c.), 80; prepare by the maceration process. =(1 in 80).

Now made with Alcohol (90 p.c.) in place of Proof Spirit.

Dose.—5 to 15 minims; if frequently repeated 2 to 5 minims.

Foreign Pharmacopœias.—Official in Swed., 1 and 30; U.S., 1 in 20; Austr., Dan., Ger., Dutch, Ital., Jap., Port., Russ. and Swiss, 1 in 10; Mex., 1 and 10; Fr., 1 and 10, also with Acetic Ether 1 and 10; Span., 1 and $12\frac{1}{2}$; Belg. and Hung., 1 and 5; all by weight, except U.S.

UNGUENTUM CANTHARIDIS. CANTHARIDES OINTMENT. (ALTERED.)

Cantharides, bruised, 1; Benzoated Lard, 10. Melt the Benzoated Lard, add the Cantharides, and digest at a temperature of about 120° F. (48·9° C.) for twelve hours. Strain through calico and press the residue gently; stir until cold. =(about 1 in 10).

Now 1 to 10 of Benzoated Lard, in place of 1 to 7 of a mixture of Olive Oil and Yellow Beeswax.

Employed to promote discharge from a blistered surface.

Foreign Pharmacopœias.—Official in Belg., 1 in 11; Fr., Pommade Epispas-

tique Verte, 1 in 33, and P. E. Jaune, 1 in 17; Port., about 1 in 23; Ital., Pomata di Cantaridi, 1 in 10; Swiss, 1 in 7; Ger. and Russ., about 1 in 5; Norw. and Swed., 1 in 5; Dan., Ung. Canth. Viride, about 1 in 3; Span., 3 in 10; U.S., Ceratum Cantharidis, 32 in 100; Jap., Unguentum Vesicans Fort., 1 in 20, also Mitius, 1 in 40; Mex. Unguento de Cantaridas, about 1 in 18; not in Austr., Dutch or Hung.

Not Official.

CANTHARIDIN, $C_{10}H_{12}O_4$.—Obtained from Cantharides. White crystalline scales. Melts at 200° C.

Solubility.—1 in 1150 of Rectified Spirit; 1 in 700 of Rectified Ether, sp. gr. ·720; 1 in 55 of Chloroform; 1 in 150 of Acetic Ether, but even when dissolved at 60° F. part separates on standing; 1 in 200 of Almond Oil; 1 in 65 of Oil of Cloves.

Acetone is the best solvent for Cantharidin, which it dissolves 1 in 40, and as it is cheaper it possesses a double advantage over Acetic Ether. It makes a good Liquor Epispasticus, dissolves Pyroxylin, and is therefore also suitable for Collodium Vesicans.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Mex., Port. and Span.; not in the others.

LINIMENTUM CRINALE.—Cantharidin, 1 grain; Acetic Ether, 6 fl. drm.: dissolve and add Alcohol (90 p.c.), 3 fl. oz.; Castor Oil, 1 fl. oz.; Oil of Lavender, 15 minims.

This Liniment is highly recommended for application to the head where the hair is falling off; but after applying it a few times the head should be washed, or it may accumulate and cause too much irritation. It may be diluted with equal parts (or more) of Alcohol (90 p.c.) for delicate skins.

LIQUOR CANTHARIDIS CONCENTRATUS.—One fluid ounce = 1 ounce of Cantharides. It is obtained by repercolation with Acetic Ether, and is standardised to contain ·5 p.c. of Cantharidin. This Liquor forms a convenient substitute for Cantharides in making the various preparations; it effects a great saving of time and produces a better result.

Acetone is better as a solvent, but cannot be employed for Official preparations.

UNGUENTUM STIMULANS.—(Erasmus Wilson's.) Cantharides in Powder, 3; Lard, 12: macerate with a moderate heat for twenty-four hours and filter through paper.

In place of the Cantharides, 6 of Liquor Epispasticus or 3 of Liquor Cantharidis Concentratus may be employed, evaporated to a thin extract, and mixed with the melted Lard.

BONI'S BLISTER.—Camphor, 20; Chloral Hydrate, 30; melt and add Powdered Cantharides, 10; digest for an hour at 150° F.; filter.—*L.M.R.* '89, 19.

CAOUTCHOUC.

INDIA-RUBBER.

[NEW.]

The prepared milk-juice of *Hevea brasiliensis*, and probably other species; known in commerce as pure Para rubber.

Official Preparation.—Liquor Caoutchouc. The **Liquor** is used in the preparation of Charta Sinapis.

Foreign Pharmacopœias.—Fr., Mex., and Span., Goma Elástica; U.S., Elastica; not in the others.

Description.—In elastic masses of varying thickness, brownish-black externally, and mottled with a pale tint internally; insoluble in Water, Ethylic Alcohol, alkaline solutions, or dilute acids; soluble in Chloroform, Oil of Turpentine, Carbon Bisulphide, Benzol, and Petroleum Spirit. When heated to about 257° F. (125° C.) it melts, remaining soft and adhesive after cooling. Odour characteristic, somewhat empyreumatic; nearly tasteless.

Preparation.

LIQUOR CAOUTCHOUC. Solution of India-rubber. (New.)

India-rubber, 1; Benzol, 10; Carbon Bisulphide, 10. Cut the India-rubber into fine shreds, and place it in a well-stoppered bottle containing the previously mixed Benzol and Carbon Bisulphide. Set aside in a cool place, and agitate occasionally until solution is effected.

CAPSICI FRUCTUS.

CAPSICUM.

The dried ripe fruit of *Capsicum minimum*.

Imported from Zanzibar, and distinguished in commerce as Guinea Pepper, Chillies or Bird Pepper. That from Nepaul has the finest flavour. These in powder are sold as Cayenne Pepper.

It yields its virtues to Water, Alcohol, Ether, Acetic Ether, and the fixed and volatile Oils.

Medicinal Properties.—Stimulant, stomachic, and tonic, used chiefly as a condiment. Given in dyspepsia and dipsomania, flatulent distension of hysteria, chronic cystitis, gleet and spermatorrhœa; to induce sleep and promote appetite in delirium tremens. Used externally as a rubefacient in rheumatism and lumbago and for chilblains.

Dose.—Not given in B.P.; ½ to 1 grain in pill.

Official Preparations.—Tinctura Capsici, and Unguentum Capsici. The **Tincture** is contained in Tinctura Chloroformi et Morphinæ Composita.

Not Official.—Tinctura Capsici Fortior, Oleo-resina Capsici, Emplastrum Capsici, and Unguentum Oleo-resinæ Capsici.

Foreign Pharmacopœias.—Official in Belg., Dan., Fr. (Poivre de Guinée), Ger., Mex. (Chile), Port. (Pimentao), Russ., Span. (Pimiento), Swed., Swiss and U.S.; not in the others.

Description.—Dull orange-red, oblong-conical, obtuse, two-celled fruits, from about one-half to three-quarters of an inch (twelve to twenty millimetres) in length and a quarter of an inch (six millimetres) in diameter; sometimes attached to a five-toothed inferior calyx, and a long, straight, slender peduncle. The pericarp is somewhat shrivelled, glabrous, translucent and leathery, and contains from ten to twenty small flat seeds, either loose or attached to a thin reddish dissepiment. Odour characteristic; taste intensely pungent.

Test.—On incineration Capsicum should not yield more than 6 p.c. of Ash.

The ash was determined from three samples of Fruits, also three samples of Pulvis Capsici: Fruits yielded, 3·75, 4·52, 5·38 p.c.; Pulvis, 4·44, 4·49, 6·31 p.c.

Good Capsicum fruits yield about 20 p.c. of Oleo-resin.—*P.J.* '96, ii. 546.

Preparations.

TINCTURA CAPSICI. TINCTURE OF CAPSICUM. (ALTERED.)

Capsicum, in No. 20 powder, 1; Alcohol (70 p.c.) 20; prepare by the maceration process. =(1 in 20).

Now 1 in 20 instead of ¾ in 20, and Alcohol (70 p.c.) in place of Rectified Spirit. It is made by maceration as suggested in *Companion;* but can also be conveniently prepared in small quantities by dilution of the Strong Tincture.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Belg., 1 and 5; Mex., 1 in 5; Dan., Ger., Russ. and Swiss, 1 in 10: all by weight. U.S., 1 in 20; not in the others.

UNGUENTUM CAPSICI. CAPSICUM OINTMENT. (NEW.)

Capsicum Fruit, bruised, 120 grains; Spermaceti, 60 grains; Olive Oil (by weight), 1 oz.; digest on a water-bath for one hour, occasionally stirring; strain; set aside to cool, without stirring.

Not Official.

TINCTURA CAPSICI FORTIOR (Turnbull's Tincture).—Capsicum in No. 40 powder, 10; percolated with sufficient Alcohol (90 p.c.) to produce 30.

This has been added to B.P.C. formulary. Previously known as **Linimentum Capsici.**

Used externally for swollen chilblains as a counter-irritant, but *not* when the skin is *broken*. For **chilblains**, saturate a piece of sponge or flannel with the tincture, and rub the chilblain well until a strong tingling is produced; continue daily until recovery. A small dossil of lint or cotton, dipped into the tincture, is an excellent remedy for toothache.

Used by aurists to paint behind the ears as a counter-irritant, but a solution of Volatile Oil of Mustard is better.

OLEO-RESINA CAPSICI (*U.S.*)—*Syn.*—CAPSICIN.—Obtained by percolating Capsicum with Ether, distilling off the Ether, and straining out the fatty matter which separates. It is a thick liquid of a yellowish red colour, which becomes very fluid when gently heated, and at a high temperature volatilises. ½ a grain only, thus volatilised in a large room, will cause all who respire the air of the room to cough and sneeze. It is soluble in Alcohol, Ether, and Oil of Turpentine.

The active principle of Capsicum has been obtained by Thresh in well defined pearly white crystals, to which he has given the name **Capsaicin.**—*P.J.* (3) vii. 21.

EMPLASTRUM CAPSICI (*U.S.*)—Spread an even layer of Resin Plaster on muslin, and allow it to cool; then apply a thin coating of Oleo-resin of Capsicum, by means of a brush, leaving a narrow blank margin along the edges.

Each square inch should contain 1 grain of Oleo-resin of Capsicum.

UNGUENTUM OLEO-RESINÆ CAPSICI (*B.P.C.*)—Oleo-resin of Capsicum, 2; Yellow Wax, 1; Benzoated Lard, 8. Melt the Wax and Lard at a low temperature, add the Oleo-resin, mix, and strain if necessary. Stir till cold.

Not Official.

CARBO ANIMALIS.

ANIMAL CHARCOAL. BONE BLACK.

This substance and the purified Animal Charcoal are now deleted from B.P. They are used in Pharmacy chiefly as decolourising agents.

CARBO LIGNI.

WOOD CHARCOAL.

The carbonaceous residue of wood charred by exposure to a red heat without access of air.

Oak, Beech, Hazel, Willow, and Poplar are employed.

Medicinal Properties.—Antiseptic, absorbent and deodoriser. Given in powder or in cachets in cases of distension by intestinal gas, and in foul eructations and diarrhœa in dysentery and typhoid; also in dyspepsia attended with flatus, acidity and pain. Externally, as a poultice, it cleanses and absorbs the fetor of ulcers and gangrenous parts.

Dose.—60 to 120 grains.

Prescribing Notes.—It has been given in powder diffused in Water, also in the form of **capsules**, **cachets**, and **biscuits**. The most palatable way is to mix it with **chocolate**.

Foreign Pharmacopœias.—Official in all except Dan., Jap., or Norw.; Fr., Charbon Végétal; Mex., Carbón Vegetal.

Description.—A black powder without taste or odour, free from gritty matter.

Test.—When burned at a high temperature, with free access of air, it should not leave more than $7\frac{1}{2}$ p.c. of ash.

6 Samples examined, showed 2 to 7 p.c. of ash.—*P.J.* (3) xx. 946.

CARBONIS BISULPHIDUM.

CARBON BISULPHIDE.

B.P. Syn.—Carbon Disulphide.

[NEW.]

CS_2, eq. 75·55.

It may be prepared by the combination of Carbon and Sulphur at a high temperature, the product being subsequently condensed and purified.

Solubility.—About 1 in 500 of Water, readily soluble in Absolute Alcohol, Ether (sp. gr. ·720), Chloroform, and the fixed and volatile Oils.

It is a good solvent for Iodine, Phosphorus, Precipitated Sulphur, etc.

Medicinal Properties.—It is not often employed in medicine. Turnbull used it as an application to enlarged lymphatic glands; also the **vapour** to the ear in deafness, applied on a sponge or absorbent wool in a wide-mouthed bottle.

Two ounces of a saturated Solution in Water, mixed with Milk or Syrup, have been given in typhoid fever.—*L.* '89, i. 596.

One or two ounces daily of a saturated Solution in Peppermint Water have been given as a substitute for Bergeon's treatment of phthisis.—*B.M.J.* '88, i. 421.

Official Preparations.—Used in the preparation of Liquor Caoutchouc and Pilula Phosphori.

Foreign Pharmacopœias.—Official in Belg., Fr., Ital., Port., Span. and U.S.; not in the others.

Description.—A clear, colourless, highly refractive liquid, having a characteristic but not fetid odour.

Tests.—Sp. gr. 1·268—1·269. Boiling point 114·8°—116·6° F. (46°—47° C.). It evaporates rapidly at ordinary temperatures, and is highly inflammable, burning with a blue flame and producing Carbonic and Sulphurous Anhydrides. It should not affect the colour of Blue Litmus-paper moistened with Water. Evaporated spontaneously in a glass vessel, it should leave no residue (absence of Sulphur). Shaken with Solution of Lead Acetate, the latter should not be blackened (absence of Hydrogen Sulphide).

CARDAMOMI SEMINA.

CARDAMOM SEEDS.

The dried ripe seeds of *Elettaria Cardamomum*. The seeds should be kept in their pericarps, and separated when required for use.

1 of fruit yields about ¾ of seeds.

Medicinal Properties.— Stomachic, carminative, stimulant; a useful adjuvant to purgatives to prevent griping.

Official Preparation.—Tinctura Cardamomi Composita. Contained in Extractum Colocynthidis Compositum, Pulvis Cinnamomi Compositus, Pulvis Cretæ Aromaticus, Tinctura Gentianæ Composita, Tinctura Rhei Composita. Of the **Tincture** contained in Decoctum Aloes Compositum, and Mistura Sennæ Composita.

Not Official.—Oleum Cardamomi, Tinctura Cardamomi, and Tinctura Carminativa.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Jap., Mex. (Cardamomo menor), Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Ital.

Description.—The fruits usually vary from two-fifths to four-fifths of an inch (one to two centimetres) in length; they are ovoid or oblong in shape, bluntly triangular in section, and shortly beaked at the apex, pale buff in colour, and longitudinally striated. The seeds are dark reddish-brown in colour, about one-eighth of an inch (three millimetres) in length, and the same in breadth and thickness, irregularly angular, transversely wrinkled, and enclosed in a thin, colourless, membranous aril. Odour and taste agreeably warm and aromatic.

Test.—Incinerated they should not yield more than 4 p.c. of ash.

The ash of Pericarps, Seeds, and Pulvis Cardamomi was determined: Pericarps (three samples) yielded 10·4, 12·0, 13·4 p. c.; Seeds (three samples), 2·38, 2·81, 3·85 p. c.; Pulvis (three samples), 7·56, 6·33, 9·93 p. c.; these results seem to indicate that the Pulvis Cardamomi was not obtained from the seeds only, as directed in the Pharmacopœia. Even whole fruits had but an average of 5·5 p.c.

Preparation.

TINCTURA CARDAMOMI COMPOSITA. Compound Tincture of Cardamoms. (Modified.)

Cardamom seeds, bruised, 1 oz.; Caraway fruit, bruised, 1 oz.; Raisins of Commerce, freed from seeds, 8 oz.; Cinnamon Bark, bruised,

2 oz.; Cochineal, in powder, 220 grains; Alcohol (60 p.c.), 80 fl. oz.; prepare by the maceration process. =(1 in 80).

Now made with Alcohol (60 p.c.) in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in U.S., 1 in 50, contains Glycerin, and is made with the **fruit** of the Cardamoms; not in the others.

Not Official.

OLEUM CARDAMOMI—A pale aromatic Oil distilled from Cardamom Seeds, which contain about 4 p.c. Sp. gr. ·900—·940.

TINCTURA CARDAMOMI.—Cardamom Seeds, bruised, 1; sufficient Alcohol (60 p.c.), to percolate 10.

Dose.—30 to 60 minims.

Foreign Pharmacopœias.—Official in Port. and Swiss, 1 in 5 by weight; U.S., 1 in 10; not in the others.

TINCTURA CARMINATIVA (*B.P.C.*).—Cardamom Seeds, bruised, 600 grains; Stronger Tincture of Ginger (*B.P.* '85), 1¼ fluid ounces; Oil of Cinnamon, 100 mins.; Oil of Caraway, 100 mins.; Oil of Cloves, 100 mins.; Rectified Spirit sufficient to produce 20 fl. oz.: macerate the Cardamoms in 15 fl. oz. of the Spirit for a week, decant, express, and dissolve the Oils in the mixed tinctures and add Rectified Spirit to make 20 fl. oz.

Dose.—2 to 10 minims. Introduced as a flavouring agent.

By replacing the 600 grains of Cardamom Seeds by 24 minims of Oil of Cardamoms the maceration is avoided.

CARUI FRUCTUS.

CARAWAY FRUIT.

The dried fruit of *Carum Carvi.*

Cultivated in England and Germany. The herb flowers in the second year, and the fruit ripens in July or August. Yields from 3 to 6 p.c. of Oil.

Medicinal Properties.—Aromatic, stomachic, and carminative. Used occasionally in flatulent colic, as an adjuvant to other medicines, and to prevent griping of purgatives.

Official Preparations.—Aqua Carui, and Oleum Carui. Contained in Confectio Piperis, Pulvis Opii Compositus, Tinctura Cardamomi Composita, Tinctura Sennæ Composita. The **Oil** is contained in Pilula Aloes Barbadensis.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr., Ger. (Kümmel), Mex. (Alcaravea), Port. (Alcaravie), Russ., Span. (Alcarabea), Swed., Swiss. and U.S.; not in the others.

Description.—Mericarps usually separate; each from about one-sixth to one-fourth of an inch (four to six millimetres) long, and about one-twenty-fifth of an inch (one millimetre) broad; brown in colour with paler primary ridges, slightly curved, tapering towards each end and glabrous. The transverse section of each mericarp exhibits six vittæ. Odour aromatic; taste aromatic and agreeable.

Test.—When incinerated the Fruit should not yield more than 8 p.c. of ash.

The ash was determined from three samples of Seeds and three samples of Pulvis Carui: Seeds, 6·68, 5·72, 7·16 p. c.; Pulvis, 5·87, 6·51, 7·05 p.c.

Analysis of 'drawn' or exhausted Caraways.—*Analyst* '96, 207.

Preparations.

AQUA CARUI. Caraway Water.

Caraway Fruit, 1; Water, 20: distil 10. =(1 in 10).

Dose.—Not given in B.P.; 1 to 2 fl. oz.

Foreign Pharmacopœias.—Official in Swed.; not in the others.

OLEUM CARUI. Oil of Caraway.

The Oil distilled from Caraway Fruit.

Dose.—½ to 3 minims.

Description.—Colourless or pale yellow, with the characteristic odour of the fruit, and a spicy taste. Sp. gr. ·910 to ·920.

Caraway Oil consists principally of a Hydrocarbon **Carvene** ($C_{15}H_{24}$) and an oxidised body **Carvol** ($C_{10}H_{14}O$). These occur in different proportions in the Oil according to its source and method of distillation. It is the Carvol to which the Oil owes its medicinal properties. The higher the sp. gr. and the greater the solubility in 50 p.c. Alcohol, the more Carvol is likely to be contained in the sample. The sp. gr. of the Oil varies between very wide limits. We have bought samples as low as ·889, but the usual range is between ·910 and ·925.

Carvol (Carvone).—Sp. gr. ·960. When obtained from the Oils of Caraway and Dill is dextrogyrate, and Lævogyrate when obtained from Oil of Spearmint. It can be assayed by conversion into Carvoxime by treatment with Hydroxylamine Hydrochlorate.—*P.J.* '96, i. 342; *C.D.* '96, i. 778.

Foreign Pharmacopœias.—Official in Austr., Ger., Port., Swiss, and U.S.; Fr., Huile Volatile de Carvi; Dan., Norw. and Swed., Aetheroleum Carvi; Russ., sp. gr. ·900—·960; not in the others.

CARYOPHYLLUM.

CLOVES.

The dried flower-buds of *Eugenia caryophyllata*.

Imported from Penang, Bencoolen, Amboyna, and Zanzibar.

Medicinal Properties.—Stimulant, aromatic, and carminative, antispasmodic, antiseptic. Administered to check nausea, vomiting, and flatulence, and to promote digestion. But chiefly used as an adjuvant to other medicines. The **oil** is a useful ingredient in liniments for whooping cough and bronchitis.

Dose.—Not given in B.P.; 5 to 10 grains.

Prescribing Notes.—The Oil may be given on a lump of sugar, and is a useful constituent of aperient pill masses. The Infusion is a nice flavouring for many mixtures.

Incompatibles.—*See* under Infusum Caryophylli.

Official Preparations.—Infusum Caryophylli, and Oleum Caryophylli. Used in the preparation of Infusum Aurantii Compositum. Contained in Pulvis Cretæ Aromaticus. The **Oil** is contained in Pilula Colocynthidis Composita, and Pilula Colocynthidis et Hyoscyami.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr. (Girofles), Ger., Hung., Ital. (Garofani), Jap., Mex. (Clavo de Especia), Norw., Port. (Cravinho), Russ., Span. (Clavo), Swed., Swiss and U.S.; not in Dutch.

Description.—About five-eighths of an inch (fifteen millimetres) long, each consisting of a dark-brown, wrinkled, subcylindrical, somewhat angular calyx tube, which tapers below and is surmounted by four thick, rigid, patent teeth, between which are four paler imbricated petals enclosing numerous stamens and a single style. Odour strong, fragrant, and spicy; taste very pungent and aromatic.

Tests.—Cloves should emit oil when indented with the finger-nail. Incinerated they should not yield more than 7 p.c. of ash.

The ash was determined from three samples of Cloves and three samples of the Powder: Cloves yielded, 4·78, 4·82, 5·11 p.c.; Powder, 6·13, 6·97, 6·97 p. c.

Microscopical examination of Cloves.—*A.J.P.* '94, 479; *P.J.* (3) xxv. 260.

The amount of Tannin present in Cloves ranges from 10 to 13 p.c. of the weight of the spice as found in the market. The Tannin of Cloves has the same percentage composition as Gallotannic Acid, and yields the same decomposition products as that compound; hence, they are identical.—*A.J.P.* '95, 306.

By substituting a 50 p.c. solution of Sodium Salicylate for Water in the retort, when distilling the Oil from Cloves, considerably higher results could be obtained. In the case of Cloves, an average of 19·45 p.c. of Oil, containing 84·52 p.c. of Eugenol, was obtained, as compared with 17·75 p.c. of Oil, containing 79·44 p.c. of Eugenol, in the Water distillation.—*Analyst* '94, 250; *J.C.S. Abs.* '94, ii. 335.

Preparations.

INFUSUM CARYOPHYLLI. Infusion of Cloves.

Cloves, bruised, 1; Distilled Water, boiling, 40: infuse in a covered vessel for fifteen minutes; strain. =(1 in 40).

Time reduced from half an hour to fifteen minutes.

Dose.—½ to 1 fl. oz.

Incompatibles.—Lime Water, salts of Iron, mineral acids, Gelatin.

(Not in the other Pharmacopœias.)

OLEUM CARYOPHYLLI. Oil of Cloves.

The Oil distilled from Cloves.

Solubility.—1 in 60 of Alcohol (60 p.c.); in all proportions of Alcohol (90 p.c.), Ether, and Strong Acetic Acid.

Dose.—½ to 3 minims.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—Colourless or pale yellow when recent, but gradually becoming reddish-brown, having the strong odour and taste of Cloves.

Tests.—Sp. gr. not below 1·050. An Alcoholic Solution yields a blue colour with Test-solution of Ferric Chloride. Shaken with its own volume of Strong Solution of Ammonia, it forms a semi-solid yellowish mass.

The principal constituent of Clove Oil is **Eugenol**, a phenol having the formula, $C_{10}H_{12}O_2$; details for its estimation by Thoms' method will be found in *P.J.* (3) xxii. 451. The percentage of Eugenol in the oil varies between 77 and 90 p.c., and it is found that a 'stem' Oil yields as high an average as that from the flower-buds.

Eugenol can be approximately determined by treating the oil with a 10 p.c. aqueous

solution of Potassium Hydroxide, warming the mixture, and measuring the uncombined portion which rises to the top.—*P.J.* (3) xxv. 951.

The presence of **Acetyleugenol** has also been demonstrated.—*J.C.S. Abs.* '98, i. 37; *J.S.C.I.* '97, 1050; *A.J.P.* '97, 638.

Sp. gr. (several examples examined) 1·041 to 1·063; the majority were over 1·055.

Schimmel states the sp. gr. of a genuine Oil never falls below 1·060; but commercial Oil in this country rarely exceeds that figure.

Note on characters of Clove Oil.—*P.J.* (3) xxv. 950.

CASCARA SAGRADA.

CASCARA SAGRADA.

B.P.Syn.—Rhamni Purshiani Cortex; Sacred Bark.

The dried bark of *Rhamnus Purshianus.*

Medicinal Properties.—Tonic laxative. Acts principally on the large intestine. Indicated in obstinate and habitual constipation, especially of old persons, and in an atonic condition of the stomach and bowels, as in anæmia. It should not be given as a purgative, but in such a constant continuous manner that a normal condition will be brought about. It is better to give two small doses, say 20 minims of the liquid extract night and morning, than one large dose. The dose should be reduced gradually.

Prescribing Notes.—Usually given in the form of Extract in Pills or Pilules, or one of the fluid preparations. The Extract is best made into Pills with Alcohol (90 p.c.) with the addition of one-tenth of its weight of Gum Acacia in powder; also obtainable in the form of Compressed Tablets. Capsules may be had containing a very concentrated Fluid Extract, equivalent to 15 and 30 minims of the ordinary Fluid Extract, and other strengths as desired.

Elixir of Cascara (Kasak) is an agreeable and reliable preparation. *See* below.

Official Preparations.—Extractum Cascaræ Sagradæ, Extractum Cascaræ Sagradæ Liquidum, and Syrupus Cascaræ Aromaticus.

Not Official.—Capsules of Cascara, Elixir of Cascara (Kasak), Elixir Cascaræ Sagradæ, Extractum Cascaræ Liquidum Insipidum, Syrupus Cascaræ Sagradæ.

Foreign Pharmacopœias.—Official in Austr., Dan., Fr., Mex., Norw., Russ., Swiss and U.S.; not in the others.

Description.—In quilled, channelled, or nearly flat pieces, frequently about four inches (ten centimetres) long, three-quarters of an inch (eighteen millimetres) wide, and about one sixteenth of an inch (one millimetre and a half) thick. It posseses a nearly smooth dark purplish-brown cork, marked with scattered, transversely elongated lenticels, but usually more or less covered with patches of silvery-grey lichen; and when these are removed the exposed cork is of a brownish-red colour. The inner surface is reddish-brown with faint transverse corrugations, and longitudinal striations. The fracture is short, and near the inner surface somewhat fibrous. The bark has a characteristic but not powerful odour, and a persistent, nauseous and bitter taste.

The glucoside **Purshianin** has been separated in the form of dark-brown red crystals, melting at 237° C. and found to yield Emodin and a dextro-rotatory, non-fermentable sugar.—*P.J.* '98, ii. 49.

Preparations.

EXTRACTUM CASCARÆ SAGRADÆ. Extract of Cascara Sagrada. *B.P.Syn.*—Extractum Rhamni Purshiani. (Altered.)

Moisten Cascara Sagrada, in No. 20 powder, with Distilled Water, and let it remain a few hours to soften and swell; then place it loosely in a percolator and percolate with more Distilled Water until it is exhausted. Evaporate on a water-bath to dryness.

It is now an aqueous extract instead of alcoholic, and evaporated to dryness.

Dose.—2 to 8 grains.

Foreign Pharmacopœias.—Official in Fr. and Mex.; not in the others.

EXTRACTUM CASCARÆ SAGRADÆ LIQUIDUM. Liquid Extract of Cascara Sagrada. *B.P.Syn.*—Extractum Rhamni Purshiani Liquidum. (Modified.)

Cascara Sagrada, in No. 20 powder, 20; Alcohol (90 p.c.), 4; Distilled Water, a sufficient quantity. Moisten the Cascara Sagrada with 15 of the Distilled Water, and set the mixture aside for six hours; then place it loosely in a percolator and percolate with more of the Distilled Water until the powder is exhausted; evaporate the percolate to 12; add the Alcohol, previously mixed with 4 of the Distilled Water or with sufficient to make up the volume of the mixed liquids to 20 of the Liquid Extract. =(1 in 1).

Process altered and Alcohol (90 p.c.) used in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

A specific gravity would have been useful if included in the B.P.—*P.J.* '98, i. 893.

Cascara and Cascara Extracts.—*P.J.* '98, i. 893.

Foreign Pharmacopœias.—Official in Austr., Dan., Mex., Norw., Swiss and U.S., with dilute Spirit; not in the others.

Given with Ferri et Ammonii Citras and Ammonia.—*B.M.J.* '88. ii. 691.

SYRUPUS CASCARÆ AROMATICUS. Aromatic Syrup of Cascara. (New.)

Liquid Extract of Cascara Sagrada, 8; Tincture of Orange, 2; Alcohol (90 p.c.), 1; Cinnamon Water, 3; Syrup, 6. Mix.
=(1 of Liquid Extract in 2½).

This is the same formula as the B.P.C. Elixir Cascaræ Sagradæ.

Dose.—½ to 2 fl. drm.

Not Official.

CAPSULES OF CASCARA.—Two strengths, containing concentrated extract equal to 15 and 30 minims respectively of Fluid Extract.

ELIXIR OF CASCARA (Kasak).—Under this title is sold a proprietary preparation of Cascara, which is palatable, uniform, and reliable.

Dose.—½ fl. oz. for an adult, 1 or 2 fl. drm. for a child.

ELIXIR CASCARÆ SAGRADÆ (*B.P.C.*)—Now official as Syrupus Cascaræ Aromaticus.

EXTRACTUM CASCARÆ LIQUIDUM INSIPIDUM.—It having been stated that the disagreeable bitterness of Cascara Sagrada could be prevented or removed by treatment with Magnesia, 'tasteless Extracts' have attracted considerable attention. Evidence both as to their tastelessness and efficacy is decidedly conflicting

In any case their action seems uncertain and the balance of evidence is against them.—*P.J.* (3) xix. 254—257; xx. 491; *C.D.* '88 ii. 169, 267, 376; '89, i. 19.

SYRUPUS CASCARÆ SAGRADÆ (*B.P.C.*).—Liquid Extract of Cascara Sagrada, 4: Liquid Extract of Liquorice, 3; Carminative Tincture, ¼; Syrup to make 20: mix.

Dose.—1 to 4 fl. drm.

CASCARILLA.

CASCARILLA.

The dried bark of *Croton Eluteria*.

It contains from ½ to 2 p.c. of an aromatic Oil.

Medicinal Properties.—Aromatic and stomachic. With some physicians it is a favourite bitter tonic. Used in dyspepsia, chronic diarrhœa, dysentery, and in recovery from acute diseases.

Prescribing Notes.—The Infusion quickly changes, and will scarcely keep good for a day in summer, but when prescribed with an aromatic Tincture it keeps well.

The Tincture is frequently prescribed with the diluted mineral acids, which, however, usually causes a separation of the resin.

Official Preparations.—Infusum Cascarillæ and Tinctura Cascarillæ.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Jap., Norw., Port., Russ., Swed., Swiss and U.S.; not in Hung., Mex., or Span.

Description.—In quills, from one to three inches (two and a half to seven and a half centimetres) or more in length, and from about one-sixth to half an inch (four to twelve millimetres) in diameter, or in small curved pieces. The outer layer consists of a dull-brown or dark-grey longitudinally wrinkled cork, frequently marked with small longitudinal and transverse cracks, and more or less completely covered with silvery-grey patches spotted with minute black dots; it easily separates, disclosing a brown or dark-grey inner layer marked with longitudinal and transverse furrows. Fracture short, and resinous; the tranverse section exhibits under a lens dark reddish-brown bast traversed by thin whitish medullary rays, but no groups of sclerenchymatous cells. It has an agreeable aromatic odour, especially when burned, and an aromatic, bitter taste.

In addition to the substance Betaïne, the bark contains an alkaloid Cascarilline. —*P.J.* '96, ii. 95; '98, i. 279; *C.D.* '96, ii. 195.

Preparations.

INFUSUM CASCARILLÆ. Infusion of Cascarilla. (Altered.)

Cascarilla, in No. 10 powder, 1; boiling Distilled Water, 20: infuse in a covered vessel for fifteen minutes; strain. =(1 in 20).

Half the strength of B.P. '85, and time reduced.

Dose.—½ to 1 fl. oz.

Incompatibles.—Lime Water and metallic salts.

(Not in the other Pharmacopœias.)

TINCTURA CASCARILLÆ. Tincture of Cascarilla. (Altered.)

Cascarilla, in No. 40 powder, 4; Alcohol (70 p.c.), a sufficient

quantity. Moisten the powder with 3 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 5).

Now 1 in 5 instead of 1 in 3, and Alcohol (70 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Austr., 1 in 10; Belg., Dan., Fr., Jap., Norw., Russ., Swed. and Swiss, 1 in 5; not in the others.

Not Official.

CASSIÆ OLEUM.

OIL OF CASSIA.

A volatile Oil distilled from *Cinnamomum Cassia*.

This Oil is official in the German and United States Pharmacopœias under the name 'Oleum Cinnamomi.'

A yellowish or brownish liquid, becoming darker and thicker by age and exposure to the air, having the characteristic odour of Cassia, and a sweetish, spicy, and burning taste.

Soluble in an equal volume of Alcohol, the solution being slightly acid to Litmus paper; also soluble in an equal volume of Glacial Acetic Acid.

Tests.—Sp. gr. 1·055 to 1·065 at 15° C. (59° F.).

When shaken with a saturated solution of Sodium Bisulphite, it solidifies to a crystalline mass.

If 4 drops of the Oil, contained in a test-tube, be cooled to 0° C. (32° F.), and then shaken with 4 drops of fuming Nitric Acid, crystalline needles or plates will be formed.

If a portion of the Oil be shaken with water, and the liquid passed through a wet filter, the clear filtrate should give, with a few drops of basic Lead Acetate T.S., a white turbidity, without a yellow colour (absence of Oil of Cloves).

If 4 drops of the Oil be dissolved in 10 c.c. of Alcohol, the subsequent addition of a drop of Ferric Chloride T.S. should produce a brown, but not a green or blue colour (absence of Oil of Cloves or of Carbolic Acid).

Schimmel states that this Oil is freely adulterated and that genuine samples contain at least 75 p.c. of Cinnamic Aldehyde.

Notes on the Bisulphite process for estimating the Cinnamic Aldehyde.—*A.J.P.* '96, 194; *J.S.C.I.* '95, 986.

CASSIÆ PULPA.

CASSIA PULP.

The pulp obtained from the pods of *Cassia Fistula*.

Imported from the East or West Indies.

Medicinal Properties.—Laxative. Useful in small doses for habitual constipation. Large doses occasion nausea, flatulence, and griping; generally given in combination.

Dose.—Not given in B.P.: 60 to 120 grains as a laxative; 1 to 2 oz. as a purgative.

Official Preparation.—Contained in Confectio Sennæ; 1 part in 8 nearly.

Foreign Pharmacopœias.—Austr., Fruit and Pulp; Belg., Fruit and Extract;

Fr., Pulpe de Casse, also Extrait de Casse; Ital., Mex., Port., Span., Swiss and U.S., Fruit; not in the others.

Description.—The pods are from a foot and a half to two feet (thirty-five to fifty centimetres) long, and from three-quarters to one inch (eighteen to twenty-five millimetres) in diameter. They are nearly cylindrical in shape, shortly stalked, blackish-brown, very hard, indehiscent, the sutures being marked by two smooth longitudinal bands. They are divided internally by thin transverse partitions into numerous cells, each containing a smooth flattish-oval reddish-brown seed, surrounded by pulp. The Pulp, which alone is official, is viscid and nearly black, with a faint odour and sweet taste.

Not Official.

CASTOREUM.

The dried preputial follicles and their secretion, obtained from the Beaver, *Castor Fiber*, the oil sacs being rejected.

Medicinal Properties.—Moderately stimulant and antispasmodic: occasionally used in hysteria and spasmodic disorders.

Dose.—Of the powder 5 to 10 grains.

Foreign Pharmacopœias.—Official in all except Ger., Jap. and U.S.

Russian Castor contains 4·5 p.c. and Canadian 2 p.c. of Castorin. The Tincture forms with water a milky liquid which on the addition of Ammonia becomes clear when made with Russian Castor, but remains cloudy when made with Canadian. —*Hager*.

Analysis of Castoreum du Gardon.—*P.J.* '97, i. 161.

Preparation.

TINCTURA CASTOREI.—Castor, in coarse powder, 1; Alcohol (90 per cent), 20: macerate seven days, agitating occasionally, strain, press, and add sufficient Alcohol to make 20. = (1 in 20).

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Dan., Hung., Norw., Port. and Swed., 1 in 5; Dutch, 1 in 8; Belg., Fr., Russ. and Swiss, 1 in 10; Mex., 1 and 10; Span., 1 in 25; all by weight. Not in Ger., Ital., Jap. or U.S.

CATAPLASMATA.

These preparations are now deleted from the B.P.

CATECHU.

CATECHU.

B.P.Syn.—Catechu Pallidum.

An extract of the leaves and young shoots of *Uncaria Gambier*.

Prepared in Singapore and in other places in the Eastern Archipelago.

Terra Japonica is a trade term (now almost obsolete) applied both to Cutch and Gambier.

Solubility.—Almost entirely soluble in boiling Water. 75 p.c. is soluble in Alcohol (90 p.c.). Of 100 parts, only 50 to 60 are dissolved by cold Water, and the solution is bright.

Medicinal Properties.—A powerful astringent. Used chiefly in diarrhœa and dysentery, also as an astringent for hæmorrhage and discharges from mucous membranes. Lozenges are the best medium for administering it in relaxed conditions of the throat and in ulcers of the mouth.

Dose.—5 to 15 grains.

Incompatibles.—The Alkalis, metallic salts, and Gelatin.

Official Preparations.—Pulvis Catechu Compositus, Tinctura Catechu, and Trochiscus Catechu.

Not Official.—Catechu Nigrum.

Foreign Pharmacopœias.—Official in Ger., Jap., Port., Cato; not in the others. *See* Catechu Nigrum, p. 198.

Description.—In cubes which are sometimes more or less agglutinated. Each side measures about an inch (twenty-five millimetres). They are deep reddish-brown externally, pale cinnamon-brown internally, porous and friable. When examined under the microscope they are found to consist chiefly of minute acicular crystals. Taste at first bitter and very astringent, but subsequently sweetish; no odour.

Tests.—Almost entirely soluble in boiling Water. 70 p.c. should be soluble in Alcohol (90 p.c.). Catechu should not afford any characteristic reaction with the tests for Starch, and should not yield more than 5 p.c. of ash when incinerated.

The pale Catechu being already in the Edin. Ph., the B.P. 1864 retained it with the Black; but the black is the one adopted by other Pharmacopœias, and is preferred in the arts and manufactures; it is well known to be far superior to the pale in astringency, and always to be had of good quality; it is therefore a matter of surprise and regret that it was rejected from the British Pharmacopœia, and not again included in the subsequent editions.

PULVIS CATECHU COMPOSITUS. Compound Powder of Catechu.

Catechu, 4; Kino, 2; Krameria Root, 2; Cinnamon Bark, 1; Nutmeg, 1: all in powder; mix. =(1 in 2½).

Keep it in a stoppered bottle.

Dose.—10 to 40 grains.

(Not in the other Pharmacopœias.)

TINCTURA CATECHU. Tincture of Catechu. (Altered.)

Catechu, in coarse powder, 4; Cinnamon Bark, bruised, 1; Alcohol (60 p.c.), 20: prepare by the maceration process. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and Alcohol (60 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in U.S. (Tinct. Catechu Co.), 1 in 10; Austr., Belg., Fr. (Tinct. Cachou), Dutch, Ger., Jap., Port., Russ., and Swiss, 1 in 5; Mex., 1 and 5; all by weight (except U.S.), and with **Black Catechu.** Not in the others.

TROCHISCUS CATECHU. Catechu Lozenge.

Catechu, 1 grain. Mix with the simple basis to form a Lozenge.

Dose.—Not given in B.P.; 1 to 6 lozenges.

Foreign Pharmacopœias.—Official in U.S., 1 grain Black Catechu in each; Belg. (Tabella) 3 grains in each; Dutch, about 1½ grains in each; Ital., Pastiglie di Catechu; not in the others.

Not Official.

CATECHU NIGRUM.—Black Catechu, Pegu Catechu, Cutch.—An extract from the heart wood of *Acacia Catechu*, dried and imported from Pegu. It generally occurs in irregularly shaped blackish-brown masses, astringent, and bitter in taste.

Solubility.—Of 100 parts, only 88 are dissolved by cold Water, the solution being very turbid. 60 parts of Isinglass precipitate the whole of the astringent matter.

Dose.—5 to 15 grains.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Fr. (Cachou), Ger., Ital., Jap., Mex., Port. (Cato), Russ., Span., Swiss and U.S.; not in the others.

*** As **GUMMI RUBRUM** is advantageously used as a substitute for Catechu, it may be proper to mention it here, but it will be found in its alphabetical order with its preparations.

CERA ALBA.

WHITE BEESWAX.

Yellow Beeswax which has been bleached by exposure to moisture, air, and light.

Solubility.—Entirely in Oil of Turpentine, insoluble in Alcohol (90 p.c.); slightly, and not uniformly, soluble in (cold) Ether; about 1 in 100 of boiling Alcohol (90 p.c.); 1 in 10 of boiling Ether.

Medicinal Properties.—Emollient; chiefly employed as an ingredient in Ointments.

Official Preparations.—Contained in Pilula Phosphori, Suppositoria Acidi Carbolici, Unguentum Aquæ Rosæ, and Unguentum Cetacei.

Not Official.—Unguentum Simplex, and Cold Cream.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Ger., Hung., Ital., Norw., Port. (Cera branca), Mex., Russ., Span., Swed., Swiss and U.S.; not in Dutch and Jap.

Description.—Hard, nearly white, translucent masses.

Test.—It should respond to the tests for Yellow Beeswax.

The Acid value might be expected to be a trifle higher than that of Cera Flava.

Not Official.

UNGUENTUM SIMPLEX.—Formerly Official in B.P., but now omitted.

Foreign Pharmacopœias.—Official in Austr. and Hung., Lard 8, White Wax 2; Belg., Lard 17, White Wax 3; Dutch, Yellow Wax 3, Olive Oil 7; Jap., Yellow Wax 1, Sesame Oil 2; Mex., White Wax 1, Sesame Oil 3; Swiss, White Wax 30, Olive Oil 70, Benzoin 2; U.S., Lard 8, Yellow Wax 2; Fr. (Cérat Simple), Oil of Almonds 6, White Wax 2; Ger. (Unguentum Cereum), Olive Oil 7, Yellow Wax 3; Port. (Ceroto Simples), White Wax 3, Almond Oil 7; Span. (Cerato Simple), White Wax 1, Almond Oil 3; Swed. (Ceratum Album), White Wax 1, Spermaceti 1, Benzoated Lard 3, also (Ceratum Flavum) Yellow Wax 1, Olive Oil, 2; Dan. and Norw. (Ung. Cerae), and Russ. (Ung. Cereum), Olive Oil 3, Yellow Wax 1.

COLD CREAM.—White Beeswax, 1; Spermaceti, 1; Oil of Almonds, 8; Rose Water, 11; Otto of Rose to perfume it. Melt together, by means of a water-bath, the Oil, Spermaceti, and Beeswax, add the Otto, strain through muslin into the Rose Water; stir together whilst gently warming until water globules are no longer visible, and the mixture is of proper consistence to pour into pots without separating.

CERA FLAVA.

YELLOW BEESWAX.

Prepared from the honeycomb of the Hive-Bee, *Apis mellifica*.

When quite fresh, is of a golden yellow, but on keeping gets brown.

Solubility.—The same as Cera Alba.

Medicinal Properties.—Chiefly used in medicine as an ingredient of plasters and ointments, and is preferable to White Beeswax for the purpose, the ointments keeping a long time without becoming rancid.

Official Preparation.—Cera Alba. Used in the preparation of Emplastrum Calefaciens, Emplastrum Cantharidis, Unguentum Menthol, Emplastrum Picis, Unguentum Hydrargyri Compositum, Unguentum Picis Liquidæ, Unguentum Resinæ and Unguentum Staphisagriæ.

Not Official.—Aseptic Wax.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Cire Jaune), Ger., Hung., Ital., Jap., Mex. (Cera Amarilla); Norw., Port. (Cera Amarella), Russ., Span., Swed., Swiss and U.S.

Description.—Firm, breaking with a granular fracture, yellowish, having an agreeable honey-like odour. Not unctuous to the touch.

Tests.—It should be readily and entirely soluble in hot Oil of Turpentine. It should not yield more than 3 p.c. to cold Alcohol (90 p.c.), nor more than 50 p.c. to cold Ether, and nothing to Water or to boiling Solution of Sodium Hydroxide, the two latter liquids after filtration neither being turbid nor yielding a precipitate on the addition of Hydrochloric Acid. (Absence of fatty acids, Resin, and Japan wax.) Sp. gr. ·960 to ·970. Melts at 144·5° to 147° F. (62·5° to 63·9° C.) when tested in the following manner:—Liquefy a small piece, and draw a little of the liquid Beeswax up into a capillary tube of not more than one millimetre in internal diameter; after it has been allowed to cool for three hours, fix a piece of the filled capillary tube to the bulb of a thermometer by thread; immerse the bulb and tube in a beaker of Water and heat the latter gradually on a water-bath; at the moment the opaque rod of Beeswax becomes transparent, note the temperature. The solidifying point is 2° to 3° lower than the melting point. 5 grammes of the Beeswax melted in and mixed with boiling Alcohol (90 p.c.), should require for neutralisation not less than 1·6 c.c. of Normal Alcoholic Volumetric Solution of Potassium Hydroxide, using Phenol-phthalein as an indicator. Upon the further addition of 20 c.c. of the Volumetric Solution, and well boiling for one hour under a reflux condenser, not less than 6·2 nor more than 6·8 c.c. should be found to have combined with the Beeswax, as shown by the titration of the uncombined alkali with Volumetric Solution of Sulphuric Acid. If 5 grammes

of Beeswax are heated for fifteen minutes with 25 grammes of Sulphuric Acid to 320° F. (160° C.) and the mixture diluted with Water, no solid, wax-like body should separate (absence of Paraffin). Beeswax should not yield any characteristic reaction with the tests for Starch.

Guyer, in an extensive paper on Beeswax analysis, recommends the following figures:—·962 to ·966 for specific gravity, and 144·5 to 147·2° F. (62·5°—64° C.) for melting point. He mentions that it is perfectly possible to add adulterants which will enable a sample to pass these tests, and suggests the determination of the Acid and Ester value, on the 'permillage' system (number of milligrammes of KHO absorbed by 1 gramme Beeswax). The average chemical constants of Beeswax thus expressed are:—Acid value 20, Ether value 75, Saponification value (a combination of the A.V. and E.V.), 95. The official figures correspond to:—A.V. not less than 18, E.V. 69 to 75, S.V. 87 to 93. In addition to the above tests every sample should be boiled with Alcohol (90 p.c.), filtered when cold, and an equal volume of water added to one part, and an equal volume of Calcium Chloride Solution to another. In both cases the mixture should remain bright and clear (absence of Japan Wax, Resin and Tallow). He also recommends inclusion of Iodine absorption on doubtful samples, those absorbing Iodine containing a foreign body, probably Carnauba Wax, Tallow, or Resin.—*P.J.* '96, ii. 384, 445; '97, i. 308.

Remarks on the Iodine absorption of Beeswax and its impurities.—*J.S.C.I.* '98, 1075.

B.P. does not state how the sp. gr. is to be taken. A ready method will be found in *P.J.* '96, ii. 385.

Not Official.

ASEPTIC WAX.—Beeswax, 87; Almond Oil, 12; Salicylic Acid, 1. Melt the Beeswax and Oil, strain through muslin, add the Salicylic Acid, heat to 150° C. (300° F.) in an oil-bath; pour into stoppered bottles, which have been sterilised, and when cold add to each bottle sufficient aqueous solution of Mercuric Chloride (1 in 500) to cover the Beeswax.

This Wax was made by us for Mr. Victor Horsley, who used it for arresting hæmorrhage from cranial bones, by smearing it over the bleeding surface.—*B.M.J.* '92, i. 1165.

CERII OXALAS.

CERIUM OXALATE.

$Ce_2(C_2O_4)_3, 9H_2O$, eq. 701·34.

It may be obtained by interaction of a soluble Cerium salt and a soluble Oxalate. It usually contains some Lanthanum Oxalate and Didymium Oxalate.

An exhaustive paper on Cerium and its salts.—*P.J.* (3) xxv, 337, 377, 418.

Medicinal Properties.—Gastric sedative. Of great value in chronic vomiting, and vomiting during pregnancy, and of phthisis; also in dyspepsia, gastrodynia, and pyrosis. It has been strongly recommended in sea-sickness, in doses of 10 to 20 grains every three hours. Given with success in spasmodic cough of gastric origin.

Dose.—2 to 10 grains.

Prescribing Notes.—It is taken in 5 to 15 grain doses as a powder mixed with a little Water; also given in **cachets**.

It can be safely administered in 10 grain doses 3 times a day for many days in succession; the only unpleasant symptom when so used was slight dryness of the

mouth; that appeared after several days. It was most efficacious in the treatment of chronic cough, and the initial dose should be 5 grains. It did not disturb the stomach; on the contrary, relieved nausea and improved digestion. (Conclusions arrived at by the Committee of the New York Therapeutical Society on April 9, 1880, *New York Medical Record*, May 1, 1880.)

Cerium Oxalate in the gastric crisis of Tabes.—*L.* '96, ii. 551.

Foreign Pharmacopœias.—Official in Dutch, Oxalas Cerosus; Mex. and Port. Oxalato de Cerio; Swed., Oxalas Cerosus Venalis; Jap. and Swiss, Cerium Oxalicum; U.S.; not in the others.

Description.—An almost white granular powder insoluble in Water.

Tests.—It is decomposed at a dull red heat, yielding a reddish-brown powder which dissolves completely and without effervescence in boiling Hydrochloric Acid; the resulting solution gives with a saturated solution of Potassium Sulphate a white crystalline precipitate. When incinerated it loses 53 p.c. in weight. It should yield no characteristic reaction with the tests for Arsenium, Iron, Aluminium, Zinc, Calcium, Carbonates, or Phosphates.

CETACEUM.

SPERMACETI.

A concrete fatty substance, obtained, mixed with Oil, from the head of the Sperm Whale, *Physeter macrocephalus*. It is separated from the Oil by filtration and pressure, and is afterwards purified.

The Sperm Whale inhabits the Pacific and Indian Oceans.

Cetine or Palmitate of Cetyl, when saponified yields Ethal (the Hydrate of Cetyl) and not Glycerin (the Hydrate of Glyceryl). Most Oils and Fats are Oleates, Palmitates, and Stearates of Glyceryl, which when saponified yield Glycerin and Oleates, Palmitates and Stearates of the metals.

Solubility.—Slightly in Alcohol (90 p.c.); 1 in 80 of boiling Alcohol (90 p.c.); 1 in 6 of Ether; 1 in 1 of boiling Ether; 4 in 5 of Chloroform, and the fixed and volatile oils.

Medicinal Properties.—Emollient. It is much employed for **ointments** and **cerates.**

Official Preparations.—Unguentum Cetacei. Contained in Unguentum Aquæ Rosæ, and Unguentum Capsici.

Not Official.—Unguentum Cetacei sine Benzoino.

Foreign Pharmacopœias.—Official in all. Fr., Blanc de Baleine; Ital., Cetina; Mex., Esperma; Span., Esperma de Ballena.

Description.—In crystalline, pearly-white, glistening masses, which are translucent, slightly unctuous to the touch, and have little taste or odour. It is reducible to powder by the aid of a little Alcohol (90 p.c.).

Tests.—Melting point 114·8°—122° F. (46°—50° C.), when tested by the method described under 'Cera Flava.' ·2 gramme dissolved, by the aid of a water-bath, in 20 c.c. of Alcohol (90 p.c.), two drops of Solution of Phenol-phthalein being added, should not require

more than one drop of Volumetric Solution of Sodium Hydroxide to produce a permanent red colour (limit of acidity). Boiled with Alcohol (90 p.c.), and the mixture cooled and filtered, the filtrate should not afford a flocculent precipitate on the addition of Water (absence of Stearic Acid).

Most samples of Spermaceti contain a trace of free acid, but the quantity ·2 grammes ordered in B.P. is insufficient for the test. We are in the habit of using 5 grammes, which we believe to be the usual quantity.

Kebler records the melting point of Spermaceti as 43°—47° C. in a number of experiments in 1886, and as 43°—46° in a second series made in 1897.—*A.J.P.* '96, 9, and '97, 105.

The Iodine Absorption of pure Spermaceti is practically *nil*.

Preparation.

UNGUENTUM CETACEI. SPERMACETI OINTMENT.

Spermaceti, 5; White Beeswax, 2; Almond Oil (by weight), 18; Benzoin, in coarse powder, ½. Melt together the Spermaceti, Beeswax, and Almond Oil; add the Benzoin, and, frequently stirring the mixture, continue the application of heat for two hours; remove from the source of heat; strain; and stir the Ointment constantly until cold.

The Almond Oil is now by weight instead of by measure.

It would be better to omit the Benzoin, which was first added in 1885; it converts this emollient preparation into one which is irritating: *see* below.

The following are called **Unguentum Cetacei**—(All by weight):—

Dan. Spermaceti 3, White Wax 1, Oil of Almonds 24, Rose Water 12.
Norw. Spermaceti 6, White Wax 6, Oil of Almonds 58, Rose Water 30.
Russ. Spermaceti 3, White Wax 3, Olive Oil 14, Rose Water 2.
Swed. Spermaceti 5, White Wax 4, Oil of Almonds 36, Rose Water 16.

The following are called **Ceratum Cetacei**—(All by weight):—

Austr. Spermaceti, White Wax, Oil of Almonds, equal parts.
Hung. Spermaceti 8, White Wax 8, Lard 9.
Port. Spermaceti 1, White Wax 1, Oil of Almonds 3.
Span. Spermaceti 3, White Wax 2, Oil of Almonds 16, Rose Water 10.
U.S. Spermaceti 2, White Wax 7, Olive Oil 11.

The following are called **Unguentum Leniens**—(All by weight):—

Dutch, Spermaceti 10, Yellow Wax 5, Olive Oil 60, Water 25, Otto of Rose ·05.
Ger. Spermaceti 5, White Wax 4, Almond Oil 32, Water 16, Otto of Rose ·05.

Unguentum Refrigerans—(All by weight):—

Swiss, Spermaceti 2, White Wax 1, Almond Oil 12, Rose Water, 25.

Pomata con Olio di Mandorle:—

Ital., Spermaceti 1, White Wax 1, Oil of Almonds (by weight) 8.

Not Official.

UNGUENTUM CETACEI SINE BENZOINO.—Spermaceti, 5; White Beeswax, 2; Almond Oil, 18: m.s.a.

The B.P. ointment made with Benzoin is unsuited for many purposes for which this ointment is useful, such as **eye** ointments, ointment for piles, &c.

Used as a cool dressing. Applied on lint to broken blisters from walking, it affords great relief, and frequently enables persons to continue the exercise without serious discomfort. It is also recommended for smearing on the feet before starting for a long walk on rough ground.

Not Official.

CETRARIA.

ICELAND MOSS.

The dried lichen, *Cetraria Islandica*. A native of the north of Europe.

Medicinal Properties.—Demulcent, nutritious, and slightly tonic.

Iceland Moss Jujubes are useful for coughs.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Port., Russ., Span., Swed. and Swiss, *Lichen Islandicus*; Mex., Liquen de Islandia; U.S., Cetraria. Not in Norw.

Description.—Almost odourless when dry, but when moistened with water has a feeble seaweed-like odour. Taste mucilaginous and bitter. A strong decoction gelatinises on cooling.

It should be freed from pine leaves, mosses, and other lichens, which are frequently found mixed with it.—*U.S.P.*

Preparations.

DECOCTUM CETRARIÆ.—Iceland Moss, 1: first wash with cold water, then add Distilled Water, 20; boil ten minutes, strain with gentle pressure whilst hot and wash the marc to make 20. =(1 in 20).

Dose.—1 to 4 fl. oz.

Foreign Pharmacopœias.—Official in U.S., 1 in 20; Belg., 1 in 25; Dutch, 6 in 100; Fr. (Tisane) 1 in 100; Russ., 1 in 32; Span., 1 in 67; not in the others.

SACCHARUM CETRARIÆ.—Iceland Moss 1, Sugar 1, Water 100. Wash the Iceland Moss with Water to remove the bitterness, then boil with 100 of Water, strain and express lightly, and in the strained liquid dissolve the Sugar and evaporate on a water-bath. When sufficiently firm remove from the bath and dry in a cupboard to a powder or scale.

GELATINA CETRARIÆ (Iceland Moss Jelly).—Saccharated Cetraria 2, Sugar 1, Water 5. Mix, boil gently till scum collects on the surface, then withdraw the heat, remove the scum, and pour into pots to cool.

Foreign Pharmacopœias.—A similar preparation is given in Austr., Belg., Fr., Ital., Norw., Port., Russ., Span. and Swed.

Cetraric Acid together with Lichenstearic Acid is obtained from Iceland Moss by extracting the powdered flakes with Petroleum Spirit, treating the residue left on evaporation of the solvent, with water and Sodium Carbonate and precipitating with Hydrochloric Acid.—*J.C.S.Abs.* '90, i. 600.

CARRAGEEN. IRISH MOSS.

The dried seaweed *Chondrus crispus*. It is used as an article of food on the west coast of Ireland, where it abounds. Has been proposed as a substitute for Acacia as an emulsifying agent and for the suspension of some powders.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Fuco Carageo), Mex. (Liquen Carragaen); Norw., Port., Russ., Span., Swed., Swiss and U.S.

SACCHARUM CARRAGEEN.—Made like Saccharum Cetrariæ.

GELATINA CARRAGEEN (Irish Moss Jelly).—Made like Gelatina Cetrariæ.

Foreign Pharmacopœias.—A similar preparation is given in the Austr., Belg., Fr., Norw., Port., Russ. and Swed.

CHARTA.

CHARTA SINAPIS. *See* SINAPIS.

Charta Epispastica is now omitted.

Not Official.

CHAULMUGRA OIL.

See GYNOCARDIÆ OLEUM.

Not Official.

CHELIDONIUM. U.S.

CELANDINE.

The entire plant *Chelidonium majus*.

The juice has been successfully used in opacities of the cornea, and is a popular application for the cure of warts.—*B.M.J.* '97, i. 25 and 354.

Has been recommended chiefly by Denisenko in the treatment of cancer. He uses the extract in doses of 20 to 75 grains daily for internal cancers, and for external cancers it is supplemented by parenchymatous injections for which he employs about 1 c.c. of a mixture of Extract, 2; Water, 1; and Glycerin, 1.—*B.M.J.* '97, i. 25, 354 and 637; *B M.J.* '97, ii. 123; *B.M.J.E.* '96, ii. 88; '97, ii. 47; *L.* '96, *ii.* 649 and 1,778; *L.* '97, ii. 737; *P.J.* '97, i. 86. Unfavourably commented on *P.J.* '98, i. 61.

Chelidonine.—This alkaloid forms colourless crystals melting at 135° C.—*P.J.* '97, ii. 21; *C.D.* '97, ii. 56.

Soluble in Alcohol, insoluble in Water, and but slightly soluble in Ether.

The **Sulphate** is readily soluble in Water, the **Hydrochloride** less so, and the **Tannate** is insoluble in Water.

CHIRATA.

CHIRETTA.

The dried plant, *Swertia Chirata*. Collected when in flower.

It is a native of, and is obtained from Northern India.

The allied species, Ophelia angustifolia and O. alata, as well as Andrographis paniculata, have frequently been imported into this country as Chirata.—*P.J.* (3) xxi. 837. A false Chiretta is described *P.J.* '95, ii. 197.

Medicinal Properties.—Bitter tonic and stomachic; is without astringency; given in atonic dyspepsia with acidity.

Official Preparations.—Infusum Chiratæ, Liquor Chiratæ Concentratus, and Tinctura Chiratæ.

Foreign Pharmacopœias.—Official in Port. and U.S.; not in the others.

Description.—Stem three feet or more (about a metre) in length, smooth, brown or purplish-brown in colour, slightly winged and much branched above, rounded below, and containing a large, continuous, easily separable pith. Branches slender, elongated, decussate. Leaves opposite, ovate, glabrous, entire, usually with three to seven lateral veins. Flowers small, numerous, panicled. Fruits superior, bicarpellary, unilocular. No odour; taste extremely bitter.

Preparations.

INFUSUM CHIRATÆ. Infusion of Chiretta. (Altered.)

Chiretta, cut small, 1; Distilled Water boiling, 20. Infuse in a covered vessel for fifteen minutes; strain. =(1 in 20).

Now 1 in 20 instead of 1 in 40, and time reduced.

Dose.—½ to 1 fl. oz.

(Not in the other Pharmacopœias.)

LIQUOR CHIRATÆ CONCENTRATUS. Concentrated Solution of Chiretta. (New.)

Chiretta, in No. 40 powder, 10; Alcohol (20 p.c.), 25, or a sufficient quantity. Moisten the Chiretta with 5 of the Alcohol; pack in a closed percolator; set aside for three days; percolate with the remaining Alcohol, added in 10 equal portions at intervals of twelve hours; continue percolation with more Alcohol until the product measures 20.

Dose.—½ to 1 fl. drm.

TINCTURA CHIRATÆ. Tincture of Chiretta. (Altered.)

Chiretta, in No. 40 powder, 2; Alcohol (60 p.c.) a sufficient quantity. Moisten the powder with 2 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 10).

Now 1 in 10 instead of 1 in 8, and Alcohol (60 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Prescribed in 5 minim doses, with acids and tincture of orange to form an acid tonic mixture.

Foreign Pharmacopœias.—Official in U.S., 1 in 10; not in the others.

CHLORAL HYDRAS.

CHLORAL HYDRATE.

$CCl_3 . CH(OH)_2$, eq. 164·15.

Chloral Hydrate or Trichlorethylidene Glycol, is obtained by the addition of Water to the liquid Chloral produced by the action of dry Chlorine gas on Ethylic Alcohol.

Solubility.—4 in 1 of Water; 5 in 1 of Alcohol (90 p.c.); 2 in 1 of Ether; 2 in 1 of Glycerin; 1 in 1 of Olive Oil; 1 in 3 of Chloroform; 1 in 10 of Oil of Turpentine (cold), 1 in 5 boiling; 1 in 68 of Carbon Bisulphide.

Medicinal Properties.—An excellent hypnotic, producing natural and placid sleep soon after its administration. Suitable in acute mania, delirium tremens, in fevers and insomnia from other causes. Good also in asthma and whooping cough, and extreme cases of chorea; efficacious in large doses in sea-sickness. Has been found useful as a spinal depressant and antispasmodic in tetanus, uræmic and puerperal convulsions, and by intravenous injection in Strychnine poisoning. Of great value in labour, as it relieves pain, assists to dilate the os and relax the rigid perinæum, especially in primiparæ, without lessening the expulsive power of the uterus. Has

been recommended in nocturnal incontinence of urine; and children bear it well. As an anodyne it is inferior to Opium, but forms a good combination with it. It does not set up sickness or dyspepsia and constipation as Opium does.

It is not suitable for subcutaneous injection, as it is likely to produce local inflammation and abscess. It should not be given in advanced cardiac disease, nor in fatty heart.

In concentrated solution, applied locally, it acts as a vesicant.

As a pigmentum with camphor and sometimes Cocaine, it is useful for the relief of neuralgia, rheumatism, toothache and chilblains.

Effects from an overdose or repeated overdoses are excitement, convulsions, and delirium, followed by deep coma and quiet sleep from which the patient may never stir; he may however pass to death without any previous convulsions.

A case of puerperal eclampsia treated by Chloral Hydrate, Potassium Bromide, and Chloroform inhalation.—*L.* '97, ii. 915.

As a pigment in acute coryza, 10 grains in 4 drms. castor oil.—*Pr.* lv. 517.

Dose.—5 to 20 grains.

Prescribing Notes.—3 oz. will dissolve in 1 fl. oz. of Water, and measure 2 fluid ounces and 5½ drachms; if to this be added 23 minims of Water, every minim will contain a grain of Chloral. This **solution** is handy for dispensing.

Incompatibles.—When prescribed with Alkalis, Chloroform will be liberated.

Official Preparation.—Syrupus Chloral.

Not Official.—Suppositoria Chloral, Chloral cum Camphora, Chloral cum Camphora et Cocaina, and Chloral et Phenol.

Antidotes.—Stomach pump or emetics; keep up the temperature by hot blankets, hot water bottles, &c.; injection of a pint of hot strong coffee into rectum; electro-magnetism; inhalations of Amyl Nitrite; in bad cases hypodermic injection $\frac{1}{25}$ grain of Strychnine Nitrate; artificial respiration.—*Murrell.*

$\frac{1}{20}$ of a grain of Picrotoxine has been found enough for 30 grains of Chloral.—*B.M.J.* '75, i. 506.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ. and Swiss, Chloralum Hydratum; Belg. and Dutch, Hydras Chlorali; Dan., Norw. and Swed., Hydras Chloralicus; Fr., Chloral Hydraté; Ital., Cloralio Idrato; Mex., Cloral Hidratado; Port., Hydrato de Chloral; Span., Hidrato de Cloral; U.S., Chloral.

Description.—In colourless, monoclinic plates, which do not deliquesce on exposure to air. It has a pungent but not an acrid odour, and a pungent and rather bitter taste.

A discoloration of Chloral Hydrate crystals caused by a trace of Iron.—*P.J.* (3) xxv, 533.

Tests.—The aqueous solution is neutral or but slightly acid to Litmus. On the application of heat, Chloral Hydrate fuses to a colourless liquid, which, as it cools, begins to solidify at a temperature of about 120° F. (48·9° C.). In a test-tube it boils, when pieces of broken glass are immersed in it, at from 202° to 206° F. (94·4° to 96·7° C.), and on platinum foil at a slightly higher temperature it volatilises without residue. In presence of alkaline substances Chloral Hydrate is decomposed and Chloroform is liberated. If 4 grammes

be heated with 30 c.c. of the Volumetric Solution of Sodium Hydroxide, no more than 6 c.c. of the Volumetric Solution of Sulphuric Acid should be required to neutralise the Soda which remains free on the completion of the reaction. A solution in Chloroform, when mixed by agitation with Sulphuric Acid, does not impart colour to the acid (absence of certain other organic impurities). When 1 gramme of Chloral Hydrate is warmed with 6 c.c. of Water and ·5 c.c. of Solution of Potassium Hydroxide, the mixture filtered, sufficient Solution of Iodine added to impart a deep brown colour, and the whole set aside for an hour, a yellow crystalline precipitate of Iodoform should not result (absence of Chloral Alcoholate). Its aqueous solution should not afford any precipitate with Solution of Silver Nitrate (absence of free Chlorides).

Squibb considers the best adjusted solidifying point to be 122° F. (50° C.). If it is higher, the sample is too much under-hydrated and prone to decompose; if lower, over-hydrated and deliquescent. For good-keeping qualities, it should be slightly under-hydrated.—*Y.B.P.* '76, 166.

A boiling point under 95° C. indicates under-hydration, and the sample is likely to decompose and become acid on keeping, whilst a boiling point above 98° C. indicates an over-hydrated and deliquescent sample. Best commercial specimens begin to boil at about 96°·5 C., quickly rising to 97°, and finally to 98° C. by the time half the liquid has passed over.—*Allen.*

It is extracted from its aqueous solution by shaking out with Ether or Acetic Ether. When in very dilute solution, it may be reduced by the copper-zinc couple and estimated by silver titration.

A simple process for the determination of the amount of Chloroform yielded on treatment with Potassium Hydroxide may be conveniently conducted in a graduated tube, thus: Place in the tube 250 grain-measures of a 20 p.c. solution of Caustic Potash, and add to it gradually (keeping it cold), 50 grains of the Chloral Hydrate; cork securely and shake: allow the liquids to separate, and the number of grain-measures of Chloroform (at the bottom), to which must be added 1 for every 200 grain-measures of supernatant liquid, multiplied by 1·5 gives the grains of Chloroform, which should be not less than 35.

Preparation.

SYRUPUS CHLORAL. Syrup of Chloral.

Chloral Hydrate, 1600 grains; Distilled Water, 30 fl. drm.; Syrup, a sufficient quantity; dissolve the Chloral Hydrate in the Distilled Water; add the Syrup until the mixed product measures 20 oz. =(1 grain in 6 minims).

1 fl. drm. of this Syrup contains 10 grains of Chloral Hydrate.

Dose.—½ to 2 fl. drm.

Foreign Pharmacopœias.—Official in Belg. and Fr., 1 in 20, with Peppermint; Mex. 1 in 20; Port. 1 in 50; Span., 1 in 25; Swiss, 1 in 11. Not in the others.

Not Official.

SUPPOSITORIA CHLORAL.—Chloral Hydrate, 180 grains; White Beeswax, 60 grains; Oil of Theobroma, 60 grains: melt together and pour into moulds.

CHLORAL CUM CAMPHORA (*B.P.C.*)—Chloral Hydrate 1, Camphor 1: rub together in a warm mortar until completely liquefied, and filter if necessary.

As a **Pigmentum** this formula has appeared for many years in the Pharmacopœias of the London, Throat and Westminster Hospitals.

Useful application for the relief of neuralgia.

CHLORAL CUM CAMPHORA ET COCAINA.—Chloral Hydrate 5, Camphor 5, Cocaine 1 : mix.

For the relief of toothache from dental caries, applied on cotton wool.—*B.M.J.* '86, ii. 131.

CHLORAL ET PHENOL.—Chloral Hydrate 1, Carbolic Acid 1 : mix.

Is soluble in Water, Alcohol (90 p.c.), and Glycerin.

So long as the proportion of Carbolic Acid to Chloral does not exceed 1·7 to 1, the product will mix with Water in all proportions; beyond this limit the excess of Carbolic Acid separates on the addition of Water. As it corresponds to 3 molecular weights to 1, there is probably a chemical combination in these proportions.—*P.J.* (3) xvi. 188.

Not Official.

CHLORALAMIDUM.

Chloralamide is a compound of Chloral Anhydride and Formamide.

In colourless crystals. Its aqueous solution should not be heated above 120° F. It is permanent in weakly acidulated solutions, but decomposed by alkalis.

Solubility.—1 in 21 of Water; 1 in 2 of Alcohol (90 p.c.).

Published solubilities of it in Water have varied considerably. The *Companion* figure (1890) has been confirmed (*P.J.* (3) xxii. 805) with the additional note that below 60° F. the solubility decreases very rapidly.—*C.D.* '92, i. 445.

Foreign Pharmacopœias.—Ger. and Russ., Chloralum formamidatum; Mex., Cloralamido; not in the others.

Medicinal Properties.—Hypnotic. It is stated to have much less influence on the heart than Chloral, and therefore may be used in cardiac disease. Other advantages are that the dose need not be increased after continued use, and that the habit of sleeping is kept up after administration has been discontinued.—*Y.B.T.* '94, 468.

Given in all kinds of insomnia.—*L.* '89, ii. 849, 1192; '90, i. 339; *B.M.J.* '89, ii. 1326; '91, i. 1060; *M.P.* '89, ii. 571; *P.J.* (3) xxi. 104; *T.G.* '91, 634, 757; *Pr.* xlvii. 274. In insomnia with 'irregular' heart after influenza.—*B.M.J.* '94, ii. 1045.

Prescribed with Potassium Bromide as a remedy for sea-sickness.—*Pr.* lvi. 145.

A paper on Chloralamide as a safe hypnotic.—*Therapist* '98, 63.

Dose.—20 to 45 grains.

It should not be prescribed with Alkalies, nor be treated with boiling Water.

Preparations.

MISTURA CHLORALAMIDI.—Chloralamide, 4 drm.; Powdered Sugar, 1 oz.; Alcohol (60 p.c.) to make 4½ fl. ounces.

Dose.—3 to 6 fl. drm., to be taken with Water.

CHLOROBROM.—A preparation containing 30 grains of Chloralamide and 30 grains of Potassium Bromide in each ounce. Dose ½ to 1 fl. oz. Has been recommended as a preventive in sea-sickness; also in persistent vomiting not arising from sea-sickness, and in gastric ulcer.—*L.* '92, i. 518; '93, ii. 88, 367, 1564; '94, i. 1001; '95, i. 91. In insomnia and delirium tremens.—*L.* '93, ii. 1486; *L.* '95, i. 1307.

Not Official.

CHLORALOSE.

ANHYDRO-GLUCO-CHLORAL.

A white crystalline powder, melting at 187° C. Soluble in Alcohol, but only slightly so in Water or Ether.

Its boiling aqueous solution does not reduce Ammonio-silver Nitrate.

Medicinal Properties.—Hypnotic and sedative, but dose requires to be watched. Best adapted to cases of simple insomnia. Condemned as a hypnotic for general use as patients rapidly become habituated to the drug, which then ceases to be effective. Found useful in doses of from 4 to 8 grains in cases of epilepsy complicated by insomnia.—*B.M.J.E.* '95, i. 104.

As small a dose as 4 grains has been found to produce alarming intoxication in a tuberculous patient.—*P.J.* (3) xxv. 1139.

In the insomnia and night sweats of phthisis.—*B.M.J.E.* '94, ii. 51; *T.G.* '95, 93; in the insomnia of asylum patients.—*B.M.J.E.* '93, ii. 75, 91; '94, i. 39; ii. 60.

Poisonous effects with large doses.—*Y.B.T.* '95, 83; *Dr.* lii., 98; *B.M.J.E.* '94, ii. 52.

Dose.—3 to 10 grains.

Not Official.

CHLORI LIQUOR.

SOLUTION OF CHLORINE.

It is now transferred to the Appendix of B.P., 1898.

A yellowish-green liquid, smelling strongly of Chlorine.

Medicinal Properties.—Deodorizer, antiseptic, and disinfectant. When diluted it is used as a **gargle** in small-pox, scarlatina, diphtheria, and putrid sore throat, and as a **wash** for ulcers, cancerous sores, buboes, and large abscesses. In India it has been given for biliary obstructions in conjunction with the Nitro-hydrochloric Acid baths.

Strongly advocated by Burney Yeo in the treatment of enteric fever. The solution he uses is obtained by pouring strong Hydrochloric Acid over Potassium Chlorate, thus: into a 12 oz. bottle put 30 grains powdered Potassium Chlorate and pour on it 1 fl. drm. strong Hydrochloric Acid, cork, shake, and allow gas to generate, then add water little by little till bottle is filled. He says it gives much better results and is more pleasant to take than the Liquor Chlori of the B.P. '85. To 12 fl. oz. of this solution he adds 24 to 36 grains of Quinine and 1 fl. oz. of Syrup of Orange peel; he gives 1 fl. oz. of this mixture every two, three, or four hours, according to the severity of the case.

Dose.—10 to 20 minims, in a wineglassful of water.

Incompatibles.—Salts of Lead and Silver.

Antidotes.—In case of poisoning by Chlorine Water, the antidotes are White of Egg, Milk, Flour.

Foreign Pharmacopœias.—Official in Austr. and Belg., Aqua Chlori, ·32 p.c. of Chlorine.; Hung., Jap. and U.S., ·4 p.c.; Ger., Aqua Chlorata (contains ·4 p.c. of Gas); Fr., Chlore Dissous, ·68 p.c.; Solutio Chlori, Swed., ·32 p.c. and Dutch, ·390 p.c.; Russ. and Swiss, Chlorum Solutum ·4 to ·6 p.c.; Port., Soluto de Chloro; Span., Solucion de Cloro; not in Dan., Ital., Mex., or Norw.

Preparation.

LIQUOR CHLORI (*L.H.*).—Potassium Chlorate, 30 grains; Hydrochloric Acid, ½ oz.; Water to 1 fl. oz.: mix.

CHLOROFORMUM.

CHLOROFORM.

$CHCl_3$, eq. 118·48.

Chloroform, or Trichloromethane, to which has been added sufficient Absolute Alcohol to produce a liquid having a specific gravity not less than 1·490, and not more than 1·495. Trichloromethane may be prepared by heating a mixture of Chlorinated Lime, slaked Lime, Ethylic Alcohol, and Distilled Water.

The quantity of Alcohol is not now defined except that the product is worked to a sp. gr.

Solubility.—10 in 7 of Alcohol (90 p.c.); in all proportions of Ether and Alcohol; freely in Olive Oil and Oil of Turpentine. In Water at 32° F. 1 in 150, at 60° F. 1 in 185, at 86° F. 1 in 210, at 113° F. 1 in 200, at 130° F. 1 in 192. Will not dissolve in Glycerin.

Chloroform acts on Vulcanite, and dissolves Caoutchouc, Gutta-percha, Mastic, Elemi, Tolu, Benzoin, and Copal. Amber, Sandarach, Lac, and Beeswax are only partially soluble. It also dissolves Iodine, Bromine, most of the organic alkaloids, the fixed and volatile Oils, most Resins and Fats. It dissolves Sulphur and Phosphorus sparingly.

Fehling's Solution is reduced by Chloroform but not by Alcohol.—*Allen.*

Medicinal Properties.—A general anæsthetic. Internally, a sedative, carminative, and antispasmodic. Its chief use is to produce general anæsthesia by **inhalation** during surgical operations, uræmic and puerperal convulsions and in obstetric practice. Should be given with caution in cases of fatty and of dilated heart, in extensive lung diseases and severe anæmia. Internally, useful to relieve flatulent distension of stomach and bowels, and the cough of fibroid phthisis; in delirium tremens and sea-sickness. Externally, with Camphor, relieves toothache and neuralgia. Applied immediately after the sting of a wasp, takes away the pain. A powerful auxiliary to the Liniments of Aconite and Belladonna.

Its vapour and aqueous solution are powerfully antiseptic.

Vinegar after Chloroform inhalation to prevent sickness. *See* p. 7.

Chloroform should not be used as an anæsthetic in a room where Gas is being burned; a mixture of Chloroform vapour and air being decomposed by a flame with the formation of irritating compounds.—*C.D.* '91, ii. 858.

The dosage of Chloroform for inhalation.—*B.M.J.* '98, i. 1057.

Dose.—1 to 5 minims.

Prescribing Notes.—As a rule in 'mixtures' Chloroform is in such small quantities as to dissolve in the Water; in concentrated 'mixtures' Mucilage of Acacia would be required to suspend it; it can be given in 'drops' dissolved in some strongly alcoholic menstruum. It mixes readily with Camphor Liniment, Soap Liniment, Olive Oil, or Oil of Turpentine.

Official Preparations.—Aqua Chloroformi, Linimentum Chloroformi, Spiritus Chloroformi, Tinctura Chloroformi et Morphinæ Composita.

Not Official.—Liquor Chloroformi Compositus, Tinctura Chloroformi Composita, Chloroformum Camphoratum, Carbon Tetrachloride. A.C.E. Mixture, Vienna Mixture, 'Methylene,' Regnauld's Anæsthetic Mixture.

Antidotes.—In case of overdose of Chloroform, the antidotes are, fresh pure air and artificial respiration (*M.T.* '74, ii. 219), and Amyl Nitrite (*L.* '75, i. 644; *B.M.J.* '97, ii. 352). Hypodermic injection of Strychnine, altogether ½ grain was used in this case in divided doses of $\frac{1}{8}$ grain followed by $\frac{1}{12}$ grain.—*B.M.J.* '97, ii. 1498.

Foreign Pharmacopœias.—Official in Austr. and Jap., sp. gr. 1·485 to 1·500; Belg. sp. gr. 1·491; Fr., sp. gr. 1·500; Dutch and U.S., sp. gr. not below 1·490; Dan., Ger., Hung., Norw. and Russ., sp. gr. 1·485 to 1·489; Ital., sp. gr. 1·493; Swed., sp. gr. 1·485 to 1·493; Mex., Port. and Span., sp. gr. 1·480; Swiss, sp. gr. 1·490.

Description.—A liquid of characteristic odour and pungent sweet taste. Chloroform should be kept cool and in a dark place.

Preservation of Chloroform.—*P.J.* '95, ii. 262; '96, i. 249.

Air and light combined are the most potent factors for inducing decomposition in Chloroform sp. gr. 1·5, which is liable to change; but 640 samples of Chloroform sp. gr. 1·497, representing 20 years' supply, were examined without finding the slightest trace of decomposition in any of them.—*P.J.* '98, ii. 669.

Tests.—Sp. gr. 1·490 to 1·495. It should boil between 140° and 143·6° F. (60° and 62° C.). On allowing 20 c.c. to evaporate from a large piece of filter paper placed on a warm plate, no foreign odour is perceptible at any stage of the evaporation. Water which has been shaken for five minutes with half its volume of Chloroform and separated from the Chloroform should be neutral to Litmus (absence of acid), should not afford any colour with 1 c.c. of Solution of Cadmium Iodide and two drops of Mucilage of Starch (absence of free Chlorine), and should not yield more than a very slight opalescence with four drops of Solution of Silver Nitrate (absence of Chlorides). After shaking Sulphuric Acid with ten times its volume of Chloroform for twenty minutes, and setting aside for fifteen minutes, both the Acid and the Chloroform should be perfectly transparent and nearly colourless. 2 c.c. taken from the layer of Sulphuric Acid and diluted with 5 c.c. of Water should remain transparent and very nearly colourless, and should have a pleasant odour. When this liquid is further diluted with 10 c.c. of Water, and stirred with a glass rod, it should still be transparent and colourless, and the addition of four drops of Solution of Silver Nitrate should not cause more than a slightly diminished transparency. Water which has been shaken with half its volume of Chloroform, previously treated with Sulphuric Acid as described above, should not afford more than a slightly diminished transparency with Solution of Silver Nitrate. (The foregoing four tests indicate absence from the Chloroform of products of its decomposition.) It evaporates without residue (absence of fixed matter).

Preparations.

AQUA CHLOROFORMI. CHLOROFORM WATER. (ALTERED.)

Chloroform, 30 minims; Distilled Water, sufficient to produce 25 fl. oz. Shake them together until the Chloroform is dissolved. =(1 in 400).

This preparation contains half the proportion of Chloroform present in the corresponding preparation of the British Pharmacopœia, 1885.

Dose.—Not given in B.P. ½ to 2 fl. oz.; but ordered in smaller quantities as a flavouring agent.

Foreign Pharmacopœias.—Official in Dan., Norw. and U.S. (1 in 200); not in the others.

LINIMENTUM CHLOROFORMI. Liniment of Chloroform.

Chloroform, 2; Liniment of Camphor, 2: mix. =(1 in 2).

The oil in the Camphor Liniment prevents rapid evaporation of the Chloroform.

Foreign Pharmacopœias.—Official in Fr., Chloroform 1, Almond Oil 9; Span., Chloroform 1, Compound Oil of Stramonium 9; Swiss, Chloroform 3, Olive Oil 3 (all by weight); U.S., Chloroform 3, Soap Liniment 7; not in the others.

SPIRITUS CHLOROFORMI. Spirit of Chloroform. *B.P.Syn.*—Chloric Ether; Spirit of Chloric Ether. (Modified.)

Chloroform, 1; Alcohol (90 p.c.), a sufficient quantity. To the Chloroform add enough of the Alcohol to make the product measure 20 of the Spirit of Chloroform. =(1 in 20).

Now made with Alcohol (90 p.c.) instead of Rectified Spirit.

Dose.—5 to 20 minims, for repeated administration; for a single administration, 30 to 40 minims.

Frequently prescribed as a sweetening agent, and to cover nauseous flavours.

Foreign Pharmacopœias.—Official in Jap., 1 in 20; U.S., Chloroform 6, Alcohol 94; not in the others.

TINCTURA CHLOROFORMI ET MORPHINÆ COMPOSITA. Compound Tincture of Chloroform and Morphine. (Altered.)

Chloroform, 1½ fl. oz.; Morphine Hydrochloride, 87½ grains; Diluted Hydrocyanic Acid, 1 fl. oz.; Tincture of Capsicum, ½ fl. oz.; Tincture of Indian Hemp, 2 fl. oz.; Oil of Peppermint, 14 minims; Glycerin, 5 fl. oz.; Alcohol (90 p.c.) a sufficient quantity. Mix the Chloroform, Tincture of Capsicum, Tincture of Indian Hemp, Oil of Peppermint, and Glycerin, with 9 fl. oz. of the Alcohol, and dissolve the Morphine Hydrochloride in the mixture; add the Diluted Hydrocyanic Acid; then mix with enough of the Alcohol to form 20 fl. oz. of the Compound Tincture.

The metric quantities are 75 c.c., 10 grammes, 50 c.c., 25 c.c., 100 c.c., 1·5 c.c., 250 c.c., to form 1000 c.c.

Dose.—5 to 15 minims.

This preparation contains in a 10-minim dose ¾ minim of Chloroform, ½ minim of Diluted Hydrocyanic Acid, and $\frac{1}{1\frac{1}{2}}$ grain of Morphine Hydrochloride—that is, more than four times the proportion of Morphine Hydrochloride present in the corresponding preparation of the British Pharmcopœia of 1885.

The formula for this preparation has been so completely changed that it will probably be a very considerable time before Practitioners become familiar with the new preparation and its results.—*C.D.* '98, i. 639.

The B.P., 1885, preparation was practically the same as Liquor Chloroformi Compositus (Squire), except that the former contained four times as much Morphine as the latter. In B.P., 1898, the formula has been completely changed, therefore that of Liquor Chloroformi Compositus, omitted in our last edition, is now re-inserted. *See* p. 213.

Foreign Pharmacopœias.—Hung. has a 'Chlorodyne,' but it differs considerably from the above; not in the others.

Not Official.

LIQUOR CHLOROFORMI COMPOSITUS (Squire).—Chloroform, 4 fl. oz.; Ether, 1 fl. oz.; Alcohol (90 p.c.), 4 fl. oz.; Treacle, 4 fl. oz.; Extract of Liquorice, 2½ oz.; Morphine Hydrochloride, 8 grains; Oil of Peppermint, 16 minims; Syrup, 17½ fl. oz.; Prussic Acid (2 p.c.), 2 fl. oz. Mix the Oil of Peppermint, Alcohol and Prussic Acid together and dissolve the Morphine Hydrochloride in the mixture; add the Chloroform and Ether; dissolve the Extract of Liquorice in the Syrup, add the Treacle, and mix in the other ingredients.

Dose.—5 to 10 minims.

TINCTURA CHLOROFORMI COMPOSITA.—Chloroform, 2; Alcohol (90 p.c.), 8; Compound Tincture of Cardamoms, 10: mix. =(1 in 10.)

This preparation is deleted from B.P., 1898, but as it is used by some prescribers it is given here.

Dose.—10 to 30 minims.

The Chloroform will separate if this Tincture is prescribed in too little Water.

Has been given successfully for the prevention of sea-sickness.

CHLOROFORMUM CAMPHORATUM. (*B.P.C.*)—Camphor, 2; Chloroform, 1: dissolve.

A remedy for toothache, and topically applied for rheumatism.

CARBON TETRACHLORIDE, sp. gr. 1·590. Has been used to produce anæsthesia; its action is said to be effective and pleasant to the patient.

A.C.E. MIXTURE.—Alcohol (90 p.c.), 1; Chloroform, 2; Ether, 3: mix.

Used as an anæsthetic in place of Chloroform.—*Med. Chir. Trans.* vol. 47, '64, 341; *B.M.J.* '87, ii. 975, 1078, 1185, 1314, 1359.

VIENNA MIXTURE.—Ether 3; Chloroform 1; by weight.—*P.J.* (3) xii. 703.

'METHYLENE' (formerly called Methylene Bichloride).—Introduced by B. W. Richardson in November, 1867. It is a limpid dense fluid, sp. gr. varies; when dropped into Water about one-fourth of it is dissolved, the remainder separates like Chloroform at the bottom of the vessel as a perfectly clear and distinct fluid, and the whole has a sweet pleasant odour, without the least smell of Ether.

Recommended as an anæsthetic in place of Chloroform.—*B.M.J.* '88, i. 1211, 1301; '88, ii. 72, 203.

REGNAULD'S ANÆSTHETIC MIXTURE.—Chloroform 4; Methylic Alcohol 1: mix.

Used as an anæsthetic in the place of Chloroform.—*B.M.J.* '83, ii. 106; '84, i. 452.

PENTAL (Trimethylethylene).—A colourless mobile, inflammable liquid. Has been recommended as a general anæsthetic for short operations. Whitla states that several deaths have been attributed to it and that it causes albuminuria.—*M.A.* '95, 40; *L.* '94, i. 1080; '96, i. 45, 710, 950; *T.G.* '93, 34; '94, 555; *B.M.J.E.* '93, ii. 28; *B.M.J.* '96, i. 730.

CHRYSAROBINUM.

CHRYSAROBIN.

A substance obtained from Araroba by extracting with hot Chloroform, evaporating to dryness, and powdering. It consists chiefly of a definite chemical substance also known as Chrysarobin, but contains a varying proportion of Chrysophanic Acid.

Purified Chrysarobin was introduced into medicine incorrectly as **Chrysophanic**

Acid, and it is still known by this name, which, however, only correctly applies to the oxidised product.

Araroba yields from 55 to 80 p.c. (average 71 p.c.) of Chrysarobin.—*P.J.* (3) xxii. 544.

Medicinal Properties.—In form of **unguentum** or **pigmentum**, it has been found efficient in chronic psoriasis, and is a powerful parasiticide in ringworm and other parasitic skin diseases, but as it may cause erythema it requires watching; it should not be allowed to touch the healthy skin. It stains the skin yellow, also the linen. Sometimes given internally for psoriasis, eczema and acne.

Alopecia areata, treated almost exclusively with Chrysarobin sticks—Chrysarobin 30; Colophony Resin, 5; Yellow Wax, 35; Olive Oil (by weight), 30.—*B.M.J.E.* '95, ii. 103; *P.J.* '96, i. 139.

Chrysophanic Acid is not an efficient substitute for Chrysarobin in the treatment of psoriasis.—*B.J.M.E.* '96, ii. 96.

Official Preparation.—Unguentum Chrysarobin.

Not Official.—Unguentum Acidi Chrysophanici, Pigmentum Chrysarobini, Chrysarobin Plaster Mulls, Anthrarobin.

Foreign Pharmacopœias.—Official in Austr., Araroba Depurata; Dan., Dutch, Ger., Ital., Jap., Norw., Russ., Swiss and U.S., Chrysarobinum, Mex., Crisarobina, the purified product; not in the others.

Description.—A crystalline yellow, tasteless, inodorous powder, entirely soluble in hot Chloroform, almost entirely soluble in hot Alcohol (90 p.c.), partially soluble in Petroleum Spirit, but only slightly soluble in Water.

Tests.—In Solution of Potassium Hydroxide it partially dissolves, and assumes a deep brownish-red colour. Heated with free access of air it melts, giving off yellow fumes, and when incinerated does not leave more than 1 p.c. of ash.

Preparation.

UNGUENTUM CHRYSAROBINI. Chrysarobin Ointment.

Chrysarobin, 2; Benzoated Lard, 48. Triturate the Chrysarobin gradually with the Benzoated Lard, previously melted by heat; continue the heat until the Chrysarobin is dissolved; stir until cold.

=(1 in 25).

Foreign Pharmacopœias.—Official in U.S., 1 in 20; not in the others.

Not Official.

UNGUENTUM ACIDI CHRYSOPHANICI (*B.S.H.*).—Purified Chrysarobin, 120 grains; Lard, 1 oz.: heat together on a water-bath for half an hour, constantly stirring; when set, mix with a pestle and mortar.

PIGMENTUM CHRYSAROBINI.—Chrysarobin 60 grains; Chloroform 10 drm.; pure Gutta Percha 60 grains; dissolve. Painted on with a stiff brush. Acts effectually, and does not stain the linen.—*B.M.J.* '87, ii. 1139.

It has also been suggested to make Chrysarobin into a **paste** with water, apply this to the skin, and cover it with Collodion.—*M.T.* '82, i. 826.

CHRYSAROBIN PLASTER MULLS (Unna).—Contain $\frac{1}{10}$ grain to the square inch; also five times this strength.

ANTHRAROBIN.—A substitute for Chrysarobin. A reduction product from Alizarin. Slightly soluble in Water, but readily in Alcohol (90 p.c.) and solution of Borax. For an **ointment** it is rubbed with Olive Oil and diluted with Lard.

Its action is similar to Chrysarobin, but it is slower and does not produce the same irritation. The part should be previously washed with Potash Soap, and the alcoholic **tincture** is preferred to the ointment. The strength of the ointment used is 1 in 10.—*B.M.J.* '88, i. 1234; *L.M.R.* '88, 234, and '89, 243.

CIMICIFUGÆ RHIZOMA.

CIMICIFUGA.

B.P.Syn.—Actææ Racemosæ Radix.

The dried rhizome and roots of *Cimicifuga racemosa*.

Medicinal Properties.—Bitter stomachic, analgesic, expectorant. Given in neuralgia, myositis, rheumatism, lumbago, and sciatica. Relieves the pain of dysmenorrhœa and pleurodynia.

Official Preparations. — Extractum Cimicifugæ Liquidum, and Tinctura Cimicifugæ.

Not Official.—Cimicifugin.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Description.—The rhizome is from about two to six inches (five to fifteen centimetres) long, and from half-an-inch to an inch (twelve to twenty-five millimetres) in diameter, hard, nearly cylindrical in shape, and bears the remains of numerous stout ascending branches marked with encircling leaf-scars. The roots are brittle, and usually broken off near the rhizome; they exhibit, in transverse section, from three to five wedge-shape wood-bundles, separated by as many broad medullary rays. Both rhizome and roots are blackened by Test-solution of Ferric Chloride (presence of Tannic Acid). Odour faint: taste bitter and acrid.

Preparations.

EXTRACTUM CIMICIFUGÆ LIQUIDUM. Liquid Extract of Cimicifuga. *B.P.Syn.*—Liquid Extract of Actæa Racemosa. (Modified.)

Mix 20 of Cimicifuga, in No. 60 powder, with 40 of Alcohol (90 p.c.); set aside in a closed vessel for forty-eight hours; transfer to a percolator; when the fluid ceases to pass, continue the percolation with more Alcohol, until the Cimicifuga is exhausted. Reserve the first 15 of the percolate; evaporate the remainder to the consistence of a soft extract; dissolve this in the reserved portion; add enough of the Alcohol to make 20 of the Liquid Extract. =(1 in 1).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—5 to 30 minims.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

TINCTURA CIMICIFUGÆ. Tincture of Cimicifuga. *B.P.Syn.*—Tincture of Actæa Racemosa. (Altered.)

Cimicifuga, in No. 40 powder, 2; Alcohol (60 p.c.), a sufficient

quantity. Moisten the powder with 1 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20.
=(1 in 10).

Now 1 in 10 instead of 1 in 8, and Alcohol (60 p.c.) used in place of Proof Spirit.

Dose.—30 to 60 minims.

The Tincture formerly in the *Companion* as 'Not Official' was twice the strength of this, and is still ordered as **Tinctura Actææ Racemosæ (Squire)** to distinguish it from the Official preparation.

Foreign Pharmacopœias.—Official in U.S., 1 in 5; not in the others.

Not Official.

CIMICIFUGIN.—A brown powder, almost entirely soluble in Alcohol (90 p.c.).

Dose.—1 to 5 grains.

Not Official.

CINCHONÆ CORTEX.

CINCHONA BARK.

The dried bark of *Cinchona Calisaya*, *C. officinalis*, *C. lancifolia*, and other species of *Cinchona*, from which the various alkaloids of the bark may be obtained.

The Peruvian Bark was known in Europe as early as 1640, on account of its having cured the Countess of Chinchon of a fever. We are ignorant of its early history, or how the Spaniards in Peru became acquainted with its virtues; but the Jesuits secretly conveyed it from Peru to Spain—hence it was called the Jesuits' Bark. Little was further known of it until the time of La Condamine, who visited Peru in 1738, and after whom Humboldt and Bonpland named the plant the *Cinchona Condaminea*. It was long supposed that only one species existed; a vast number, however, have been discovered, all of which possess medicinal properties, though varying much, both according to their species and the locality of their growth.

The ash was taken of six samples of Cinchona Bark:—Yellow Bark, 2·01 p. c. and 1·67 p. c.; Pale Bark, 2·95 p. c.; Red Bark, 3·07 p. c. and 2·06 p. c.; Cinchona nitida, 2·27 p. c.

The Official salts of Quinine, which are Quininæ Hydrochloridum, Quininæ Hydrochloridum Acidum, and Quininæ Sulphas, may be prepared from the bark of various species of Cinchona and Remijia.

Only Red Cinchona Bark is Official for the Galenical preparations.

Foreign Pharmacopœias.—Official in Austr., Dan., Ger., Jap. and Russ., any species, especially Succirubra; Belg, China Flava, China Fusca, China Rubra; Dutch, Cinchona Succirubra; Fr. (Quinquina) and Mex., any species; Hung., China Calisaya and Succirubra; Norw. and Swed., Cinchona Calisaya; Port., Cinchona Flava, Fusca and Rubra; Span., Cinchona Calisaya, Peruviana and Succirubra; Swiss and Ital., Cinchona Succirubra, Ledgeriana, and Calisaya; U.S., any species of Cinchona, especially Calisaya Officinalis, and Succirubra; the latter used for Compound Tincture only.

CINCHONÆ RUBRÆ CORTEX.

RED CINCHONA BARK.

The dried bark of the stem and branches of cultivated plants of *Cinchona succirubra*.

Medicinal Properties.—Tonic, bitter stomachic and astringent. It is a valuable remedy in neuralgia and tic douloureux, and in convalescence from acute diseases; in diarrhœa, excessive perspiration, chronic discharges from mucous membranes, and in dipsomania; used as a dusting powder for foul ulcers and moist eczema. (*See also Quinine.*)

An almost white powder was sold in India as the Government Cinchona Febrifuge, which had an average percentage composition of 15·5 crystallisable Quinine, 33·5 Cinchonine, 29 Cinchonidine, 17 Amorphous Alkaloid, 5 colouring matter.

It has been suggested to mix the crystalline salts in the proportion of 4 parts of Sulphate of Quinine, 8 parts of Sulphate of Cinchonidine, 9 parts of Sulphate of Cinchonine.

The results of experiments in India proved that Sulphate of Quinidine was quite equal to Sulphate of Quinine in therapeutic value, and Sulphate of Cinchonidine very nearly so; that Sulphate of Cinchonine, while possessing valuable febrifuge properties, was in large doses apt to cause nausea, vomiting, and derangements of the bowels, and was not quite so speedy in its action in arresting periodic fevers as the other alkaloids; that in nine-tenths of the fever cases of India, Cinchonidine is just as efficient as Quinine, and only about one-fourth of the cost.—*Cinchona Committee's Report*, 31 August, 1878.

Official Preparations.—Extractum Cinchonæ Liquidum, Infusum Cinchonæ Acidum, Tinctura Cinchonæ, Tinctura Cinchonæ Composita, and is a source of the Alkaloid Quinine.

Not Official.—Decoctum Cinchonæ, Cinchonidinæ Sulphas and Cinchoninæ Sulphas.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Norw., Port., Russ., Span., Swed., Swiss, and U.S.

Description.—Imported in quilled or more or less incurved pieces, coated with the periderm, and varying in length from two inches to a foot (five to thirty centimetres) or more—the bark itself from about one-tenth to a quarter of an inch (two and a half to six millimetres) thick, or rarely more; outer surface brownish or reddish-brown in colour, more or less rough from longitudinal ridges which are most apparent in the branch bark, with numerous warts often running into lines in the larger pieces; in some varieties marked with numerous transverse cracks which have not thickened edges; inner surface brick-red or deep reddish-brown, irregularly and coarsely striated; fracture shortly fibrous in the smaller and finely fibrous in the larger pieces; powder brownish or reddish-brown; no marked odour; taste bitter and somewhat astringent.

Umney points out (*P.J.* (3) xvi. 407) that a bark may contain the requisite total alkaloid and the Official percentage of Quinine and Cinchonidine, and still contain only a trace of Quinine. What therefore is really wanted in the Pharmacopœia is a *Quinine-standard* for the bark.

Tests.—When used for purposes other than that of obtaining the alkaloids or their salts, it should yield between 5 and 6 p.c. of total alkaloids, of which not less than half should consist of Quinine and Cinchonidine, as estimated by the following methods:—

Mix 20 grammes of Red Cinchona Bark, in No. 60 powder, with 6 grammes of Calcium Hydroxide; slightly moisten the powders with

20 c.c. of Water; mix the whole intimately in a small porcelain dish or mortar; allow the mixture to stand for an hour or two, when it will present the characters of a moist dark-brown powder, in which there should be no lumps or visible white particles. Transfer this powder to a suitable flask fitted with a small reflux condenser, add 130 c.c. of Benzolated Amylic Alcohol, boil them together for about half an hour, decant the liquid on to a filter, leaving the powder in the flask; add more of the Benzolated Amylic Alcohol to the powder, and boil and decant as before; repeat this operation a third time; then turn the contents of the flask on to the filter, and wash by percolation with more of the Benzolated Amylic Alcohol until the Bark is exhausted. Introduce the collected filtrate, while still warm, into a stoppered glass separator; add to it 2 c.c. of Diluted Hydrochloric Acid, mixed with 12 c.c. of Water; shake them well together, and when the acid liquid has separated this may be drawn off, and the process repeated with Water slightly acidulated with Hydrochloric Acid, until the whole of the alkaloids have been removed. The liquid should then, while warm, be carefully and exactly neutralised with Solution of Ammonia, and concentrated to the bulk of 16 c.c. If now about 1·5 grammes of Sodium Potassium Tartrate, dissolved in twice its weight of Water, be added to the solution, and the mixture stirred with a glass rod, insoluble Tartrates of Quinine and Cinchonidine will separate completely in about an hour, and these collected on a filter, washed, and dried in a water-oven, will contain eight-tenths of their weight of the alkaloids, Quinine and Cinchonidine, which, multiplied by 5, gives the weight of those alkaloids present in 100 grammes of the bark. To the mother-liquor from the preceding process add Solution of Ammonia in slight excess. Collect, wash, and dry the precipitate, which will contain the other alkaloids. The weight of this precipitate, multiplied by 5, and added to the percentage weight of the Quinine and Cinchonidine, gives the percentage weight of total alkaloids.

Preparations.

EXTRACTUM CINCHONÆ LIQUIDUM. Liquid Extract of Cinchona. (Modified).

A Liquid Extract containing 5 grains of the alkaloids of Red Cinchona Bark in 110 minims.

Red Cinchona Bark, in No. 60 powder, 20 oz.; Hydrochloric Acid, 5 fl. drm.; Glycerin, 2½ fl. oz.; Alcohol (90 p.c.) and Distilled Water of each a sufficient quantity. Mix the Red Cinchona Bark with 5 pints of the Distilled Water to which the Hydrochloric Acid and Glycerin have been added; set aside in a covered vessel for forty-eight hours, stirring frequently; transfer to a percolator; when the liquid ceases to pass, and the contents of the percolator have been properly packed, continue the percolation with Distilled Water until 15 pints of liquid have passed, or until that which is passing has ceased to give a precipitate on the addition to it of an excess of Solution of Potassium Hydroxide. Evaporate the percolate in a porcelain or enamelled iron vessel at a temperature not exceeding 180° F. (82·2° C.) until it is reduced to 20 fluid ounces of Liquid.

Determine the proportion of alkaloids in the liquid product by the following analytical process:—

Put 5 c.c. of the liquid, together with 25 c.c. of Water, into a stoppered glass separator; add 30 c.c. of Benzolated Amylic Alcohol and 15 c.c. of Solution of Potassium Hydroxide; shake them together thoroughly and repeatedly; allow them to remain at rest until the spirituous solution of the alkaloids shall have separated and formed a distinct stratum over the dark-coloured alkaline liquid. Run off the latter by the stopcock into another separator; agitate it thoroughly with 30 c.c. of Benzolated Amylic Alcohol; allow the liquids to separate; draw off and reject the lower layer; add the Alcoholic layer to the liquid in the first separator; wash the mixture with a little Water; agitate thoroughly with 30 c.c. of a warm mixture of 1 volume of Diluted Hydrochloric Acid and 5 volumes of Water; allow the liquids to separate; draw off the lower acid layer into another separator; agitate the Alcoholic layer with a second quantity of 30 c.c. of the mixture of Water and Diluted Hydrochloric Acid; when separated draw this off into the other portion of acid liquid; to the mixture add 10 c.c. of Chloroform and sufficient Solution of Ammonia to impart a strongly alkaline reaction; shake thoroughly; allow the liquids to separate; draw off the lower Chloroformic layer into a weighed dish; repeat the agitation and separation with two successive quantities of 10 c.c. of Chloroform, and add the Chloroformic liquids to that in the dish. Allow the Chloroform to evaporate slowly; dry the residue in the dish at a temperature of about 230° F. (110° C.). The weight of the dish and its contents, after deducting the known weight of the dish, will give that of the alkaloids.

Having thus ascertained the alkaloidal strength of the 20 fl. oz. of liquid product, every volume of it containing 5 grammes of total alkaloids is first to be brought to 85 c.c. either by evaporation, or, if necessary by dilution with Distilled Water, then a volume of 12·5 c.c. of the Alcohol is to be added, and the final adjustment of the volume to 100 c.c. is to be effected by the addition of Distilled Water. The finished liquid extract will thus contain five grammes of the alkaloids of the bark in every 100 c.c., or 5 grains in 110 minims.

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Dan., Dutch, Jap., Mex., Norw., Swiss and U.S., 1 in 1; Solid Extracts.—Austr. and Hung., Aqueous; Dutch, Mex., Span. and Swiss, Alcoholic; Belg., Ger., Ital., Mex., Port. and Russ., both Aqueous and Alcoholic; not in the others.

Ext. Cinch. Fluid. U.S. (Red Bark) is sometimes prescribed, it means the substitution of Red for the other species used in that formula.

INFUSUM CINCHONÆ ACIDUM. Acid Infusion of Cinchona.

Red Cinchona Bark, in No. 40 powder, 1; Aromatic Sulphuric Acid, ¼; Distilled Water, boiling, 20: mix the Red Cinchona Bark with the Distilled Water in a covered vessel; add the Aromatic Sulphuric Acid; infuse for one hour, and strain. =(1 in 20).

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in U.S. (C. any species not Red), 6 in 100, with Aromatic Sulphuric Acid; Russ. (C. Rubra), 1 in 8, with Phosphoric Acid; Fr. (Tisane), 1 in 50; Span., 1 in 46, without acid; not in the others.

TINCTURA CINCHONÆ. Tincture of Cinchona. (Altered.)

Red Cinchona Bark, in No. 40 powder, 4; Alcohol (70 p.c.) a sufficient quantity. Moisten the powdered Bark with 4 of the Alcohol; set aside for twenty-four hours in a closed vessel; percolate with more of the Alcohol, until 14 of percolate have been collected; press the marc; add the expressed liquid to the percolate; set aside for twenty-four hours; filter.

Take 10 c.c. of the resulting strong Tincture and determine its proportion of alkaloids by the assay process given under 'Extractum Cinchonæ Liquidum.'

Add to the bulk of the strong Tincture such a quantity of the Alcohol that 100 c.c. of the resulting Tincture shall contain 1 gramme of alkaloids.

Alcohol (70 p.c.) is now used in place of Proof Spirit, and the preparation is standardised.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Tinctura Chinæ, Tinct. Chinæ Flavæ, Tinct. Chinæ Rubræ; Dutch Tinctura Chinæ Rubræ; Fr., Teinture de Quinquina Gris, Jaune, also Rouge; Dan., Ger. and Russ., Tinctura Chinæ (from any species); Hung. Tinctura Chinæ Simplex (from C. Succirubra); Ital., Tintura di China; Jap., Tinct. Chinæ; Mex., Tintura de Quina; Norw. and Swed., Tinct. Chinæ (from C. Calisaya); Port., Tintura de Quina (from C. Flava); Span., Tintura Alcoholica de Quina (from C. Calisaya and C. Loja); Swiss, Tinctura Cinchonæ; U.S., Tinctura Cinchona (C. any species not Red); all 1 in 5, and all by weight, except U.S.; not in Austr.

Test.—10 c.c., when treated by the assay process described under 'Extractum Cinchonæ Liquidum,' should yield an amount of alkaloids representing not less than ·95 gramme nor more than 1·05 grammes, in 100 c.c. of the Tincture.

TINCTURA CINCHONÆ COMPOSITA. Compound Tincture of Cinchona. (Altered.)

Tincture of Cinchona, 20 fl. oz.; Dried Bitter-Orange Peel, well-bruised, 2 oz.; Serpentary Rhizome, in No. 40 powder, 1 oz.; Cochineal, in powder, 56 grains; Saffron, 110 grains; Alcohol (70 p.c.) a sufficient quantity. Mix the solid ingredients with 20 fl. oz. of the Alcohol; set aside in a closed vessel for seven days, agitating frequently; strain; press the marc; mix the liquids; add the Tincture of Cinchona, and enough of the Alcohol to produce 40 fl. oz. of the Compound Tincture; set aside for twenty-four hours; filter.

Now made with Tincture of Cinchona instead of Red Cinchona Bark. Alcohol (70 p.c.) used in place of Proof Spirit, and the preparation standardised.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Span., resembles Brit., but made with Loxa Bark; Austr., Ger., Hung., and Russ., Tinct. Chinæ Comp., also Belg. (Tinct. Whyttii), and Swiss (Tinct. Cinch. Co.), with Cinchona, Gentian, Orange Peel, and

Cinnamon (various strengths); Dan., Dutch, Norw., and Swed. (Tinct. Chinæ Comp.), similar to the above but without Cinnamon; Mex., (Tintura de Quina Compuesta), Bitter Orange Peel, Cinchona and Gentian: Port. (Tinct. de Quina Comp.), Cinchona, Orange Peel, and Serpentary; U.S., almost the same with Glycerin; not in Fr. and Jap.

Tests.—10 c.c., when treated by the assay process described under 'Extractum Cinchonæ Liquidum,' should yield not less than ·045 gramme nor more than ·055 gramme of alkaloids. 2 c.c. of the Compound Tincture after evaporation should leave a residue which imparts a yellow colour to Chloroform.

HUXHAM'S TINCTURE OF BARK (Original Formula in 1788).—Powdered Peruvian Bark, 4 oz.; Orange Peel, 3 oz.; Serpentary Root, 80 grains; Saffron, 160 grains; Cochineal, 80 grains; Brandy, 40 fl. oz.; digest 3 or 4 days.

Not Official.

DECOCTUM CINCHONÆ.—Red Cinchona Bark, in No. 20 powder, 1¼; Distilled Water, 20: boil ten minutes; when cold, strain, and pour on the marc sufficient Water to make 20. =(1 in 16).

Dose.—1 to 2 fl. oz.

Foreign Pharmacopœias.—Official in Belg., China Fusca, 1 in 10, also Flava and Rubra 1 in 10; Dan., 1 in 8 with Hydrochloric Acid; Dutch, 6 in 100; Norw., China Calisaya 1 in 10 with Hydrochloric Acid; Port., Cinchona Flava 1 in 10, also Fusca 1 in 10; Russ., Cinchona Rubra, 1 in 7·5, containing Sulphuric Acid; Span., Quina Calisaya 1 in 46, also Quina ex Loja 1 in 46; not in the others.

CINCHONIDINÆ SULPHAS $(C_{19}H_{22}N_2O)_2,H_2SO_4$, xH_2O. — Colourless silky crystals.

Solubility.—1 in 150 of Water, 1 in 60 of Alcohol (90 p.c.), sparingly in Chloroform and Ether.

Dose.—1 to 10 grains.

Foreign Pharmacopœias.—Official in Fr., and U.S., not in the others.

CINCHONINÆ SULPHAS, $(C_{19}H_{22}N_2O)_2$, H_2SO_4, $2H_2O$.—Colourless prismatic crystals.

Solubility.—1 in 70 of Water, 1 in 9 of Alcohol (90 p c.), 1 in 60 of Chloroform, sparingly in Ether.

Dose.—1 to 10 grains.

Foreign Pharmacopœias.—Official in Dutch, Fr., Mex., Port., Span., Swed. and U.S., not in the others.

Alleged conversion of Cinchonine into Cinchonidine.—*J.C.S. Abs.* '96, i. 707; *P.J.* '97, i. 141.

CINNAMOMI CORTEX.

CINNAMON BARK.

The dried inner bark of shoots from the truncated stocks of *Cinnamomum Zeylanicum*. Obtained from cultivated trees. Imported from Ceylon, and distinguished in commerce as Ceylon Cinnamon.

Medicinal Properties.—Carminative, astringent, aromatic stimulant, and antiseptic, chiefly used as an adjuvant to other medicines. Often employed with Chalk in diarrhœa.

60 grain doses for dysentery.—*B.M.J.* '95, i. 530: *L.* '95, i. 567. Has been lauded for cancer, but the majority of evidence is not in its favour.—*M.A.* '95, 163.

Inhalation of **Oil of Cinnamon** in the treatment of consumption.—*B.M.J.* '96, ii. 1374.

Dose.—Not given in B.P.; 10 to 20 grains in powder.

Official Preparations.—Of the **Bark**, Aqua Cinnamomi, Oleum Cinnamomi, Pulvis Cinnamomi Compositus, and Tinctura Cinnamomi; used in the preparation of Decoctum Hæmatoxyli, Pulvis Catechu Compositus, Pulvis Cretæ Aromaticus, Pulvis Kino Compositus, Tinctura Cardamomi Composita, Tinctura Catechu, and Tinctura Lavandulæ Composita. Of the **Water**, Mistura Cretæ, Mistura Guaiaci, Mistura Olei Ricini, Mistura Spiritus Vini Gallici, Syrupus Aromaticus and Syrupus Cascaræ Aromaticus. Of the **Oil**, Spiritus Cinnamomi. Of the **Compound Powder**, Pilula Aloes et Ferri and Pilula Cambogiæ Composita. Of the **Spirit**, Acidum Sulphuricum Aromaticum.

Foreign Pharmacopœias.—Official in Belg., Fr. (Cannelle), Ital. (Cannella), Jap., Mex. (Canela), Norw., Port. (Canella), and Swed. use Ceylon Cinnamon only. Austr., Ger., Hung. and Russ., use Chinese Cinnamon or Cassia only. Dan., Dutch, Span., Swiss and U.S. use both kinds.

Description.—In closely rolled quills, each about three-eighths of an inch (nine millimetres) in diameter, and containing numerous smaller quills or channelled pieces. It is thin, brittle, splintery, dull light yellowish-brown externally, and marked by little scars or holes and faint shining wavy lines; darker brown on its inner surface. Odour fragrant; taste warm, sweet, and aromatic.

With a decoction (1 in 10) a dark bluish-grey colour is produced by Tincture of Iodine, which at first disappears on shaking, owing to absorption of the Iodine by the Essential Oil, but is permanent with excess of the reagent. Cassia contains much more Starch, and gives a strong blue reaction with excess of Iodine. The absorption is much less with Cassia than with Cinnamon.

The ash was determined of Cortex and Pulvis Cinnamomi: Cortex (3 samples) 4·26, 4·02, 3·43 p.c.; Pulvis (4 samples) 4·61, 4·8, 5·07, 4·44 p.c.

A mixture of Cassia buds in powdered Cinnamon.—*P.J.* (3) xxv. 646.

Examination of powdered Cinnamon for walnut shells, by determining Volatile Oil, Alcoholic Extract, insoluble Ash, and Nitrogen.—*Analyst*, '95, 130; *C.D.* '95, i. 867.

Preparations.

AQUA CINNAMOMI. Cinnamon Water. (Modified.)

Cinnamon Bark, bruised, 1; Water, 20: distil 10. =(1 in 10).

The strength is now 1 in 10 in place of 1 in 8.

The distilled 'Aqua' is very turbid from suspended Oil. There is no recognised rule in dispensing as to whether it should be filtered or not, but it is customary to do so.

Dose.—Not given in B.P.; 1 to 2 fl. oz.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Ger., Russ., Swed. and Swiss, 1 in 10; Fr. (Eau de Cannelle), and Ital. (Acqua dist. di Cannella), Mex. (Agua destilada de Canela), 1 in 4; Hung., 1 in 5; Port., 1 in 8; Jap., Norw. and U.S., made with Oil 1 in 500.

OLEUM CINNAMOMI. Oil of Cinnamon.

The Oil distilled from Cinnamon Bark.

Solubility.—10 in 3 of Alcohol (90 p.c.); 1 in 45 of Alcohol (60 p.c.).

Possesses the aromatic and antiseptic properties of Cinnamon Bark without its astringency.

Dose.—½ to 3 minims.

In pill or on Sugar.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr. (Huile Volatile de Cannelle), Ital., Jap., Mex. (Aceite Volatil de Canela); Port. and Span. use Oil of Cinnamon; Austr., Dan., Ger., Hung., Norw., Russ., Swed., Swiss and U.S. use Oil of Cassia.

Description.—Yellow when freshly distilled, but gradually becoming reddish; having the odour and taste of the Bark.

It is almost identical in composition with Oil of Cassia, both of which consist mainly of **Cinnamic Aldehyde**; the difference in flavour being due to the presence of small quantities of other bodies, chief of which are Eugenol in Cinnamon Oil and Cinnamyl Acetate in Oil of Cassia. Cinnamon Oil mixed with three or four times its volume of a saturated solution of Potassium Bisulphite sets to a crystalline mass.

Tests.—Sp. gr. 1·025—1·035. 1 c.c. dissolved in 5 c.c. of Alcohol (90 p.c.), and Test-solution of Ferric Chloride added, should afford a pale green, but not a decided blue colouration (absence of Cinnamon-leaf Oil). If 10 c.c. be well shaken with 50 c.c. of a boiling 30 p.c. solution of Sodium Hydrogen Sulphite, an oily layer separates, which, when cooled to 60° F. (15·5° C.), should not measure more than 5 c.c. (absence of more than 50 p.c. of constituents other than Aldehydes.)

This test is for the determination of Cinnamic Aldehyde, but it is equally applicable to Oil of Cassia, which likewise consists mainly of that substance.

The odour and sp. gr. of these two oils are somewhat different and there is a marked contrast in the price, but no reliable method for determining an admixture of the two oils appears to have been published.

The brown colour produced by Ferric Chloride with Oil of Cassia is so much darker than the tint afforded with Oil of Cinnamon, that an admixture of 1 part of Oil of Cassia with 2 parts of Oil of Cinnamon can be readily detected by that test.

Schimmel states that a genuine oil from Cinnamon Bark sometimes reaches sp. gr. 1·038.—*P.J.* '95, ii. 329.

PULVIS CINNAMOMI COMPOSITUS. Compound Powder of Cinnamon. *B.P.Syn.*—Pulvis Aromaticus.

Cinnamon bark, 1; Cardamom seeds, 1; Ginger, 1, all in powder: mix. =(1 in 3).

Dose.—10 to 40 grains.

Foreign Pharmacopœias.—Official in Port. (Pó de Canella Comp.), Cinnamon 7, Cardamoms 7, Ginger 6; Pulvis Aromaticus—Belg., Dutch, Jap. and Swiss, same as Brit.; Swed., Cinnamon 2, Cardamoms 1, Ginger 1; U.S., Cinnamon 7, Ginger 7, Cardamoms 3, Nutmeg 3; Russ., Cinnamon 4, Cloves, Mace, Nutmeg, Ginger, of each 1; not in the others.

SPIRITUS CINNAMOMI. Spirit of Cinnamon. (Altered.)

Oil of Cinnamon, 1; Alcohol (90 p.c.), a sufficient quantity. To the Oil of Cinnamon add enough of the Alcohol to form 10 of the Spirit of Cinnamon. =(1 in 10).

Now 1 in 10 in place of 1 in 50, and Alcohol (90 p.c.) used instead of Rectified Spirit.

Dose.—5 to 20 minims.

This Spirit of Cinnamon contains five times the proportion of Oil of Cinnamon present in the Spirit of Cinnamon of the B.P. '85.

Foreign Pharmacopœias.—Official in Belg., 1 in 100; Jap., 1 in 50; U.S., 1 in 10; Dutch, Ital., Mex., Port. and Span. (distilled from the bark); not in the others.

TINCTURA CINNAMOMI. TINCTURE OF CINNAMON. (ALTERED.)

Cinnamon bark, in No. 40 powder, 1; Alcohol (70 p.c.), a sufficient quantity. Moisten the powder with 1 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 5. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and Alcohol (90 p.c.) used in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Jap., Mex., Norw., Port., Russ., Span., Swed., and Swiss, 1 in 5; all by weight; U.S., 1 in 10.

COCÆ FOLIA.

COCA LEAVES.

The dried leaves of *Erythroxylum Coca*, and its varieties.

Commercially the leaves show two main varieties, the Peruvian or Truxillo and the Bolivian or Huanuco. A third variety from Java and other East Indian countries is used to a considerable extent in Germany.

It would appear from investigations on the subject of Coca Leaves and Coca Alkaloids: 1. That the original broad-leaved Bolivian (Huanuco) Coca contains principally Cocaine; 2. That the alkaloid of N. Peruvian or Truxillo Coca is only about one-half Cocaine, a large proportion of the remainder being Cinnamyl-Cocaine; 3. That frequently in Truxillo Coca, and particularly in East Indian (Java), there is another alkaloid around which the controversy still turns. It is called Cocamine by Hesse, and is said to be similar in action to Cocaine, but weaker. Liebermann, however, holds that this Cocamine is the body first called by him Isotropyl-Cocaine and later α-Truxilline, and to which he ascribes dangerously toxic properties.

As this latter compound interferes with the crystallisation of the Cocaine, and Cinnamyl-Cocaine is readily detected by the Permanganate test, neither of these impurities is likely to be found in a well-crystallised commercial sample.

Medicinal Properties.—A nervine and muscular tonic, stimulant and restorative. Useful during convalescence, in debility and nervous exhaustion, and the opium and alcohol habits. It is chewed by the natives of Peru and Bolivia to sustain them during the day, that they may defer eating till the evening.

Official Preparation.—Extractum Cocæ Liquidum. Used in the preparation of Cocaina and Cocainæ Hydrochloridum.

Not Official.—Extractum Cocæ, and Vinum Cocæ.

Foreign Pharmacopœias.—Austr. and Belg., Folia Coca; Fr., Port. and U.S., Coca; Mex. and Span., Coca del Peru; Swiss, Folium Cocæ; not in the others.

Description.—The leaves imported from Bolivia vary usually from one and a-half to three inches (three and a-half to seven centimetres) in length, and from one to one and a-half inches (twenty-five to thirty-five millimetres) in breadth. They are brownish-green in colour, oval, entire and glabrous, the upper surface bearing a distinct ridge above the midrib. On the under surface near to the midrib and on either side of it a curved line is almost always distinctly visible. The midrib itself is prolonged into a minute horny apiculus, which, however, is frequently broken off. Most of the epidermal cells of the under surface are seen in transverse section to project in the form of small papillæ. The leaves possess a faint but characteristic odour and a slightly bitter taste, which is succeeded by a sensation of numbness. They should be free from mildew.

The leaves imported from Peru are somewhat smaller, narrower, and more fragile than those imported from Bolivia; they are pale green in colour, and do not exhibit a prominent ridge above the midrib on the upper surface, nor such distinct curved lines on either side of it on the under surface.

Coca leaves contain an amount of alkaloids varying from 0 to 1·5 p.c. The average amount is about ·5 p.c. The leaves frequently contain very little alkaloid owing to the alkaloids readily undergoing decomposition when the leaves are exposed to heat and moisture. The amount of Cocaine in a good sample of leaves is about 70 p.c. or even less of the total alkaloids.

A comparison of different processes of assay of Coca leaf and the fluid extract.—*A.J.P.* '95, 572.

Preparation.

EXTRACTUM COCÆ LIQUIDUM. Liquid Extract of Coca.

Mix 20 of Coca Leaves, in No. 20 powder, with 40 of Alcohol (60 p.c.); set aside in a closed vessel for forty-eight hours; transfer to a percolator; when the fluid ceases to pass, continue the percolation with more of the Alcohol until the Coca Leaves are exhausted. Reserve the first 15 of the percolate; evaporate the remainder, at a temperature below 176° F. (80° C.), to the consistence of a soft extract, dissolve this in the reserved portion; add enough of the Alcohol to produce 20 of the Liquid Extract. =(1 in 1.)

Note.—As the Coca leaves would be but imperfectly exhausted by the first 15 parts of the Alcohol, and as the active constituents are greatly damaged or destroyed by heat, a fluid extract prepared by repercolation is much to be preferred. When thus prepared from carefully dried green leaves, it contains 25 p.c. of solid Extract (dried at 212° F.).

Alcohol (60 p.c.) now used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in U.S., same as Brit.; Mex.; not in the others.

Belg. has solid Extract; French Codex has solid Extract, Tincture 1 in 5, Tisane 1 in 100; Swiss has Tincture 1 in 5.

A 'miscible' liquid extract of Coca, for adding to wine, made by percolating the leaves with a weak Alcohol and subsequent addition of Glycerin.—*P.J.* (3) xxv. 1169; *P.J.* '96, i. 306.

Not Official.

EXTRACTUM COCÆ.—A solid alcoholic extract, of a green colour, prepared from carefully dried leaves.

Dose.—2 to 10 grains.

VINUM COCÆ. *Syn.*—Vin de Coca, Fr.—Dried leaves of Coca 6, Vin de Grenache or Vin Rouge 100: macerate for 6 days and filter.

Wine of Coca can also be made by adding an equivalent quantity of Liquid Extract to Wine.

Foreign Pharmacopœias.—Official in Belg. and Fr., 6 in 100; Mex., 3 in 100; Span., 1 in 30; Swiss, 1 in 20; not in the others.

COCAINA.

COCAINE.

$C_{17}H_{21}NO_4$, eq. 300·93.

An alkaloid, obtained from the leaves of *Erythroxylum Coca*, and its varieties.

Solubility.—About 1 in 1300 of Water (Paul); 1 in 10 of Alcohol (90 p.c.); 1 in 12 of Olive Oil; 1 in 4 of Oleic Acid; 2 in 1 of Chloroform; 1 in 4 of Ether; 1 in 14 of Oil of Turpentine. Insoluble in Glycerin.

Foreign Pharmacopœias.—Official in Fr., and Mex.; not in the others.

Description.—Colourless monoclinic prisms which have a bitter taste followed by a sensation of tingling and numbness.

Tests.—It melts at 204·8° to 208·4° F. (96° to 98° C.) Its solution in Water acidulated with Hydrochloric Acid, and the dry Salt obtained on evaporating this solution, afford the reactions mentioned under 'Cocainæ Hydrochloridum.' Its solution in Water acidulated with Nitric Acid yields no reaction with the tests for Chlorides or Sulphates.

Pure Cocaine melts at 98° C.

Preparation.

UNGUENTUM COCAINÆ. Cocaine Ointment. (New.)

Cocaine, 1; Oleic Acid (by weight), 4; Lard, 20. Rub the Cocaine with the Oleic Acid, and gently warm the mixture until dissolved; add the Lard; mix. =(1 in 25).

COCAINÆ HYDROCHLORIDUM.

COCAINE HYDROCHLORIDE.

Hydrochlorate of Cocaine.—*B.P.* '85.

$C_{17}H_{21}NO_4$, HCl. eq. 337·12.

The Hydrochloride of an alkaloid obtained from the leaves of *Erythroxylum Coca*, and its varieties.

Solubility.—2 in 1 of Water; 1 in 2½ of Alcohol (90 p.c.); 1 in 2½ of Glycerin; about 1 in 20 of Chloroform; almost insoluble in Ether; insoluble in Fixed Oils.

Medicinal Properties.—Local anæsthetic, mydriatic. Has been largely used for producing local anæsthesia in examinations of and operations on the eye and throat; and in dentistry (¼ to ½ grain being injected into the gum); 2 to 4 p.c. **solutions** being used for the eye and 20 p.c. for the throat. It has also been used in producing anæsthesia of other mucous membranes, as the urethra, vagina, nose and rectum. It has been used successfully as a preventive of sea-sickness, in doses of ¼ to 1 grain in solution, and in doses of ⅛ grain every half-hour in the vomiting of pregnancy. The local applications are assisted by subcutaneous injection in producing anæsthesia of the deeper seated tissues for minor operations and for neuralgia; injected locally for sciatica; a 10 p.c. solution applied on lint to a rigid os uteri is followed by rapid dilatation, *B.M.J.* '98, ii. 1374. Unless a preservative be used, solutions should be freshly prepared to avoid the formation of a fungus which has been found in stale solutions, and to which have been attributed injurious effects such as sudden fainting and collapse. As an ointment it is used in painful skin diseases as shingles; in facial neuralgia and in pruritus.

In pertussis, dose $\frac{1}{10}$ grain three times daily for infants, increasing it according to the age, ⅓ grain being given to children of 5 or 6 years.—*P.J.* '95, ii. 27; *L.* '95, i. 1429; *B.M.J.E.* '95, ii. 28.

Combined with Opium in the treatment of cancerous disease.—*B.M.J.* '96, ii. 718.

In operations for piles, *B.M.J.* '85, i. 227; '86, ii. 586; *L.* '86, i. 527; and for fistula, *L.* '87, ii. 793; in prostatic disease, *B.M.J.* '86, i. 822, 999; in parturition, *B.M.J.* '85, ii. 473; *L.* '86, i. 1148; for relief of pain in passing catheter, *B.M.J.* '86, ii. 413; in lithotrity, *B.M.J.* '87, i. 589; '88, i. 972; for scalds, burns, and blisters, *B.M.J.* '85, i. 300; *T.G.* '88, 360; in hay fever, *L.* '85, i. 1021; *B.M.J.* '86, ii. 18; '87, i. 1256; in morphinism, *B.M.J.* '85, ii. 1112; in diabetes, *L.* '89, ii. 735. It is also useful in alcoholism. As an antigalactagogue, *T.G.* '95, 119. Toxic effects, *L.* '86, i. 658; '95, ii. 1104; '98, i. 718; *B.M.J.* '85, ii. 971, 983, 1060; '87, i. 617; '88, i. 151, 757; *P.J.* (3) xxv. 1185.

Four cases in which toxic symptoms have followed anæsthesia of the throat.—*B.M.J.E.* '96, ii. 95.

Dose.—⅛ to ½ grain.

Hypodermic solutions are used, containing 4 to 10 p.c. of the salt.

For **external application** in neuralgia, 10 or 20 p.c. solution of the *alkaloid* in Oil of Cloves.

Official Preparations.—Lamellæ Cocainæ, and Injectio Cocainæ Hypodermica. Used in the preparation of Trochiscus Krameriæ et Cocainæ.

Not Official.—Pastillus Cocainæ, Trochisci Cocainæ, Guttæ Cocainæ Hydrochloratis, Eucaine (A and B), Eucaine Hydrochloride (A and B), Orthoform, Orthoform Hydrochloride, Benzoyl-pseudotropine, Holocaine and Holocaine Hydrochloride.

Antidote.—Inhalation of Nitrite of Amyl.—*B.M.J.* '87, i. 625, 695, 1401; '88, i. 757. Strychnine and Digitalin.—*L.* '98, i. 718.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Russ. and U.S.; not in the others.

Description.—In colourless acicular crystals or crystalline pow-

der. Soluble in four times its weight of Alcohol (90 p.c.) or of Glycerin.

Tests.—It melts at 356° to 366·8° F. (180° to 186° C.). Soluble in half its weight of cold Water, forming a clear and colourless solution, neutral to Litmus. Its aqueous solution has a bitter taste, produces on the tongue a tingling sensation followed by numbness, and when applied to the eye dilates the pupil. It affords a yellow precipitate with Solution of Auric Chloride; a white precipitate with Solution of Ammonium Carbonate, and also with solution of Borax. It dissolves without colour in cold Sulphuric or Nitric Acid, but chars with hot Sulphuric Acid, evolving an agreeable odour, and yielding a crystalline sublimate of Benzoic Acid. Its aqueous solution yields with Solution of Potassium Hydroxide a white precipitate soluble in Alcohol or Ether, with Solution of Picric Acid a yellow precipitate becoming crystalline on standing, with Test-solution of Mercuric Chloride slightly acidulated with Hydrochloric Acid, a white precipitate soluble in hot Water. Moistened with Nitric Acid, the mixture evaporated to dryness, and a drop of Alcoholic Solution of Potassium Hydroxide added, a characteristic odour is evolved more or less recalling that of Peppermint. A solution containing not less than 1 p.c. gives with excess of Solution of Potassium Permanganate a copious red precipitate which does not change colour within an hour (absence of Cinnamyl Cocaine and Cocamine or other products derived from Cocaine). ·1 gramme dissolved in 100 c.c. of Water and ·25 c.c. of Solution of Ammonia added, affords a clear solution, from which a crystalline deposit should gradually separate on stirring (limit of amorphous alkaloid). It affords the reactions characteristic of Hydrochlorides. It should not afford more than the slightest reactions with the tests for Sulphates. Dried for twenty minutes at 204° to 212° F. (95·6° to 100° C.), it should not lose more than 1 p.c. of moisture. Heated to redness with free access of air it burns without residue.

As commercial Cocaine Hydrochloride frequently contains, in addition to Cocaine, hydrochlorides of some of the other alkaloids of the Coca leaf, the therapeutic actions of which are only imperfectly known and some which are said to be poisonous, it is essential that the purity of this salt should be ascertained before being used for medicinal purposes. According to Paul and Cownley, the most efficient test for this purpose is Maclagan's.

Maclagan Test.—Dissolve 1 grain of the salt in 2 fl. oz. of Water, add 3 drops of Solution of Ammonia (B.P.) and stir briskly with a glass rod; within a few minutes a crystalline precipitate should be thrown down, leaving no turbidity in the supernatant liquid.

This test has recently been subjected to some adverse criticism on the continent. The utility of the test has however been fully established by Boehringer and by Paul and Cownley.—*P.J.* '98, i. 449, 473, 586; *C.D.* '98, i. 511.

Permanganate Test.—A delicate test for the purity of the salt is to add ½ c.c. of $\frac{1}{10}$ p.c. solution of Potassium Permanganate to $\frac{1}{10}$ gramme of the Cocaine salt dissolved in 5 c.c. of Water acidified with Sulphuric Acid. The colour should not disappear within an hour.

For **melting point** *see P.J.* (3) xxi. 1109; *A.J.P.* '93, 131.

Preparations.

INJECTIO COCAINÆ HYPODERMICA. Hypodermic Injection of Cocaine. (Name altered.)

Cocaine Hydrochloride, 33 grains; Salicylic Acid, ½ grain; Distilled Water, 6 fl. drm., or a sufficient quantity. Boil the Distilled Water; add the Salicylic Acid; dissolve the Cocaine Hydrochloride in the solution when cool; add, if necessary, sufficient recently boiled and cooled Distilled Water to produce 6 fl. drm. of the Injection.

Same strength as Liquor Cocainæ Hydrochloratis of the *B.P.* Additions 1890.

Dose.—By subcutaneous injection, 2 to 5 minims.

110 minims contain about 10 grains of Cocaine Hydrochloride; 100 c.c. contain 10 grammes.

LAMELLÆ COCAINÆ. Discs of Cocaine. (Altered.)

Discs of Gelatin, with some Glycerin, each weighing about $\frac{1}{20}$ grain and containing $\frac{1}{80}$ grain of Cocaine Hydrochloride.

Each Disc is four times the strength of a Disc of Cocaine of the British Pharmacopœia of 1885.

TROCHISCUS KRAMERIÆ et COCAINÆ. *See* Krameria.

Not Official.

PASTILLUS COCAINÆ (*T.H.*).—Contains Cocaine Hydrochloride $\frac{1}{10}$ grain.

TROCHISCI COCAINÆ.—Contains $\frac{1}{12}$ grain of Cocaine Hydrochloride (*G.H.*); $\frac{1}{10}$ grain (*Central Throat*); $\frac{1}{12}$ or $\frac{1}{8}$ grain (*L.H.*) in each.

GUTTÆ COCAINÆ HYDROCHLORATIS (*L.O.H.*).—Cocaine Hydrochloride 10 grains, Distilled Water 1 fl. oz.

EUCAINE (A) (Methylester of Benzoyl-n-methyl-tetra-methyl-gamma-oxy-piperidine-carboxylic Acid).—A synthetic body crystallizing from Alcohol and Ether in prisms melting at 104° C.

EUCAINE HYDROCHLORIDE (A).—A white crystalline body.

Solubility.—1 in 10 of Water; 1 in 3 of Alcohol (90 p.c.). Introduced as a substitute for Cocaine in the production of local anæsthesia. Applied to the throat, nose, and ear in 2, 5 and 8 p.c. solutions. Useful in dental work; injected into the gums before extraction.—*L.* '96, ii. 107, '97, i. 609; *P.J.* '96, i. 342, '96, ii. 337, '97, i. 82; *B.M.J.E.* '97, i. 32, 35, '98, i. 48; *B.M.J.* '97, i. 134, '97, ii. 1560.

In ophthalmic practice it has not been found satisfactory as it causes severe smarting.—*L.* '97, ii. 39; *B.M.J.E.* '97, i. 48, 79.

Eucaine salts may be sterilized by boiling without undergoing decomposition.—*P.J.* '97, i. 82; *B.M.J.E.* '96, ii. 91. Solutions prepared with sterilized water remain clear and require no preservative.—*B.M.J.* '97, i. 134. Physiological action of.—*T.G.* '97, 767.

EUCAINE (B).—(Benzoyl-vinyl-di-aceton-alkamine).—A synthetic product closely allied to Eucaine (A) and Cocaine.

EUCAINE HYDROCHLORIDE (B).—Solubility.—1 in 20 of water; 1 in 14 of Alcohol (90 p.c).

Is superior to Eucaine Hydrochloride (A) for use in ophthalmic work, as it is free

from the irritating effects of the latter, and is an equally powerful local anæsthetic. Used in 2 p.c. aqueous solution. Solutions may be sterilized by boiling.—*B.M.J.* '97, i. 134; '97, ii. 1560.

ORTHOFORM (Para-methyl-amido-meta-oxybenzoic Acid).—A synthetic product introduced as a substitute for Cocaine. A white, odourless, tasteless crystalline powder, melting at 120° C. Sparingly soluble in Water.

Medicinal Properties.—Local anæsthetic employed in ulcerations of the upper air passages. Useful where nerve endings are exposed, but has no action on unbroken skin and but little on healthy mucous membrane. Best administered as a **spray**, using 10 p.c. solution made with Alcohol (45 p.c.), but may be employed in the crude powder, either alone or mixed with an equal quantity of Lycopodium for insufflation, or as an **ointment** (10 p.c.); a saturated solution of Orthoform in Collodion is used as a varnish. Said to be of value as an anodyne in ulcer or cancer of the stomach in doses of 8 to 16 grains. An aqueous solution of the **Hydrochloride** is used as a **paint**.—*B.M.J.* '98, i. 362; *Pr.* lxi. 505.

As an ointment it is useful in treatment of burns; in ulcers of the leg and in syphilitic ulcers.—*L.* '93, i. 1024; *B.M.J.E.* '98, i. 76; *P.J.* '98, ii. 661.

Non-toxic and powerfully antiseptic. On account of its sparing solubility it is but slowly absorbed.

Nearly 2 oz. have been employed in the course of a week for dusting wounded surfaces without injurious effect.—*B.M.J.E.* '97, ii. 55; *P.J.* '97, ii. 277; *B.M.J.* '98, i. 362.

Used (suspended in Glycerin) for operations within the uterus.—*L.* '98, i. 1434.

ORTHOFORM HYDROCHLORIDE is more soluble in Water and may be employed for internal administration or for urethral injection, but is too acid for hypodermic injection or application to the eye.—*L.* '97, ii. 738; *B.M.J.E.* '97, ii. 55. Injection of a 10 p.c. solution in gleet.—*L.* '97, ii. 738.

Dose.—8 to 16 grains.

BENZOYL-PSEUDOTROPEINE (Tropacocaine, Tropain).—First obtained from Java Coca leaves and afterwards made synthetically. The **Hydrochloride** has been used to produce anæsthesia of the eye during operations; it is much less toxic than Cocaine.—*B.M.J.* '92, ii. 406; '94, ii. 598; *L.* '94, ii. 598; *T.G.* '94, 653; *M.A.* '93, 52.

HOLOCAINE (Para-diethoxy-ethenyl-diphenyl-amidine).—A new synthetic product introduced as a substitute for Cocaine.

Prepared by the interaction of Phenacetin and Paraphenetidin. A powerful base forming sparingly soluble salts with acids. In crystals which melt at 121° C. Insoluble in Water, readily soluble in Alcohol (90 p.c.) and Ether.

HOLOCAINE HYDROCHLORIDE.—The Hydrochloride of the above base. Occurs in colourless needle-shaped crystals.

Solubility.—1 in 50 of Water; 1 in 6 of Alcohol (90 p.c.).

Medicinal Properties.—Used in the form of 1 p.c. solution in ophthalmic surgery. Produces complete and rapid anæsthesia without pain and neither dilates the pupil, nor affects the blood vessels. On account of its toxicity, it cannot be used hypodermically. Its installation into the eye causes a slight feeling of burning which rapidly passes off.—*L.* '97, i. 1466; *B.M.J.* '98, ii. 619; *B.M.J.E.* '97, i. 55, 75, 87, 92; '98, i. 99; *Pr.* lxi. 503.

A 1 p.c. solution did not show the slightest cloudiness when allowed to stand in an open vessel for two months.—*P.J.* '97, i. 368.

COCCUS.

COCHINEAL.

The dried fecundated female insect, *Coccus Cacti*; reared on *Nopalea coccinellifera*, and on other species of *Nopalea*.

When dried in the sun the insects are of an ash-grey colour with a silvery surface, but when killed by immersion in boiling water they have a reddish appearance, and if dried by artificial heat they are black.

Medicinal Properties.—Used chiefly as a colouring agent. Was formerly given in whooping cough.

Official Preparation.—Tinctura Cocci. Used in the preparation of Tinctura Cardamomi Composita and Tinctura Cinchonæ Composita.

Not Official.—Carmine and Liquor Carmini.

Foreign Pharmacopœias.—Official in U.S., Coccus; Belg., Swed. and Swiss, Coccionella; Fr., Cochenille; Port., Cochonilha; Mex. and Span., Cochinilla; not in the others.

Description.—About one-fifth of an inch (five millimetres) long; somewhat oval in outline, flat or concave beneath, convex above, transversely wrinkled, purplish-black or purplish-grey, easily reduced to powder which is dark-red or puce-coloured.

Test.—When Cochineal is macerated in Water, no insoluble powder is separated. Incinerated with free access of air, it should yield not more than 6 p.c. of ash.

Preparation.

TINCTURA COCCI. TINCTURE OF COCHINEAL. (ALTERED.)

Cochineal, in powder, 1; Alcohol (45 p.c.), 10. Prepare by the maceration process. =(1 in 10).

Now 1 in 10 instead of 1 in 5, and Alcohol (45 p.c.) used instead of Proof Spirit.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Fr. and Mex., 1 in 10; by weight; not in the others.

Not Official.

CARMINE.—Prepared from Cochineal, an excellent colouring agent for powders and ointments. It is also used as a staining agent in microscopy.

LIQUOR CARMINI (*U.S.N.F.*).—Carmine, 480 grains; Water of Ammonia, 6 fl. oz.; Glycerin, 6 fl. oz.; Water sufficient to make 16 fl. oz.

CODEINA.

CODEINE.

$C_{17}H_{18}(CH_3)NO_3$, H_2O, eq. 314·84.

An alkaloid obtained from Opium or from Morphine.

Solubility.—1 in 80 of Water; 1 in 24 of boiling Water; 1 in 2 of Alcohol (90 p.c.); 1 in 2 of Chloroform; 1 in 30 of Ether; 1 in 12 of Benzol; 1 in 85 of Liquor Ammoniæ.

Medicinal Properties.—It has been given with benefit in diabetes (an entire abstinence from starchy food being strictly observed) in doses of 1 grain three times a day, gradually raised to 2 grains. It has been found useful in relieving the hacking cough of phthisis; also ovarian pain.

It has a powerful action in allaying abdominal pain and it can be pushed to a much greater extent than Morphine without causing drowsiness or interfering with the respiration or with the action of the bowels.—*B.M.J.* '88, i. 1214.

Dose.—$\frac{1}{4}$ to 2 grains.

Not Official.—Syrupus Codeinæ (B.P.C.), and Codeine Pastils.

Foreign Pharmacopœias.—Official in Belg., Dan., Dutch, Fr., Hung., Ital., Jap., Mex., Port., Russ., Span., Swed., Swiss and U.S.; not in the others.

Description.—In colourless, or nearly colourless trimetric crystals. The aqueous solution has a bitter taste and an alkaline reaction.

Tests.—The alkaloid dissolves in an excess of Sulphuric Acid, forming a colourless solution, a small quantity of which, when gently warmed on a water-bath with 2 drops of Solution of Ammonium Molybdate or with a trace of Ferric Chloride, or Potassium Ferricyanide, develops a blue or bluish-black colour, which, on the addition of a minute trace of Diluted Nitric Acid, changes to a bright scarlet, becoming orange. Heated to redness in air it yields no ash. Moistened with Nitric Acid the liquid becomes yellow, but not red. A 2 p.c. solution of Codeine in Water acidulated with a few drops of of Hydrochloric Acid, gives a whitish precipitate with Solution of Potassium Hydroxide, but not with Solution of Ammonia. A saturated solution of Codeine in Water acidulated with Hydrochloric Acid, should give no blue colour, but only gradually a dull green on the addition of Test-solution of Ferric Chloride and a very dilute solution of Potassium Ferricyanide (absence of Morphine and other impurities).

Adulteration of Codeine with Ammonium Tartrate (*P.J.* (3) xiv. 1035); with sugar crystals (*P.J.* '96, i. 99, 312).

Not Official.

SYRUPUS CODEINÆ (*B.P.C.*).—Codeine, 8 grains; Proof Spirit, $\frac{1}{2}$ fl. oz.; Water, $\frac{1}{2}$ fl. oz.; dissolve and add Syrup to make 8 fl. oz.

This is the same strength as in former editions of the *Companion*, half the Water being replaced by Proof Spirit.

Dose.—1 to 2 teaspoonfuls.

Foreign Pharmacopœias.—Official in Belg., Fr., Ital., Mex. and Swiss, 1 in 500; Span., 1 in 600; not in the others.

CODEINE PASTILS.—Contain $\frac{1}{8}$th grain of Codeine in each. One for a dose when the cough is troublesome.

An improvement on Codeine Jelly.

Foreign Pharmacopœias.—Official in Ital., $\frac{1}{12}$ grain in each; not in the others.

CODEINE IODATE.—A combination of Iodic Acid with the alkaloid. Has been introduced as an analgesic. Dose, $\frac{1}{2}$ grain by hypodermic injection.

CODEINÆ PHOSPHAS.

CODEINE PHOSPHATE.

[NEW.]

$(C_{17}H_{18}(CH_3)NO_3, H_3PO_4)_2, 3H_2O$, eq. 842·20.

The Phosphate of an alkaloid obtained from Opium or from Morphine.

The most soluble salt of Codeine.

Solubility.—1 in 4 of Water; 1 in 200 of Alcohol (90 p.c.).

Medicinal Properties.—*See* Codeina.

Dose.—¼ to 2 grains.

Official Preparation.—Syrupus Codeinæ.

Foreign Pharmacopœias.—Official in Ger., Norw., Russ. and Swiss; not in the others.

Description.—White crystals which have a slightly bitter taste.

Tests.—A 5 p.c. aqueous solution has a slightly acid reaction, and yields a whitish precipitate with Solution of Potassium Hydroxide, but not with Solution of Ammonia. It affords the reactions characteristic of Codeine and of Phosphates. It loses its water of crystallisation when dried at 212° F. (100° C.), and at a higher temperature melts, forming a yellowish-brown liquid. It should yield no characteristic reaction with the tests for Chlorides or Sulphates. It should not be coloured blue by Test-solution of Ferric Chloride (absence of Morphine).

Preparation.

SYRUPUS CODEINÆ. SYRUP OF CODEINE. (NEW.)

Codeine Phosphate, 40 grains; Distilled Water, ¼ fl. oz.; Syrup, 19¾ fl. oz. Dissolve the Codeine Phosphate in the Distilled Water; add the Syrup; mix.

40 grains of Codeine Phosphate will not dissolve in ¼ fl. oz. Distilled Water, it is better to use 180 minims.

Dose.—½ to 2 fl. drm.

1 fl. drm. of this Syrup contains ¼ grain of Codeine Phosphate.

It is twice the strength of the Syrup described in previous editions of the *Companion*.

COLCHICI CORMUS.*

COLCHICUM CORM.

The fresh corm of *Colchicum autumnale*, collected in early summer; and the same stripped of its coats, sliced transversely, and dried at a temperature not exceeding 150° F. (65·5° C.).

Contains about ·5 p.c. of **Colchicine.**

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* The young corm (an offset of the old one) first appears about the end of June: it flowers late in autumn, the impregnated germen remains latent under ground quite close to the bulb until the following spring, when the capsule rises above the surface, accompanied by several long upright leaves, the seeds ripening in June: after which the leaves decay. The corm is considered to be most active when it is a year old, that is, about July.

Medicinal Properties.—Produces increased action of the kidneys, especially as regards the excretion of urea and uric acid and other solids of the urine; the action of the liver, intestine, and skin is also increased. Employed in gout, especially the acute form, controlling the pain and inflammation and cutting short the attack. May be combined with saline purgatives in cases of hepatic congestion in gouty patients. It is apt to produce depression if given on an empty stomach. The Extract is frequently prescribed with Dover's Powder to relieve painful gout.

In very large doses Colchicum is a powerful stimulant of the liver and intestine. It renders the bile more watery, but increases the secretion of biliary matter proper.—Dr. Rutherford.

Dose of the dried Corm.—2 to 5 grains.

Official Preparations.—Extractum Colchici and Vinum Colchici.

Incompatibles.—Tincture of Iodine, Guaiacum, and all astringent preparations.

Antidotes.—In case of poisoning with Colchicum, emetics followed by demulcent drinks, and, if coma be present, Brandy, Ammonia, Coffee, and other powerful stimulants may be given. Hypodermic injection of ½ grain of Morphine.

Foreign Pharmacopœias.—Official in Fr., Ital., Mex., Port., Span. and U.S.; not in the others.

Description.—The fresh corm is about one inch and a half (thirty-five millimetres) long and an inch (twenty-five millimetres) broad, somewhat conical, hollowed on one side where it has a new corm in process of development, and rounded on the other; covered with an outer thin brown membranous coat, and an inner reddish-yellow one; internally white and solid, and when cut yielding a milky juice of a bitter taste and disagreeable odour. Dried slices are one-tenth or one-eighth of an inch (two or three millimetres) thick, yellowish at their circumference, somewhat reniform in outline; firm, whitish, amylaceous; breaking readily with a short fracture; taste bitter; no odour.

Preparations.

EXTRACTUM COLCHICI. Extract of Colchicum.

Crush fresh Colchicum Corms, deprived of their coats; press out the juice; allow the feculence to subside; decant; heat the clear liquid to 212° F. (100° C.); strain through flannel, and evaporate at a temperature not exceeding 160° F. (71·1° C.) to the consistence of a soft extract.

100 pounds of Corms yield about 4 pounds of Extract.

Dose.—¼ to 1 grain.

Foreign Pharmacopœias.—Official in Belg., Fr., and Mex., Alcoholic Extract of Seeds; Mex. and Span., Alcoholic from Corms; Swiss has **Fluid Extract** of Seeds; Mex. and U.S. **Fluid Extracts** of Corms and Seeds; not in the others.

Ordinary extract of Colchicum (dried at 100° C.) yielded 1·62 p.c. of alkaloid; Acetic Extract yielded 1·55 p.c.—*P.J.* '98, i. 131.

The Acetic Extract is now deleted from B.P.

VINUM COLCHICI. Colchicum Wine.

Colchicum Corm in No. 20 powder, 4; Sherry, 20; macerate as directed for Tinctures. =(1 in 5).

Dose.—10 to 30 minims.

Foreign Pharmacopœias.—Official in U.S., 1 in 2·5 White Wine; Fr., 1 and 10 Malaga; Ital., 1 and 10 Marsala; Port., 1 and 10 Maderia; Mex., 1 in 10 Sherry; Span., 1 and 16·6 Sherry.

Diluted Acetic Acid appears to be about as good a solvent as Sherry, but Proof Spirit was better than either.—*P.J.* '97, i. 173. Further notes on the same.—*P.J.* '98, i. 131.

COLCHICI SEMINA.

COLCHICUM SEEDS.

The dried ripe seeds of *Colchicum autumnale.*

The seeds contain ·6 to 1·0 p.c. of alkaloid.

Medicinal Properties.—Similar to those of the corm, but considered by some to be superior both in certainty of effect and mildness of operation.

Official Preparation.—Tinctura Colchici Seminum.

Not Official.—Tinctura Colchici Composita, Tinctura Colchici Florum and Vinum Colchici Seminum.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—About one-tenth of an inch (two and a half millimetres) in diameter, subglobular, slightly pointed at the hilum, rough and of a dull reddish-brown colour, minutely pitted, very hard and tough. The endosperm is oily; its cells are seen in tranverse section to have thickened walls with large pits. The seeds have a bitter acrid taste, but no odour.

Detection of Colchicine.—*J.S.C.I.* '94, 1099; *C.N.* '94, 26; *J.C.S.* Abs. '95, ii. 300.

Preparation.

TINCTURA COLCHICI SEMINUM. Tincture of Colchicum Seeds. (Altered.)

Colchicum Seeds in No. 30 powder, 4; Alcohol (45 p.c.), a sufficient quantity. Moisten the powder with 2½ of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20.

=(1 in 5).

Now 1 in 5 instead of 1 in 8, and made with Alcohol (45 p.c.) in place of Proof Spirit.

Dose.—5 to 15 minims.

This preparation is made with rather more than one and a-half times the proportion of Colchicum Seeds ordered for the corresponding preparation in the B.P. of 1885.

According to the experiments of Wright and Farr (*P.J.* (3) xxi. 957) the best yield of alkaloid was obtained by 50 p.c. Alcohol (by volume); the average percentage in (1 in 8) tinctures from 10 samples of ground Seeds was ·0857, which is equivalent to ·685 p.c. in the Seeds, supposing these to be completely exhausted.

From the unbroken Seeds *cold* Alcohol only extracts about one-third of the alkaloid (*P.J.* (3) viii. 507), corroborated by Cripps (*P.J.* (3) xxii. 364).

From the unbroken Seeds *hot* (80° C.) diluted Alcohol (sp. gr. ·941) extracts the whole of the alkaloid in a few hours.—*P.J.* (3) xi. 734.

Foreign Pharmacopœias.—Official in Austr. and Jap., 1 in 10; Belg., Fr., Hung., Mex. and Port., 1 in 5; Dutch, Ger., Russ., Swed. and Swiss, 1 in 10: U.S., 15 in 100: all from Seeds. Port. and Span., 1 in 5 with Corms: all by weight except U.S.; not in the others.

Not Official.

TINCTURA COLCHICI COMPOSITA (*P.L.*).—Colchicum Seeds, bruised, 1; Aromatic Spirit of Ammonia, 8: macerate for seven days, then press and strain.

Dose.—15 to 30 minims.

TINCTURA COLCHICI FLORUM.—Fresh Flowers, 2; Alcohol (90 p.c.), by weight, 1: digest seven days.

It will yield on the average ·1 p.c. of total alkaloid.

Dose.—10 to 30 minims. This preparation closely resembles the Eau Médicinale, and is considered by some medical men to be the most effective preparation of any.

VINUM COLCHICI SEMINUM.—Colchicum Seeds in fine powder, 1; Sherry, 10: macerate for seven days, agitating occasionally, strain, press, and filter.

Dose.—10 to 30 minims.

Foreign Pharmacopœias.—Official in Austr. and Dutch, 1 and 10 Malaga; Hung., 1 in 5 Malaga; Belg., 1 and 16·6 Malaga and Spirit; U.S., 15 in 100 White Wine; Dan., Ger., Jap., Norw. and Russ., 1 and 10 Sherry; Fr., 1 and 16·6 Malaga; Port., 1 and 10 Madeira; Swiss, Fluid Extract 1 in 10 Marsala; all by weight except U.S.

Not Official.

COLLINSONIA.

The root of *Collinsonia Canadensis*.

Various preparations of this have been recommended in acute cystitis and in the treatment of renal calculi.—*B.M.J.* '87, ii. 712; *L.* '88, i. 68.

Preparation.

TINCTURA COLLINSONIÆ.—Collinsonia Root, 1; Alcohol (60 p.c.), 10.

Dose.—30 to 120 minims.

COLLODIUM.

COLLODION.

Pyroxylin, 1; Ether, 36; Alcohol (90 p.c.), 12: mix the Ether and the Alcohol; add the Pyroxylin; set aside for a few days; should there be any sediment, decant the clear Collodion.

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Mixes with Ether; but when mixed with Water or Alcohol (90 p.c.) the Pyroxylin is thrown out.

Official Preparations.—Collodium Flexile and Collodium Vesicans.

Description.—A colourless, highly inflammable liquid of syrupy consistence and ethereal odour. It dries quickly upon exposure to the air, and leaves a thin transparent film, which contracts rapidly on drying and is insoluble in Water or Alcohol (90 p.c.).

Foreign Pharmacopœias.—Official in Austr., Hung. and Jap., proportions not given; Belg., Pyroxylin 1, Ether 20, Alcohol (90 p.c.) 2½, Castor Oil 1½;

Dutch, Pyroxylin 3, Ether 80, Alcohol (90 p.c.) 17; Fr., Pyroxylin 1, Ether 15, Alcohol (95 p.c.) 4; Dan., Ger., Russ. and Swiss, Pyroxylin 1, Ether 21, Alcohol (90 p.c.) 3; Ital., Pyroxylin 1, Alcohol (90 p.c.) 4, Ether 12; Mex., Pyroxylin 5, Alcohol (90 p.c.) 20, Ether (·720) 75; Norw., Pyroxylin 4, Ether 84, Alcohol (90 p.c.) 12; Port., Pyroxylin 1, Ether 14, Alcohol (90 p.c.) 4, Castor Oil 1; Span., Pyroxylin 1, Ether 25, Alcohol (90 p.c.) 3; Swed., Pyroxylin 1, Ether 35, Alcohol (90 p.c.) 5; U.S., Pyroxylin 3, Stronger Ether 75, Alcohol (94 p.c.) 25: all by weight except U.S.

Preparations.

COLLODIUM FLEXILE. FLEXIBLE COLLODION.

Collodion, 12 fl. oz. Canada Turpentine, ½ oz. (by weight); Castor Oil, ¼ oz. (by weight): mix.

Medicinal Properties.—Chiefly used for coating with a protective film, fresh wounds, leech bites, and fissured nipple; it has been recommended as an application to erysipelatous surfaces and to burns, and to prevent the pitting of smallpox. A large number of substances can be dissolved in Collodion to form medicated Collodions; some of these are noticed under other headings.

It does not contract in drying.

Not Official.—Styptic Colloid and Hæmostatic Collodion.

Foreign Pharmacopœias.—(Known also as Collodium Elasticum).—Official in Austr., Russ. and Swiss, Collodion 49, Castor Oil 1; Dan., Collodion 99, Castor Oil 1; Dutch, Collodion 96, Castor Oil 4; Fr., Collodion 15, Castor Oil 1; Ger., Collodion 94, Turpentine 5, Castor Oil 1; Hung., Collodion 50, Castor Oil 1; Ital., Collodion 97, Castor Oil 3; Jap., Collodium 30, Castor Oil 1; Norw., Collodium 99, Glycerin 1; Swed., Collodion 100, Glycerin 1; Mex. and Span., Collodion 10, Castor Oil 1; U.S., Collodion 92, Canada Turpentine 5, Castor Oil 3; Belg. (Collodium), and Port. (Collodio), both contain Castor Oil. *See* COLLODIUM.

COLLODIUM VESICANS (BLISTERING COLLODION).—*See* CANTHARIS.

Not Official.

STYPTIC COLLOID (DR. RICHARDSON'S).—A saturated solution of Tannic Acid and Pyroxylin in Absolute Alcohol and Pure Ether. In the first step of the process, the Tannic Acid, rendered as pure as it can be, is treated with Absolute Alcohol, and digested in it for several days. Then the Pure Ether, also absolute, is added until the whole of the thick Alcoholic Mixture is rendered quite fluid. Lastly the Pyroxylin is added until it ceases readily to dissolve. A little Benzoin may be added to give an agreeable odour to the Colloid.

It can be applied directly with a brush, or mixed with an equal quantity of Ether, and used in the form of **spray**.

HÆMOSTATIC COLLODION (Dr. PAVESI'S).—Collodion, 100; Carbolic Acid, 10; Tannic Acid, 5; Benzoic Acid, 5: dissolve. Is applied by means of a camel-hair pencil, or by soaking strips of linen in it.

COLLODIUM SALICYLICUM.—*See* ACIDUM SALICYLICUM.

COLOCYNTHIDIS PULPA.

COLOCYNTH PULP.

The dried pulp of the fruit of *Citrullus Colocynthis*, freed from seeds.

The fruit is imported chiefly from Smyrna, Trieste, France and Spain.

Medicinal Properties.—It is a powerful drastic hydragogue cathartic, dangerous in large doses; but very commonly prescribed as an aperient, in the form of Compound Extract or Pill combined with Henbane. The Tincture is ordered in Mixtures.

In large doses a powerful hepatic as well as intestinal stimulant; it renders bile more watery, but increases the secretion of biliary matter.—Dr. Rutherford.

Dose.—Not given in B.P.; 2 to 8 grains, but seldom prescribed alone.

Official Preparations.—Extractum Colocynthidis Compositum and Pilula Colocynthidis Composita; Pilula Colocynthidis Composita is used in the preparation of Pilula Colocynthidis et Hyoscyami.

Not Official.—Tinctura Colocynthidis.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Coloquinte), Ger., Hung., Ital. (Coloquintide), Jap., Norw., Port. (Coloquintidas), Russ., Mex. and Span. (Coloquintida), Swed., Swiss and U.S.

Description.—The fruit is usually imported peeled, in more or less broken balls about two inches (five centimetres) or less in diameter. The Pulp, which alone is official, is light, spongy, whitish, and odourless, but intensely bitter.

Tests.—It should not yield the characteristic reactions with the tests for Starch, and only traces of fixed Oil should be removed from it by Ether. It yields, when dried at 212° F. (100° C.) and incinerated, at least 9 p.c. of ash (indicating absence of seeds).

These tests are intended to exclude: 1. Adulteration with Starch, which of course need not be expected in dealing with any respectable drug-house; 2. Imperfect separation of Seeds. This latter is the point most worthy of attention in connection with Colocynth. According to Tichborne the unpeeled fruit consists of Seeds (inert) 47 p.c., Rind (almost inert) 34 p.c., Pulp (active) 19 p.c., (*Y.B.P.* '78, 564). The decorticated Pulp will therefore contain 71 p.c. of Seeds.

212 lbs. of peeled Colocynth fruits ground under small edge-running stones so as to crush the pulp without breaking the seeds yielded 48 lbs. of pulp containing 12 p.c. of ash, and 164 lbs. of seeds containing 2·37 p.c. of ash. This method may be safely used for separating pulp from seeds.—*C.D.* '96, i. 277.

A sample of very fine decorticated Colocynth examined by us in 1878 yielded 66 p.c. of Seeds.

The removal of the Seeds commercially is carried out very imperfectly; we have bought Colocynth Pulp from wholesale houses in London containing from 4 p.c. up to 33 p.c. of Seeds, 10 p.c. being quite a common figure. Now, as the Seeds contain about 15 p.c. of Oil (they are stated (*Y.B.P.* '78, 565) to contain 50 p.c.), it is doubtful whether a single trade sample could be found which would pass the Official Ether test, even on the supposition that the Pulp itself was free from Ether-soluble constituents. But the Pulp *perfectly freed from Seeds* yields to Ether about 3 p.c. of extractive of an oily nature, so that the Official test should be completely modified. If complete separation of Seeds be insisted upon, the Ether extractive should not exceed 4 p.c., but a maximum of 5 p.c. would probably serve all practical purposes. This would allow about 10 p.c. of Seeds supposing them to contain 15 p.c. of Oil.

The proportion of ash as indicated in *Companion* 1886, also furnishes a good test. We have found the ash of the Pulp to vary between 8·6 and 14 p. c., and that of the Seeds between 2·2 and 4 p. c.; on these figures Colocynth Pulp with an

allowable 10 p. c. of Seeds would yield not less than 8 p. c. of ash. It should be noted that the ash both of Pulp and Seed is very deliquescent.

Preparations.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM. Compound Extract of Colocynth. (Altered.)

Colocynth Pulp, 6; Extract of Barbados Aloes, 12; Scammony Resin, 4; Curd Soap, in shavings, 4; Cardamom Seeds, in the finest powder, 1; Alcohol (60 p.c.), 160. Macerate the Colocynth Pulp in the Alcohol for four days; press out the tincture; remove the Alcohol by distillation; add the Extract of Aloes, Scammony Resin, and Soap; evaporate to the consistence of a firm extract, adding the Cardamoms towards the end of the process.

Extract of Barbados Aloes used instead of Extract of Socotrine Aloes, Curd Soap increased; Alcohol (60 p.c.) in place of Proof Spirit.

Dose.—2 to 8 grains.

The product weighs 24, therefore in every 6 of Extract. Coloc. Compos. there is the power of $1\frac{1}{2}$ of Pulp = Simple Extract $\frac{1}{2}$, Extract of Aloes 3, Resin of Scammony 1, Curd Soap $\frac{3}{4}$, Cardamoms $\frac{1}{4}$, Water $\frac{1}{2}$.

Better to evaporate the Colocynth Extract to dryness, powder it, and mix with the other ingredients to form Pulv. Ext. Coloc. Co.

Commonly prescribed with Extract of Hyoscyamus, to prevent griping.

An examination of commercial samples.—*C. D.* '96, i. 277.

Foreign Pharmacopœias.—Official in Port., Colocynth 30, Aloes 55, Scammony 22, Hard Soap 15, Cardamoms 3; Span., contains Colocynth, Aloes, Scammony, and six other ingredients; Swed., Colocynth 5, Aloes 10, Scammony 3, Cardamoms 1, Soap 2; Swiss, Extract of Colocynth 2, Extract of Aloes 10, Scammony 4, Cardamoms 1, Soap 3, Russ., Extract Colocynth 3, Aloes 10, Scammony 8, Extract of Rhubarb 5; U.S., Extract Colocynth 16, Purified Aloes 50, Resin Scammony 14, Cardamoms 6, Soap 14: not in the others. Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Russ., Swiss and U.S., have Simple Extract made with Alcohol.

PILULA COLOCYNTHIDIS COMPOSITA. Compound Pill of Colocynth.

Colocynth Pulp, in powder, 1; Barbados Aloes, in powder, 2; Scammony Resin, in powder, 2; Potassium Sulphate, in very fine powder, $\frac{1}{4}$; Oil of Cloves, $\frac{1}{4}$; Distilled Water, a sufficient quantity (about $\frac{1}{4}$). Triturate the Oil of Cloves with the Potassium Sulphate; add the Colocynth Pulp; mix; add the Barbados Aloes and Scammony Resin; after mixing intimately add the Distilled Water and beat to form a mass. =(about 1 in 6).

Dose.—4 to 8 grains.

For dispensing, keep the powders and oil ready mixed, and make up the mass as required with Water, or better still with Alcohol (60 p.c.).

Dr. Gregory's favourite pill.

The *minimum* dose is somewhat high, as it is frequently prescribed in smaller doses. The same may be said of the next pill, which is only two-thirds of the strength.

Foreign Pharmacopœias.—Official in Fr., Colocynth in powder 10, Aloes 10, Scammony 10, Honey q.s., Oil of Cloves ·2; Norw., Colocynth 2, Aloes 4, Scammony 4, Oil of Cloves $\frac{2}{3}$, Suet 3, Glycerin 3; Span., Compound Extract of

Colocynth 20, Extract of Colchicum 20, Extract of Opium 1; Swed., Compound Extract of Colocynth 7, Cloves 1, Jalap 2, Extract of Wormwood q.s.; not in the others.

PILULA COLOCYNTHIDIS ET HYOSCYAMI. Pill of Colocynth and Hyoscyamus.

Compound Pill of Colocynth, 2; Extract of Hyoscyamus, 1. Mix to form a mass. =(Pil Coloc. Co. 6; Extr. Hyos. 3).

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in Jap.; not in the others.

This mass when made into 5 grain pills is known as Hamilton's pill, and when in 2½ grain pills it is known as Christison's pill.

Not Official.

TINCTURA COLOCYNTHIDIS.—Colocynth Pulp, in coarse powder, 1; Alcohol (90 p.c.), 10. Made by maceration.

Dose.—10 to 15 minims three times a day.

Foreign Pharmacopœias.—Official in Belg., Hung. and Mex., 1 in 5; Jap., Russ. and Swiss, 1 in 10; Ger., Fruits 1, Alcohol 10; Swed., 1 in 10, with Anise Fruits $\frac{1}{10}$; Dutch, 1 in 14, with $\frac{1}{8}$ Anise Fruits.

Not Official.

CONDURANGO CORTEX.

The bark obtained from *Gonolobus condurango*.

Medicinal Properties.—It was introduced as a remedy for cancer, but it has not fulfilled the expectations formed of it. It relieves catarrh and hyperæsthesia of the stomach, and has been used with benefit in ulcer and cancer of the stomach, relieving the vomiting, pain and hæmatemesis, and improving the appetite.—*L.M.R.* '88, 337; *L.* '95, i. 1004.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Ger., Mex. and Russ.; not in the others.

CONFECTIONES.

CONFECTIONS.

The following are now contained in the British Pharmacopœia, the formulas for which will be found under the names of the substance from which they are prepared:—

CONFECTIO PIPERIS. Dose, 1 to 2 drm.
CONFECTIO ROSÆ GALLICÆ.
CONFECTIO SENNÆ. Dose, 1 to 2 drm.
CONFECTIO SULPHURIS. Dose, 1 to 2 drm.

CONIUM.

CONIUM.

The fresh leaves and young branches of *Conium maculatum*, as well as the dried unripe fruits are Official, and are described under 'Conii Folia' and 'Conii Fructus.'

Medicinal Properties.—Sedative and antispasmodic; allays the cough in bronchitic affections, pertussis, and phthisis. Has been recommended in chorea and other spasmodic affections; also in visceral neuralgias and gastric pains. Applied externally in the form of **ointment** to ease pain of anal fissure or hæmorrhoids, and cancer.

Pharmacological comparison of a standardised fluid extract, with a solution of the mixed alkaloids, and a solution of Conine. As a result of experiments on animals (guinea pigs and rabbits), the same general action was observed as belonging to Conine, the mixed alkaloids, and the fluid extract.—*P.J.* '97, ii. 136.

Dose.—Of the Succus 1 to 2 fl. drm. Of the Tincture 30 to 60 minims.

Incompatibles.—Caustic Alkalis, and vegetable Astringents.

Official Preparations.—Succus Conii from the **Folia**. Unguentum Conii from the **Succus**. Tinctura Conii from the **Fructus**.

Not Official.—Conina and Coninæ Hydrobromidum.

Antidotes.—In case of poisoning by Hemlock, stomach tube or emetics, followed by stimulants, Strychnine hypodermically, artificial respiration.

CONII FOLIA. Conium Leaves.

The fresh leaves and young branches of *Conium maculatum*, collected when the fruit begins to form.

Foreign Pharmacopœias.—Official in Belg. and Fr., Leaves; Austr., Dutch, Ger., Ital., Mex., Port., Russ., Span. and Swed., Herb; not in Dan., Hung., Jap., Norw., Swiss or U.S.

Description.—The leaves are more or less divided in a pinnate manner, the lower decompound and sometimes two feet (nearly seventy centimetres) in length, glabrous, and arising from a smooth stem, marked with dark purple spots, the clasping petioles are of varying length, those of the lower leaves being hollow. The ultimate divisions of the leaves terminate in smooth, colourless, horny points. The odour is strong and disagreeable, resembling that of mice, more especially when rubbed with Solution of Potassium Hydroxide.

Preparations.

SUCCUS CONII. Juice of Conium. (Modified.)

Bruise the fresh leaves and young branches of Conium maculatum; press out the juice; to every three volumes of juice add 1 of Alcohol (90 p.c.); set aside for seven days; filter.

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—1 to 2 fl. drm.

Much larger doses are given.

UNGUENTUM CONII. Conium Ointment. (Altered.)

Juice of Conium, 2; Hydrous Wool Fat, $\frac{3}{4}$. Evaporate the Juice of Conium on a water-bath to one-eighth of its volume, at a temperature not exceeding 140° F. (60° C.); add the Hydrous Wool Fat; mix by trituration.

Boric Acid is now omitted.

Contrary to what might have been expected, the alkaloidal strength of the Juice is not affected by the evaporation.

Becomes mouldy on keeping.—*P.J.* '98, ii. 165, 232.

CONII FRUCTUS. Conium Fruit.

The dried, full-grown, unripe fruits of *Conium maculatum*.

The alkaloidal value of the fruits appears to be as variable as that of the leaves. Some estimations published (*C.D.* '92, ii. 401) gave ·17 to ·91, average ·58 p.c. of Conine.

Alkaloidal strength of Hemlock leaves, fresh and dried, in various stages of development. The yellow fruits yielded a much smaller amount of alkaloid than those gathered earlier. No appreciable loss of alkaloid occurs in drying Hemlock fruit at 100° F. Good dried fruits should yield about 2 p.c. of alkaloidal hydrochlorides.—*Y.B.P.* '93, 368.

Determination of the alkaloidal contents of the stems, leaves, flowers and green fruits of Conium tabulated.—*P.J.* '96, ii. 89; *C.D.* '96, ii. 190.

Description.—Broadly ovoid in shape, greenish-grey in colour; about one-eighth of an inch (three millimetres) long, and nearly as broad, somewhat laterally compressed, and crowned by the depressed stylopod. In the drug as met with in commerce the mericarps are usually separated; each is glabrous and possesses five irregular, more or less crenate primary ridges; the endosperm is deeply grooved on the commissural surface, and in the transverse section of the mericarp no vittæ are visible. No marked odour or taste, but when rubbed with Solution of Potassium Hydroxide a strong disagreeable odour is produced, resembling that of mice.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., Port., Span., Swiss and U.S.; not in the others.

Preparation.

TINCTURA CONII. Tincture of Conium. (Altered.)

Conium Fruit, recently reduced to No. 40 powder, 1; Alcohol (70 p.c.) a sufficient quantity. Moisten the powder with 1 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 5. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and Alcohol (70 p.c.) used in place of Proof Spirit.

Dose.—30 to 60 minims.

From the experiments of Wright and Farr, in 1891 (*P.J.* (3) xxi. 858), it would appear that after eliminating one sample of evidently damaged seed, the percentage of alkaloid in ten samples of Tincture averaged ·0854 (corresponding to ·683 p.c. in the fruit). The percentages were very variable, being ·064 to ·157. Alcohol 70 to 80 p.c. by volume is the best alkaloidal solvent, and a very fine powder is in no way necessary. Continuous percolation gave a product slightly stronger than the old Official macero-percolation process.

Examination of Commercial Tinctures.—*C.D.* '95, ii. 199.

Foreign Pharmacopœias.—Official in Belg. and Port., Tinct. Cicutæ, 1 in 5, also Fresh Herb 1, Spirit 1; Fr. and Span., from dried leaves, 1 in 5, Fr., also Alcoolature, fresh Herb 1, Spirit 1, also Ethereal 1 in 5; Mex., leaves, 1 in 5; not in the others.

Not Official.

CONINA. *Syn.*—Cicutine. $C_8H_{17}N$, eq. 126·22. A colourless volatile liquid alkaloid, with a characteristic penetrating odour. It is obtained from *Conium maculatum* by distilling the fruit with dilute Potash or Soda, and purified by conversion into a Tartrate. It unites with acids to form crystalline salts, which are much more stable than the alkaloid.

Sp. gr. ·886 (Schorm), ·844 (Ladenburg). It boils at about 336° F. (169° C.). It is dextro-rotatory.

Solubility.—1 in 100 of Water. It mixes in all proportions with Alcohol and Ether.

Dose.—It has been given in doses of $\frac{1}{12}$ grain to 2 grains, but the foreign Pharmacopœias give much smaller doses, 1 to 4 milligrammes ($\frac{1}{67}$ to $\frac{1}{16}$ grain).

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., Span. and Swed.; not in the others.

CONINÆ HYDROBROMIDUM.—A colourless crystalline salt. The usual form for prescribing Conine, of which it contains about 60 p.c.

Solubility.—1 in 2 of Water; 1 in 3 of Alcohol (90 p.c.).

Foreign Pharmacopœias.—Official in Mex. and Russ.; not in the others.

Not Official.

CONVALLARIA.

The entire plant of *Convallaria majalis* (Lily of the Valley).

Medicinal Properties.—A cardiac tonic; diuretic. Not cumulative like Digitalis, but according to Mitchell Bruce it is a very uncertain remedy. It has been long employed by the Russian peasantry as a remedy for dropsy. The late Professor Sée considered that it may be used in all forms of heart failure, for it has none of the nauseating effects of Digitalis, nor does it exhaust the contractility of the heart and arteries.

Foreign Pharmacopias.—Official in Fr. (Muguet), Ital., Mex. and Span. (Lirio de los Valles), Swiss and U.S.; not in the others.

Preparations.

EXTRACTUM CONVALLARIÆ.—(Fr., Ital. and Span.)—Stalks and flowers of Convallaria freshly gathered and dried with one-third quantity of leaves and roots. Cut and infuse twelve hours in six times the weight of Distilled Water. Press, and repeat the operation. Mix the two liquors and evaporate to a soft extract. Dissolve this in sufficient cold Distilled Water. Filter and evaporate over a water-bath to the consistence of a hard extract. Also made from expressed juice, clarified.

The Russians prepare it from the flowers only.

Dose.—Professor Sée gave ½ to 1 gramme daily. Dr. Sansom recommends 5 to 8 grains three times a day. Convallaria contains 2 glucosides—**Convallarin**, a purgative, and **Convallamarin**, allied to Digitalin in its action on the heart; the dose of the latter is ¼ to 2 grains.

Foreign Pharmacopœias.—Official in Swiss and U.S., **Fluid Extract**, with diluted Alcohol, 1 in 1; Mex. (Aqueous Extract) from Roots; not in the others.

TINCTURA CONVALLARIÆ (*B.P.C.*).—Lily of the Valley flowers and stalks dried, in No. 20 powder, 1; Proof Spirit sufficient to percolate 8.

Dose.—5 to 20 minims.

COPAIBA.

COPAIBA.

B.P.Sym.—Copaiva.

The Oleo-Resin obtained from the trunk of *Copaifera Lansdorfii*, and other species of Copaifera.

Obtained from the northern part of South America. The commercial varieties Para, Maranham, Maracaibo and Angostura, are named from the various ports of shipment. Sp. gr. varies from (Para) ·916 to (Maracaibo) ·995 or (Angostura raw) 1·009. Resin (Para) 23·87 to (Maracaibo) 61·43. Sp. gr. of Etherial Oil (Para) ·897 to (Bahia) ·908.—*Y.B.P.* '86, 221.

Solubility.—(nearly clear) 1 in 1 (*or less*) of Alcohol (90 p.c.) but if more Alcohol be added it becomes cloudy; in all proportions of Absolute Alcohol, Ether, Benzol, and the fixed and volatile Oils; also in four times (*or less*) its bulk of Petroleum Spirit, the solution only yielding a filmy deposit on standing; also 1 in 2 (*or less*) of Glacial Acetic Acid.

Medicinal Properties.—Stimulant and antiseptic, diuretic. Acts more particularly upon the mucous membrane of the genito-urinary tract. Used in gonorrhœa, after the acute stage has passed, and in gleet. Useful in chronic bronchitis and bronchiectasis, when a disinfectant expectorant is indicated. The **resin** is used as a diuretic in cardiac and hepatic dropsy, but not in renal.

Dose.—30 to 60 minims.

Prescribing Notes.—Can be given in the form of **pills** or **paste** (*see* p. 245), also in **capsules**. It may be suspended in water by means of Mucilage (*see* p. 2) or Tincture of Quillaia, or Liquor Potassæ which saponifies it. Cinnamon Water, Peppermint Water, the Tinctures of Orange and Ginger have been used as flavouring agents. The **Oil** of Copaiba can be suspended by means of Mucilage, as can also the **Resin** of Copaiba (*see* p. 2).

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Copahu), Ger., Hung., Ital., Jap., Mex., Norw., Port. (Terebinthina Copahiba), Russ., Span., Swed., Swiss and U.S.

Description.—A more or less viscid liquid; generally transparent and not fluorescent, but some varieties are opalescent and occasionally slightly fluorescent; light yellow to pale golden brown, having a peculiar aromatic odour, and a persistent acrid somewhat bitter taste. Its sp. gr. varies from ·916—·993. Entirely soluble in Absolute Alcohol, and in four times its bulk of Petroleum Spirit, the latter solution yielding only a filmy deposit on standing.

Test.—A small quantity heated until all volatile Oil is removed yields a residue which when cold is hard and easily rubbed to powder (absence of fixed oil); and the Oil volatilised during the operation does not smell of Turpentine. The volatile Oil should be present to the extent of at least 40 p.c., and should rotate the plane of a ray of polarised light from 28° to 34° to the left (absence of African Copaiba), and should not boil under 482° F. (250° C.). When 2 drops are dissolved in 20 parts of Carbon Bisulphide, and a drop of a cooled mixture of equal parts of Nitric and Sulphuric Acids added, a transient violet colour is not produced (absence of Gurjun Balsam). 4 drops of Copaiba, carefully added to a mixture of half an ounce of Glacial Acetic Acid with 4 drops of Nitric Acid, should not afford a reddish or purple colour (absence of Gurjun Balsam).

The violet colour with Nitric and Sulphuric Acids produced by Gurjun Balsam is generally stated to be pretty permanent.—*P.J.* '98, ii. 645.

The presence of Hydrocarbon Oil will be shown by warming 1 c.c. of the Balsam with 4 c.c. Alcohol (95 p.c.) in a test-tube, when it forms a separate layer at the bottom of the tube.—*A.J.P.* '95, 395.

Kebler in an exhaustive paper on the characters and tests for Copaiba finds the Glacial Acetic Acid test the most reliable, and does not consider the determination of the acid number satisfactory. Dietrich however thinks a quantitative test for Gurjun Balsam should certainly be included in the Pharmacopœia, and suggests the determination of the acid and saponification number.—*A.J.P.*, '95, 395; '96, 143; '97, 577; *C.D.* '98, ii. 129. A process for determining the same is given in the German Pharmacopœia, and a modification in *J.S.C.I.* '98, 806.

Hirschsohn's test for fatty oils.—*P.J.* '97, ii. 74.

Detection of Castor oil in Copaiba Balsam.—*J.S.C.I.* '94, 981.

Preparation.

OLEUM COPAIBÆ. Oil of Copaiba.

The Oil distilled from Copaiba.

The yield appears to be from 41 to 60 p.c.—*Y.B.P.* '91, 414.

Solubility.—1 in 20 of Alcohol (90 p.c.); nearly insoluble in Alcohol (60 p.c.); mixes in all proportions with Absolute Alcohol.

Dose.—5 to 20 minims.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Description.—Colourless or pale yellow, with the odour and taste of Copaiba.

Tests.—Sp. gr. ·900 to ·910. It turns the plane of a ray of polarised light to the left, and is soluble in its own volume of Absolute Alcohol (distinction from African Copaiba Oil).

Sp. gr. varies considerably with the age of the Oil and its exposure to air.

It has a neutral reaction. Boils between 245° and 260° C.

Not Official.

MISTURA COPAIBÆ (*L.H.*).—Copaiba, 20 minims; Tincture of Quillaia, 20 minims; Spirit of Nitrous Ether, 30 minims; Camphor Water to 1 fl. oz.

PASTA COPAIBÆ.—Copaiba, 8; Powdered Cubebs, 24; Extract of Hyoscyamus, 1; Camphor, 1; Treacle, q.s.

Dose.—A piece the size of a filbert nut three or four times a day in gonorrhœa.—*L.* '88, i. 1019.

PILULA COPAIBÆ.—Copaiba, 94; Magnesia, 6; mix intimately and set aside to concrete. Should the mixture not concrete in eight or ten hours, the Copaiba before use should be shaken with $\frac{1}{20}$ of its weight of Water, then the uncombined Water allowed to subside and the Copaiba poured off.

Foreign Pharmacopœias.—Official in Belg., Balsamum Copaibæ Solidefactum; U.S., Massa Copaiba.

RESINA COPAIBÆ.—Prepared from the Oleo-resin by distilling off the Volatile Oil.

A yellowish or brownish-yellow brittle resin, with an acid reaction. Soluble in Alcohol.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

CORIANDRI FRUCTUS.

CORIANDER FRUIT.

The dried ripe fruit of *Coriandrum sativum*.

The ash was determined of the fruits (three samples), 4·69, 5·28, 5·74 p.c., and of Pulvis Coriandri, 5·64, 5·7, 7·09, 7·79 p.c.

Medicinal Properties.—Stimulant, aromatic, and carminative.

Dose.—20 to 60 grains.

Official Preparation.—Oleum Coriandri. Contained in Confectio Sennæ, Syrupus Rhei, Tinctura Rhei Composita, and Tinctura Sennæ Composita. The **Oil** is contained in Syrupus Sennæ.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Hung., Mex. (Culantro), Norw., Port. (Coentro), Span. (Colantro), Swed. and U.S.; not in Ger., Ital., Jap. or Russ.

Description.—Nearly globular, about one-fifth of an inch (five millimetres) in diameter, uniform brownish-yellow in colour, and glabrous. The two mericarps usually remain closely united, and are crowned by the calyx teeth and stylopod. Primary ridges wavy and inconspicuous; secondary ridges straight and more prominent. The transverse section exhibits two vittæ on the commissural surface of each mericarp. Odour aromatic, especially when bruised; taste agreeable.

Preparation.

OLEUM CORIANDRI. Oil of Coriander.

The Oil distilled from Coriander fruit.

Consists to the extent of 90 p.c. of **Coriandrol**, $C_{10}H_{18}O$, dextro-rotatory; sp. gr. ·868; boiling point 194°—198° C.—*P.J.* (3) xxi. 940.

Sp. gr. (several samples examined) ·867—·887.

Solubility.—2 in 1 of Alcohol (90 p.c.); 1 in 75 of Alcohol (60 p.c.).

1 lb. of fruit yields about 42 grains of Oil.

Used to render medicines more palatable, and prevent griping.

Dose.—½ to 3 minims.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Description.—Colourless or pale yellow, having the odour and flavour of the fruit.

Tests.—Sp. gr. ·870 to ·885. If 1 c.c. of the Oil be mixed with 3 c.c. of Alcohol (70 p.c.), a clear solution results (absence of Oil of Turpentine and added Terpenes).

Not Official.

COTO.

A bark from Bolivia—origin unknown.

It contains a bitter principle, **Cotoin**, sparingly soluble in cold Water, soluble in Alcohol.

Paracotoin is obtained from an allied bark, which has similar properties.

It is difficult to distinguish true Coto bark from the Para variety, but Coto bark is practically unobtainable in English commerce at the present time. Paracoto bark is stouter and has a rougher inner surface. The glucoside Cotoin melts at 124° C.,

and gives a blood-red coloration with Nitric Acid, while the melting point of Paracotoin is 152° C. and with Nitric Acid only turns yellow.—*C.D.* '84, 530.

Medicinal Properties.—Aromatic stimulant and intestinal astringent. Has been used in chronic diarrhœa.

Cotoin is recommended as checking the night sweats of phthisis. Dose ½ grain. *L.* '96, 255.

Preparation.

TINCTURA COTO (*B.P.C.*).—Coto Bark bruised 1; Rectified Spirit 10: macerate seven days, press, filter, and add Rectified Spirit to make 10.

Dose.—10 to 30 minims.

CREOSOTUM.

CREOSOTE.

A mixture of Guaiacol, Creosol, and other Phenols; obtained in the distillation of Wood Tar.

It preserves animal substances from decay, from which property its name is derived. It is to the presence of this substance that the process of smoking hams owes its efficacy.

The two chief constituents of Creosote are **Guaiacol** and **Creosol**, the first of which predominates in some specimens and the second in others. Beechwood Creosote contains most Guaiacol; formerly it was stated to contain more than 60 p.c., but when the demand for Guaiacol and its salts arose, the proportion in commercial Creosote dropped to 20 p.c. It can now be obtained containing 50 p.c.

Guaiacol is soluble 1 in 80 of Water, and mixes with Glycerin in all proportions. Creosol is soluble 1 in 150 of Water, and will not form a clear solution with Glycerin in any proportion.

Solubility.—Beechwood Creosote is soluble about 1 in 110 of Water and mixes in all proportions with Alcohol (90 p.c.), Absolute Alcohol, Ether sp. gr. ·735 and ·720, Glacial Acetic Acid, Chloroform, Benzol, and Petroleum Spirit, it also mixes with Glycerin in all proportions up to nearly 3 of Glycerin to 1 of Creosote, but on the further addition of Glycerin the mixture is turbid.

'English Creosote' differs from Beechwood Creosote in that it is not nearly so soluble in Water, and does not mix readily with Glycerin. It dissolves about 1 in 350 of Water, and forms a turbid mixture with equal volumes of Glycerin.

Medicinal Properties.—Disinfectant and antiseptic. Given internally in gastric fermentation, in putrefactive diarrhœa, and in phthisis with abundant fetid sputum (see below); for arresting nausea in hysteria, for obstinate sea-sickness, and the vomiting of pregnancy. A lotion (8 minims to 1 oz.) and the **ointment** are used for eruptions of a scaly character, for venereal ulcers and in parasitic skin diseases; toothache, when depending on caries, is relieved by its application. As an **inhalation** in fetid bronchitis and in phthisis.

Employed by internal administration with considerable success in phthisis, commencing with 5 minims in 2 fl. drm. Cod Liver Oil three times daily after meals and gradually increasing till at the end of three or four weeks 30 to 60 minims or even 80 minims are being taken three times daily. It is said to have no

tendency to bad effects even in such large doses. Should a patient be unable to take Cod Liver Oil, the Creosote may then be prescribed in spiritous solution. If the best Beechwood Creosote be used and due care exercised in increasing the dose gradually, it will be found to produce good results without unpleasantness or risk.—*B.M.J.* '98, i. 144, 299, 1383.

One drop of Creosote at bedtime every night for juvenile incontinence of urine (*B.M.J.* '87, i. 809). In diabetes 4 drops daily increased to 10 drops (*L.* '89, i. 702). Its effects on the virulence of the Tubercle Bacillus (*L.* '94, ii. 684). Intra-tracheal injection of Creosoted Oil (1 in 20) to aid the expulsion of false membrane after Tracheotomy.—*B.M.J.* '98, i. 1381.

Successful in cases of tuberculosis in children by pills and drops (*T.G.* '93, 766).

Hypodermic injection of Creosote and Guaiacol dissolved in sterilised Almond Oil, 1 in 5 or 1 in 15.—*L.* '96 ii., 371; *B.M.J.* '95, ii. 1488. Small doses in gastric affections.—*L.* '97, ii. 404. In habitual constipation.—*L.* '97, ii. 932. Enemata containing 8 minims of Creosote in 4 oz. of Cod Liver Oil in pleuro-peritoneal tuberculosis in children.—*L.* '97, i. 159. In malarial enteric fever 15 minims rubbed into the axilla and covered up with cotton wool produced free perspiration and lowered the temperature.—*B.M.J.* '96, i. 18; '97, i. 1332; *I.M.G.* '96, 11; *T.G.* '96, 325.

Dose.—1 to 5 minims.

Prescribing Notes.—In **pills** made with Soap and Liquorice Powder (*see* p. 249) or in **capsules**. When given as a draught or mixture it is best emulsified with Mucilage of Acacia and given in Milk, or dissolved in Almond Oil; *see* 'Guttæ Creosoti' and 'Mistura Creosoti' (Squire). For Hypodermic injection, alone or dissolved in Almond Oil. When mixed with Magnesia it forms a tasteless compound insoluble in Water. Orange, Juniper, and Fluid Extract of Liquorice have been used as flavouring agents.

Incompatibles.—Silver salts.

Official Preparations.—Mistura Creosoti, Unguentum Creosoti.

Not Official.—Elixir Créosoté, Guttæ Creosoti, Mistura Creosoti (Squire), Pilula Creosoti, Creosote Carbonate, Creosote Valerianate, Creosote Phosphate, Creosote Tannate (see below). The preparations of Guaiacol will be found under that name.

Foreign Pharmacopœias.—Official in Austr. (Creosotum), Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swiss and U.S.; not in Swed.

Description.—A colourless or yellowish highly refractive liquid having a strong empyreumatic odour and acrid taste; neutral or only faintly acid to Litmus. It is dissolved by about 150 parts of Water at ordinary temperatures, and is more soluble in hot Water. It is freely soluble in Alcohol (90 p.c.), Ether, Chloroform, Glycerin, and Glacial Acetic Acid.

Tests.—Sp. gr. not below 1·079. It distils between 392° F. (200° C.) and 428° F. (220° C.). A 1 p.c. solution in Alcohol (90 p.c.), or ½ p.c. solution in Water, with a drop of the Test-solution of Ferric Chloride yields a green coloration, rapidly changing to a reddish brown. It rotates the plane of a ray of polarised light to the left. Dropped on white filtering-paper, and exposed to a temperature of 212° F. (100° C.), it leaves no translucent stain (absence of less volatile liquids). It is miscible with an equal volume of Collodion without gelatinisation; and, when shaken with five times its bulk of

Solution of Ammonia, its volume should not be diminished materially (distinction from Phenol).

B.P. now requires a higher sp. gr. and gives limits of temperature between which it should distil. Creosote was stated in *B.P.* '85 to rotate a ray of polarised light to the right, and to the left in *B.P.* '98. We find that pure Guaiacol, pure Creosol, and most commercial samples of genuine Wood Tar Creosote, have no measurable effect whatever upon polarised light. In no case have we observed a rotation greater than + 2°.

The best differentiating test between Creosote and Phenols is the insolubility of the former in *diluted* Glycerin. Dilute 3 measures (sp. gr. 1·26) with 1 of Water, and agitate 1 volume of the Creosote sample with 3 volumes of the diluted Glycerin. When separation is complete, a diminution in the Creosote volume indicates roughly the soluble impurity. If the Glycerin layer be run off, the Coal-tar Acids may be extracted from it for examination, by shaking out with Chloroform, after dilution with Water.—*Allen.*

Preparations.

MISTURA CREOSOTI. Creosote Mixture. (Altered.)

Creosote, 16 minims; Spirit of Juniper, 16 minims; Syrup, 1 fl. oz.; Distilled Water, a sufficient quantity. Shake the Creosote with 14 fl. oz. of the Distilled Water; add the Syrup and the Spirit of Juniper, and sufficient Distilled Water to produce 16 fl. oz. of the Mixture.
=(about 1 in 480).

Glacial Acetic Acid is now omitted.

Dose.—½ to 1 fl. oz.

UNGUENTUM CREOSOTI. Creosote Ointment. (Altered.)

Creosote (by weight), 1; Hard Paraffin, 4; Soft Paraffin, white, 5. Melt the Hard and Soft Paraffins together; add the Creosote; stir until cold. =(about 1 in 10).

Now made with Hard and Soft Paraffin in place of Simple Ointment.

Not Official.

ELIXIR CREOSOTÉ (Fr.).—Creosote, 15; Rum, 985; mix and filter.

GUTTÆ CREOSOTI (Squire).—Creosote, 16 minims; Mucilage of Acacia, 60 minims; Syrup of Orange, 1 fl. oz.; Water to 2 fl. oz.: mix the Creosote with the Mucilage and add the other ingredients. One or two teaspoonfuls for a dose in an ounce of milk.

MISTURA CREOSOTI (Squire).—Creosote, 16 minims; Almond Oil, ½ fl. oz.; Syrup of Orange, 1 fl. oz., Powdered Gum Acacia, 1½ drm., Water to 8 fl. oz. Dissolve the Creosote in the Oil, mix it with the Powdered Gum Acacia in a mortar; add all at once 3 fl. drm. of Water, and triturate until an emulsion is formed, then add the remainder of the Water and the Syrup of Orange. Dose.—½ to 1 fl. oz.

PILULA CREOSOTI.—Creosote, 12 minims; Curd Soap, in powder, 6 grains; Liquorice, in powder, 30 grains: mix and divide into 12 pills.

CREOSOTAL (Creosote Carbonate).—A viscid amber-coloured liquid nearly odourless and tasteless; insoluble in water. It is stated to contain 90 p.c. of Creosote, and to be free from the irritating effects of that substance.—*B.M.J.E.* '96, i. 15; *L.* '97, ii. 1472. One teaspoonful doses for adults, smaller doses for children, —*L.* '98, i. 222; this dose has been criticised and 5 drops three times daily recommended as preferable.—*L.* '98, i. 960.

CREOSOTE PHOSPHATE.—A dense oily substance, insoluble in water. Dose.—5 to 15 grains in capsules.

EOSOTE (Creosote Valerianate).—A fluid distilling at 240° C. has been recommended as a substitute for Creosote on account of its freedom from corrosive and toxic properties. Commencing dose 3 grains, increasing to 6 or 9 grains three times a day, given in capsules.—*B.M.J.E.* '96, ii. 59.

TANNOSAL (Creosote Tannate).—A brown powder, soluble in water. Dose.—5 to 15 grains.

CRETA PRÆPARATA.

PREPARED CHALK.

Native Calcium Carbonate, freed from most of its impurities by elutriation.

Solubility.—Insoluble in Water, readily dissolved by weak acids.

Medicinal Properties.—It is astringent and antacid. Combined with other astringents and aromatics, it is used in infantile diarrhœa and in diarrhœa accompanied with acidity. One of the best antidotes for Oxalic Acid, the mineral acids, and Zinc Chloride. Used externally to burns, ulcers, and eczema, as a protective and desiccant.

Dose.—10 to 60 grains.

Prescribing Notes.—Generally given in the form of Mistura Cretæ with astringent Tinctures and Opium.

The Pulvis Cretæ Aromaticus is useful for administration to children, either in powder or in mixture with Mucilage.

Incompatibles.—All Acids and Sulphates.

Official Preparations.—Mistura Cretæ, Pulvis Cretæ Aromaticus, and Pulvis Cretæ Aromaticus Cum Opio. Contained in Hydrargyrum cum Cretâ.

Not Official.—Cholera Mixture and Unguentum Cretæ.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr., Hung., Ital., Port., Russ., Span., Swed. and U.S.; not in the others.

Description.—White friable masses or a white powder yielding the reactions of Calcium and of Carbonates.

Tests.—It should yield only the slightest characteristic reactions with the tests for Iron, Aluminium, Magnesium, Phosphates, Sulphates, or Silica. Dissolved in Diluted Acetic Acid, the solution should yield no precipitate with Solution of Potassium Chromate (absence of Barium Carbonate).

Preparations.

MISTURA CRETÆ. Chalk Mixture. (Modified.)

Prepared Chalk, ¼ oz.; Tragacanth, in powder, 15 grains; Refined Sugar, ½ oz.; Cinnamon Water, a sufficient quantity. Triturate the Prepared Chalk with the Tragacanth and Refined Sugar, and gradually add sufficient Cinnamon Water to produce 8 fl. oz. of the Mixture.

=(about 1 in 32).

Tragacanth is now used in place of Gum Acacia and Sugar in place of Syrup.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in Port., Carbonate of Lime 3, Gum

Arabic 3, Syrup of Cinnamon 10, Water 84; U.S., Prepared Chalk 6, Acacia 4, Sugar 10, Cinnamon Water 40, Water to measure 100; not in the others.

PULVIS CRETÆ AROMATICUS. AROMATIC POWDER OF CHALK. (ALTERED.)

Prepared Chalk, 11; Cinnamon, 4; Nutmeg, 3; Cloves, 1½; Cardamom Seeds, 1; Refined Sugar, 25; all in powder: mix.
=(about 1 Chalk in 4½).

Saffron is now omitted.

Dose.—10 to 60 grains.

PULVIS CRETÆ AROMATICUS CUM OPIO. AROMATIC POWDER OF CHALK WITH OPIUM.

Aromatic Powder of Chalk, 39; Opium, in powder, 1: mix.
=(1 Opium in 40).

This Powder contains 2½ p.c. of Opium.

Dose.—10 to 40 grains.

Not Official.

CHOLERA MIXTURE.—Aromatic Powder (B.P. '64), 3 drm.; Spirit of Sal Volatile, 3 fl. drm.; Tincture of Catechu, 10 fl. drm.; Compound Tincture of Cardamoms, 6 fl. drm.; Tincture of Opium, 1 fl. drm.; Chalk Mixture to make 20 fl. oz.

This mixture was proposed by the Board of Health during the prevalence of cholera, and is useful in cases of diarrhœa.

Dose.—1 fl. oz. for an adult, ½ fl. oz. for a child twelve years old, ¼ fl. oz. for seven years old, after each liquid motion.

UNGUENTUM CRETÆ.—Prepared Chalk, 1; Spermaceti Ointment, 4: mix.

CROCUS.

SAFFRON.

The dried stigmas and tops of the styles of *Crocus sativus*.

Imported from Spain, France, and Italy.

Medicinal Properties.—Useful for giving colour and flavour to preparations.

Official Preparation.—Tinctura Croci. Used in the preparation of Decoctum Aloes Compositum and Tinctura Cinchonæ Composita.

Not Official.—Glycerinum Croci in place of Syrupus Croci.

Foreign Pharmacopœias.—Official in all; Fr., Safran; Ital., Zafferano; Mex., Azafran; Norw., Stigma Croci.

Description.—Each entire portion of commercial Saffron is an inch (twenty-five millimetres) or somewhat more in length, and consists of three orange-red stigmas, thickened and tubular above, jagged or notched at the upper extremities, and united below to the top of the yellow style. Saffron is flexible and unctuous to the touch, unless quite dry; it has a peculiar strong aromatic odour, and a bitter somewhat aromatic taste.

Tests.—Rubbed on the wet finger it leaves an intense orange-yellow tint. When pressed between folds of white filtering-paper it leaves no oily stain. When a small portion is placed in a glass of

warm Water it colours the liquid orange-yellow, becomes itself paler in colour, and does not deposit any white or coloured powder. Incinerated with free access of air, dried Saffron does not deflagrate (absence of Nitrates), and yields about 7 p.c. of ash. It should not lose more than 12·5 p.c. of moisture when dried at 212° F. (100° C.).

Concentrated Sulphuric Acid instantly changes its colour to indigo-blue, which soon disappears.

1 part of Saffron shaken with 100,000 parts of Water gives it a distinct yellow colour. Should lose not more than 14 p.c. when dried at 100° C. The dried Saffron should yield not more than 7·5 p.c. of ash. Ger. Ph.

A Paper on Detection of Adulterants.—*P.J.* (3) xxi. 612.

The purity of commercial Spanish Saffron.—*A.J.P.* '85, 487; '96, 198.

Adulteration of Saffron with the stamens.—*P.J.* (3) xxv. 644.

Tritonia aurea proposed as a substitute.—*P.J.* '96, i. 85.

Barium Sulphate in Saffron.—*P.J.* '97, i. 223, 257.

Preparation.

TINCTURA CROCI. Tincture of Saffron. (Modified.)

Saffron, 1; Alcohol (60 p.c.), 20. Prepare by the maceration process. =(1 in 20).

Now made with Alcohol (60 p.c.) in place of Proof Spirit.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Belg. and Span., 1 in 5 Dutch, Fr., Russ., Swiss and U.S., 1 in 10; all by weight except U.S.; not in the others.

Not Official.

GLYCERINUM CROCI.—Saffron 1; Glycerin 20; Alcohol (60 p.c.) 20; mix the Glycerin and the Alcohol, and digest in it the Saffron for an hour at a gentle heat, and filter. This is introduced as a substitute for **Syrupus Croci**, which deposits and loses its colour. The Syrup can be prepared by diluting 1 of Glycerinum with 7 of simple Syrup.

CROTONIS OLEUM.

CROTON OIL.

The Oil expressed from the seeds of *Croton Tiglium*.

A native of Hindostan, Ceylon, and the Moluccas.

100 parts of seed yield about 50 of Oil.

Solubility.—Soluble in Ether, Oil of Turpentine, and Olive Oil, partially soluble in Alcohol (90 p.c.).

B.P. 1898 still retains the sentence 'entirely soluble in Absolute Alcohol' although it has been repeatedly pointed out that this is not strictly the case. An oil recently expressed will dissolve the Absolute Alcohol up to equal parts, but when more than one volume of Alcohol is added to one of Oil the mixture becomes turbid, and with two volumes of Alcohol the mixture separates into two layers on standing. With a sample of oil two or three years old rather more Alcohol can be added without the mixture becoming turbid, but it is only a question of degree.

The solubility of Croton Oil in Absolute Alcohol appears to depend in great measure on the age of the Oil, and the greater or less freshness of the seeds from which it is expressed, as oxidised or resinified Oil dissolves more readily.—*P.J.* (2) xxiv. 382; (3) viii. 705; (3) xviii. 546.

The explanation of the above appears to be that the solubility of the Oil as a whole depends upon the proportion of free Acid, which is very soluble in Alcohol, and also carries the difficultly soluble neutral Glyceride into solution along with it. —*P.J.* (3) xx. 1060.

Croton Oil can be separated by Alcohol into two parts. The non-vesicating portion insoluble in Alcohol possesses the full purgative properties of the Oil in a less irritating form; the alcohol-soluble or vesicating portion had no purgative action in the same doses, but caused irritation and nausea.—*P.J.* (3) xiv. 446.

Medicinal Properties.—A powerful drastic cathartic, acting with great rapidity. Given in cases of intestinal obstruction from impacted fæces, in dropsy, in apoplexy, in maniacal and unconscious patients and in eclampsia, its small dose being an advantage. Applied externally as a powerful counter-irritant in rheumatism, gout, neuralgia, and in acute laryngeal and pulmonary diseases in the form of **liniment.** Its external application is often followed by an eruption which becomes pustular.

Croton Oil must be given with great care, and is inadmissible in feeble subjects, in organic obstruction, and in inflammatory states of the stomach and intestines.—*Mitchell Bruce.*

5 minims to 1 fl. oz. of Olive Oil are used to promote the growth of hair.

Is an hepatic stimulant of very feeble power.—Dr. Rutherford.

Dose.—$\frac{1}{2}$ to 1 minim.

Prescribing Note.—In pill with Soap and Liquorice Powder (see p. 484), or in combination with Compound Extract of Colocynth.

Official Preparation.—Linimentum Crotonis.

Not Official.—Croton Oil Pencils.

Antidotes.—In case of an overdose an emetic should be at once administered, the stomach should be washed out with olive oil or milk, 4 fl. oz. to pint of water; mucilaginous fluids and Opium or Morphine should then be given to check the pain and enteritis.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex. (Aceite de Croton Tiglio), Norw., Port., Russ., Span. (Aceite de Grano Tiglii), Swed., Swiss and U.S.

Description.—Brownish-yellow to dark reddish-brown, viscid, with a disagreeable odour and an acrid burning taste. Entirely soluble in Absolute Alcohol. Freely soluble in Ether and Chloroform.

Isolation of 'Croton-Resin' the vesicating constituent, by the saponification of that part of Croton Oil which is soluble in strong Alcohol and fractional precipitation.—*P.J.* '95, ii. 5; *C.D.* '95, ii. 22; *J.C.S. Abs.* '95, i. 680.

Tests.—Sp. gr. ·940 to ·960. An Alcoholic Solution should not redden moistened Blue Litmus Paper. If to 2 c.c. 1 c.c. Fuming Nitric Acid and 1 of Water be added, and the mixture be shaken vigorously, it should not solidify, either completely or partially, but only thicken slightly, after standing for two days (absence of other non-drying Oils).

Detection of Croton Oil in Mixtures.—Shake the mixture with Alcoholic Potash; separate the alcoholic layer, add dilute acid, and distil off the spirit. Shake the residue with Ether, separate, and evaporate the solvent; the oil thus

obtained should produce the characteristic pustular eruption when applied to the skin.—*P.J.* (3) xviii. 547.

Preparation.

LINIMENTUM CROTONIS. Liniment of Croton Oil. (Modified.)

Croton Oil, 1; Oil of Cajuput, 3½; Alcohol (90 p.c.), 3½: mix. =(1 in 8).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.
(Not in the other Pharmacopœias.)

Not Official.

CROTON OIL PENCILS.—Croton Oil 2, Cacao Butter 1, White Beeswax 1: melt together the last two in a water-bath, add the Oil, and when nearly cold pour into moulds.

CUBEBÆ FRUCTUS.

CUBEBS.

The dried full-grown unripe fruits of *Piper Cubeba*.

Medicinal Properties.—Aromatic, stimulant, and antiseptic diuretic. Acts specially on the genito-urinary mucous membrane. Given in all stages of gonorrhœa, gleet, cystitis, pyelitis, and sometimes in chronic bronchitis. Frequently combined with Copaiba.

Dose.—30 to 60 grains.

Prescribing Notes.—The Powder is given in the above doses wrapped in moistened Wafer-paper, or in smaller doses in **cachets**. In **mixture** well rubbed down with Mucilage. A popular form of administration is the **paste**, made with an equal quantity of Copaiba, which may be taken in Wafer-paper. It is also made into a paste with Glycerin and various Syrups. For throat affections lozenges and Compressed Tablets are made.

The **Oil** is given in Capsules or suspended in Water with Mucilage.
For Inhalation the Oil may be used with or without the vapour of water.

Official Preparations.—Oleum Cubebæ and Tinctura Cubebæ.

Not Official.—Extractum Cubebæ Fluidum, Oleo-resina Cubebæ, Gossypium Cubebæ, Trochiscus Cubebæ, and Vapor Cubebæ.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—Nearly globular, sometimes depressed at the base, about one-sixth of an inch (four millimetres) in diameter, greyish-brown or nearly black in colour. The pericarp is reticulately wrinkled, thin, brittle, and abruptly prolonged at the base into a slender rounded stalk, which is about one and a-half times the length of the globular portion, within which is a single seed attached by the base. A transverse section of the pericarp exhibits two layers of sclerenchymatous cells, one near the outer, the other near the inner surface, those of the latter being radially elongated. Odour strong, aromatic, and characteristic; taste warm, aromatic, and somewhat bitter.

Cubebin ($C_{20}H_{20}O_6$), is a crystalline substance which occurs in the pericarp as

well as the perisperm. It melts at 125° C., is coloured a reddish-purple by Sulphuric Acid, and in Chloroformic solution is lævo-rotatory.—*J.C.S. Abs.* '96, i. 494.

Microscopical investigation of Cubebs and its adulterants.—*P.J.* (3) xxv. 314, 757, 797.

Test.—The crushed fruit imparts a crimson colour to Sulphuric Acid.

Preparations.

OLEUM CUBEBÆ. Oil of Cubebs.

The Oil distilled from Cubebs.

The yield is about 10 p.c.

Solubility.—1 in 18 of Alcohol (90 p.c.), in all proportions of Absolute Alcohol.

Dose.—5 to 20 minims.

Foreign Pharmacopœias.—Official in Port., sp. gr. ·929; Span. and U.S., sp. gr. about ·920; not in the others.

Description.—Sp. gr. ·910 to ·930. Colourless, pale-green, or greenish-yellow; with the odour and camphoraceous taste of Cubebs.

TINCTURA CUBEBÆ. Tincture of Cubebs. (Altered.)

Cubebs, in powder, 4; Alcohol (90 p.c.) a sufficient quantity. Moisten the powder with 2 of the Alcohol, and complete the percolation process. The resulting tincture should measure 20. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and Alcohol (90 p.c.) used in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Fr., 1 in 5, by weight; Mex., and U.S., 1 in 5; not in the others.

Not Official.

EXTRACTUM CUBEBÆ FLUIDUM (*U.S.*).—Cubebs in No. 60 Powder, 100 grammes, percolated with Alcohol (94 p. c. by vol.) until the Cubebs are exhausted, reserve the first 90 c. c. of percolate, and evaporate the remainder to a soft extract, dissolve this in the reserved portion and add sufficient Alcohol to make 100 c. c.

Dose.—5 to 30 minims.

OLEO-RESINA CUBEBÆ. *Syn.*—Extractum Cubebæ. Percolate Cubebs in coarse powder with Ether, slowly, until the liquor passes colourless. Let the Ether evaporate from the liquor, at first spontaneously and then over a water-bath, or recover it by distillation; and transfer the residue to a closed vessel, letting it stand until waxy or crystalline matter ceases to be deposited. Decant the Oleo-Resin and preserve it in a well-stoppered bottle.

Dose.—5 to 30 minims.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Mex. (Extracto Alcoholico de Cubebas), Russ., Swiss and U.S.; not in the others.

GOSSYPIUM CUBEBÆ (*T.H.*). Tincture of Cubebs 1 fl. oz., Glycerin 10 minims, Cotton Wool in a thin sheet 60 grains. Mix the Tincture and Glycerin, and saturate the wool evenly with the mixture. Dry by exposure to the air. Useful in catarrh with excessive secretion.

TROCHISCUS CUBEBÆ (*T.H.*). Each lozenge contains about ½ grain of Cubebs.

VAPOR CUBEBÆ (*T.H.*). Oil of Cubebs, 40 minims, Light Magnesium Carbonate, 20 grains, water to 1 fl. oz. Mix. A teaspoonful in a pint of water at 140° F. for each inhalation.

Not Official.

CUPRI SUBACETAS.

Syn.—Æruco. Verdigris.

Pale green powder or masses, partly crystalline.

When treated with Water about 50 p.c. dissolves as Copper Acetate, leaving an insoluble basic Acetate.

Medicinal Properties.—Used as a stimulant to foul and indolent ulcers, also as an escharotic.

Foreign Pharmacopœias.—Official in Belg., Dan., Fr., Mex. (Acetato de Cobre bibasico), Port. and Span. (Cardenillo); not in the others.

Preparation.

LINIMENTUM ÆRUGINIS (*P.L.*).—Made by dissolving Verdigris 1, in Vinegar 7, adding Honey 14, and boiling down to a proper consistence.

This preparation, with different proportions, also occurs in Belg., Fr., Ital., Port., Span and Swiss. Most of them direct that the preparation shall be boiled until it assumes a red colour, which indicates that the Cupric Acetate has been reduced to a Cuprous compound.

CUPRI ACETAS.—Deep green, prismatic crystals.

Solubility.—1 in 15 of Water, 1 in 300 of Alcohol (90 p.c.), 1 in 112 of Glycerin.

Medicinal Properties.—Similar to the Subacetate, but more definite when required for solution in Water.

Foreign Pharmacopœias.—Official in Ital., Swed. and Swiss; not in the others.

CUPRI SULPHAS.

COPPER SULPHATE.

B.P.Syn.—Cupric Sulphate.

$CuSO_4,5H_2O$, eq. 247·86.

The salt may be obtained by the interaction of Water, Sulphuric Acid, and Copper or Cupric Oxide.

When rendered anhydrous by heating, the powder is white.

Solubility.—1 in $3\frac{1}{2}$ of Water, 2 in 1 of Water (at 212° F.); insoluble in Alcohol (90 p.c.); 1 in $2\frac{1}{2}$ of Glycerin.

Medicinal Properties.—Astringent, prompt emetic, escharotic. Recommended in chronic diarrhœa, especially that of phthisis. Externally, as a styptic for bleeding surfaces and a stimulant to ulcers, as an escharotic for warts, &c. For **lotions**, in proportions from 2 to 4 grains to 1 oz.; also 8 grains to 1 oz. for prurigo. As an astringent **injection** to diminish excessive secretion from mucous membranes, especially in cases of leucorrhœa and gonorrhœa. For urethral **injections**, 1 to 4 grains in an ounce of Water. It is also used 1 to 2 grains to 1 oz. in granular conjunctivitis and various affections of the eyes when astringent applications are required. Also in some skin affections.

An antidote in Phosphorus poisoning—3 grains every few minutes till vomiting is produced.—*Mitchell Bruce.*

Copper Sulphate 10 grains, Tincture of Opium 60 minims, Water 4 fl. oz. This was used as a rectal injection in a bad case of dysentery.—*L.* '89, ii. 739.

Dose.—As an astringent, ¼ to 2 grains; as an emetic 5 to 10 grains.

Prescribing Notes.—Best given in form of pill. A good pill is prepared by adding ½ of Pulvis Tragacanthæ Compositus and Dispensing Syrup, q.s.; varnish if required.

Incompatibles.—Alkalis and their Carbonates, Lime Water, Iodides, and most vegetable astringents.

Not Official.—Guttæ Cupri Sulphatis, Cupri Oleas, Unguentum Cupri Oleatis, Lapis Divinus (Cuprum Aluminatum) and Pavy's Solution.

Antidotes.—In case of poisoning by Copper Sulphate, Albumen or White of Egg is the best antidote; the stomach should then be washed out, demulcent drinks given, followed by Laudanum internally or Morphine hypodermically, and Linseed Meal poultices applied to the abdomen.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Solfato di Rame), Jap., Mex. (Sulfato de Cobre), Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—Blue triclinic prisms, soluble in 3·5 parts of cold Water, forming a solution which strongly reddens Litmus.

Tests.—It affords the reactions of Copper and of Sulphates. It should yield no characteristic reaction with the tests for Lead, Arsenium, Zinc, or Aluminium, and not more than the slightest reactions with the tests for Iron.

Not Official.

GUTTÆ CUPRI SULPHATIS (*L.O.H.*).—Copper Sulphate, 2 grains; Water to 1 fl. oz.—The strength in use at the principal Hospitals.

CUPRI OLEAS.—Dissolve 180 grains of Copper Sulphate in 20 fl. oz. of Distilled Water, then add 20 fl. oz. of Solution of Sodium Oleate; heat till the precipitate melts and agglomerates, wash once or twice with boiling Water, collect and dry. When prepared from concentrated solutions it is much more difficult to free from Soap and adhering salts.

When prepared from Castile Soap, it is very soft and sticky at 130° F. and melts to a clear blue liquid at 160° F., but when prepared from a pure Oleic Acid Soap, it softens and melts about 20 degrees lower.

Has also been made by heating Oleic Acid with excess of freshly precipitated Copper Carbonate, freeing from Water, dissolving in Petroleum Spirit, and evaporation. Made in this way it is a hard, brittle solid, melting at 167° C.—*P.J.* (3) xxii. 1009.

Medicinal Properties.—It is an excellent antiseptic and antiparasitic agent. When diluted it is especially useful in ringworm.

UNGUENTUM CUPRI OLEATIS.—Copper Oleate, 1; Lard, 4: melt together, and stir till cold.

Useful in ringworm, hard and horny warts, corns, and bunions.—*B.M.J.* '84, ii. 752.

LAPIS DIVINUS. CUPRUM ALUMINATUM.—Copper Sulphate, Potassium Nitrate, and Alum, of each equal parts, in powder, fused in a glazed earthen crucible, powdered Camphor, to the extent of $\frac{1}{10}$th part of the whole, being added near the end of the process. When cold, break in pieces and keep in a closely stoppered bottle. An **eye-wash** may be made by dissolving 2 grains in an ounce of distilled Water.

Foreign Pharmacopœias.—Official in Belg., Dan., Dutch, Fr. (Pierre Divine), Ger., Hung., Jap., Russ., Span., Swed. and Swiss; not in the others.

FEHLING'S SOLUTION. *See* Appendix.

PAVY'S SOLUTION.—Crystallised Copper Sulphate, 34·65 grammes; Rochelle Salt, 170 grammes; Potassium Hydroxide, 170 grammes; Water to 1000 c.c.

When 120 c.c. of this Solution are mixed with 400 c.c. of Ammonia (sp. gr. ·880) and diluted to 1,000 c.c., then 10 c.c. may be taken as equivalent to ·005 grammes of Glucose.

The method is well adapted for the examination of Diabetic Urine and Milk, also mixtures of Milk and Cane Sugars, and certainly has the advantage over the ordinary Fehling method by its definite end reaction.—*Sutton.*

Not Official.

CURARA—WOORARA.

A powerful poison obtained from various species of Strychnos, and used by the Indians in the Northern part of South America for arming the points of their arrows. A brownish black shining brittle resinous mass almost wholly soluble in Water, sparingly soluble in Absolute Alcohol. Different samples vary very much in strength, so that the dose of every parcel has to be arrived at by experiment. It is only used **hypodermically**, and the **solution** 1 grain in 12 minims given in former editions of the *Companion* is included in B.P.C. Formulary. An Alkaloid **Curarine** has been obtained from Curara.

Arrow Poisons: Their history, sources, and constituents.—(*Stockman*) *P.J.* '98, ii. 548, 585.

Medicinal Properties.—It has been used in the treatment of hydrophobia and chorea. 'It has been given successfully in tetanus, and is probably the most useful of all the drugs employed for this very fatal disease.'

It is not poisonous when swallowed, but is strongly toxic when injected under the skin.—*Ringer.*

Dose.—$\frac{1}{12}$th to $\frac{1}{2}$ grain, but should be used with great care.

Foreign Pharmacopœias.—Official in Fr., Mex. (Curaro) and Span.; not in the others.

Preparation.

INJECTIO CURARÆ HYPODERMICA (*B.P.C.*).—Curare 5 grains; powder and make it into a paste with Distilled Water; transfer to a funnel plugged with absorbent wool, and gradually pour upon it Distilled Water until one fluid drachm is obtained. If the injection be required in haste, rub the Curare with 60 minims of Distilled Water, throw on a filter, and when it ceases to drop, pour over the contents of the filter sufficient Distilled Water to produce one fluid drachm.

Dose.—1 to 6 minims.

CUSPARIÆ CORTEX.

CUSPARIA BARK.

The dried bark of *Cusparia febrifuga.*

The alkaloids, **Cusparine** and **Galipeine,** have been extracted from Cusparia Bark. Cusparine Sulphate and Hydrochloride are slightly soluble in Water, the Acetate and Tartrate much more so.—*P.J.* (3) xiv. 423; reactions of Cusparine and description of its salts.—*J.C.S. Abs.* '96, i. 66; contains about 1·5 p.c. of ethereal oil.—*J.C.S. Abs.* '98, i. 37.

Medicinal Properties.—An aromatic bitter tonic. In South America it is given for malarial fever.

Prescribing Notes.—Given in the form of the Infusion or the Concentrated Liquor, generally combined with Aromatics to prevent nausea.

Official Preparations.—Infusum Cuspariæ and Liquor Cuspariæ Concentratus.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex. (Angostura Verdadera) Port. and Span. (Angustura), not in the others.

Description.—Occurs in flattened or curved pieces, or in quills, generally about four or five inches (ten or twelve centimetres) long, an inch (twenty-five millimetres) wide, and one-twelfth of an inch (two millimetres) thick. The outer layer usually consists of a grey or yellowish cork which is often soft and easily removed, disclosing a hard, dark-brown inner layer; the inner surface is light-brown and frequently laminated. The fracture is short and resinous; on the fractured surface many white points are visible. A transverse section exhibits numerous cells filled with acicular crystals of Calcium Oxalate and small oil glands, but seldom any sclerenchymatous tissue other than small isolated groups of bast fibres. Odour, musty; taste, bitter.

Preparations.

INFUSUM CUSPARIÆ. Infusion of Cusparia. (Altered).

Cusparia Bark, in No. 20 powder, 1; Distilled Water, boiling, 20: infuse in a covered vessel for fifteen minutes; strain.

Boiling Water now used and time reduced one-fourth. =(1 in 20).

Dose.—1 to 2 fl. oz.

Incompatibles.—Mineral Acids, Ferric Chloride, and other metallic salts. (Not in the other Pharmacopœias).

LIQUOR CUSPARIÆ CONCENTRATUS. Concentrated Solution of Cusparia. (New.)

Cusparia Bark, in No. 40 powder, 10; Alcohol (20 p.c.), 25, or a sufficient quantity. Moisten the Cusparia with 5 of the Alcohol; pack in a closed percolator; set aside for three days; percolate with the remaining Alcohol, added in ten equal portions at intervals of twelve hours; continue percolation with more Alcohol until the product measures 20.

Dose.—½ to 1 fl. drm.

CUSSO.

KOUSSO.

The dried panicles of pistillate flowers of *Brayera anthelmintica*.

Obtained from Abyssinia.

Medicinal Properties.—Anthelmintic. Especially useful for the different kinds of tapeworm. Should be followed by a purgative to expel the dead worm.

Dose.—¼ to ½ oz.

Prescribing Notes.—The Flowers, in coarse powder, are mixed with half a pint of warm Water, allowed to stand for 15 minutes, stirred up (not strained), and

taken in 2 or 3 draughts at short intervals. It should be taken in the morning on an empty stomach, the bowels having previously acted. After 3 or 4 hours a brisk purgative should be administered. On account of its liability to produce nausea a little Lemonade may be taken afterwards.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger. and Russ., Koso; Belg., Fr. and Port., Cousso; Ital., Kousso; Jap., Flores Koso; Dan., Hung., and Swed., Kusso; Mex., Cuso; Norw., Flos Koso; Span., Couso; Swiss, Kosso; U.S., Cusso.

The Infusion is Official in Fr. (Apozème de Cousso) about 1 in 8; Span. (Inf. de Couso), 1 in 11½.

Description.—Usually in more or less cylindrical rolls, from one to two feet (three to six decimetres) in length, composed of reddish panicles of pistillate flowers. The panicles are much branched, the branches arising from the axils of large sheathing bracts; they are more or less covered with hairs and glands. Flowers numerous, small, shortly stalked, mostly unisexual, with two roundish membranous veined bracts at the base of each. The calyx has reddish veins, is hairy externally, and consists of two alternating whorls each of five segments, the inner whorl being curved inwards over the young fruit and shrivelled. No marked odour; taste bitter and acrid.

Not Official.

CYDONIUM.

QUINCE SEED.

The seeds of *Pyrus Cydonia*.

Their coriaceous envelope abounds in mucilage.

Medicinal Properties.—Demulcent. The **decoction** is used externally for cracks in the skin. A nice adjunct to eye-lotions in cases of irritation and inflammation.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Fr. (Coing), Port. (Marmelo), Russ., Mex. and Span. (Membrillo), Swed. and Swiss; not in the others.

Preparations.

DECOCTUM CYDONII.—Quince Seed, 1; Distilled Water, 80: boil for ten minutes, and strain.

MUCILAGO CYDONII, by cold maceration.—Austr., 1 in 25; Belg. and Port., 1 in 100; Norw., Russ., Swed. and Swiss, 1 in 50; Fr., 1 in 10; Span., 1 in 46.

Not Official.

DAMIANA.

The leaves of one or more species of *Turnera*, from Mexico and California.

Contains a bitter substance, resins, and a volatile oil.

Medicinal Properties.—Tonic, diuretic, and aphrodisiac.

Prescribing Notes.—Frequently given in the form of Pill; the Hard Extract makes a good pill with a small quantity of Alcohol (90 p.c.), the Soft Extract is best hardened with the powdered Leaves.

Preparations.

EXTRACTUM DAMIANÆ LIQUIDUM.—Damiana leaves exhausted with Alcohol (60 p.c.) so that 1 of fluid will represent 1 of the drug.

Dose.—30 to 60 minims.

EXTRACTUM DAMIANÆ.—The above evaporated to a soft extract.

Dose.—5 to 10 grains.

DECOCTA.

DECOCTIONS.

The following are the Decoctions of the British Pharmacopœia, the formulas of which will be found under the names of the substances from which they are prepared:—

	Proportion of active ingredients to the whole.	Dose.
DECOCTUM ALOES COMPOSITUM . .	1 in 100.	½ to 2 fl. oz.
DECOCTUM GRANATI CORTICIS . .	1 in 5.	½ to 2 ,, ,,
DECOCTUM HÆMATOXYLI	1 in 20.	½ to 2 ,, ,,

Decoctions not Official are enumerated in the Index.

U.S. Ph. gives a general formula for Decoctions: pour 20 of cold Water upon 1 of the substance, cover it well, and boil for fifteen minutes. Then let it cool to about 104° F. (40° C.), express, strain the expressed liquid, and pour through the strainer enough cold Water to make the product measure 20.

Ger. Ph.:—Pour cold Water upon the substances in a suitable vessel and expose for half an hour with occasional agitation to the steam from boiling Water on a water-bath, and strain with expression while still warm; 10 of strained product should be obtained from 1 of substance.

Both U.S. and Ger. Ph. state that in Decoctions of energetic substances the strength should be specially prescribed by the physician.

Paper on Decoctions.—*P.J.* '95, ii. 415.

DIGITALIS FOLIA.

DIGITALIS LEAVES.

The dried leaves of *Digitalis purpurea*. Collected from plants commencing to flower.

Medicinal Properties.—Cardiac and circulatory stimulant and tonic, increases the strength and efficiency of the cardiac contractions, and reduces the pulse rate without diminishing tension. Specially useful in mitral and tricuspid lesions with loss of compensation; in cardiac insufficiency from whatever cause, with irregular and rapid action and low arterial tension; not indicated in purely aortic cases. Of great value as a cardiac stimulant in acute pneumonia; useful in pulmonary hæmorrhage due to mitral disease. Diuretic, useful in cardiac dropsy; also in renal dropsy when acute or when due to failure of a hypertrophied heart.

It is cumulative in action, and requires watchfulness. Its continued use deranges the alimentary system; therefore, after it has been taken for eight or ten days it should be left off for three or four days and then recommenced. According to Lauder Brunton, Digitalis

is distinctly dangerous in advanced fatty degeneration of the heart; he also thinks it harmful in advanced Bright's disease. For a comparison with Strophanthus *see* under *Strophanthi Semina*.

Treatment of pneumonia by Digitalis.—*B.M.J.E.* '95, ii. 32; '96, ii. 76; '97, i. 15.

Digitoxin in doses of $\frac{1}{4}$ milligramme = $\frac{1}{240}$ grain.—*B.M.J.E.* '97, i. 31.

Research on the histological effects produced by Digitalis.—*T.G.* '97, 800; *Pr.* lx. 293.

Therapeutics of Digitalis.—*L.* '96, i. 1477.

Dose.—In powder $\frac{1}{2}$ to 2 grains.

Prescribing Notes.—The fresh Infusion is preferred by some to the Tincture. The powdered leaf is ordered in Pills with other ingredients.

Incompatibles.—Ferrous Sulphate, Tincture of Ferric Chloride, preparations of Cinchona, and Lead Acetate.

Official Preparations.—Infusum Digitalis and Tinctura Digitalis.

Not Official.—Pilula Digitalis Composita, Succus Digitalis, and Digitalin (various).

Antidotes.—In case of an overdose, a recumbent posture is of paramount importance; and after the stomach has been emptied, 20 grains of Tannic Acid in hot Water given frequently, or hot strong tea or coffee; stimulants and warmth should be employed.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port. (Dedaleira), Russ., Span. (Digital), Swed., Swiss and U.S.

Description.—From four to twelve inches (ten to thirty centimetres) or more in length, and sometimes as much as five or six inches (twelve and a half to fifteen centimetres) broad, with a winged petiole of varying length down which the lower veins are decurrent; broadly ovate or ovate-lanceolate, subacute, crenate or irregularly crenate-dentate. Upper surface somewhat rugose, dull green and slightly hairy, with glandular, simple, usually three-celled hairs, under surface paler and densely pubescent. The transverse section exhibits a mesophyll free from crystals of Calcium Oxalate. No marked odour, taste very bitter.

According to Kiliani the **seeds** of *Digitalis purpurea* contain Digitalinum verum, and Digitonin; the **leaves** contain Digitoxin, but neither of the other two. Preparation of Digitalin also described.—*J.C.S. Abs.* '96, i. 58, 59, 180; '97, i. 95; *P.J.* '95, ii. 29, 120; '96, ii. 289.

The more or less definite principles contained in Digitalis may be arranged as follows under the names applied to them by Schmiedeberg, and the important references connected with the subject are *P.J.* (3) v. 741; (3) xvii. 163, 871; (3) xx. 503; (3) xxii. 694:—

(*a*) **Digitonin.**—A crystallisable body resembling Saponin, constituting the larger part of the glucosidal constituents. Soluble in Water, insoluble in cold Alcohol, Ether, Benzol, or Chloroform. It has none of the physiological action peculiar to Digitalis and in other respects is directly injurious.

(*b*) **Digitalein.**—An amorphous glucoside (possibly a mixture). Soluble in Water and in Alcohol, insoluble in Ether or Chloroform. Its action on the heart is non-cumulative and causes no irritation when subcutaneously injected.

(*c*) **Digitalin.**—A granular (if not crystalline) glucoside, soluble in Alcohol, almost insoluble in Water, sparingly soluble in Ether or Chloroform.

Possesses in a high degree the medicinal action of Digitalis.

(*d*) **Digitoxin.**—Crystalline. Easily soluble in Alcohol, slowly in Chloroform, very sparingly in Ether, quite insoluble in Water.

The most toxic of all the constituents, but uncertain, cumulative and dangerous in its action.

(*e*) **Digitin.**—A crystalline body, physiologically inert, difficultly soluble in Water, more readily in Alcohol, insoluble in Ether or Chloroform.

The commercial varieties are given under Digitalin, p. 264.

Reactions of glucosides of Digitalis with Sulphuric Acid to which has been added 1 p.c. of an aqueous solution containing 5 p.c. of Ferric Sulphate. Digitalinum verum is coloured a deep golden yellow, and then forms a red solution, which rapidly changes to a permanent reddish-violet.—*J.C.S. Abs.* '96, ii. 551.

A proposal to standardise preparations of Digitalis on the Digitoxin constituent. —*P.J.* '97, ii. 62; *A.J.P.* '97, 450. Valuation of Digitalis Leaves by the process.—*P.J.* '97, ii. 283.

A characteristic reaction for Digitoxin. When dissolved in Acetic Acid to which has been added 1 p.c. of a solution containing 5 p.c. of Ferric Sulphate, and Sulphuric Acid containing the same quantity of Ferric Sulphate is poured into the tube so as to form a layer beneath it, a blue coloration is gradually developed in the Acetic Acid, whilst the Sulphuric Acid remains colourless. This coloration in the Acetic Acid is not produced by any other of these compounds. If Digitalinum verum is present, the Sulphuric Acid becomes reddish-violet, and the Acetic Acid indigo-blue.—*J.S.C. Abs.* '96, ii. 551.

Preparations.

INFUSUM DIGITALIS. Infusion of Digitalis. (Altered.)

Digitalis leaves, in No. 20 powder, 60 grains; Distilled Water, boiling, 20 fl. oz. Infuse in a covered vessel for fifteen minutes; strain. =(1 in 146).

Formerly made 56 grains to the pint.

Dose.—2 to 4 fl. drm.

It seems generally admitted in France that a *cold* infusion is the best of the preparations of Digitalis. 25 to 40 centigrammes of coarsely powdered leaves are macerated in 300 grammes of cold Water for twelve hours and filtered. This quantity is taken in 2 or 3 doses, as a powerful diuretic.—*L.* '90, i. 1153.

Foreign Pharmacopœias.—Official in Dutch, Mex., and Port., 1 in 200; Span., 1 in 345; Swed., 1 in 100; U.S., with Cinnamon, 3 in 200; not in the others.

TINCTURA DIGITALIS.—Tincture of Digitalis. (Modified.)

Digitalis leaves, in No. 20 powder, 2½; Alcohol (60 p.c.) a sufficient quantity. Moisten the powder with 2 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 18).

Now made with Alcohol (60 p.c.) in place of Proof Spirit.

Dose.—5 to 15 minims.

Larger doses are occasionally given, but, according to some observers, the results with small doses are equally good and not nearly so dangerous.

In cases of delirium tremens, 1 fl. drm. every three hours. Two or even three fl. drm. have been given in cases carefully watched.—*Pr.* xxvii. 373.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Ital., Jap., Norw., Russ., Swed. and Swiss, 1 in 10; Belg., Fr., Hung., Port. and Span., 1 in 5; U.S., 15 in 100. Also Belg., Fr., Port. and Span., 1 **fresh leaves**, 1 Spirit; Ger., **fresh leaves** 5, Spirit 6; Fr., with Ether, 1 dried leaves in 5; Dan. and Port., with Spirit of Ether, 1 dried leaves in 10; Mex., **seeds** 1 in 5; also Ethereal Tincture 1 and 5: all by weight except U.S.

Not Official.

PILULA DIGITALIS COMPOSITA.—Digitalis Powder ½ grain; Squill, 1 grain; Blue Pill, 1½ grains: in one pill.—*St. George's.*

SUCCUS DIGITALIS.—The Expressed Juice, 3; Alcohol (90 p.c.), 1.

This preparation may be given for a longer period than the Tincture without causing nausea.

Dose.—5 to 10 minims.

DIGITALIN.—Under this name four distinct varieties occur in commerce, which differ so considerably in their medicinal properties that prescribers should be careful to distinguish and specify the kind intended. All four of them are soluble in Alcohol.

1. **Digitalin Amorphous (Homolle).**—Stated to consist mainly of Digitalin with some Digitoxin.

   Soluble in Chloroform, slightly soluble in Water.

Foreign Pharmacopœias.—Official in Belg., Fr., Port., Russ. and Span.; formerly in Brit.

2. **Digitalin Crystallised (Nativelle).**—Stated to consist almost entirely of Digitoxin.

   Soluble in Chloroform, insoluble in Water.

Foreign Pharmacopœias.—Official in Fr., Mex., and Span.

Granules de Digitaline Cristallisée (Fr. Codex Supp.) contains $\frac{1}{10}$ milligramme in each granule. Soluté Officinal de Digitaline Cristallisée au Millième contains 1 milligramme in each gramme.

3. **Digitalin German.**—Amorphous; consists principally of Digitalein with some Digitonin and Digitalin.

   Readily soluble in Water, almost insoluble in Chloroform.

4. **Digitalin Verum.**—Kiliani (*P.J.* (3) xxii. 1061) states, with some show of reason, that the Digitalin of Schmiedeberg is the best form in which to prescribe Digitalis, and to distinguish it he applies the name Digitalin Verum. Its composition is definite; it is obtainable commercially in a sufficiently pure condition; it possesses all the medicinal activity in regard to the action of Digitalis upon the heart; it is non-cumulative in its action; the dose is ¼ mgrm. ($\frac{1}{250}$ grain) every 2 or 3 hours; it is soluble about 1 in 1000 of Water, about 1 in 100 of (50 p.c.) Alcohol. The aqueous solution froths upon being shaken, and is remarkably prone to become mouldy.

Not Official.

DUBOISIA MYOPOROIDES.

A plant indigenous in N.S. Wales and Queensland; it has been classed in the order *Solanaceæ.*

Foreign Pharmacopœias.—Official in Span.; not in the others.

Ringer's experiments show that the physiological action of the extract is apparently identical with that of Atropine. Tweedy has used it as an application to the eye in all cases in which Atropine is indicated.

Ladenburg examined a sample of Duboisine Sulphate received from Merck, and found the alkaloid to be identical with Hyoscyamine, the Gold salt melting at 159° C.—*P.J.* (3) x. 790. Ladenburg some years later examined another sample from the same maker, and found it to be identical with Hyoscine, the Gold salt melting at 197—198° C.—*P.J.* (3) xvii. 1049. The identity of **Duboisine** with any other of the mydriatic alkaloids has not as yet been proved, but it is extremely probable that it is a mixture in varying proportions of Hyoscyamine and Hyoscine. —*P.J.* (3) xx. 709 ; (3) xxii. 59.

The name Duboisine should be once and for all abandoned as it only represents a variable product obtained from a particular plant. Pseudo-hyoscyamine from *Duboisia myoporoides*, isomeric with Atropine and Hyoscyamine, has been described by Merck.—*P.J.* '98, ii. 195.

Preparation.

DUBOISINÆ SULPHAS.—Amorphous, hygroscopic. Very soluble in Water.

It dilates the pupil ; its action is quicker, more powerful, and more transient than that of Atropine. Its application, however, sometimes causes toxic symptoms.

Recommended as a sedative and hypnotic in certain excited mental conditions (delirium and mania and hystero-epilepsy), in doses of $\frac{1}{150}$ to $\frac{1}{60}$ grain.—*B.M.J.E.* '93, ii. 52, 76, 84. Should be given hypodermically in fractional doses and interruptedly.—*M.A.* '95, 23. It disorders the nutritive processes except in general paralytics.—*T.G.* '94, 342.

Given hypodermically or by the mouth in dose of $\frac{1}{100}$ to $\frac{1}{30}$ grain. Indications for and against its use : Cases of excitement due to hallucinations and delusions give excellent results. In all forms of chronic insanity with excitement, and in occasional cases of epilepsy, it may be used as a sedative with good results. Duboisin should be used only in physically healthy persons. It should never be used, or only very carefully, in debilitated persons. It is not suited to acute mania, and is distinctly injurious in melancholia.—*B.M.J.E.* '97, ii. 39.

Antidotes.—The same as for Atropine.

Foreign Pharmacopœias.—Official in Dutch ; Mex. (Duboisina) ; not in the others.

Not Official.

DUGONG OIL.

An oil obtained in Australia from *Halicore australis* and *H. Dugong* by boiling the superficial fat. A substitute for Cod-Liver Oil, recommended at one time (*P.J.* (3) iii. 100) as not being disagreeable in taste, but does not possess this character now.

Not Official.

DULCAMARA.

The dried young branches of *Solanum Dulcamara* (Bittersweet), from indigenous plants which have shed their leaves.

Medicinal Properties.—Alterative, analgesic and narcotic of feeble power, Used in cutaneous eruptions, chiefly of a scaly nature, as psoriasis and pityriasis. a decoction being applied externally, at the same time that it is used internally. Also in chronic rheumatism and pulmonary catarrh.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr. (Douce-amère), Ital., Mex., Port. (Doce-amarga), Span., Swed., Swiss and U.S. ; not in Dan., Dutch, Ger., Hung., Jap., Norw. or Russ.

Preparations.

EXTRACTUM DULCAMARÆ FLUIDUM (U.S.).

1 fl. oz. equals 1 oz. Dulcamara. Prepared with Diluted Alcohol.

Dose.—30 to 60 minims.

INFUSUM DULCAMARÆ.

Dulcamara, 1; boiling Water, 10: infuse one hour.

Dose.—1 to 2 fl. oz.

Foreign Pharmacopœias.—Official in Fr. (Tisane), 1 in 50; not in the others.

SOLANINE.—An Alkaloid obtained from *Solanum nigrum*, *S. Dulcamara*, and *S. tuberosum* (Potato plant).

It has been recommended as an analgesic.—*L.M.R.* '86, 496; '88, 242; *T.G.* '87, 56; '88, 630; L. '87, ii. 1097.

ELATERIUM.

ELATERIUM.

A sediment from the juice of the fruit of *Ecballium Elaterium*.

'Extractum Elaterii' was the official synonym in B.P. '85 for Elaterium.

Medicinal Properties.—The most powerful hydragogue cathartic. Used in dropsical affections connected with cardiac or renal disease and in cerebral congestion. Its administration in a debilitated state of the system or in gastro-intestinal inflammation requires caution.

Dose.—$\frac{1}{10}$ to $\frac{1}{2}$ grain.

Prescribing Notes.—On account of the similarity in name to the active principle care must be exercised to avoid confusion. The Pulvis Elaterini Compositus is often preferred; it is frequently given in the form of Pill with Compound Extract of Colocynth and Henbane. To prevent it causing persistent diarrhœa, it may be given with Henbane, especially in renal diseases; in cardiac cases it should be guarded by a stimulant to prevent too much depression.

Official Preparations.—Elaterinum. **Elaterin** is contained in Pulvis Elaterini Compositus.

Not Official.—Pilula Elaterii Composita.

Antidotes.—The same as for Croton Oil (q.v.)

Foreign Pharmacopœias.—Official in Mex., Elaterio; Port., Extracto de Pepinos de S. Gregorio; Swed., Elaterium Album; not in the others.

Description.—In light friable flat or slightly curved opaque cakes about one-tenth of an inch (two and a half millimetres) thick; pale green, greyish-green, or yellowish-grey in colour; fracture finely granular; odour faint, tea-like; taste bitter and acrid.

Tests.—It should not give the characteristic reactions with the tests for Carbonates or for Starch, and should yield half its weight to boiling Alcohol (90 p.c.). When exhausted with Chloroform, the solution evaporated, the residue washed with Ether, and the process of solution, evaporation, and washing repeated, Elaterium should yield 25 p.c., or not less than 20 p.c. of Elaterin.

Preparations.

ELATERINUM. ELATERIN.

The active principle of Elaterium ($C_{20}H_{28}O_5$), eq. 345·6.

Solubility.—1 in 160 of Alcohol (90 p.c.); insoluble in Water.

Description.—In small hexagonal scales having a bitter taste, readily soluble in Chloroform.

Tests.—Neutral to Litmus. Heated with access of air it first melts and then burns, leaving no residue. With melted Phenol it yields a solution which, on the addition of Sulphuric Acid, acquires a crimson colour, rapidly changing to scarlet. It is not precipitated from Alcoholic Solutions by Solution of Tannic Acid, Test-solution of Mercuric Chloride, or Solution of Platinic Chloride (absence of alkaloids).

Dose.—$\frac{1}{40}$ to $\frac{1}{10}$ grain.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

PULVIS ELATERINI COMPOSITUS. Compound Powder of Elaterin.

Elaterin, 1; Milk Sugar, 39: triturate in a mortar until a fine powder is produced.

Dose.—1 to 4 grains.

Foreign Pharmacopœias.—Official in U.S. (Trituratio), Elaterin, 1; Milk Sugar, 9; not in the others.

Not Official.

PILULA ELATERII CO. (*L.H.*)—Elaterium $\frac{1}{6}$ grain, Pill of Colocynth and Henbane 5 grains.

Dose.—1 or 2 pills.

Not Official.

ELEMI.

A concrete resinous exudation, the botanical source of which is undetermined, but is sometimes referred to *Canarium commune*.

It is imported from Manila.

Brazilian and Yucatan Elemis are Official in some of the Foreign Pharmacopœias.

Solubility.—The greater part is soluble in Alcohol (90 p.c.); wholly soluble in Ether.

Medicinal Properties.—Analogous to those of Turpentine. For external use only. The ointment is stimulant to indolent ulcers, and is used to keep up discharge caused by setons.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Fr., Mex. (Goma de Limon), Port., Russ., Span. and Swiss; not in the others.

Preparation.

UNGUENTUM ELEMI.—Elemi, 1; Spermaceti Ointment, 4: melt, strain, and stir till cold. =(1 in 5).

Foreign Pharmacopœias.—Official in Belg., Fr. (Onguent d'Arceus), Russ., Span. and Swiss, 1 of Elemi and 1 of Turpentine in 4 of Ointment; Dutch, 3 of Elemi, 2 of Turpentine, in 10 of Ointment; Port. 2 of Elemi and 1 of Turpentine in 10; not in the others.

Not Official.

EMBELIA RIBES.

The Powdered Seeds are used in India as a remedy for tapeworm.—*L.* '87, ii. 199.

Dose.—1 to 4 drm.

ACIDUM EMBELICUM.—Obtained from the Seeds. It is insoluble in Water, forms salts with Ammonium, Potassium, and Sodium.

AMMONII EMBELAS.—A tasteless crystalline salt, in red needles.

Dose.—3 to 6 grains in Honey or Simple Syrup.—*P.J.*, (3) xix. 305.

EMPLASTRA.

PLASTERS.

The Emplastra of the British Pharmacopœia are as follows, the formulas for which will be found under the names of the drugs from which they are prepared:—

	Proportion of active ingredients in the mass.
EMPLASTRUM AMMONIACI CUM HYDRARGYRO	(Mercury) 1 in 5.
EMPLASTRUM BELLADONNÆ	(Liquid Extract) 1 in 6.
EMPLASTRUM CALEFACIENS	(Cantharides) about 1 in 25.
EMPLASTRUM CANTHARIDIS	(Cantharides) about 1 in 3.
EMPLASTRUM HYDRARGYRI	(Mercury) 1 in 3.
EMPLASTRUM MENTHOL	(Menthol) 1 in 6⅔.
EMPLASTRUM OPII	(Opium) 1 in 10.
EMPLASTRUM PICIS	(Pitch) about 1 in 2.
EMPLASTRUM PLUMBI	(Lead Oxide) about 1 in 4.
EMPLASTRUM PLUMBI IODIDI	(Lead Iodide) 1 in 10.
EMPLASTRUM RESINÆ	(Resin) 1 in 9½.
EMPLASTRUM SAPONIS	(Soap) about 1 in 7.

Plasters which are not Official are enumerated in the Index.

ENEMATA.

These are now deleted from B.P.

Not Official.

EPHEDRINE HYDROCHLORIDE.

The Hydrochloride of an alkaloid obtained from *Ephedra vulgaris* or *E. Helvetica*. Has been recommended as a mydriatic in the form of a 5 p.c. Solution.—*B.M.J.E.* 98, ii. 92.

The addition to it of 1 p.c. of Homatropine Hydrochloride enhances its action.

The mixture is supplied under the name 'Mydrin,' which is a white powder readily soluble in Water; a 10 p.c. aqueous solution dilates the pupil moderately within a few minutes, without affecting the accommodation, and its effects pass away in two to four hours. It is useful in diagnostic examinations.—*L.* '98, ii. 24; *T.G.* '98, 757.

ERGOTA.

ERGOT.

The sclerotium of *Claviceps purpurea*, originating in the ovary of *Secale cereale*.*

* Ergot is common on grasses, and if it occurs in the pastures where cattle feed, it is said to occasion dry gangrene, causing them to lose their hoofs and horns.

During an epidemic of *Secale cornutum* it was noticed that one of the symptoms of ergot-poisoning was suppression of milk in lactating women. The same result followed in cows that had been fed on meal containing Ergot.—*M.T.* '75, i. 586.

Medicinal Properties.—Ecbolic; used in obstetric practice to contract the uterus, assist expulsion of placenta, and prevent or stop post-partum hæmorrhage. Employed in uterine hæmorrhage from other causes such as fibroid tumour; and in subinvolution; also in hæmoptysis, hæmatemesis, hæmaturia, and epistaxis. Efficacious in flatulent dilatation of stomach; in acute myelitis and in paraplegia of inflammatory origin; in night sweats of phthisis. Deep intramuscular **injection** gives most rapid action in critical cases. Injections into the sphincter are valuable in prolapsus ani. After elaborate investigations Kobert recommends freshly powdered Ergot for certainty of action.

In hiccough (*L.* '85, ii. 276); in post-partum hæmorrhage, equal parts of Liquid Extract of Ergot and Acetic Acid diluted with Water (*B.M.J.* '88, i. 295, 1148); in the sweats of phthisis (*L.M.R.* '81, 451 and *B.M.J.E.* '94, ii. 4); in periodic neuralgia (*T.G.* '94, 343); in diabetes insipidus, 30 minim doses of the Liquid Extract every three hours.—*L.M.R.* '80, 231, 446; '81, 12.

Dose.—20 to 60 grains.

Prescribing Notes.—The unpleasant taste of the preparations of Ergot is best covered by Tincture of Orange or Tincture of Orange and Cinnamon Water. The Infusion and Hypodermic Injection should be made fresh as required. When the Extract is ordered in pills, Powdered Liquorice Root added q.s. makes a good pill.

Incompatibles.—Astringents, metallic salts.

Official Preparations.—Extractum Ergotæ, Extractum Ergotæ Liquidum, Infusum Ergotæ, Tinctura Ergotæ Ammoniata. Injectio Ergotæ Hypodermica is made with Extractum Ergotæ.

Not Official.—Discs of Ergotin, Pilula Ergotini, Acidum Sclerotícum, Ergotinine, Extractum Secalis Cornuti Cornutino-Sphacelinicum, and Cornutine Citrate.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Ger., Hung., Jap., Norw., Russ., Swed. and Swiss, Secale Cornutum; Fr., Ergot de Seigle; Ital., Segala Cornuta; Mex., Cuernecillo de Centeno, Port., Cravagem de Centeio; Span., Cornezuelo de Centeno; U.S., Ergota.

Description.—Subcylindrical or somewhat triangular, tapering towards the ends, generally curved; from one-third of an inch to an inch and a half (one to four centimetres) in length; longitudinally furrowed on each side, but more especially on that which is concave; often irregularly cracked; very dark violet-black externally, whitish or pinkish-white within; fracture short. Odour peculiar and disagreeable, especially if the powder be triturated with Solution of Potassium Hydroxide; taste disagreeable. Ergot should be free from mustiness; it is liable to deteriorate by keeping and by exposure to damp.

The two principal commercial varieties are Spanish and Russian. The former is usually considered the best.

The Ergot of Russia and Austria is stated to contain the larger amount of Cornutine. Ergot should not be exposed to heat, but dried over quicklime.—*P.J.* '96, i. 84, 163.

Yields its virtues to Water and Alcohol.

It contains about 33 p.c. of fixed Oil, which can be extracted with Ether, Petroleum Ether, and also to a great extent by hydraulic pressure.

Papers by Kobert are summarised (*C.D.* '90, ii. 551), but it must be noted that many of his results are not only questioned but flatly contradicted by Tanret. According to Kobert the most active constituent is **Cornutine**, which together with Sphacelinic Acid is contained in an alcoholic extract after removal of Oil by Petroleum Ether. He also states that no aqueous extract of Ergot will have any therapeutic value after having been made for nine months.

Keller is of opinion that Ergot contains only one basic substance, the Ergotinine of Tanret, the Cornutine of Kobert, and the Picrosklerotine of Dragendorff and Podwyssotski, being according to him identical or somewhat altered forms of the same substance. The Sphacelotoxin or Spasmotin of Jakobi is considered to owe its activity to the presence of some alkaloid.—*P.J.* '96, ii. 378.

Jacobi has given the name of Sphacelotoxin to a substance of a resinous nature which he has obtained from Ergot, and regards as the specifically active constituent of the drug.—*P.J.* '97, ii. 84.

New reaction for Ergotinine.—*P.J.* '96, i. 299.

Summary of literature on Ergot and description of 'Ergot aseptic.'—*T.G.* '98, 433; *P.J.* '98, ii. 345.

In this country it has been the general opinion that an ammoniated menstruum gave the most reliable preparation, but preference is given by Kobert to an acid (HCl) extractive as in U.S. and the previous Ger. (1882).

Ergot is stated (*P.J.* (3) xvi. 274) to keep much better if a large proportion of the Oil has been extracted by hydraulic pressure; this, however, is disputed (*C.D.* '90, ii. 552), and it is there recommended to keep the drug whole, in air-tight vessels and perfectly dry.

Preparations.

EXTRACTUM ERGOTÆ. Extract of Ergot. *B.P.Syn.*—Ergotin. (Altered).

Ergot in No. 40 powder, 20 oz.; Alcohol (60 p.c.), a sufficient quantity; Distilled Water, a sufficient quantity; Diluted Hydrochloric Acid, 7½ fl. drm.; Sodium Carbonate, 175 grains. Moisten the powdered Ergot with 10 fl. oz. of the Alcohol; pack the damp powder in a percolator; percolate with the Alcohol until the Ergot is exhausted. Evaporate the percolate to 5 fl. oz.; add 5 fl. oz. of Distilled Water; filter when cold, washing the residue with a little Distilled Water. Add the Diluted Hydrochloric Acid to the filtrate; set aside for twenty-four hours; filter; wash the residue with Distilled Water until the washings no longer have an acid reaction, adding the washings to the filtrate; add the Sodium Carbonate to the latter; evaporate to a soft extract.

The corresponding preparation to this in B.P. '85 was prepared from Liquid Extract of Ergot and Rectified Spirit.

Dose.—2 to 8 grains.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Ger., Hung., Ital., Jap., Mex. Ergotina de Bongean, Norw., Port., Russ., Span., Swed., Swiss and U.S.

EXTRACTUM ERGOTÆ LIQUIDUM. Liquid Extract of Ergot. (Modified.)

Ergot, crushed, 40; Distilled Water, 300; Alcohol (90 p.c.), 15. Digest the crushed Ergot in 200 of the Distilled Water for twelve hours; draw off the infusion; repeat the digestion with the remainder

of the Distilled Water; press; strain; evaporate the liquid to 28; when cold, add the Alcohol; set aside for an hour; filter. The product should measure 40. =(1 in 1).

Alcohol (90 p.c.) used instead of Rectified Spirit.

Dose.—10 to 30 minims.

60 minims is not infrequently prescribed.

Foreign Pharmacopœias.—Official in Dan., Ger., Norw., and Russ. Extract with Hydrochloric Acid and dilute Alcohol; Mex. (Extracto fluido de Cuernecillo de Centeno) with Acetic Acid and Dilute Alcohol; U.S. percolated with dilute Alcohol acidified with Acetic Acid; Swiss from solid Extract; not in the others.

INFUSUM ERGOTÆ. Infusion of Ergot. (Altered.)

Ergot, freshly crushed, 1; Distilled Water, boiling, 20: infuse in a covered vessel for fifteen minutes; strain. =(1 in 20).

Now 1 in 20 instead of 1 in 40, and time reduced from 30 to 15 minutes.

Dose.—1 to 2 fl. oz.

Used also as an injection for gleet.

(Not in the other Pharmacopœias.)

INJECTIO ERGOTÆ HYPODERMICA. Hypodermic Injection of Ergot. *B.P.Syn.*—Hypodermic Injection of Ergotin. (Altered.)

Extract of Ergot, 100 grains; Phenol, 3 grains; Distilled Water, 220 minims, or a sufficient quantity. Mix the Phenol with the Distilled Water; boil for a few minutes; cool; add the Extract of Ergot, and, if necessary, sufficient recently boiled and cooled Distilled Water to produce 330 minims of the Injection. =(1 in 3).

Camphor Water now omitted and Phenol added.

Dose, *by subcutaneous injection.*—3 to 10 minims.

This injection should be recently prepared. 110 minims contain about 33 grains of Extract of Ergot; 100 c.c. contain about 33 grammes.

Foreign Pharmacopœias.—Official in Port. (Soluto de Ergotino com Glycerino), Ergotin 1, Glycerin 4, Water 5; all by weight. Mex. (has Injection Ergotinine).

TINCTURA ERGOTÆ AMMONIATA. Ammoniated Tincture of Ergot. (New.)

Ergot, in No. 20 powder, 5; Solution of Ammonia, 2; Alcohol (60 p.c.) a sufficient quantity. Mix the Solution of Ammonia with 18 of the Alcohol; moisten the powder with two of this mixture, and percolate with the remainder; press the marc; mix the expressed liquid with the percolate; add enough of the Alcohol to form 20 of the Tincture; set aside for twenty-four hours; filter. =(1 in 4).

Dose.—30 to 60 minims.

Foreign Pharmacopœias.—A simple tincture is official in Belg., Dutch, Mex., and Port., 1 in 5; Russ. and Swiss, 1 and 10; all by weight; not in the others; U.S. (Vinum Ergotæ), 15 in 100.

Not Official.

DISCS OF ERGOTIN ⅓ grain and ¼ grain are prepared for hypodermic use.

PILULA ERGOTINI (*L.H.*).—Ergotin 2 grains, Liquorice Powder 3 grains.

ACIDUM SCLEROTICUM.—A weak acid obtained from Ergot by Dragendorff. It

is used **hypodermically** $\frac{1}{3}$ to $\frac{3}{4}$ grain dissolved in Distilled Water or Thymol Water.—*P.J.* (3) vi. 1001; *Y.B.P.* '84, 87.

ERGOTININE.—An alkaloid obtained from Ergot, insoluble in Water, soluble in Alcohol or Chloroform. Used in post-partum hæmorrhage by **hypodermic injection** of 5 to 10 minims of a solution containing $\frac{1}{30}$ grain in 20 minims.—*B.M.J.* '82, ii. 1004. (Fr. Ergotinine Cristallisée).

EXTRACTUM SECALIS CORNUTI CORNUTINO-SPHACELINICUM (KOBERT).—An Extract which combines the action of **Cornutine** and **Sphacelinic Acid**, an alkaloid and a resinous body, obtained by Kobert from Ergot. It is prepared by exhausting Ergot with strong Alcohol, and evaporating the liquid to an Extract, the fatty Oil being removed by Ether.

He does not give the dose of the above, but states that 'the extract thus prepared is not well suited for subcutaneous injection,' and 'the dose cannot be foretold because the proportion of active principles present in Ergot varies exceedingly with the year and the district.'—*Pr.* xxxiii., 409; xxxv., 414.

CORNUTINE CITRATE.—A soluble salt of an alkaloid which is stated by Kobert to be the active principle of Ergot. A brown powder, which is used in obstetric practice.

Dose.—$\frac{1}{12}$ to $\frac{1}{6}$ grain, or subcutaneously $\frac{1}{32}$ to $\frac{1}{8}$ grain.

Not Official.

ERIGERONTIS CANADENSIS OLEUM.

OIL OF CANADIAN FLEABANE.

A volatile Oil distilled from the fresh flowering herb *Erigeron Canadense;* it grows abundantly in the American Mint fields and frequently contaminates that Peppermint Oil, as shown by its insolubility in 85 p.c. Alcohol.—*Y.B.P.* '82, 214.

When rectified, the Oil, which is a terpene ($C_{10}H_{16}$), has a sp. gr. ·850, and boils at 176° C.

A very pale yellow liquid, with neutral reaction.

Medicinal Properties.—Diuretic, tonic, and astringent. Chiefly employed for arresting internal hæmorrhage.

Dose.—5 to 10 minims every two or three hours.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Not Official.

ERYTHROPHLÆUM.

CASCA BARK. SASSY BARK.

The bark of the *Erythrophlæum guineense.* Introduced as a cardiac tonic in 1877. An ordeal bark used in West Africa.

Preparations.

TINCTURA ERYTHROPHLÆI (*B.P.C.*).—Casca Bark in No. 20 powder, 2; Rectified Spirit to percolate 20.

Dose.—5 to 10 minims.

ERYTHROPHLÆINÆ HYDROCHLORIDUM.—Soluble in Water.

The statement that it possessed local anæsthetic properties has given rise to a good deal of discussion, the result of which is not in favour of its use for that purpose.—*B.M.J.* '88, *i.* 317, 545, 604, 661, 1083; *L.* '88, i. 249, 346.

ESSENTIÆ.

These have been deleted from B.P.

Not Official.

ERYTHROL TETRANITRATE.

Is prepared from Erythrite (a tetratomic Alcohol). A colourless crystalline solid melting at 61° C. (142° F.). When kept in a dark and moderately cool place it is fairly stable, but if exposed to warmth, and especially sunlight, it rapidly undergoes decomposition. It is but slightly soluble in Water, but dissolves readily in Alcohol (90 p.c.) and Ether. It is a vaso-dilator and belongs to the group of which Glycerol Trinitrate (Nitroglycerin) may be regarded as the typical representative. Blood pressure experiments show that it has a less marked but more prolonged action than that substance.

Dose.—1 grain, in Alcoholic solution or in the form of tablets.—*B.M.J.* '95, ii. 1213; '97, i. 907; '98, i. 18, 37, 248; ii. 936.

ETHYL NITRITIS LIQUOR.

See under SPIRITUS ÆTHERIS NITROSI.

EUCAINE. *See* COCAINE, p. 229.

EUCALYPTI GUMMI.

EUCALYPTUS GUM.

A ruby-coloured exudation, or so-called Red Gum, from the bark of *Eucalyptus rostrata* and some other species of Eucalyptus. Imported from Australia.

Under the name of Gummi Rubrum, this has been 'Not Official' in the *Companion* since 1871.

Medicinal Properties.—Astringent, principally used in diarrhœa, dysentery, and relaxed throat.

This gum adheres with great pertinacity to the mucous surfaces, and it is probably on this account that its astringency is more effective than that of Catechu, Kino, etc., although it contains less astringent matter.

Dose.—2 to 5 grains.

Prescribing Notes.—Given in the form of **cachets** or in **pills** massed with Dispensing Syrup q.s. The Tincture mixes with Water and does not require Mucilage.

Official Preparation.—Trochiscus Eucalypti Gummi.

Not Official.—Extractum Gummi Rubri Liquidum, Suppositoria Gummi Rubri, Syrupus Gummi Rubri, Tinctura Gummi Rubri, Trochiscus Gummi Rubri (*Squire*).

Description.—In grains or small masses. Thin fragments are transparent and of a ruby-red or garnet-red colour. It is somewhat tough and has a very astringent taste. When chewed it adheres to the teeth and tinges the saliva red.

Tests.—Cold Water dissolves from 80 to 90 p.c., forming a neutral solution. It is almost entirely soluble in Alcohol (90 p.c.).

TROCHISCUS EUCALYPTI GUMMI. Eucalyptus Gum Lozenge. (New.)

Eucalyptus Gum, 1 grain. Mix with the Fruit Basis to form a Lozenge.

Not Official.

EXTRACTUM GUMMI RUBRI LIQUIDUM.—Red Gum, 7; Water, 21: dissolve, strain, and add Alcohol (90 p.c.), 1.

Dose.—30 to 60 minims in a wineglassful of water.

An excellent styptic; injected into the nostril, at once stays bleeding of the nose.

A tablespoonful in a pint of water forms an astringent **injection** for the vagina or rectum; it also forms an astringent **lotion** for the eyes.

SUPPOSITORIA GUMMI RUBRI.—Powdered Red Gum, 5 grains; Extract Nux Vomica, 1 grain; Cocoa-nut Stearin, *q.s.* to make one suppository.

SYRUPUS GUMMI RUBRI.—Liquid Extract, 20; Sugar, 12: dissolve.

Dose.—30 to 60 minims.

TINCTURA GUMMI RUBRI.—Gum, 1; Alcohol (90 p.c.), 4: digest and strain. Mixes with water without becoming turbid.

Dose.—20 to 40 minims.

1 part of this with 6 or 8 of Water for a **gargle.**

TROCHISCUS GUMMI RUBRI (Squire).—Made with Rose Paste. This lozenge, which has been in use for about forty years, differs in appearance and flavour from that now introduced into the B.P.

Useful for relaxed throat. They have also been recommended as a preventive of sea-sickness.

EUCALYPTI OLEUM.

OIL OF EUCALYPTUS.

The Oil distilled from the fresh leaves of *Eucalyptus globulus*, and other species of *Eucalyptus*.

Solubility.—3 in 1 (or less) of Alcohol (90 p.c.), in all proportions of Absolute Alcohol; 1 in 38 of Alcohol (60 p.c.) (Amygdalina Oil, 1 in 175).

Medicinal Properties.—It is a powerful antiseptic and deodorizer; antipyretic. It has been used in the treatment of wounds and in surgical operations; as an inhalation in cases of pulmonary gangrene, phthisis, influenza and coryza, and internally or by inhalation to relieve the cough in chronic bronchitis, phthisis, and asthma. Mixed with Iodoform as an application to hard and soft chancres, and as urethral suppository in gonorrhœa. Given internally for chronic inflammation of the bladder.

Eucalyptus antiseptic spray in eye operations.—*L.* '86, i. 305.

Inhalation in whooping cough.—*B.M.J.* '86, i. 430. As a disinfectant, as a throat and nose spray, and as an inunction in scarlet fever.—*L.* '95, i. 861.

Dose.—½ to 3 minims.

Prescribing Notes.—Given in the form of Emulsion with Mucilage of Acacia and Water, or taken on Sugar. Used as an **inhalation** or **spray**.

Official Preparation.—Unguentum Eucalypti.

Not Official.—Tinctura Eucalypti, Eucalyptus Gauze, Eucalyptus Wool and Lint, Nebula Eucalypti, Pessarium Eucalypti, Vapor Eucalypti, Eugol, Eucalypteol, and Eucalyptol.

Foreign Pharmacopœias.—Official in Belg., Hung., Jap.; Mex. (Aceite Volatil de Eucalipto), sp. gr. ·905; Norw. and U.S., sp. gr. ·915—·925; not in the others.

Description.—Colourless or pale yellow, having an aromatic camphoraceous odour, and a pungent taste, leaving a sensation of coldness in the mouth.

Tests.—Sp. gr. ·910 to ·930. It should not rotate the plane of a ray of polarised light more than 10° in either direction in a tube 100 millimetres long, and it should become semi-solid on being stirred, when cold, with a third or half its volume of Phosphoric Acid of commerce of Sp. gr. 1·750 (presence of a due proportion of Cineol). If to 1 c.c. of the Oil there be added 2 c.c. of Glacial Acetic Acid and 2 c.c. of a saturated aqueous solution of Sodium Nitrite, the mixture, when gently stirred, should not form a crystalline mass (exclusion of Eucalyptus Oils containing much Phellandrene).

The distinction between the two principal commercial varieties (the Oil from *E. globulus*, and the Oil from *E. amygdalina*) seems strongly marked. The former has a gravity over ·900 (generally ·915—·925), a weak dextro-rotatory power, yields crystallisable Eucalyptol (Cineol), and contains no Phellandrene. The latter has a gravity below ·900 (generally ·880—·890), a lævo-rotatory power, yields little or no crystallisable Eucalyptol (Cineol), and consists largely of Phellandrene, which may be recognised by dissolving the Oil in twice its volume of Glacial Acetic Acid, and adding a solution of Sodium Nitrite; Phellandrene if present separates as an insoluble Nitrite. A pure *Amygdalina* Oil solidifies almost instantly; a *Globulus* Oil, treated in the same way, assumes a green colour, but does not otherwise change. The boiling point of the two Oils appears not to differ to any definite extent. No comparative tests seem to have been made as to the therapeutic values of the different varieties. —*Companion*, 1890.

We noted (*C.D.* '90, ii. 380) the existence of a commercial Oil allied to Amygdalina, but with a left-handed rotation three times as great as the ordinary variety, the origin of which has not been identified.

For many years the oil from *E. Amygdalina* was the most esteemed variety and was included in *B.P.* '85, but it is now excluded by the tests given in *B.P.* '98.

Improved process for extraction and determination of Eucalyptol (Cineol).—*J.S.C.I.* '94, 1106; *L.* '95, i. 687.

Note on the estimation of Eucalyptol (Cineol).—*A.J.P.* '98, 492.

Note on Eucalyptus Oil.—*P.J.* (3) xxv. 501.

Examination of commercial oils for Eucalyptol (Cineol).—*C.D.* '98, i. 713.; *J.C.S. Abs.* '98, ii. 543.

Description of oil from *E. loxophleba*.—*C.D.* '98, ii. 287; *P.J.* '98, ii. 198.

Leaves of *E. punctata* yield an abundance of oil containing over 50 p.c. of Eucalyptol (Cineol).—*C.D.* '98, ii. 519.

Preparation.

UNGUENTUM EUCALYPTI. Eucalyptus Ointment. (Altered.)

Oil of Eucalyptus (by weight), 1; Hard Paraffin, 4; Soft Paraffin. white, 5. Melt the Hard and Soft Paraffins together; add the Oil of Eucalyptus; stir until cold. =(1 in 10.)

Now 1 in 10 instead of 1 in 5, and white Soft Paraffin specified.

The leaves and oil of *E. amygdalina* are recommended by Bosisto for making the ointment.—*P.J.* '96, i. 224.

Not Official.

TINCTURA EUCALYPTI (*B.P.C.*).—Eucalyptus Leaves (of the *Eucalyptus globulus*), in No. 20 powder, 4; Rectified Spirit to percolate, 20.

Dose.—15 to 120 minims.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Hung., Mex., Port., Span. and Swiss, 1 in 5; not in the others.

EUCALYPTUS GAUZE.—Contains about 6 p.c. of Oil of Eucalyptus.

EUCALYPTUS WOOL and **LINT.**—Each contains 10 p.c. of the Oil.

NEBULA EUCALYPTI (*T.H.*).—Oil of Eucalyptus, 5 minims; White Adepsine Oil to 1 fl. oz. Mix. Stimulant.

PESSUS EUCALYPTI.—Oil of Eucalyptus, 15 minims; Oil of Theobroma to 2 fl. drm.

VAPOR EUCALYPTI (*T.H.*).—Oil of Eucalyptus, 20 minims; Light Magnesium Carbonate, 10 grains; Water to 1 fl. oz. Mix a teaspoonful in a pint of Water at 140° F. for each inhalation. Stimulant.

Eugol is a liquid containing Beta-naphthol, Boric Acid, Menthol, Thymol, Eucalyptol, Gaultheria, and Hamamelis.—*B.M.J.* '98, i. 702; *L.* '98, i. 37.

Eucalypteol (Eucalyptene Bichloride).—A crystalline substance almost insoluble in water, melting at 50° C. and boiling at 115° C.

EUCALYPTOL (Crystallisable).—A definite chemical body ($C_{10}H_{18}O$), obtained from Eucalyptus Oil by a freezing process, or by separation as Phosphate and subsequent decomposition of this salt by hot Water. It is liquid at ordinary temperatures, but crystallises about 0° C. (32° F.). It has no action on polarised light. The sp. gr. is given in U.S. as ·930, and in the Fr. Codex Supp. as ·940. It is identical with an oxidised compound obtained from Oil of Cajuput and a number of other essential oils, consequently the names **Cineol** and **Cajuputol** have also been applied to it.

EUONYMI CORTEX.

EUONYMUS BARK.

The dried root-bark of *Euonymus atropurpureus.*

Medicinal Properties.—Tonic, cathartic, and diuretic. The dry extract is a powerful cholagogue and purgative; useful in chronic constipation and torpid liver.

Prescribing Notes.—Dried **Extract** in one form or another has been known for many years as Euonymin; usually given in the form of **pills** with Extract of Henbane; if prescribed alone a little Soap, one-sixth grain in a 2 or 3 grain pill, and Alcohol (90 p.c.) q.s. makes a good mass. It is also given in Compressed Tablets.

Official Preparation.—Extractum Euonymi Siccum.

Not Official.—Tinctura Euonymi.

Foreign Pharmacopœias.—Official in Fr., Jap. and U.S.; not in the others.

Description.—In quilled or curved pieces, varying in thickness from one-twelfth to one-sixth of an inch (two to four millimetres). The outer layer is a soft friable cork of a light ash-grey colour, marked with darker patches. The inner surface is pale tawny-white and smooth when free from fragments of the white wood. The bark breaks with a short fracture; the fractured surface is yellowish in colour. Odour faint but characteristic; taste somewhat mucilaginous and afterwards bitter and slightly acrid.

Preparation.

EXTRACTUM EUONYMI SICCUM. Dry Extract of Euonymus. (Altered.)

Euonymus Bark, in No. 20 powder, 20; Alcohol (45 p.c.) a sufficient quantity; Calcium Phosphate, a sufficient quantity. Moisten the powdered Euonymus Bark with 10 of the Alcohol; pack in a percolator; gradually pour on more of the menstruum until the Euonymus is exhausted; collect the liquid and evaporate the Alcohol; thoroughly dry the residue; powder the product as far as possible and mix it with one-fourth of its weight of Calcium Phosphate, continuing the drying and powdering until a satisfactory preparation is obtained; then immediately transfer it to a well-closed bottle.

Now made with Alcohol (45 p.c.) in place of Rectified Spirit, and Calcium Phosphate substituted for Milk Sugar.

Dose.—1 to 2 grains.

This preparation rapidly absorbs moisture on exposure to the air; which is not the case when Magnesia is used, as previously recommended in the *Companion*.

Is a powerful hepatic, but feeble intestinal stimulant.—Dr. Rutherford.

Foreign Pharmacopœias.—Fr. a powder; U.S. an extract.

Not Official.

TINCTURA EUONYMI (*B.P.C.*).—Euonymus bark in No. 20 powder, 4; Rectified Spirit sufficient to percolate 20.

Dose.—10 to 40 minims.

Not Official.

EUPHORBIA PILULIFERA.

A plant growing in Queensland and Tropical America. The herb is collected when in flower and carefully dried.

It has been recommended in spasmodic asthma and bronchial affections; in coryza and hay fever; and in spasmodic dyspnœa of whatever origin..—*L.* '85, ii. 86; *T.G.* '85, 92; *M.A.* '93, 260; '94, 20; *Y.B.T.* '94, 32.

Preparations.

EXTRACTUM EUPHORBIÆ PILULIFERÆ.—Obtained by the evaporation of an Alcohol (60 p.c.) Tincture.

Dose.—½ to 1 grain.

TINCTURA EUPHORBIÆ PILULIFERÆ (*B.P.C.*).—Euphorbia in No. 20 powder, 4; Proof Spirit to percolate 20.

Dose.—10 to 30 minims.

Not Official.

EXALGIN.

METHYLACETANILIDE.

$C_6H_5N(CH_3)CH_3CO$.

This crystalline substance, which was described by Hofmann in 1874, has been more recently submitted to physiological experiment and found to possess analgesic and, to a much less degree, antipyretic properties.

Solubility.—1 in 50 of Water; 1 in 2 of Alcohol (90 p.c.); 1 in 4 of Alcohol (60 p.c.); 1 in 2 of Chloroform; 1 in 10 of Ether.

In hot water Exalgine is very apt to form supersaturated solutions, which when cold will not separate even when stirred or scratched, but set solid at once on the addition of a fragment of crystal.

Medicinal Properties.—In small doses it acts as an analgesic without producing ill effects, giving the best results in neuralgia and toothache.—*B.M.J.* '90, i. 344, 558; '90, ii. 735; *P.J.* (3) xix. 781, 861; *T.G.* '89, 339, 534, 746, 797; *L.* '89, i. 658; '90, ii. 845; '92, i. 1174, 1175; '93, i. 785. In large doses it possesses toxic properties.

Dose.—½ to 1 grain was found sufficient by Fraser, but larger doses, 4 to 8 grains, have been given in France.

Foreign Pharmacopœias.—Official in Fr. and Mex., not in the others.

Prescribing Notes.—May be given in Mixtures, previously dissolving it in a little Alcohol, or Tincture before adding the Water. A nice **pill** mass is made by adding Glucose q.s. or ½ grain Compound Tragacanth powder to each 3 grains of Exalgin and Dispensing Syrup q.s. It may also be conveniently given in **cachets**. Compressed Tablets are also prepared.

Preparation.

MISTURA METHYLACETANILIDI (*L.H.*).—Methylacetanilide 3 grains, Syrup of Orange Peel 1 fl. drm., Chloroform Water to 1 fl. oz.

EXTRACTA.

EXTRACTS.

The following is a complete list of the Extracts of the British Pharmacopœia, the mode of preparation for which will be found under the names of the drugs from which they are prepared:—

DOSE.	EXTRACTUM.	MENSTRUUM.
1 to 4 grains.	ALOES BARBADENSIS.	Boiling water.
2 to 8 grains.	ANTHEMIDIS (flowers and oil).	Water.
¼ to 1 grain.	BELLADONNÆ ALCOHOLICUM (liquid extract)	
	EXTRACTUM BELLADONNÆ LIQUIDUM (root) (standardised).	Alcohol (90 p.c.) and cold water.
¼ to 1 grain	BELLADONNÆ VIRIDE (juice of fresh herb).	
¼ to 1 grain.	CANNABIS INDICÆ (dried herb).	Alcohol (90 p.c.)
2 to 8 grains.	CASCARÆ SAGRADÆ (dried bark).	Cold water.
½ to 1 fl. drm.	CASCARÆ SAGRADÆ LIQUIDUM.	Cold water.
5 to 30 minims.	CIMICIFUGÆ LIQUIDUM.	Alcohol (90 p.c.).

DOSE.	EXTRACTUM.	MENSTRUUM.
5 to 15 minims.	CINCHONÆ LIQUIDUM (Red bark).	Hydrochloric acid, Glycerin & Water.
½ to 1 fl. drm.	COCÆ LIQUIDUM (dried leaves).	Alcohol (60 p.c.).
¼ to 1 grain.	COLCHICI (juice of fresh corms).	
2 to 8 grains.	COLOCYNTHIDIS COMPOSITUM (pulp)	Alcohol (60 p.c.).
2 to 8 grains.	ERGOTÆ (dried Ergot).	Alcohol (60 p.c.).
10 to 30 minims.	ERGOTÆ LIQUIDUM (dried Ergot).	Cold water.
1 to 2 grains.	EUONYMI SICCUM (dried bark).	Alcohol (45 p.c.).
45 to 90 minims.	FILICIS LIQUIDUM (dried rhizome).	Ether.
2 to 8 grains.	GENTIANÆ (dried root).	Water.
	GLYCYRRHIZÆ (dried root).	Cold water.
½ to 1 fl. drm.	GLYCYRRHIZÆ LIQUIDUM.	Cold water.
5 to 15 minims.	HAMAMELIDIS LIQUIDUM.	Alcohol (45 p.c.).
5 to 15 minims.	HYDRASTIS LIQUIDUM.	Alcohol (45 p.c.).
2 to 8 grains.	HYOSCYAMI VIRIDE (juice of fresh herb).	
Expectorant, ½ to 2 minims. Emetic, 15 to 20 minims.	IPECACUANHÆ LIQUIDUM (dried root) (standardised).	Alcohol (90 p.c.).
5 to 15 minims.	JABORANDI LIQUIDUM (dried leaves).	Alcohol (45 p.c.).
2 to 8 grains.	JALAPÆ (dried root).	Alcohol (90 p.c.), and cold water.
5 to 15 grains.	KRAMERIÆ (dried root).	Cold water.
¼ to 1 grain.	NUCIS VOMICÆ (liquid extract) (standardised).	
1 to 3 minims.	NUCIS VOMICÆ LIQUIDUM (dried seeds) (standardised).	Alcohol (70 p.c.).
¼ to 1 grain.	OPII (standardised).	Cold water.
5 to 30 minims.	OPII LIQUIDUM (extract) (standardised).	
½ to 2 fl. drm.	PAREIRÆ LIQUIDUM (dried root).	Boiling water.
¼ to 1 grain.	PHYSOSTIGMATIS.	Alcohol (90 p.c.).
2 to 8 grains.	RHEI (dried root).	Alcohol (60 p.c.).
2 to 4 fl. drm.	SARSÆ LIQUIDUM (root).	Alcohol (20 p.c.).
¼ to 1 grain.	STRAMONII (dried seeds).	Alcohol (70 p.c.).
¼ to 1 grain.	STROPHANTHI (dried seeds).	Ether (rejected) and Alcohol (90 p.c.).
5 to 15 grains.	TARAXACI (juice of fresh root).	
½ to 2 fl. drm.	TARAXACI LIQUIDUM (dried root).	Alcohol (60 p.c.), and Water.

For Liquid Extracts in India *see* Appendix.

Extracts which are not official are enumerated in the Index.

Extracts and the determination of their alkaloidal values.—*P.J.* '96, ii. 161; '97, ii. 517.

Examination of commercial Fluid Extracts.—*A.J.P.* '95, 291; *P.J.* '95, ii. 242.

The Liquid Extracts of *B.P.* '98.—*C.D.* '98, ii. 458.

FEL BOVINUM PURIFICATUM.

PURIFIED OX BILE.

Evaporate one pint (or 500 c.c.) of fresh Ox Bile to one quarter of its volume; shake it with half a pint (or 250 c.c.) of Alcohol (90 p.c.); set the mixture aside until the solid matter has subsided; decant the clear solution, and filter the remainder, washing the filter and contents with a little more Alcohol (90 p.c.). Distil off most of the Alcohol from the mixed liquids, and evaporate the residue in a porcelain dish, by the heat of a water-bath, until it acquires the consistence of a thick extract.

Solubility.—Soluble in Water and in Alcohol (90 p.c.). Insoluble in Ether.

Medicinal Properties.—Antiseptic and purgative. Used where there is a deficiency of bile, and assists the emulsification of fats.

Dose.—5 to 15 grains.

It is not desirable that it should come in contact with the stomach, hence the pills should be coated with Keratin Solution, p. 390.

8 fl. oz. Ox Bile, diluted with 8 fl. oz. Water and a few crystals of Sodium Carbonate, used as an **enema**, is sometimes useful in severe cases of intestinal obstruction.—*L.* '78, ii. 276, 316.

Foreign Pharmacopœias.—Official in Belg. (Fel Bovinum Depuratum), Swed. (Bilis Bovina Depurata), equal weights of Gall and Alcohol (90 p.c.); Ital. (Bile Crystallizzata di Platner); Port. (Extracto de Fel de Boi), Gall 1, Alcohol 1, Animal Charcoal $\frac{1}{10}$; U.S. (Fel Bovis Purificatum), Ox Gall 3, concentrated to 1, Alcohol 1; not in others. Fr. (Extrait de Fiel de Bœuf), Span. (Extracto de Hiel); Gall evaporated, without purification by alcohol. Mex. (Hiel de toro).

Description.—A yellowish-green hygroscopic substance, having a taste partly sweet and partly bitter.

Tests.—A solution in twenty or thirty times its weight of Water, when treated, first with a drop of freshly made syrup consisting of one part of Refined Sugar and four of Water, and then with Sulphuric Acid cautiously added until the precipitate at first formed is redissolved, gradually acquires a cherry-red colour, which changes in succession to carmine, purple, and violet. Its aqueous solution gives no precipitate on the addition of Alcohol (90 p.c.) (absence of unpurified Ox Bile).

FERRUM.

IRON.

Fe, eq. 55·60.

Annealed iron wire, having a diameter about ·005 inch (·1 millimetre) (about No. 35 wire gauge), or wrought iron nails; free from Oxide.

Sp. gr. 7·8; fuses about 2786° F. The use of Iron in medicine is of great anti-

quity; it is said to have been the first mineral used internally, more than 3000 years ago.

Iron Salts naturally divide into two groups; the Ferrous or Protosalts based upon the Oxide FeO, and the Ferric or Sesquisalts (Persalts) based upon the Oxide Fe_2O_3. Ferrous Salts have a strong tendency to pass into the Ferric condition by absorption of atmospheric Oxygen, a change which takes place very rapidly in presence of oxidising agents, as Chlorine, Nitric Acid, &c.

Medicinal Properties.—Hæmatinic, tonic, astringent. Ferrous Carbonate, in the form of pill (Pil. Ferri) or capsule, is now the most largely used salt of Iron. The Phosphates are much used, and the Tincture of Ferric Chloride is still a favourite and trustworthy preparation.

Of the salts of Iron, the Ferrous are more easily absorbed and tolerated, are less irritating and astringent than the Ferric, and are more suitable for prolonged administration. Salts of Iron are useful in diseases characterised by debility, especially in anæmia from whatever cause; dyspepsia and neuralgia, which so often depend on anæmia; also in convalescence from acute and febrile diseases. They are contra-indicated in apoplectic persons and in fever, producing, when injudiciously employed, headache, flushing, noises in the ears, and other symptoms of disturbed circulation. Ferric salts are also used as hæmostatics.

It is useless to prescribe Iron till constipation is relieved and a regular action of the bowels ensured.

Official Preparations.—Of metallic **Iron,** Ferri Sulphas, Liquor Ferri Pernitratis; of **Iron wire,** Liquor Ferri Perchloridi Fortior, Syrupus Ferri Iodidi, Syrupus Ferri Phosphatis, Syrupus Ferri Phosphatis cum Quinina et Strychnina, Vinum Ferri; of **Ferrous Sulphate,** Ferri Arsenas, Ferri Carbonas Saccharatus, Ferri Phosphas, Ferri Sulphas Exsiccatus, Ferrum Redactum, Liquor Ferri Persulphatis, Mistura Ferri Composita; of **Strong Solution of Ferric Chloride,** Liquor Ferri Perchloridi, Tinctura Ferri Perchloridi; of **Solution of Ferric Sulphate,** Ferri et Ammoniæ Citras, Ferri et Quininæ Citras, Ferrum Tartaratum, Liquor Ferri Acetatis; of **Exsiccated Ferrous Sulphate,** Pilula Ferri, Pilula Aloes et Ferri; of **Reduced Iron,** Troschiscus Ferri Redacti; of **Iron and Ammonium Citrate,** Vinum Ferri Citratis.

Not Official.—Extractum Pomi Ferratum, Tinctura Pomi Ferrati, Mistura Ferri Aromatica, Syrupus Ferri Subchloridi, and Iron Malate Wine.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Ger., Hung., Jap., Norw., Russ., Swed. and Swiss, Ferrum Pulveratum; Belg., Limatura Ferri, also ditto Porphyrisata; Fr., Fer Metallique; Ital. and Port., Ferro; Mex., Fierro; Span., Hierro; U.S., Ferrum.

Preparation.

VINUM FERRI. Iron Wine.

Iron, in wire, 1; Sherry, 20. Set aside for thirty days in a closed vessel, the Iron wire being almost, but not quite, immersed in the Sherry, the vessel being frequently shaken, and the stopper occasionally removed; filter.

The quantity of Iron dissolved seems to depend almost wholly upon the acidity of the Wine. We found that a good dinner Sherry containing Acids equal to ·396

p.c. of Acetic Acid, dissolved ·14 p.c. of Iron, and had its acidity reduced to ·09 p.c. It was treated as directed in the B.P., and the bottle was about half full.

Of such a Vinum Ferri, 3 fl. drm. would represent the Iron contained in 5 minims of Tinctura Ferri Perchloridi.

Commercial samples seem to lie between ·2 and ·3 p.c. of Iron, although occasionally samples are found much weaker.

According to *P.J.* (3) xxi. 641, the Iron strength increases for three weeks and then diminishes. Our experience does not agree with this. A gallon quantity was put on and examined after the first week and afterwards every month for four months with the following results, ·084, ·114, ·157, ·185, ·204 p.c. of Metallic Iron.

N.B.—The old Vinum Ferri, made with Malaga, is much sweeter than that of the B.P., and is sometimes ordered on that account.

(Not in the other Pharmacopœias.)

Medicinal Properties.—Useful in restoring the blood. Prescribed for children and delicate females with irritable stomach.

Dose.—1 to 4 fl. drm.

Not Official.

MISTURA FERRI AROMATICA.—Fine Iron Wire, 2; Red Cinchona Bark, in powder, 4; Calumba, in coarse powder, 2; Cloves, bruised, 1; Compound Tincture of Cardamoms, 12; Tincture of Orange Peel, 2; Peppermint Water, 48: macerate the first four ingredients in the last one for three days in a closed vessel, agitating occasionally, filter, and make up with Peppermint Water to 50; to this add the Tinctures, and preserve in a well-stoppered bottle.

Dose.—1 to 2 fl. oz.

Much valued, especially in Dublin, as a stomachic tonic and hæmatinic.

(Not in the other Pharmacopœias.)

EXTRACTUM POMI FERRATUM.—Sour Apples, 50; convert them into a pulp and express; to the expressed liquid add Iron Wire 1; heat the mixture on a water-bath until the evolution of gas ceases. Dilute the liquid with Water to make 50 parts, and set it aside for several days; then filter and evaporate to a thick extract. The extract should be a greenish-black, and should form a clear solution with Water.

Dose.—3 to 10 grains.

Foreign Pharmacopœias.—Official in Austr. and Hung., Ext. Malatis Ferri; Dan., Ext. Pomi Ferratum; Ger., Jap., Russ. and Swiss, Ext. Ferri Pomatum; Swed., Ext. Pomorum Ferratum. Swiss is prepared by dissolving freshly precipitated Peroxide of Iron in Apple Juice; all the others are with Metallic Iron and Apple Juice.

TINCTURA POMI FERRATA.—Ferrated Extract of Apples, 1; Alcohol (90 p.c.), 1; Cinnamon Water to make 10.

Dose.—30 to 90 minims.

Foreign Pharmacopœias.—Official in Austr., Dan., Hung., Norw. and Swed., 1 and 5; Ger., Jap., Russ. and Swiss, 1 and 9; not in the others.

SYRUPUS FERRI SUBCHLORIDI.—*B.P.* '85. It contains about 3½ grains of anhydrous Ferrous Chloride and is roughly half the strength in Iron of the Tinctura Ferri Perchloridi.

Dose.—½ to 1 fl. drm.

IRON MALATE WINE.—In Devonshire a quantity of Iron Wire or Nails is digested in a bottle of Cider for a week, and a wineglassful three times a day is the dose.

FERRI ACETATIS LIQUOR.

SOLUTION OF FERRIC ACETATE.

O.M.P.—Solution of Ferric Sulphate, 2½; Solution of Ammonia, 4, or a sufficient quantity; Glacial Acetic Acid, liquefied, 1½; Distilled Water, a sufficient quantity. Mix the Solution of Ammonia with 20 of Distilled Water; gradually add to this the Solution of Ferric Sulphate diluted with 20 of Distilled Water; stir well together, taking care that Ammonia is, even finally, in slight excess, as indicated by the odour of the mixture; let the whole stand for two hours, stirring occasionally; transfer it to a calico filter; wash the precipitated Ferric Hydroxide with Distilled Water until free from Sulphates; let it drain; squeeze it to remove superfluous moisture; dissolve it in the Glacial Acetic Acid; make the volume up to 20 with Distilled Water; allow any insoluble matter to subside; pour off the clear Solution.

Now made direct; Liquor Ferri Acetatis Fortior is deleted.

Medicinal Properties.—Has a diuretic in addition to its hæmatinic action, and being compatible with Potassium Acetate, is used in some cases of Bright's disease.

Dose.—5 to 15 minims.

Not Official.—Tinctura Ferri Acetici Ætherea.

Foreign Pharmacopœias.—Official in Ger., Russ. and Swiss, sp.gr. 1·087—1·091; U.S., sp. gr. 1·160; Swed., sp. gr. not given; not in the others.

Description.—A red liquid with a sour styptic taste and acetous odour. Miscible with Water and Alcohol (90 p.c.) in all proportions.

Tests.—Sp. gr. 1·031. It affords the reactions characteristic of Ferric salts and of Acetates. It should not yield any characteristic reaction with the tests for Lead, Copper, Arsenium, Zinc, Calcium, Sodium, Potassium, Ammonium, Nitrates, or Ferrous salts, and only very slight reactions with the tests for Sulphates.

This solution will not react with Potassium Sulphocyanide except in the presence of a free mineral acid (not Phosphoric); neither will it liberate Iodine from Potassium Iodide.

Not Official.

TINCTURA FERRI ACETICI ÆTHEREA—

Dutch, Solution of Acetate of Iron, 100; Strong Spirit, 12; Acetic Ether, 8.

Ger. and Swiss, Solution of Acetate of Iron (sp. gr. 1·087—1·091), 8; Alcohol, 1; Acetic Ether, 1.

Russ., Solution of Acetate of Iron (sp. gr. as above), 9; Alcohol (90 p.c.), 2; Acetic Ether, 1.

Swed., Solution of Acetate of Iron, 15; Alcohol (90 p.c.), 3; Acetic Ether, 2. All by weight.

Dose.—10 to 20 minims.

Not Official.

FERRI ALBUMINAS.

A liquor is official in the Dutch Pharmacopœia containing ·25 p.c. of Ferric Oxide, and several other formulas have been proposed, but it is more convenient

to use the commercial scale preparation, which is fairly soluble in Water, and contains 5 p.c. of Ferric Oxide.

Medicinal Properties.—Hæmatinic tonic. Given with success in anæmia and specially recommended in gastric ulcer.—*T.G.* '86, 399; *L.* '94, ii. 1113; '95, i. 1065; *B.M.J.E.* '94, i. 28; '94, i. 96; *Pr.* liii. 87.

Dose.—3 to 10 grains.

Foreign Pharmacopœias.—Official in Dan., Dutch, Ger., Russ. and Swiss, Liquor Ferri Albuminati, containing ·4 p.c. of Iron.

FERRATIN.—A brown tasteless powder containing 7 p.c. of Iron, prepared from egg Albumen and Tartarated Iron in alkaline solution. Daily dose for children 5 to 15 grains, and for adults 20 to 30 grains.—*Pr.* li. 427; *A.J.P.* '94, 500; *B.M.J.* '95, i. 985; *B.M.J.E.* '95, ii. 16; '96, i. 8; *T.G.* '96, 40; *L.* '96, ii. 1820.

FERRI ARSENAS.

IRON ARSENATE.

Arseniate of Iron.—*B.P.* '85.

Ferrous Arsenate, $Fe_3(AsO_4)_2$, $6H_2O$, with Ferric Arsenate and some Iron Oxide.

Medicinal Properties.—Similar to those of Arsenious Acid.

Dose.—$\frac{1}{16}$ to $\frac{1}{4}$ grain.

Prescribing Note.—Best given in **pill** well triturated with Milk Sugar and massed with a little Glucose.

Antidotes.—*See* Acidum Arseniosum.

Foreign Pharmacopœias.—Official in Belg. Fr., Ital., Mex. (Arseniato de Fierro), and Span.; not in the others.

O.M.P.—Ferrous Sulphate, $20\frac{3}{4}$; Sodium Arsenate, $26\frac{1}{2}$; Sodium Bicarbonate, $4\frac{1}{2}$; Distilled Water, boiling, a sufficient quantity. Dissolve the Sodium Arsenate in about 100, and the Ferrous Sulphate in about 120 of the Distilled Water; mix the solutions; add the Sodium Bicarbonate dissolved in a little cold Distilled Water; stir thoroughly; collect the resulting precipitate on a calico filter; wash until free from Sulphates; squeeze the washed precipitate between folds of strong linen in a screw-press; dry it on porous bricks in a warm air-chamber, the temperature of which does not exceed 100° F. (37·8° C.).

Description.—A tasteless amorphous powder, of a greenish colour; insoluble in Water, but readily dissolved by Hydrochloric Acid.

Tests.—It affords the reactions characteristic of Ferrous and Ferric salts and of Arsenates. Each gramme dissolved in an excess of Sulphuric Acid diluted with Water should not cease to give a blue precipitate with Solution of Potassium Ferricyanide until at least 6·7 c.c. of the Volumetric Solution of Potassium Bichromate have been added, corresponding to nearly $12\frac{1}{2}$ p.c. of Hydrous, or 10 p.c. of Anhydrous Ferrous Arsenate. It should yield no characteristic reaction with the tests for Sulphates.

Not Official.

FERRI BROMIDUM.

The Commercial salt is in greyish-white crystalline masses, coated with red insoluble Oxybromide, which amounts to about ·5 p. c.

It generally contains about 18 p. c. of Water, corresponding with the formula $FeBr_2.3H_2O$. When this is not allowed for, a Syrup or Liquor made from the solid Bromide will be proportionately weaker than when made from Iron Wire and calculated as if anhydrous, which is done in the preparations that follow.

Preparations.

LIQUOR FERRI BROMIDI FORTIS.—A clear green liquid. Sp. gr. 1·554.

Each fl. drm. contains 36 grains of Iron Bromide ($FeBr_2 = 214·3$).

This solution keeps well in a corked bottle, with bright Iron Wire immersed in it, and on filtration gives a clear green liquid.

A small quantity of Hypophosphorous Acid is now commonly used for the same purpose. With this addition the Liquor will keep without any precautions, and may even be exposed to the air for some days without depositing.

Foreign Pharmacopœias.—Official in Fr., 33 p.c.; Mex. (Bromuro Ferroso), and Port. (Brometo Ferroso), both solid, no solution; not in the others.

SYRUPUS FERRI BROMIDI.—Strong Solution of Iron Bromide (filtered), 1; Simple Syrup, 7: mix.

Contains 4½ grains of Iron Bromide in each fl. drm.

Medicinal Properties.—A tonic in anæmia and amenorrhœa.

(Not in the other Pharmacopœias.)

SYRUPUS FERRI BROMIDI (*B.P.C.*).—Iron Wire free from oxide, ½ oz.; Bromine 533 grains; Refined Sugar 14 oz.; Distilled Water a sufficiency. Dissolve the Sugar in 6 fl. oz. of the Water in a water-bath. Put the Iron Wire with 4 fl. oz. of the Water into a glass flask, having a capacity of at least 20 fl. oz., and surround it with cold water, and add the Bromine in successive quantities; shake occasionally until the froth becomes white and the reaction is complete. Filter the solution into the warm Syrup, and if necessary add sufficient of the Water to produce 20 fl. oz.

Each fluid drachm contains about 4½ grains of Iron Bromide.

Dose.—30 to 60 minims.

SYRUPUS FERRI ET QUININÆ HYDROBROMATUM (*B.P.C.*).—Acid Quinine Hydrobromide, 160 grains; Diluted Hydrobromic Acid, 1 fl. oz.; Distilled Water, 1 fl. oz.: mix the Acid and Water and dissolve the Quinine salt; then add Syrup of Iron Bromide to make 20 fl. oz.

1 fl. drm. = 1 grain Acid Quinine Hydrobromide, and about 4 grains Iron Bromide.

The acid solution must, however, be made warm, and if filtration is necessary, kept warm during the process, otherwise the salt will crystallise out (*see below*).

Dose.—30 to 60 minims.

SYRUPUS FERRI, QUININÆ ET STRYCHNINÆ HYDROBROMATUM (*B.P.C.*)—Strychnine in powder, 2½ grains; Acid Quinine Hydrobromide, 160 grains; Diluted Hydrobromic Acid 1 fl. oz.; Distilled Water 1 fl. oz.: mix the Acid and Water, and in this dissolve the Strychnine and Quinine salt by the aid of a gentle heat; then add Syrup of Iron Bromide to make 20 fl. oz.

In the case of this and the preceding formula, as we have previously pointed out (*C.D.* '93, i. 422), there is too great an excess of Acid. The Acid Quinine Hydrobromide is soluble 1 in 6 of cold Water, but its solubility is greatly reduced in

presence of free Hydrobromic Acid. With the full *B.P.C.* quantity of Acid, the Syrup is very prone to crystallise; with half the quantity a slight separation takes place during very cold weather; with no Acid at all the Syrup is absolutely permanent, except for a slight precipitation of Ferric Hydrate. It is obvious, therefore, that the proportion of Acid in the *B.P.C.* formula should be greatly reduced—say to a fourth of the quantity now prescribed.

1 fl. drm. = $\frac{1}{64}$ grain Strychnine, 1 grain Acid Quinine Hydrobromide and about 4 grains Iron Bromide.

Dose.—30 to 60 minims.

FERRI CARBONAS SACCHARATUS.

SACCHARATED IRON CARBONATE.

Ferrous Oxycarbonate, $x\mathbf{FeCO_3}, y\ \mathbf{Fe(OH)_2}$, more or less oxidised, mixed with sugar; the Ferrous salt, if reckoned as Carbonate, $\mathbf{FeCO_3}$, forming about one-third of the mixture.

Medicinal Properties.—An excellent chalybeate; readily taken and well borne. Not astringent. Useful in anæmic forms of amenorrhœa, neuralgia and sciatica.

Dose.—10 to 30 grains.

The above dose is equivalent to $3\frac{1}{3}$ to 10 grains of Ferrous Carbonate.

Prescribing Notes.—Given in **cachets**, **lozenges**, or **pills**. Sometimes ordered in the form of Powders to be taken on bread and butter. A good Pill can be made by adding Dispensing Syrup q.s.

Incompatibles.—Acids and Acidulous salts; all vegetable astringents.

Official Preparations.—Mistura Ferri Composita and Pilula Ferri. Although not actually prepared from the Saccharated Iron Carbonate, they are here grouped for comparison.

Not Official.—Trochisci Ferri Carbonatis Saccharati.

Foreign Pharmacopœias.—Official in Austr. Ferrum Carbonicum Saccharatum, contains about 40 p.c. of Carbonate of Iron, and Swiss 20 p.c.; Belg. Carbonas Ferri Saccharatus, 20 p.c.; U.S. contains 15 p.c.; Ger. and Russ., 9·5 to 10 p.c. of Iron equal to about 20 p.c. of Carbonate; Dan., Norw. and Swed. Hydratocarbonas Ferrosus Saccharatus. No sugar, Jap. Ferrum Subcarbonicum, and Mex. Carbonato de Fierro; not in the others.

O.M.P.—Ferrous Sulphate, 2; Ammonium Carbonate, $1\frac{1}{4}$; Distilled Water, boiling, 320; Refined Sugar, 1. Dissolve the Ferrous Sulphate and the Ammonium Carbonate each in one quarter of the Distilled Water; add the former to the latter with brisk stirring, in a deep cylindrical vessel; cover this so as to protect it as much as possible from the air; set the mixture aside for twenty-four hours; separate the supernatant liquid from the precipitate by means of a siphon; pour on the remainder of the Distilled Water; stir well; after subsidence remove the clear liquid; collect the precipitate on a calico filter; subject it to expression; triturate it with the Refined Sugar in a porcelain mortar; dry the mixture at a temperature not exceeding 212° F. (100° C.).

When cold or tepid Water is used in the place of boiling Water, the precipitate occupies much less bulk, and is more easily washed. To avoid the formation of basic salts, the Iron should always be added to the Alkali.

Description.—Small coherent lumps or powder, of a brownish-grey colour with a sweet feebly chalybeate taste.

It dissolves with effervescence in warm Hydrochloric Acid, diluted with half its volume of Water.

Tests.—Each gramme, dissolved in excess of warm Concentrated Phosphoric Acid and diluted with Water, should not cease to give a blue precipitate with Solution of Potassium Ferricyanide until at least 29 c.c. of the Volumetric Solution of Potassium Bichromate have been added. It should yield only the slightest characteristic reaction with the tests for Sulphates.

Warm Phosphoric Acid is now ordered in place of Phosphoric Acid, presumably from the experiments of Coull (*P.J.* (3), xxii., 805), but in September, 1897, Liversedge showed that correct results are only obtained with *cold* Phosphoric Acid; heating the acid on a water-bath, even for ten minutes, introduced an error of 25 p.c. The statement is based upon results obtained with a standard solution of Ferrous Sulphate, in the presence of sugar.—*C.D.* '97, ii. 492.

Preparations.

MISTURA FERRI COMPOSITA. Compound Mixture of Iron. *N.O.Syn.* —Griffith's Mixture. (Modified.)

Ferrous Sulphate, 25 grains; Potassium Carbonate, 30 grains; Myrrh, 60 grains; Refined Sugar, 60 grains; Spirit of Nutmeg, 50 minims; Rose Water, 10 fl. oz., or a sufficient quantity. Reduce the Myrrh to powder; add the Potassium Carbonate and Refined Sugar; triturate the mixture with a small quantity of the Rose Water so as to form a thin paste; gradually add more Rose Water and the Spirit of Nutmeg; continue the trituration and further addition of Rose Water until 7 fl. oz. of liquid result; dissolve the Ferrous Sulphate in 3 fl. oz. of the Rose Water; mix the liquids.

Spirit of Nutmeg reduced to 50 minims instead of 4 fl. drm.

It is convenient to keep this mixture without the Iron; the addition of the Ferrous Sulphate, as directed, can be made when required.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in Dan., similar to Brit., but with three times as much Sugar, and without Nutmeg; Norw. without Nutmeg, with Peppermint Water; Swed., with Peppermint Water and Tincture of Lavender in the place of Rose Water and Nutmeg; U.S. similar to Brit., but with Sp. of Lavender in the place of Nutmeg; not in the others.

PILULA FERRI. Iron Pill. (Altered).

Exsiccated Ferrous Sulphate, in fine powder, 150 grains; Exsiccated Sodium Carbonate, in fine powder, 95 grains; Gum Acacia, in powder, 50 grains; Tragacanth, in powder, 15 grains; Syrup, 150 grains; Glycerin, 10 grains; Distilled Water, 20 grains, or a sufficient quantity. To the Syrup, Glycerin, and Distilled Water, previously mixed, add the Ferrous Sulphate; mix; add quickly the Sodium Carbonate; mix; set aside for fifteen minutes, or until the reaction is complete; add the Gum Acacia and Tragacanth, and incorporate thoroughly.

If divided into five-grain pills, each pill will contain about 1 grain of Ferrous Carbonate.

Now made with Exsiccated Ferrous Sulphate and Exsiccated Sodium Carbonate instead of Ferri Sulphas and Potassii Carbonas.

Dose.—5 to 15 grains.

As the French Codex orders equal parts of the *dried* salts, the proportions are somewhat similar to the above.

Vallet's mass is made by precipitating and washing the Iron Carbonate, and mixing it with Honey and Milk Sugar to form a mass.

Blaud's Pills are made by mixing (in the pill mass) dried Ferrous Sulphate and dried Potassium or Sodium Carbonate.

Amount of Ferrous Carbonate in commercial samples of Blaud's pills.—*C. D.*, '95, ii. 923.

Foreign Pharmacopœias. — Official in Belg., Pilulæ Blaud and Pilulæ Vallet; Dan., Dutch, and Norw. Pilulæ Blaudii; Fr., Pilules de Carbonate Ferreux and Pilules Ferrugineuses de Blaud; Ger. and Jap., Pilulæ Ferri Carbonici; Ital., Pillole di Carbonato Ferroso (Pilole di Blaud) also (Pillole di Vallet); Mex., Pildoras de Blaud and Pildoras de Vallet; Port., Pilulas de Carbonato Ferroso; Span., Pildoras de Blaud and Pildoras Ferruginosas de Vallet; Swed., Pilulæ Myrrhæ Ferratæ; Swiss, Pilulæ Ferratæ Kalinæ (Pil. Blaudii) and Pilulæ Ferri Carbonici (Pil. Valleti); U.S., Pilulæ Ferri Carbonatis (Blaud's Pills), also Massa Ferri Carbonatis (Vallet's Mass); not in the others.

Not Official.

TROCHISCI FERRI CARBONATIS SACCHARATI—These are now largely used, containing 3 grains of Saccharated Carbonate in each.

Dose.—1 to 3 lozenges.

FERRI ET AMMONII CITRAS.

IRON AND AMMONIUM CITRATE.

Solubility.—10 in 5 of water; 2 dissolved in 3 of water measure 4; almost insoluble in Alcohol (90 p.c.).

Medicinal Properties.—As a hæmatinic, it is a very effectual salt, and it possesses scarcely any astringency or tendency to cause constipation; it may often be given when the stomach will not bear the more astringent preparations of Iron. It becomes moist if kept in paper.

Dose.—5 to 10 grains.

Prescribing Notes. — Generally prescribed in Solution with Tincture of Orange which covers the taste well. If ordered to be taken during effervescence, care must be taken to put the Iron salt into the *Acid* Solution,—*not* the alkaline.

An **Aqueous Solution** may be made and kept for dispensing, 2 fl. oz. representing 480 grains of the scale preparation; it is quite permanent.

Incompatibles.—Mineral acids, vegetable astringents, and fixed alkalis.

Official Preparation.—Vinum Ferri Citratis.

Foreign Pharmacopœias.—Official in U.S.; Austr. and Swiss, Ferrum Citricum Ammoniatum; Belg., Citras Ferri; Fr., Citrate de Fer Ammoniacal; Mex., Citrato de Fierro Amoniacal; Norw., Citras Ferrico-Ammonicus; Port., Citrato de Ferro Ammoniacal; Russ. and Swiss, Ferrum Citricum Oxydatum Ammoniatum; Span., Citrato Ferrico-Amonico; not in the others. Ger. has Ferrum Citricum Oxydatum; Ital., Citrato di Ferro.

O.M.P.—Solution of Ferric Sulphate, 10, or a sufficient quantity; Solution of Ammonia, 23, or a sufficient quantity; Citric Acid, 4; Distilled Water, a sufficient quantity. Prepare Ferric Hydroxide as follows: mix 16 of Solution of Ammonia with 40 of Distilled Water; gradually add to this the Solution of Ferric Sulphate, previously diluted with 40 of Distilled Water; stir constantly and briskly, taking care that Ammonia is, finally, in slight excess as indicated by the odour; set aside the mixture for two hours, stirring it occasionally; pour it on a calico filter; when the liquid has drained away, wash the precipitated Ferric Hydroxide with Distilled Water until free from Sulphates.

Dissolve the Citric Acid in its own weight of Distilled Water; warm the mixture on a water-bath; add the Ferric Hydroxide, previously well drained; stir them together until nearly the whole of the Hydroxide has dissolved, or until the Citric Acid is saturated with Ferric Hydroxide (prepared, if necessary, from more of the Solution of Ferric Sulphate); let the solution cool; add 5½ of Solution of Ammonia; filter through flannel, adding some Distilled Water if necessary; evaporate to the consistence of syrup, the presence of a very slight excess of Ammonia being maintained; dry in thin layers on flat porcelain or glass plates at a temperature not exceeding 100° F. (37·8° C.); remove the dry flakes of Iron and Ammonium Citrate.

Description.—In thin transparent scales of a deep red colour, slightly sweetish and astringent in taste.

Tests.—It feebly reddens Litmus. When incinerated with free access of air, it leaves 31 to 32 p.c. of Ferric Oxide which is not alkaline to Litmus (absence of fixed alkali). Heated with Solution of Potassium Hydroxide, it evolves Ammonia and deposits Ferric Hydroxide. The alkaline solution from which the Iron has separated does not, when slightly supersaturated with Acetic Acid, give any crystalline precipitate (absence of Tartrates). It should not yield more than the slightest characteristic reactions with the tests for Sulphates.

In commercial samples the ash is almost always alkaline, owing to fixed alkali being used for the precipitation of the Iron; as in the case of Ferrum Tartaratum, some Magnetic Oxide (Fe_3O_4) is also formed during the ignition.

Of seven commercial samples examined (*P.J.* (3) xviii. 425 and 777), four contained 30 p.c. of ash, and the others 33, 38, 43 p.c.; only one of the seven was free from Tartaric Acid.

It has been pointed out (*P.J.* (3) xx. 246) that commercial samples frequently contain Sulphuric Acid, presumably from basic Ferric Sulphate precipitated with the Hydrate, also that part of the Iron was reduced to the ferrous condition.

Preparation.

VINUM FERRI CITRATIS. Wine of Iron Citrate.

Iron and Ammonium Citrate, 160 grains; Orange Wine, a sufficient quantity. Dissolve the Iron and Ammonium Citrate in sufficient Orange Wine to form 20 fl. oz. Agitate occasionally for three days; filter.

Dose.—1 to 4 fl. drm. =(1 grain in each fl. drm.).

Foreign Pharmacopœias.—Official in Jap., Vinum Ferri, 1 in 50; Mex., Vino de Fierro, 1 in 150; U.S., Tincture of Orange, Syrup, and stronger White Wine, 1 in 25; Fr. Vin Chalibé, 1 and 200 of Malaga; not in the others.

FERRI ET QUININÆ CITRAS.

IRON AND QUININE CITRATE.

Solubility.—2 in 1 of Water.

Medicinal Properties.—Bitter stomachic, astringent and tonic, combining the properties of both Iron and Quinine.

6⅔ grains contain 1 grain of Quinine.

Dose.—5 to 10 grains.

Prescribing Notes.—Generally given in Mixture or in Pills made with Alcohol (90 p.c.) q.s. Compressed Tablets are also prepared.

For dispensing purposes, an aqueous **solution**, 2 fl. oz. = 480 grains of the salt.

Incompatibles.—Alkalis and their Carbonates, Tannic Acid, and vegetable astringents. Incompatible with Potassium Citrate.—*P.J.* '97, i. 344.

Foreign Pharmacopœias.—Official in Austr., Ger. and Russ., Chininum Ferro-Citricum; Port., Citrato de Ferro et de Quinina; Span., Citrato Ferrico-Quinico; Swed., Citras Ferrico-Chinicus; Swiss, Chinino-Ferrum Citricum; U.S.; not in the others.

O.M.P.—Prepare Ferric Hydroxide from 9 of Solution of Ferric Sulphate as directed under 'Ferri et Ammonii Citras.' Mix 2 of Quinine Sulphate with eight times its weight of Distilled Water; add 3 of Diluted Sulphuric Acid; when the Salt is dissolved precipitate the Quinine with a slight excess of Solution of Ammonia; collect the precipitate on a filter; wash it with 60 of Distilled Water.

Dissolve 6⅔ of Citric Acid in its own weight of Distilled Water; warm the solution on a water-bath; add the Ferric Hydroxide, previously well-drained; stir them together; when the Hydroxide has dissolved, add the precipitated Quinine; continue the agitation until this also has dissolved; let the solution cool; add, in small quantities at a time, 3 of Solution of Ammonia diluted with 4 of Distilled Water; stir briskly, allowing the Quinine which separates with each addition of Ammonia to dissolve before the next addition is made; filter the solution; evaporate it to the consistence of a thin syrup; dry the latter in thin layers on flat porcelain or glass plates at a temperature of 100° F. (37·8° C.); remove the dry flakes of Iron and Quinine Citrate.

Description.—In thin scales of a greenish golden-yellow colour, somewhat deliquescent. It has a bitter chalybeate taste.

Tests.—The aqueous solution is very slightly acid, and yields precipitates which are reddish-brown with Solution of Potassium Hydroxide, white with Solution of Ammonia, blue with Solution of Potassium Ferrocyanide and with Solution of Potassium Ferricyanide, and greyish-black with Solution of Tannic Acid. The salt when incinerated with free access of air, leaves a residue which when moistened with Water is not alkaline to Test-paper (absence of fixed alkali). 5 grammes dissolved in 45 c.c. of Water and treated with a slight excess of Solution of Ammonia should yield a white precipitate, which, when dissolved out by repeated treatment of the liquid with Ether, and the latter evaporated, and the residue completely dried at 248° F. (120° C.), weighs ·75 gramme.

This precipitate is almost entirely soluble in a little Purified Ether; when burned it leaves but a minute residue; neutralised by Sulphuric Acid, it should answer to the characters of and tests for Quinine Sulphate.

According to Allen, the scales may be expected to contain 8 p.c. of Water, but not more than 12 p.c. The Ferric Oxide left on ignition should be 18 to 20 p.c. In shaking out with Chloroform or Ether a *considerable* excess of Ammonia should be present, and the volume of solvent should equal that of the ammoniacal liquid. The alkaloidal residue should be dried at 110—120° C., a constant weight being difficult to obtain at water-bath temperature.

Not Official.

FERRI HYPOPHOSPHIS.

There are two Iron Hypophosphites, the Ferrous or Protosalt which is the basis of all the *B.P.C.* preparations, and the Ferric or Persalt used in most of the American and other proprietary Syrups of the Hypophosphites.

FERROUS HYPOPHOSPHITE when freshly prepared is a greenish crystalline powder, soluble about 1 in 10 of Water, but the commercial salts are so insoluble as to be practically useless for Pharmaceutical purposes.

FERRI HYPOPHOSPHITIS LIQUOR FORTIS (*B.P.C.*).—Ferrous Sulphate, 760 grains; Barium Hypophosphite (containing not less than 95 p.c. of Ba. $2(PH_2O_2)\,H_2O$), 830 grains; Diluted Sulphuric Acid 100 minims; Distilled Water, 20 fl. oz.: put the Ferrous Sulphate with 5 fl. oz. of the Water in a tall 24-oz. bottle and shake till dissolved. Dissolve the Barium Hypophosphite in the remainder of the Water, 15 fl. oz., and add slowly to the former solution: shake and add the Diluted Sulphuric Acid, again shake and set aside for two days, then syphon off the clear liquid. Keep it in bottles quite full and in a dark place.

Each fl. drm. = about 5 grains of Ferrous Hypophosphite.

The Solution has an acid reaction, and it should not give more than a faint precipitate, if any, with either Diluted Sulphuric Acid or solution of Barium Chloride.

Dose.—10 to 30 minims.

In Churchill's original formula for the Compound Solution, the Ferrous Hypophosphite was prepared by double decomposition between Calcium Hypophosphite and Ferrous Sulphate. This was improved upon (*B.P.C.* '87) by dissolving precipitated Ferrous Carbonate in Hypophosphorous Acid, and afterwards (*B.P.C.* '88) exchanged for the Barium method described above; but the solution is readily made (as described by Everson, *P.J.* (3) xviii. 517), and without the use of Barium salts which are always objectionable, by dissolving with the aid of heat, 153 grains of Iron Wire in 3 fl. oz. of Hypophosphorous Acid, with sufficient Water to make at the finish 20 fl. oz. The product having been filtered through Cotton Wool, it will contain 5 grains per fl. drm. of the Hydrated salt ($FeP_2H_4O_4.6H_2O$), to which all the *B.P.C.* formulas are calculated.

LIQUOR HYPOPHOSPHITUM COMPOSITUS (*B.P.C.*).—Calcium Hypophosphite, 320 grains; Sodium Hypophosphite, 320 grains; Magnesium Hypophosphite, 160 grains; Strong Solution of Ferrous Hypophosphite, 6 fl. oz.; Hypophosphorous Acid (30 p. c.), ½ fl. oz.; Distilled Water, a sufficiency. Dissolve the Calcium, Sodium, and Magnesium Hypophosphites in 12 fl. oz. of the Water; add the solution of Ferrous Hypophosphite and the Hypophosphorous Acid. Filter, and add Distilled Water to make 20 fl. oz.

Each fl. drm. = 2 grains each of Sodium and Calcium Hypophosphites, 1 grain Magnesium Hypophosphite, and 1½ grain of Ferrous Hypophosphite.

Dose.—½ to 2 fl. drm.

SYRUPUS FERRI HYPOPHOSPHITIS (*B.P.C.*).—Strong Solution of Ferrous Hypophosphite, 4 fl. oz.; Syrup, 16 fl. oz.: mix.

Each fl. drm. = about 1 grain of Ferrous Hypophosphite.

Dose.—½ to 2 fl. drm.

SYRUPUS HYPOPHOSPHITUM COMPOSITUS (*B.P.C.*).—Quinine (alkaloid), 20 grains; Strychnine, 1 grain; Hypophosphorous Acid (30 p.c.), 2 fl. drm.; Strong Solution of Ferrous Hypophosphite, 3 fl. oz.: dissolve and add Calcium Hypophosphite, 80 grains; Manganese Hypophosphite, 40 grains; Potassium Hypophosphite, 40 grains: dissolve, filter, and add Syrup to produce 20 fl. oz.: mix.

All these Syrups oxidise on exposure to air with precipitation of Ferric Hypophosphite. It is stated (*Y.B.P.* '90, 501) that this may be prevented to a great extent by addition of a small quantity (¼ grain per fl. oz.) of Citric Acid; but in our experience even larger proportions are of little or no use.

Each fl. drm. contains $\frac{1}{150}$ grain Strychnine and ⅛ grain of Quinine.

Dose.—½ to 2 fl. drm.

The odour occasionally emitted by this syrup is due to Sulphuretted Hydrogen derived from Sulphites present as an impurity in the Hypophosphites used. Most samples of Hypophosphites contain Phosphites. An addition of 80 grains of Potassium Citrate to 20 fl. oz. of the Syrup, will prevent it becoming turbid for some time. *P.J.* '95, ii. 144.

FERRIC HYPOPHOSPHITE.—This compound is obtained as a white precipitate on adding a solution of a soluble Hypophosphite to one of Ferric Chloride containing as little free Acid as possible.

It is fairly insoluble in Water, but with the addition of Potassium Citrate it dissolves readily to a green solution which forms with Sugar a pale yellow *neutral* Syrup permanent and unalterable by exposure to air, which may be combined with other soluble Hypophosphites, Quinine Hydrochloride, and Strychnine without the addition of Acid, and is free from all the pharmaceutical objections attaching to Hypophosphite Syrups containing Iron in the ferrous condition.

It is usually sold as **Compound Syrup of Hypophosphites,** and is also made without Quinine to suit those who are peculiarly susceptible to that drug, it is then prescribed 'sine Quinina.'

Not Official.

FERRI IODIDUM.

IODIDE OF IRON.

FeI_2. eq. 307·40.

In reddish-brown dense masses, easily soluble in Water, with a slight residue, and forming a reddish-yellow solution owing to partial oxidation. The solution may be made green by either hot or cold digestion over bright Iron Wire.

A volumetric process (Mercuric Chloride) for estimating Ferrous Iodide in either purely aqueous or saccharine solution is given *P.J.* (3) xii. 268. A good process with Silver Nitrate is given in U.S.P.

Medicinal Properties.—It combines the properties both of Iodine and Iron, and is a most valuable tonic and alterative in the treatment of scrofulous and syphilitic diseases.

Prescribing Notes.—Best given in the form of the official Syrup of Ferrous Iodide; it is also given in the form of pills massed with powdered Gum Acacia and Dispensing Syrup *q.s.* In some cases Liquorice Powder must be used instead of Dispensing Syrup.

Official Preparation.—Syrupus Ferri Iodidi.

Foreign Pharmacopœias.—Official in Belg., Mex., Yoduro Ferroso, Port., Span. and Swiss; not in the others.

Preparations.

LIQUOR FERRI IODIDI FORTIS.—A clear greenish liquid. Sp. gr. 1·511. Each fl. drm. contains 34 grains of Ferrous Iodide (FeI_2 = 307·40).

The solution keeps well in a corked bottle, with bright Iron Wire immersed in it, and on filtration gives a clear green liquid. A small quantity of Hypophosphorous Acid is now commonly used for the same purpose; with this addition the Liquor will keep well, and may be exposed to the air without depositing.

Foreign Pharmacopœias.—Official in Ger. (Liquor Ferri Iodati) and Russ. (Ferrum Iodatum Solutum), containing 50 p.c. of Ferrous Iodide; Mex., 20 p.c.

FERRI IODIDUM SACCHARATUM.—U.S.P.; a solution of Ferrous Iodide evaporated to dryness and mixed with Milk Sugar and Reduced Iron; 5 parts contain about 1 of Iodide.

Incompatibles.—Acids, Acid salts, Alkalis and their Carbonates, Lime Water, vegetable astringents.

PILULÆ FERRI IODIDI, U.S.P.—Reduced Iron, 4 grammes; Iodine, 5 grammes; Glycyrrhiza, in No. 60 powder, 4 grammes; Sugar, in fine powder, 4 grammes; Extract of Glycyrrhiza, in fine powder, 1 gramme; Acacia, in fine powder, 1 gramme; Water, a sufficient quantity. To the Reduced Iron, contained in a small mortar, add 6 c.c. of Water, and then, gradually, the Iodine, constantly triturating, until the mixture ceases to have a reddish tint. Then add the remaining powders, previously well mixed together, and mix the whole thoroughly. Transfer the mass to a porcelain capsule, and evaporate the excess of moisture, on a water-bath, with constant stirring, until the mass has acquired a pilular consistence. Coat with Balsam of Tolu dissolved in Ether. To make 100 pills.

Foreign Pharmacopœias.—Official in Belg., Dan., Dutch, Fr., Ital., Mex., Norw., Port., Span., Swed., and Swiss, each pill contains about ¾ grain Iodide of Iron, Hung. about 1 grain, and all coated with Bals. Tolu dissolved in Ether, except the Swiss; not in the others.

Official Preparation.

SYRUPUS FERRI IODIDI. Syrup of Ferrous Iodide. (Altered.)

Iron, in wire, ½ oz.; Iodine, 726 grains; Refined Sugar, 16½ oz.; Distilled Water, a sufficient quantity. Add the Refined Sugar to 6 fl. oz. of boiling Distilled Water and heat until dissolved. Dilute ½ fl. oz. of the resulting syrup with an equal volume of Distilled Water and set aside. Digest the Iodine and the Iron wire in a flask with 2½ fl. oz. of Distilled Water; heat gently, and finally boil slightly, until the froth loses its yellow colour; filter the liquid while still hot into the syrup, washing the flask and the filter with the diluted syrup previously set aside and now heated to boiling. Pass sufficient boiling Distilled Water through the filter to produce, when cold, 20 fl. oz. Mix. The Syrup should have a sp. gr. of 1·380 to 1·387.

Now about 25 p.c. stronger than the B.P. '85 Syrup.

Dose.—30 to 60 minims.

11 minims of this Syrup contain 1 grain of Ferrous Iodide.

This Syrup is very liable to become discoloured. It may be due to one or other of two causes. (1.) Oxidation of Iron, which may be prevented by careful manipulation or removed by Hypophosphorus Acid. (2.) Slight caramelisation of the Sugar by overheating; this cannot be removed by reducing agents.

A good process for determining the Iodine is given in the U.S.P.

The assay of Syrup of Ferrous Iodide.—*C.D.* '98, i. 837.

Foreign Pharmacopœias.—Official in Brit. 5·7 p.c. of Iodide of Iron; Austr., Dutch, Ger., Jap., and Russ., 5 p.c.; Belg., Fr., Ital. and Port., 0·5 p.c.; Dan., Norw., Swed. and U.S., 10 p.c.; Hung., 12 p.c.; Span., ·67 p.c.; Mex. and Swiss, 1 p.c.; all by weight.

Test.—Dissolve 1 gramme of dried Sodium Carbonate in 10 c.c. of Water, in a flask of which the capacity to a mark on the neck is 100 c.c.; pour into the flask 10 c.c. (or 13·87 grammes) of the Syrup, and agitate the mixture occasionally until the precipitation of the iron is complete; then add more Water to make the whole measure 100 c.c.; mix and filter. 25 c.c. of the filtrate, neutralised with Diluted Nitric Acid, should require not less than 16 and not more than 16·5 c.c. of the Volumetric Solution of Silver Nitrate for complete precipitation of the Iodine, Solution of Potassium Chromate being used as an indicator.

Not Official.

FERRI LACTAS.

$Fe(C_3H_5O_3)_2.3H_2O$, eq. 285·98.

Small greenish crystals, with a tendency to oxidise on exposure to air.

Solubility.—1 in 300 of Water.

Medicinal Properties.—Given in anæmia.

Dose.—2 to 10 grains given in lozenge, pill, or syrup.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Not Official.

FERRI PERCHLORIDUM.

The Anhydrous Chloride of Iron (Fe_2Cl_6 eq. 322·34), prepared by sublimation, is in black metallic-looking plates. It deliquesces rapidly on exposure to the air, and then solidifies again to a Hydrate ($Fe_2Cl_6.12H_2O$), containing 40 p.c. of Water. Another Hydrate ($Fe_2Cl_6.5H_2O$), containing 21·7 p.c. of Water (Official in the Portuguese Pharmacopœia), can be obtained by evaporating an acid solution until syrupy, and then cooling it.

The commercial solid or crystalline Ferric Perchloride approximates to the formula $Fe_2Cl_6.12H_2O$; it occurs in yellow or yellowish-brown crystalline masses, deliquescing in air. It is soluble in Water, Alcohol, Ether, and Glycerin.

Foreign Pharmacopœias.—Official in Austr., Ger. and Hung., Ferrum Sesquichloratum Crystallisatum; Belg., Chloruretum Ferricum Anhydricum; Dan., Dutch, Norw., and Swed., Chloretum Ferricum; Mex., Cloruro Ferrico; Port. Chloreto Ferrico Anhydro, also Crystallisado; Jap. and Russ., Ferrum Sesquichloratum; Span., Chloruro Ferrico (anhydrous and the Hydrate); U.S., Ferri Chloridum; not in Fr., Ital. or Swiss.

FERRI PERCHLORIDI LIQUOR FORTIS.

STRONG SOLUTION OF FERRIC CHLORIDE.

Medicinal Properties.—A powerful local styptic and astringent; escharotic. Mixed with equal parts of Glycerin has been used as a **paint** in diphtheria. Diluted (1 to 3), is injected into the uterus in bad cases of post-partum hæmorrhage, but the risk of embolism or metritis should not be forgotten; and into the nose for chronic hypertrophic rhinitis. The more dilute forms are used internally to arrest hæmorrhage in the gastro-intestinal or urinary tracts. *See* also 'Tinctura Ferri Perchloridi,' p. 296.

Prescribing Notes.—Preparations of Iron can be given in Infusion of Quassia or Calumba, but they tinge Infusion of Chiretta and Hops, and change to brown or black those of Cusparia, Gentian, Orange, Cascarilla, Cinchona, Cloves, Digitalis, and all astringent infusions.

Official Preparations.—Liquor Ferri Perchloridi and Tinctura Ferri Perchloridi.

Not Official.—Glycerinum Ferri Perchloridi, Liquor Ferri Chloroxydi, Liquor Ferri Dialysatus, and Tinctura Ferri Chlorati Ætherea.

Foreign Pharmacopœias.—Official in Mex., sp. gr., 1·260; Austr., sp. gr. 1·280; Jap., sp. gr. 1·280—1·282; Belg., Fr., Port. and Span., sp. gr. 1·260 (about 9 p.c. of Iron); Dan., Norw. and Swed., sp. gr. 1·298—1·302, Swiss, sp. gr. 1·280—1·290 (about 10 p.c. of Iron); Dutch, 1·441—1·488 (about 15 p.c. of Iron); Ger., Hung. and Russ., sp. gr. 1·280—1·282 (10 p.c. of Iron); Ital., sp. gr. 1·469—1·480; U.S., sp. gr. 1·387.

O.M.P.—Iron, 4; Hydrochloric Acid, 20½; Nitric Acid, 1½; Distilled Water, a sufficient quantity. Place the Iron in a flask; add a mixture of 12½ of Hydrochloric Acid and 7 of Distilled Water; expose to a moderate temperature until effervescence ceases; then boil; filter from undissolved Iron; rinse the flask and contents with a little Distilled Water; pour the rinsings over the filter; add to the filtrate 7 of Hydrochloric Acid; mix; pour the solution in a slow continuous stream into the Nitric Acid, chemical action being promoted if necessary by the application of slight heat; evaporate the product until no more Nitrous fumes escape and a precipitate begins to form; add 1 of Hydrochloric Acid, and sufficient Distilled Water to produce 17½ of the Solution.

Description.—An orange-brown solution with a strong styptic taste, miscible with Water and Alcohol in all proportions.

110 minims contain 22½ grains of Iron; 100 c.c. contain 22·5 grammes.

Tests.—Sp. gr. about 1·42. It affords the reactions characteristic of Ferric salts and Chlorides, and should not yield any characteristic reaction with the tests for Lead, Copper, Arsenium, Zinc, Calcium, Sodium, Potassium, Ammonium, Nitrates, or Ferrous salts. 5 c.c. of it diluted with 80 c.c. of Water should give, upon the addition of an excess of Solution of Ammonia, a reddish-brown precipitate, which, when well washed and incinerated, weighs 1·6 grammes.

Preparations.

LIQUOR FERRI PERCHLORIDI. Solution of Ferric Chloride.

Strong Solution of Ferric Chloride, 1; Distilled Water, a sufficient quantity. Mix the Strong Solution of Ferric Chloride with sufficient Distilled Water to produce 4 of this Solution of Ferric Chloride. =(1 in 4).

Sp. gr. 1·11.

Dose.—5 to 15 minims.

This solution and the 'Tincture of Ferric Chloride' contain identical proportions of Ferric Chloride.

Examination of commercial samples of Solution and Tincture of Ferric Chloride in U.S.A.—*A.J.P.* '94, 323.

TINCTURA FERRI PERCHLORIDI. Tincture of Ferric Chloride.
N.O.Syn.—Steel Drops. Tincture of Steel. (Modified.)

Strong Solution of Ferric Chloride, 5; Alcohol (90 p.c.), 5; Distilled Water, a sufficient quantity. Mix the Strong Solution of Ferric Chloride with the Alcohol; add sufficient Distilled Water to produce 20 of the Tincture. =(1 in 4).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Medicinal Properties. — Astringent, tonic, hæmostatic. The Tincture and Solution of Ferric Chloride have been more used than any other fluid preparation of Iron; given in passive hæmorrhage and as a general tonic during convalescence; invaluable as a remote astringent in chronic inflammatory discharges such as leucorrhœa and gleet; highly useful in anæmia; valuable in large doses for erysipelatous inflammations; also in chronic diarrhœa and dysentery, and to arrest hæmorrhage in typhoid.

Liquor Ferri Chloroxydi and **Liquor Ferri Dialysatus** have been much used as palatable, non-astringent and non-irritant hæmatinics, given in cases where the astringent salts would derange the stomach.

Dose.—5 to 15 minims.

Incompatibles. — Alkalis and their Carbonates, Lime Water, Calcium Carbonate, Magnesia and its Carbonate, Mucilage of Acacia.

Foreign Pharmacopœias.—Official in Dan., Norw. and Swed., Solutio Chloreti Ferrici Spirituosa; Ger., Tinct. Ferri Chlorati Ætherea; U.S., Tinctura Ferri Chloridi; Belg., Port. and Russ., from the salt, with Alcohol and Ether; Ital. (Soluzione Alcoolico-Eterea di Cloruro Ferrico), from the Solution with Alcohol and Ether; not in the others.

Tinctura Ferri Sesquichloridi P.L.—Tinctura Ferri Muriatis P.E.—There is an idea which periodically finds its way into print, that a Tincture made according to the formula of the London and Edinburgh Pharmacopœias is more efficacious than the B.P. and can be given in cases where the other is not tolerated. From a chemical point of view the only difference is that P.L. is three-fourths the strength of B.P., and when freshly made contains one-fifteenth of the Iron in the Ferrous condition. Alcohol has no reducing action on Ferric Chloride even after years of contact.

Not Official.

GLYCERINUM FERRI PERCHLORIDI (*G.H.*).—Ferric Chloride 1 part, Glycerin 4 parts.

LIQUOR FERRI CHLOROXYDI.—A solution in Water of a basic Ferric Chloride, containing ·8 per cent. of Chlorine for 5 per cent. of Ferric Oxide, approximating to the formula $Fe_2Cl_6.7Fe_2O_3$. This is the ratio of the Solution made by us many years previous to the use of 'Dialysed Iron.' It was and is stil lmade to contain 7·1 p.c. of Ferric Oxide to correspond with the Official Tincture.

Dose.—10 to 30 minims.

LIQUOR FERRI DIALYSATUS (Dialysed Iron).—This was formerly official in B.P. but is now omitted. It contains 5 p.c. of Ferric Oxide, and was dialysed until nearly tasteless. It is better to work to a definite percentage of Chlorine; it may be reduced to ·3 p.c. without interfering with the stability of the solution. It is very doubtful, however, whether there is any advantage in reducing the Chlorine ratio below that of Liquor Ferri Chloroxydi as described above.

Another method is to add a certain proportion of diluted Ammonia to a solution of Ferric Chloride, so that the precipitate which first forms just re-dissolves. The Ammonia becomes Ammonium Chloride and the Iron a very basic Oxychloride, from which the Ammonium salt is readily dialysed. Where a saving of expense is an object, as in some large institutions, it would probably be equally efficacious without dialysis.

Dose.—10 to 30 minims.

Foreign Pharmacopœias.—Official in Austr., Ferrum Hydro-oxydatum Dialysatum Liquidum, Ger., Hung., and Russ., when Liquor Ferri Oxydati Dialysati is prescribed, Liquor Ferri Oxychlorati (sp. gr. 1·050) may be dispensed; Swiss, Ferrum Oxychloratum Solution, sp. gr. 1·05; Mex., Oxido de Fierro Dialisado, sp. gr. 1·046, not in the others.

TINCTURA FERRI CHLORATI ÆTHEREA. Liquor (sp. gr. 1·280), 1; Ether, 2; Spirit, 7; all by weight.

Foreign Pharmacopœias.—Official in Ger.

FERRI PERNITRATIS LIQUOR.

SOLUTION OF FERRIC NITRATE.

Ferric Nitrate, $Fe_2 6NO_3$, eq. 480·68, in solution in Water.

Iron, 1; Nitric Acid, 4½; Distilled Water, a sufficient quantity. Dilute the Nitric Acid with 16 of the Distilled Water; introduce the Iron; set aside until the metal is dissolved, taking care to moderate the action, should it become too violent, by the addition of a little more Distilled Water; filter the liquid; add enough Distilled Water to produce 30 of the Solution.

Medicinal Properties.—Tonic, astringent, and escharotic. Like the Ferric Chloride, it is useful in chronic diarrhœa and dysentery; also in hæmatemesis and in hæmorrhage from the bowel, either by the mouth or as an injection with starch mucilage.

Dose.—5 to 15 minims.

110 minims contain 3⅓ grains of Iron; 100 c.c. contain 3·3 grammes.

Foreign Pharmacopœias.—Official in U.S., Liquor Ferri Nitratis, half the strength, sp. gr. 1·050; not in the others.

Description.—A clear solution, of a reddish-brown colour, distinctly acid and astringent to the taste.

Tests.—Sp. gr. 1·107. It affords the reactions characteristic of Ferric salts and of Nitrates. It should not yield any characteristic reaction with the Tests for Lead, Copper, Arsenium, Zinc, Calcium, Sodium, Potassium, Ammonium, Chlorides, Sulphates, or Ferrous salts. 5 c.c. treated with an excess of Solution of Ammonia should give a precipitate which, when washed, dried, and incinerated, weighs ·23 gramme.

FERRI PHOSPHAS.

IRON PHOSPHATE.

A powder containing not less than 47 p.c. of Hydrous Ferrous Phosphate, $Fe_3(PO_4)_2 8H_2O$, with Ferric Phosphate and some Iron Oxide.

Solubility.—Insoluble in Water, but soluble in Hydrochloric Acid.

Medicinal Properties.—Tonic. Possesses the general properties of the ferruginous preparations. Given with advantage in amenorrhœa, some forms of dyspepsia, rachitis and tubercular bone diseases; in nervous depression and exhaustion with tendency to phosphaturia.

Dose.—5 to 10 grains.

Prescribing Notes.—Given in **cachets**, **pills** or **powders**. A good pill can be made by adding one-third of its weight of Glucose.

Official Preparations.—Syrupus Ferri Phosphatis, Syrupus Ferri Phosphatis cum Quinina et Strychnina.

Not Official.—Liquor Ferri Phosphatis Fortis, Pilula Trium Phosphatum, Syrupus Ferri Phosphatis Compositus, Squire's Chemical Food, Syrupus Ferri Phosphatis c. Manganesio.

Foreign Pharmacopœias.—Official in Belg., Span. and U.S.; Mex., Fosfato Ferroso-Ferrico; not in the others.

O.M.P.—Ferrous Sulphate, 3; Sodium Phosphate, $2\frac{3}{4}$; Sodium Bicarbonate, $\frac{3}{4}$; Distilled Water, boiling, a sufficient quantity. Dissolve the Ferrous Sulphate in 30 of the Distilled Water, and the Sodium Phosphate in an equal quantity of Distilled Water; when each of the solutions has cooled to between 100° and 130° F. (37·8° and 54·4° C.), add the latter to the former, pouring in also a solution of the Sodium Bicarbonate in a little Distilled Water; mix thoroughly; transfer the precipitate to a calico filter; wash it with hot Distilled Water until the washings no longer afford any reaction with the tests for Sulphates; finally dry the precipitate at a temperature not exceeding 120° F. (48·9° C.).

Note on Ferrous Phosphate recommending decantation instead of washing on a calico filter.—*P.J.* '97, i. 141.

Description.—A slate-blue amorphous powder.

Tests.—The solution in Hydrochloric Acid yields a precipitate with Solutions of Potassium Ferrocyanide and Ferricyanide; and when treated with Tartaric Acid and an excess of Solution of Ammonia, and subsequently with the Solution of Magnesium Ammonio-Sulphate, it gives a white granular precipitate. Each

gramme dissolved in Hydrochloric Acid should not cease to yield a blue precipitate with Solution of Potassium Ferricyanide until at least 28·2 c.c. of the Volumetric Solution of Potassium Bichromate have been added. It should yield no characteristic reaction with the tests for Arsenium.

Preparation.

SYRUPUS FERRI PHOSPHATIS. Syrup of Ferrous Phosphate. (Altered.)

Iron, in wire, 75 grains; Concentrated Phosphoric Acid, 1¼ fl. oz.; Syrup, 14 fl. oz.; Distilled Water, a sufficient quantity. Place the Iron wire and the Concentrated Phosphoric Acid, previously diluted with an equal volume of Distilled Water, in a small flask; plug the neck with cotton wool, and heat gently until the Iron is dissolved. When cold, filter into the Syrup, and pass a sufficient quantity of Distilled Water through the filter to make the product measure 20 fl. oz.

Formerly made with Granulated Ferrous Sulphate, Sodium Phosphate, Sodium Bicarbonate, Concentrated Phosphoric Acid, Refined Sugar, and Distilled Water.

Dose.—½ to 1 fl. drm.

One fl. drm. of the Syrup represents 1 grain of anhydrous Ferrous Phosphate.

This syrup can be conveniently made by adding 1 volume of Liquor Ferri Phosphatis Fortis to 5½ vols. of Simple Syrup and 1½ vol. of Distilled Water.

Ferrous Phosphate absorbs Oxygen with great rapidity on exposure to air, and requires such a large excess of Acid to keep it in solution, that in framing a formula for Syrupus Ferri Phosphatis a compromise must be made between liability to deposit on the one hand and acidity on the other. We think it is better to use a comparatively small excess, and keep the Syrup in small bottles lying down.

(Not in the other Pharmacopœias.)

SYRUPUS FERRI PHOSPHATIS CUM QUININA ET STRYCHNINA. Syrup of Phosphate of Iron with Quinine and Strychnine. (New.)

Iron, in wire, 75 grains; Concentrated Phosphoric Acid, 1¼ fl. oz.; Strychnine, in powder, 5 grains; Quinine Sulphate, 130 grains; Syrup, 14 fl. oz.; Distilled Water, a sufficient quantity. Place the Iron wire and the Concentrated Phosphoric Acid, previously diluted with an equal volume of Distilled Water, in a small flask; plug the neck with cotton wool, and heat gently until the Iron is dissolved; in the resulting solution dissolve the Strychnine and Quinine Sulphate; filter into the Syrup; pass sufficient Distilled Water through the filter to make the product measure 20 fl. oz.

Dose.—½ to 1 fl. drm.

1 fl. drm. of this Syrup represents 1 grain of Anhydrous Ferrous Phosphate, ⅘ grain of Quinine Sulphate, and $\frac{1}{32}$ grain of Strychnine.

It resembles the compound known as Easton's Syrup.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Not Official.

LIQUOR FERRI PHOSPHATIS FORTIS.—Containing 8 grains per fluid drachm of the anhydrous Phosphate, is made by dissolving 360 grains of Iron Wire in 6 fl. oz. of Concentrated Phosphoric Acid, with sufficient Water to make 12 fl. ounces.

PILULA TRIUM PHOSPHATUM. Easton's Pill (*G.H.*).—Ferrous Phosphate, 1 grain; Quinine Sulphate, 1 grain; Strychnine, $\frac{1}{32}$ grain; Concentrated Phosphoric Acid, $1\frac{1}{2}$ minims; Liquorice Powder to 5 grains.

Dose.—5 to 10 grains.

SYRUPUS FERRI PHOSPHATIS COMPOSITUS (*B.P.C.*).—Iron Wire, free from oxide, $37\frac{1}{2}$ grains; Concentrated Phosphoric Acid (sp. gr. 1·5), 1 fl. oz.; Distilled Water, 5 fl. drm.: dissolve by a gentle heat in a flask plugged with cotton-wool, the Iron being completely covered by the liquid.

Precipitated Calcium Carbonate, 120 grains; Concentrated Phosphoric Acid 4 fl. drm.; Distilled Water, 2 fl. oz.: mix, and add Potassium Bicarbonate, 9 grains; Sodium Phosphate, 9 grains: filter and set aside.

Cochineal, 30 grains; Distilled Water, $7\frac{1}{2}$ fl. oz.: boil for fifteen minutes and filter, pouring over the filter a sufficient quantity of Distilled Water to produce 7 fl. oz. of filtrate; to this add Refined Sugar, 14 oz.: heat till dissolved and strain. When cold add the Iron and Calcium solutions and sufficient Distilled Water to produce 20 fl. oz.

Each fl. drm. = $\frac{1}{2}$ grain Ferrous Phosphate and $\frac{1}{5}$ grain Calcium Phosphate with small quantities of Potassium and Sodium Phosphates. It should be kept in bottles quite full.

Dose.—$\frac{1}{2}$ to 2 fl. drm.

SQUIRE'S CHEMICAL FOOD.—The preparation made for many years by Parrish and imported by Squire, and subsequently purchased by Squire.

It contains Ferrous Phosphate, Calcium Phosphate, Sodium Phosphate, and Potassium Phosphate.

Dose.—Half to one teaspoonful in water with meals.

A formula was published many years ago, but how far this has been a success is shown by comparing the syrups commercially sold, all of them more or less emphatically stated to be made according to the published formula.

In nine samples analysed, the Iron Phosphate ranged from ·19 to ·66, the Calcium Phosphate from ·5 to 1·6, the total Phosphoric Acid from 1·5 to 4·7; these results are expressed in grains per fl. drm.

Medicinal Properties.—A tonic in debility of whatever origin and during convalescence from acute diseases. Specially indicated in scrofula and rickets, and during pregnancy.

SYRUPUS FERRI PHOSPHATIS C. MANGANESIO.—Dissolve 100 grains Manganese Phosphate in $1\frac{1}{4}$ fl. oz. of Liquor Ferri Phosphatis Fortis and 30 minims of Phosphoric Acid, then dilute to 20 fl. oz. with Simple Syrup.

This Syrup will contain in each fl. drm. $\frac{1}{2}$ grain each of Anhydrous Ferrous Phosphate and Anhydrous Manganese Phosphate.

Dose.—1 fl. drm.

This can sometimes be taken when Syrup of Ferrous Phosphate disagrees.

FERRI SULPHAS.

FERROUS SULPHATE.

$FeSO_4.7H_2O$, eq. 276·10.

May be prepared by the interaction of diluted Sulphuric Acid and Iron.

Solubility.—1 in 1½ of Water: the solution rapidly oxidizes on exposure; insoluble in Absolute Alcohol or Alcohol (60 p.c.), hence it cannot be dissolved in Tinctures.

Medicinal Properties.—A powerful astringent and a hæmatinic tonic, but it is apt to irritate the stomach. Internally it is given in anæmia, amenorrhœa, and general debility; along with Quinine it promotes the appetite; given with cathartics, such as Magnes. Sulph. and Aloes, to increase their action, but at the same time reduce their dose; externally it is used as a **lotion** for ulcerated and erysipelatous surfaces, 3 to 5 grains in an oz. of Water; also as an **injection** for urethral and vaginal inflammations and prolapse of rectum.

Dose.—1 to 5 grains.

Prescribing Notes.—Given in solution or pill form, generally with other ingredients. The **Dried Sulphate** is best given in pills. 2½ grains, which are equal to 4 of the crystallised salt, make a nice pill with a mixture of equal parts of Liquid Glucose and Treacle. Compressed Tablets are also prepared.

Official Preparations.—Ferri Sulphas Exsiccatus and Liquor Ferri Persulphatis. *See also* 'Ferrum.'

Not Official.—Gossypium Ferratum.

Ferri Sulphas Granulata has been deleted from B.P.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap.; also Crudum, Norw., Port., Russ., Span., Swed., Swiss and U.S., Mex., Sulfato Ferroso.

Description.—In oblique rhombic prisms, of a pale greenish-blue colour and astringent taste.

Tests.—The salt is insoluble in Alcohol (90 p.c.), soluble in less than 2 parts of cold Water giving a clear solution (absence of Oxysulphate). It affords the reactions characteristic of Ferrous salts and of Sulphates. Each gramme dissolved in Water acidulated with Sulphuric Acid should not cease to yield a blue precipitate with Solution of Potassium Ferricyanide until 36 c.c. of the Volumetric Solution of Potassium Bichromate have been added. It should yield no characteristic reaction with the tests for Copper, Zinc, Potassium, Sodium, or Ammonium. Its solution in Water should not give any precipitate with Hydrogen Sulphide (absence of Ferric compounds, etc.).

Preparations.

FERRI SULPHAS EXSICCATUS. Exsiccated Ferrous Sulphate. Dried Sulphate of Iron.—*B.P.* '85.

Expose Ferrous Sulphate, $FeSO_4 7H_2O$, in a porcelain or iron dish to a temperature of 212° F. (100° C.), stirring occasionally until aqueous vapour ceases to be given off; reduce the residue, which should weigh about 60 p.c. of the original salt, to a fine powder.

Dose.—½ to 3 grains.

Description.—A nearly white powder, slowly but entirely soluble in Water.

Test.—Each gramme dissolved in Water acidulated with Sul-

phuric Acid should not cease to yield a blue precipitate with Solution of Potassium Ferricyanide until at least 54·6 c.c. of the Volumetric Solution of Potassium Bichromate have been added, corresponding to at least 92½ p.c. of Exsiccated Ferrous Sulphate, $FeSO_4,H_2O$, eq. 168·82.

The percentage has been lowered from 97½ in *B.P.* '85 to 92½ in *B.P.* '98.

Foreign Pharmacopœias.—Official in Belg.; Dan., dried at 104°—122° F.; Dutch; Ger. and Swiss, dried at 212° F.; Russ., dried at 77°—86° F.; U.S., dried at 300° F.; not in the others.

LIQUOR FERRI PERSULPHATIS.—Solution of Ferric Sulphate.

Ferrous Sulphate, 16; Sulphuric Acid, 1½; Nitric Acid, 1½; Distilled Water, a sufficient quantity. Add the Sulphuric Acid to 20 of the Distilled Water; dissolve the Ferrous Sulphate in the mixture with the aid of heat. Mix the Nitric Acid with 4 of the Distilled Water; add to this diluted acid, warmed, the solution of Ferrous Sulphate; concentrate by boiling, until, by the sudden disengagement of ruddy vapours, the liquid ceases to be black and acquires a red colour. If any Ferrous Salt remain in the solution, add a few drops of Nitric Acid, and boil again. When the solution is cold, make up the quantity to 22 by the addition, if necessary, of Distilled Water.

Introduced for making several preparations of Iron, which are enumerated under 'Ferrum,' p. 281.

Description.—A dense solution of a dark-red colour, inodorous and very astringent, miscible in all proportions with Alcohol and Water.

Tests.—Sp. gr. 1·441. It affords the reactions characteristic of Ferric salts and of Sulphates. It should yield no characteristic reaction with the tests for Ferrous salts. 5 c.c. diluted with 80 c.c. of Water should give, upon the addition of an excess of Solution of Ammonia, a precipitate which, when well washed and incinerated, weighs 1·04 grammes.

This solution is a good styptic; it mixes in all proportions with Water and Alcohol (90 p.c.).

Foreign Pharmacopœias.—Official in Jap., Russ. and Swiss, sp. gr. 1·428—1·430; U.S., sp. gr. 1·320; not in the others.

Not Official.

GOSSYPIUM FERRATUM. (*L. H.*)—Moisten Cotton Wool with Glycerin, then express strongly; steep the damp wool in a solution of Ferrous Sulphate, 1 part to 2 parts of water, squeeze out as much as possible of the liquid, and, without drying, pack the prepared wool into a bottle furnished with a glass stopper.

FERRUM REDACTUM.

REDUCED IRON.

A fine powder, containing at least 75 p.c. of metallic Iron, with a variable amount of Iron Oxide; prepared by reducing Ferric Hydroxide, heated to dull redness, by a stream of dry Hydrogen.

With reference to the keeping qualities of Reduced Iron it may be noted that under ordinary atmospheric conditions, a sample containing 91·5 p.c. of Iron, loosely covered with paper to keep out dust, lost only 1 p.c. in a month.

Medicinal Properties.—Chalybeate and hæmatinic. It does not, however possess the astringent properties of some of the other preparations of Iron, and therefore cannot be used as a substitute in passive hæmorrhage. It is chiefly employed in chlorosis and amenorrhœa. There is no pulverulent state of Iron so convenient as this for children, as it has no taste, a very small dose is required, and it may be given on bread and butter.

As Hydrogen is evolved by its contact with the acid gastric secretion, flatulence may be set up.

Dose.—1 to 5 grains.

Prescribing Notes.—Given in powder, pill, or in Lozenges. An excellent pill can be made by mixing Reduced Iron 24 grains, Liquorice Powder 6 grains, Glycerin of Tragacanth 6 grains, and dividing into 12 or more pills as desired.

Official Preparation.—Trochiscus Ferri Redacti.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swiss and U.S.; not in Swed.

Description.—A fine greyish-black powder, strongly attracted by the magnet, and producing metallic streaks when rubbed with firm pressure in a mortar.

Test.—It dissolves in Hydrochloric Acid with the evolution of Hydrogen, and without any smell of Hydrogen Sulphide, and the solution gives a light-blue precipitate with Solution of Potassium Ferrocyanide. If ·25 gramme be added to a hot solution of 1 gramme of Copper Sulphate in 15 c.c. of Water, in a flask that can immediately be well corked, and the whole be shaken occasionally during ten minutes, the liquid, after being rapidly filtered with the minimum of exposure to air, and acidulated with Sulphuric Acid, should not cease to yield a blue precipitate with Solution of Potassium Ferricyanide until at least 33·7 c.c. of the Volumetric Solution of Potassium Bichromate have been added.

B.P., '98, has raised the percentage of metallic Iron from 50 to 75 p.c., but there is no difficulty in obtaining Reduced Iron containing over 90 p.c. of metal.

On treatment with Hydrochloric Acid there is usually a residue of Carbon and Silica, and the liberated Hydrogen when passed through filter paper soaked in Lead acetate solution caused a discoloration. Nine samples out of twelve contained traces of Arsenic, five samples gave distinctly alkaline reactions. Proposed that more stringent tests be added to ensure the absence of Sulphides, of more than 1 p.c. of insoluble residue and of alkaline Carbonates; also, that there should be a limit to the amount of Arsenic present, and that various modifications be made in the method for estimation.—*P. J.* '98, ii. 161.

Preparation.

TROCHISCUS FERRI REDACTI. Reduced Iron Lozenge.

Reduced Iron, 1 grain. Mix with the Simple Basis to form a Lozenge.

Dose.—Not given in B.P.; 1 to 6 lozenges.

FERRUM TARTARATUM.

TARTARATED IRON.

Solubility.—1 in 1 of Water, very sparingly in Alcohol (90 p.c.).

Medicinal Properties.—Chalybeate tonic, and slightly diuretic, suitable in the anæmia of convalescence.

Dose.—5 to 10 grains.

Foreign Pharmacopœias.—Official in Belg., Tartras Ferrico-Potassicus; Fr., Tartrate Ferrico-Potassique; Ital., Tartrato Ferrico-Potassico; Mex., Tartrato de Potasio y Fierro; Port., Tartrato de Potassa e de Ferro; Russ., Ferro-Kalium Tartaricum; Span., Tartrato Ferrico-Potasico; Swed., Tartras Ferrico-Kalicus; Swiss, Tartarus Ferratus; U.S., Ferri et Potassii Tartras; not in the others.

O.M.P.—Solution of Ferric Sulphate, 10 fl. oz; Solution of Ammonia, 16 fl. oz. or a sufficient quantity; Acid Potassium Tartrate, in powder, 3 oz. and 146 grains; Distilled Water, a sufficient quantity. Prepare Ferric Hydroxide from 10 fl. oz. of Solution of Ferric Sulphate as directed under 'Ferri et Ammonii Citras.'

Mix the Ferric Hydroxide intimately with the Acid Potassium Tartrate in a porcelain dish; let the mixture stand for twenty-four hours; heat to a temperature not exceeding 140° F. (60° C.), add gradually 30 fl. oz. of Distilled Water; stir constantly until nothing more will dissolve; filter; evaporate at a temperature not exceeding 140° F. (60° C.), to the consistence of syrup; dry in thin layers on flat porcelain or glass plates in a drying closet at a temperature not exceeding 100° F. (37·8° C.); remove the dry flakes of Tartarated Iron.

Description.—In thin transparent scales of a deep garnet colour, somewhat sweetish and astringent in taste.

Tests.—The aqueous solution, when acidulated with Hydrochloric Acid, affords a copious blue precipitate with Solution of Potassium Ferrocyanide, but none, or only a greenish turbidity, with Solution of Potassium Ferricyanide. When the salt is boiled with Solution of Sodium Hydroxide, a reddish-brown precipitate separates, and the filtered solution, when slightly acidulated with Acetic Acid yields, as it cools, a crystalline deposit, especially if the solution is previously mixed with a little Alcohol (90 p.c.). By incinerating 10 grammes at a red heat, washing the residue with Water, and again incinerating, with free access of air, a residue of Ferric Oxide is obtained weighing not less than 3 grammes.

It always contains Ferrous salt, which precipitates with Potassium Ferricyanide; the Oxide left after incineration is strongly magnetic, so that it cannot be wholly Peroxide.

If prepared from ordinary Acid Potassium Tartrate, the residue will always contain Calcium; it is recommended to use a Tartrate prepared from Tartaric Acid by semi-neutralisation with Potassium Hydroxide.—*P.J.* (3) xvi. 514.

FICUS.

FIGS.

The dried fleshy receptacles of *Ficus Carica*.

Medicinal Properties.—Nutritious, laxative, and demulcent. Chiefly used medicinally in constipation. Cut open and heated, it is a convenient cataplasm.

Official Preparation.—Contained in Confectio Sennæ.

Foreign Pharmacopœias.—Official in Fr., Figue; Port., Figos Passados; Span., Higuera; U.S.; not in the others.

Description.—The Fig consists of the enlarged hollow succulent receptacle, bearing very numerous achenes on its inner surface. As met with in commerce it is compressed, irregular in form, soft, tough, brownish or yellowish, with a sweet taste.

FILIX MAS.

MALE FERN.

The rhizome of *Aspidium Filix-mas*, collected late in the autumn, divested of its roots, leaves, and dead portions, and carefully dried.

Medicinal Properties.—The powder of the rhizome is slightly tonic and astringent; chiefly used in the form of Liquid Extract as an anthelmintic for tapeworm.

Prescribing Notes.—The Fluid Extract can be given in milk, or made into an **emulsion** with 1 to 2 fl. drm. of very fresh Mucilage, or ½ to 1 drm. of powdered Acacia, and with Peppermint Water or Milk to form a 2 oz. draught; or in **capsules.** Best given at bedtime on an empty stomach and followed next morning by a powerful purgative.

Official Preparation.—Extractum Filicis Liquidum.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Jap., Fr. (Fougère), Ger., Hung., Norw., Ital. (Felce Maschio), Port. (Feto Macho), Russ.; Mex., Span. (Helecho Macho), Swed., Swiss, U.S. (Aspidium).

Description.—From three to six inches (seven and a-half to fifteen centimetres) or more in length, the rhizome itself is from three-quarters to one inch (two to two and a-half centimetres) in diameter. Entirely covered with the hard, persistent, curved, angular, dark-brown bases of the petioles, which bear numerous brown, membranous scales. The rhizome is brown externally, but green internally. The bases of the petioles are also green internally, and exhibit in transverse section about eight pale yellow fibro-vascular bundles in each, arranged in a diffuse circle. Odour feeble but disagreeable; taste sweetish and astringent at first, but subsequently bitter and nauseous.

Male Fern should not be kept more than a year.

Preparation.

EXTRACTUM FILICIS LIQUIDUM. LIQUID EXTRACT OF MALE FERN.

Exhaust Male Fern Rhizome, in No. 20 powder, with Ether, by percolation; evaporate the Ether from the clear percolate on a water-bath or by distillation, until an oily Extract remains.

Dose.—45 to 90 minims.

For larger doses than 90 minims, see *L.* '88, ii. 1037; *B.M.J.* '89, i. 319, and particularly as to mode of administration, *L.* '94, ii. 255.

The activity of the Extract is supposed to be due to **Filicic Acid.**—*P.J.* (3) xxii. 84; and this varies in different samples from ·71 to 9·59 p.c., reaching in one sample 13·07 p.c.—*P.J.* '97, ii. 85.

3 p.c. of Aspidin, $C_{23}H_{27}O_7$, has been extracted from the ethereal extract: it is poisonous, but nothing certain is known about its therapeutic effect.—*P.J.* '97, i. 288.

Foreign Pharmacopœias.—Official in Austr. and Russ., Ext. Filicis Maris; Belg., Dan., Dutch, Ger., Jap.; Norw., Swed., and Swiss, Ext. Filicis; Fr., Extrait de Fougère Mâle; Hung., Extract. Filicis Maris Æthereum; Ital., Estratto di Felce Maschio Etereo; Port., Extracto de Feto Macho Ethereo; Span., Aceite de Helecho; U.S., Oleoresina Aspidii. All made with Ether.

FŒNICULI FRUCTUS.

FENNEL FRUIT.

The dried ripe fruit of *Fœniculum capillaceum*, collected from cultivated plants.

Medicinal Properties.—Stimulant, aromatic, and carminative. In action similar to Anise. Antispasmodic in intestinal colic of children.

Official Preparation.—Aqua Fœniculi. Used in the preparation of Pulvis Glycyrrhizæ Compositus.

Not Official.—Oleum Fœniculi.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Fenouil Doux), Ger., Hung., Jap., Norw., Ital. (Finocchio), Port. (Funcho), Russ., Mex. and Span. (Hinojo), Swed., Swiss and U.S.

Description.—From one-fifth to about two-fifths of an inch (five to ten millimetres) long, and about one-tenth of an inch (three millimetres) in diameter; oblong, more or less curved, capped by a conspicuous stylopod and two styles, glabrous, greenish-brown or pale yellowish-brown in colour; odour aromatic; taste aromatic, sweet, and agreeable. The Fruit is readily separated into its two mericarps, each of which has five prominent primary ridges and exhibits in transverse section six large vittæ.

The ash was determined of Fruits (4 samples) 8·47, 8·93, 9·75, 7·70 p.c.; of Pulvis Fœniculi (6 samples) 24·64, 12·8, 9·90, 8·91, 13·0, 9·89 p.c., the first contained sand.

Preparation.

AQUA FŒNICULI. FENNEL WATER.

Fennel Fruit, 1; Water, 20: distil 10. =(1 in 10).

Dose.—Not given in B.P. 1 to 2 fl. oz.

Foreign Pharmacopœias.—Official in Austr., 1 in 20; Fr., Ital., Mex. and Port., 1 in 4; Ger. and Russ., 1 in 30; Hung. and Swed., 1 in 10; Span., 1 in 6; Swiss, 1 in 25; Belg., with Oil, 1 in 3000; Dan., with Oil, 1 in 2000; Dutch, Jap., and U.S., with Oil, 1 in 500; not in Norw.

Not Official.

OLEUM FŒNICULI.—A volatile Oil distilled from Fennel. Sp. gr. not less than ·960. Between 5° and 10° C. it usually solidifies to a crystalline mass, but occasion-

ally it remains liquid at a considerably lower temperature. The important constituent is Anethol.

The Oil from Japanese Fennel resembles closely that from the other varieties.—*P.J.* '96, ii. 91; *C.D.* '96, ii. 191.

Commercial varieties of Fennel and their essential oils.—*P.J.* '97, i. 225.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Jap., Norw., Port., Russ., Span. Swed., Swiss and U.S.; not in Ital. or Mex.

Not Official.

FORMIC ALDEHYDE.

METHANAL. METHYL ALDEHYDE.

Produced by the limited oxidation of Methyl Alcohol. A gas condensible by cold to a clear mobile liquid. The commercial article 'Formol' or 'Formalin' is stated to be a 40 p.c. solution.

FORMALDEHYDUM SOLUTUM (*Ph. Ger. Supp.*).—A clear colourless fluid containing about 35 p.c. of Formaldehyde. Sp. gr. 1·079—1·081. Mixes readily with Water and Alcohol (90 p.c.), but not with Ether.

Medicinal Properties.—The strong solution (35—40 p.c.) is a powerful antiseptic, disinfectant and deodorant; it is also a powerful caustic, and should be handled with care. The vapour is irritating to the eyes and nose, probably due to traces of Formic Acid. The strong (40 p.c.) solution diluted with 10 to 50 volumes of Water is useful for fixing and hardening histological and pathological specimens. When diluted with 100 to 200 parts, it may be used as a general antiseptic in the sick room for washing the hands, &c.

Formic Aldehyde as a disinfectant.—There is no conflict of evidence as to Formaldehyde being a reliable disinfectant when used in solution. Considerable difference of opinion exists, however, as to its value when used in a gaseous state. In the form of a ½ to 1 p.c. solution, which may be used as a wash or spray, it is a cheap, rapid and powerful disinfectant. The Aldehyde vapours are non-poisonous, but very irritating to the eyes and throat; they possess marked deodorant and disinfectant properties, and are well suited to the purposes of room disinfection, for they do not affect colours. The use of the reagent in a gaseous form appears to possess the advantages over disinfection by Sulphurous Acid, that it injures nothing except Iron, it diffuses better, and it possesses greater disinfectant power.—*B.M.J.* '98, i. 1542.

Muller's Fluid containing 10 p.c. of Formol has been recommended for hardening pathological specimens, but it deposits in five days and must be changed; 60 p.c. Alcohol to which 1 p.c. Formol has been added is a good preservative fluid after hardening in above.—*B.M.J.E.* '96, i. 88.

Formalin (40 p.c.) in 2000 to 3000 of Water used freely to hypopyon ulcers, and septic abrasions of the cornea.—*B.M.J.* '96, i. 144.

2 p.c. solution in ringworm.—*B.M.J.E.* '94, ii. 103; *Y.B.T.* '95, 394.

40 p.c. solution applied to ringworm.—*B.M.J.* '96, ii. 650.

40 p.c. solution sometimes causes suppuration and is not so useful for ringworm as Carbolic Acid.—*B.M.J.* '97, i. 972.

A paper by Kanthack on the use of Formalin lamps for the disinfection of rooms.—*L.* '98, ii. 1049.

Tests.—On mixing with an ammoniacal solution of Silver Nitrate, metallic silver is separated. Heated with alkaline Copper Tartrate solution, cuprous oxide is separated.

If to 2 c.c. of the solution, an equal volume of 5 p.c. Potassium Hydroxide Solution and about ·5 gramme of Resorcinol be added and the mixture heated to boiling, the yellow color which first appears gradually becomes red. (This reaction is said to be given by no other substance.)

If 5 c.c. be evaporated to dryness on a water-bath, a white amorphous mass is left, which should leave no residue on ignition (absence of mineral impurities).

10 c.c. should require not more than ·25 c.c. of $\frac{n}{1}$ Potassium Hydroxide Solution for neutralisation, using Phenol-phthalein as indicator (absence of more than ·1 p.c. of Formic Acid). It should not contain more than traces of Chlorides, Sulphates, or heavy metals.

Dissolve 2 grammes of pure, neutral Ammonium Chloride in 25 c.c. of water, and introduce it into a flask provided with a well-fitting stopper. Add 2·25 grammes of the sample, and then run in from a burette 25 c.c. of $\frac{n}{1}$ Potassium (or Sodium) Hydroxide Solution. Stopper the flask at once, and put it aside for half an hour.* Then add a few drops of Rosolic Acid solution and determine the excess of Ammonia with $\frac{n}{1}$ Sulphuric Acid, each c.c. of $\frac{n}{1}$ Potassium Hydroxide Solution consumed indicating 2 p.c. of Formaldehyde. These tests have been taken from a very extensive paper by Carl E. Smith.—*A.J.P.* '98, 86, 447.

Amyloform, Dextroform, and **Glutol** are compounds of Formaldehyde with Starch, Dextrin, and Gelatin respectively, and have been recommended as dressings.

PARAFORMIC ALDEHYDE.—A solid polymer of Formic Aldehyde. It volatilises at 100° C. (212° F.), and is readily convertible into that substance when heated to the above temperature in the presence of water. It is used for disinfecting rooms.

UROTROPINE (Hexamethylenetetramine).—Prepared by the action of Ammonia on Formic Aldehyde.

A white crystalline powder readily soluble in Water. Recommended in the treatment of cystitis and in phosphaturia.

Dose.—7 grains dissolved in water or in aerated water.

Daily doses of 15 to 20 grains or more may be taken without harm for a long period.

Not Official.

FUCUS VESICULOSUS.

Bladder-wrack collected from rocks by the seaside and dried.

Foreign Pharmacopœias.—Official in Fr., Varech Vesiculeux; Mex. Encina de Mar; Port., Bodelha; Span., Fuco Vejigoso; not in the others.

Preparations.

EXTRACTUM FUCI.—Prepared by percolation in the same manner as the Fluid Extract, and evaporation of the resulting fluid to a stiff extract.

100 of dried Fucus yield about 16 of Extract.

Dose.—3 to 5 grains in **pill.**

EXTRACTUM FUCI LIQUIDUM.—Dried Fucus Vesiculosus in No. 20 Powder, 16; percolate with a mixture of Alcohol (90 p.c.) 2; Water, 1; so that the resulting fluid shall measure 32.

Dose.—A teaspoonful, given for obesity; it also diminishes tubercular glandular swellings.

Smelling fresh seaweed is said to relieve hay asthma.

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* Six hours' contact is better.—*A.J.P.* '98, 432.

GALBANUM.

GALBANUM.

A gum-resin obtained from *Ferula galbaniflua*, and probably from other species.

For information as to geographical and botanical sources, *see P.J.* (3) xxii. 194.

The pure resin is probably a Galbaresinotannylic salt of Umbelliferone.—*J.C.S. Abs.* '94, i. 423.

Medicinal Properties.—Similar to Asafetida, but less energetic; antispasmodic and stimulating expectorant. Chiefly used in chronic affections of the bronchial mucous membrane; externally as a plaster in chronic inflammatory swellings.

Dose.—5 to 15 grains.

Official Preparation.—Pilula Galbani Composita.

Not Official.—Emplastrum Galbani and Unguentum Galbani Compositum.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Mex., Norw., Port., Russ., Span., Swed. and Swiss; not in Hung., Jap. or U.S.

Description.—In tears or in masses of agglutinated tears. The tears are rounded or irregular in form, and vary in size from that of a lentil to that of a hazel nut, although rarely exceeding that of a pea; yellowish-brown or orange-brown externally; often rough and dirty on the surface, usually opaque and yellowish-white internally; sometimes more or less translucent, bluish-green in colour, and mixed with transverse slices of the root. They are hard and brittle in cold weather, but soften in the summer, and by the heat of the hand become ductile and sticky. The masses are irregular in form, and vary in colour from yellowish-brown to translucent bluish-green. The taste is bitter and unpleasant; both taste and odour are characteristic.

Usually heated to 212° F. (100° C.), and strained before using.

Test.—If a small fragment is heated to redness in a dry test-tube, the contents of the tube, after cooling, yield with boiling Water a solution which, when largely diluted and rendered alkaline by Solution of Ammonia, exhibits a blue fluorescence.

For remarks on this test *see* 'Ammoniacum.'

Ash should not exceed 10 p.c. and the proportion insoluble in Alcohol (90 p.c.) should not exceed 50 p.c.—*C.D.* '98, ii. 131.

Preparation.

PILULA GALBANI COMPOSITA. Compound Pill of Galbanum.

B.P.Syn.—Compound Pill of Asafetida. (Modified.)

Asafetida, 2; Galbanum, 2; Myrrh, 2; Syrup of Glucose (by weight), 1 or a sufficient quantity. Heat all together on a water-bath, stirring until the mass is uniform in consistence.

Syrup of Glucose now used in place of Treacle.

Dose.—4 to 8 grains.

The following modification will be found convenient for dispensing: Powder the Myrrh, mix it with the Asafetida and Galbanum melted on a water-bath, allow the mixture to cool, and after chilling it by artificial means reduce it to powder with $\frac{1}{6}$

of its weight of Light Magnesium Carbonate. This powder will keep well and can be made into pills as required with the aid of Alcohol (60 p.c.).

Foreign Pharmacopœias.—Official in Port., similar to Brit.; U.S., Asafetida 20, Soap 6; Swed., has Pilula Fœtida Succinata, but very different from Brit.; not in the others.

Not Official.

EMPLASTRUM GALBANI.—Galbanum, 1; Ammoniacum, 1: melt together and strain, then add them to Yellow Beeswax, 1; Lead Plaster, 8, previously melted together: mix. =(1 in 11).

Foreign Pharmacopœias.—A plaster more or less resembling this is in all except Hung. and U.S. Mex. has Emplasto de Galbano Azafranado.

UNGUENTUM GALBANI COMPOSITUM.—Galbanum Plaster, 4 oz.; Lead Plaster, 4 oz.; White Beeswax, 4 oz.; soft Extract of Opium, 1 drm.; Olive Oil, 20 fl. oz.: melt together.

It is used for boils and carbuncles, and for sore nipples and suppurating breasts.

Not Official.

GALIUM APARINE.

CLEAVERS. GOOSE-GRASS.

This old remedy for scrofula still finds occasional notice. Besides its external application as a poultice to stimulate chronic ulcers, the general form of administration is the juice of the plant in wineglassful doses several times a day, but as the Succus cannot be preserved without 25 p.c. of Alcohol (90 p.c.), the quantity of Alcohol involved would in many cases preclude its use. The most suitable preparation therefore is a **Fluid Extract** prepared from the fresh plant.

GALLA.

GALLS.

Excrescences on *Quercus infectoria*, resulting from the puncture and deposition of an egg or eggs of *Cynips Gallæ tinctoriæ*.

Chiefly from Turkey, Persia and Greece.

Galls contain 60 to 70 p.c. of Tannin or Tannic Acid, and 3 to 5 p.c. of Gallic Acid, to which their therapeutic qualities may be attributed.

Solubility.—All the soluble matter of Galls is taken up by forty times their weight of boiling Water, and the residue is tasteless.

Medicinal Properties.—Astringent. Chiefly used locally in form of lotion or injection to suppress hæmorrhage from the gums, nose, &c.; to lessen the discharge from mucous membranes, as in gleet, leucorrhœa, &c.; both Ointments are useful in painful hæmorrhoids.

Dose.—Not given in B.P.; (of powder) 10 to 20 grains.

Incompatibles.—The mineral Acids, Iron and Lead salts, Copper Sulphate, Silver Nitrate, Potassium and Sodium Carbonates, Lime Water, Tartar Emetic, Ipecacuanha, and Opium; Infusions of Cinchona, Calumba, and Cusparia.

Official Preparations.—Unguentum Gallæ and Unguentum Gallæ cum Opio. Used in the preparation of Acidum Gallicum and Acidum Tannicum.

Not Official.—Decoctum Gallæ, Suppositoria Gallæ, and Tinctura Gallæ.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Galle

de Chêne d'Alep), Ger., Hung., Ital. (Noci di Galla), Jap., Mex. (Agallas de Levante), Norw., Port. (Galha), Russ., Span. (Agalla), Swed., Swiss and U.S.

Description.—Hard, heavy, subglobular, from half an inch to three-quarters of an inch (twelve to eighteen millimetres) or more in diameter, tuberculated on the surface, the tubercules and intervening spaces being smooth; dark bluish-green or dark olive-green externally, yellowish or brownish-white within, with a small central cavity. No odour; taste intensely astringent.

Preparations.

ACIDUM GALLICUM.—*See* ACIDUM GALLICUM.

ACIDUM TANNICUM.—*See* ACIDUM TANNICUM.

UNGUENTUM GALLÆ. GALL OINTMENT. (ALTERED.)

Galls, in very fine powder, 1; Benzoated Lard, 4 oz.: mix by trituration. =(1 in 5).

Now 1 in 5 instead of 1 in 6½.

Foreign Pharmacopœias.—Official in U.S., 1 in 5; not in the others.

UNGUENTUM GALLÆ CUM OPIO.—GALL AND OPIUM OINTMENT. (ALTERED.)

Gall Ointment, 925; Opium, in very fine powder, 75; mix by trituration. =(Opium, 1 in 13⅓).

Opium slightly stronger. Galls now 1 in 5 instead of 1 in 6½.

100 parts of this Ointment contain 7½ parts of Opium.

The Ointment might be made direct by mixing 15 grains of Opium and 37 grains of Galls with 148 grains of Benzoated Lard.

(Not in the other Pharmacopœias.)

Not Official.

DECOCTUM GALLÆ.—Bruised Galls, 2½; Distilled Water, 40: boil to 20 and strain. =(1 in 8).

An astringent **lotion** to suppress hæmorrhage from the gums or nose, and to lessen discharges from mucous surfaces.

SUPPOSITORIA GALLÆ.—5 grains powdered Galls and 1 grain Opium in each, with a basis of Cocoa-nut Stearin.

TINCTURA GALLÆ.—Galls, in No. 40 powder, 1; Alcohol (60 p.c.), 8: macerate for forty-eight hours with 6 of the Alcohol, agitating occasionally; pack in a percolator, let it drain, and then pour on the remaining Alcohol; when it ceases to drop, press the marc and add Alcohol (90 p.c.) to make 8.

Dose.—½ to 2 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch., Fr., Ger., Hung., Jap., Mex., Norw., Russ., Swiss, and U.S., 1 in 5; all by weight, except U.S.; not in the others.

Not Official.

GARCINIA PURPUREA.

KOKUM BUTTER TREE.

Grows in the forests of Malabar, the Concans, and other parts of the Madras Peninsula.

The oil of the seeds (*Kokum Butter*) is obtained by first exposing the seeds for

some days to the action of the sun to dry; they are then bruised and boiled in water; the oil collects on the surface and on cooling contracts into a solid cake. It melts at 98° F. The seeds yield about 10 p.c. of oil.

It is used in India in the preparation of ointments, suppositories, &c.

Not Official.

GAULTHERIÆ OLEUM.

OIL OF WINTERGREEN.

Three nearly allied substances are sold as Oil of Wintergreen, and they are all official in U.S.P.

Oil of Gaultheria (Wintergreen).—A volatile oil distilled from the leaves of *Gaultheria procumbens*, consisting almost entirely of Methyl Salicylate, and nearly identical with Volatile Oil of Betula. It deviates polarised light slightly to the left. Sp. gr. 1·175 to 1·185.

Volatile Oil of Betula (Sweet Birch). A Volatile Oil obtained by distillation from the bark of *Betula lenta*. It is identical with Methyl Salicylate, and nearly identical with Oil of Gaultheria. It has the same properties and conforms to the same reactions and tests as Methyl Salicylate.

Methyl Salicylas, produced synthetically. A large proportion of the oil in commerce is now synthetic Methyl Salicylate or Artificial Oil of Wintergreen. Gaultheria Oil contains 99 p.c. and Birch Oil about 99·8 p.c. of Methyl Salicylate. Sp. gr. of both oils is between 1·180 and 1·187 at 15° C. Like synthetic Methyl Salicylate they form with 5 parts of Alcohol (70 p.c.), a perfectly clear solution at about 20° C.—*P.J.* '95, ii. 329.

Solubility.—Readily Soluble in Alcohol (90 p.c.), Ether, Chloroform, and Glacial Acetic Acid.

Medicinal Properties.—A valuable remedy in acute rheumatism, internally; also externally, applied directly to the skin and covered with oiled silk or gutta percha tissue, to prevent evaporation; also mixed with equal parts of Olive Oil. Used largely as a flavouring agent in America, more particularly in dentifrices. It is a good antiseptic. Methyl Salicylate is better for application to rheumatic patients than the Essence of Wintergreen. In all cases it was applied according to the process, become classic, of 50 to 100 drops poured upon a double fold of aseptic gauze, and covered by an impermeable material, applied for some hours, either to the forearm or to the leg, and renewed twice every twenty-four hours. The part treated with natural essence of Wintergreen was more or less red, painful, and covered sometimes with a rubeoliformic eruption; pure Methyl Salicylate produced no such reaction.—*L.* '98, i. 52.

Dose.—10 to 15 minims every four hours, when given as a substitute for Sodium Salicylate, but the taste is rather pungent.

Prescribing Notes.—When required to be made into an emulsion or pills, the same general rules would apply as for other Essential Oils, *see* 'Mucilago Acaciæ' and 'Pilulæ.'

Foreign Pharmacopœias.—Official in Fr. and U.S.; not in the others.

METHYL SALICYLATE. (*U.S.*).—A colourless or slightly yellowish liquid having the characteristic, strongly aromatic odour, and the sweetish, warm, and aromatic taste of Oil of Gaultheria, with the essential constituent of which it is identical. It is wholly identical with Volatile Oil of Betula.

Tests.—Sp. gr. 1·183 to 1·185 at 15° C. (59° F.). Boiling point, 219° to 221° C.

It is optically inactive. The alcoholic solution is neutral or slightly acid to Litmus paper. If a drop of Methyl Salicylate be shaken with a little water, and a drop of Ferric Chloride (10 p.c.) solution subsequently added, a deep violet colour will be produced. When heated on a water bath, in a flask provided with a suitable condenser, it should yield no distillate having the characteristics of Alcohol or Chloroform. If to 1 c.c. of Methyl Salicylate, contained in a capacious test-tube, 10 c.c. of Sodium Hydrate T.S. (5 p.c.) be added, and the mixture agitated, a bulky, white, crystalline precipitate will be produced; then, if the test-tube, loosely corked, be allowed to stand in boiling water for about five minutes, with occasional agitation, the precipitate should dissolve, and form a clear, colourless or faintly yellowish solution, without the separation of any oily drops, either on the surface or at the bottom of the liquid (absence of other Volatile Oils, or of Petroleum). If the alkaline liquid thus obtained be subsequently diluted with about three times its volume of water, and a slight excess of Hydrochloric Acid added, a white crystalline precipitate will be produced, which, when collected on a filter, washed with a little water, and recrystallised from hot water, should respond to the tests of identity and purity described under Acidum Salicylicum (absence of Methyl Benzoate, etc.).

Note on the production of artificial Oil of Wintergreen.—*A.J.P.* '95, 243.

Note on the Oils of Wintergreen and Birch.—*A.J.P.* '95, 560.

The leaves of the two plants yield a glucoside **Gaultherin**, which decomposes and forms Methyl Salicylate.—*A.J.P.* '95, 14.

SANOFORM (Diiodomethylsalicylate).—Is prepared by the action of Iodine on Methyl Salicylate.

A white crystalline powder almost odourless and tasteless, melting at 110° C. It contains 62·7 p.c. Iodine.

Solubility.—Insoluble in Water and Glycerin; slightly soluble in cold Alcohol (90 p.c.) and readily in Ether.

Introduced as a substitute for Iodoform in the treatment of wounds and ulcers.

SPIRITUS GAULTHERIÆ (*U.S.*).—Oil of Gaultheria 5; Alcohol 95: both by measure: mix.

GELATINUM.

GELATIN.

The air-dried product of the action of boiling Water on such animal tissues as skin, tendons, ligaments, and bones.

Official Preparations.—Used in the preparation of the Lamellæ and Suppositoria Glycerini, p. 320.

Not Official.—Gelatin Basis for Pessaries and Suppositories, Glyco-gelatin and Gelato-glycerin.

Foreign Pharmacopœias.—Official in Austr., Dan., Fr., Hung., Mex., Port., Russ., Swed. and Swiss; not in the others.

Description.—In translucent, almost colourless, sheets or shreds. A solution in 50 parts of hot Water is inodorous, and solidifies to a jelly on cooling. Gelatin is insoluble in Alcohol (90 p.c.) and Ether. It dissolves in Acetic Acid.

These characters apply more particularly to 'French Gelatin,' which is less coloured than that made in this country, although from the point of odour some French samples of fine appearance and great tenacity leave much to be desired.

Commercial Gelatin varies considerably in its gelatinising power, and the following test was given in our last edition.

Place 5 grains of Gelatin in a test-tube (¾ in. diameter) with 250 grains of Water for half an hour, warm gently until dissolved, then place the test tube in water at 60° F., and leave it undisturbed for 30 minutes, by which time a jelly should be formed of such consistence that it will remain in position if the test-tube be inverted.

There is no difficulty in obtaining Gelatin answering this test.

Tests.—Its aqueous solution yields a precipitate with Solution of Tannic Acid, but not with solutions of other acids, nor with Solution of Alum, Solution of Lead Acetate, or test solution of Ferric Chloride.

Not Official.

GELATIN BASIS FOR PESSARIES AND SUPPOSITORIES.—Soften 1 oz. of Gelatin by allowing it to soak in 1 fl. oz. of Water until it is absorbed, then dissolve in 3½ fl. oz. of Glycerin by the heat of a water-bath, and allow it to cool and solidify.

It can be medicated by melting it over a water bath and suspending or dissolving in it substances in fine powder, and then pouring the mixture into moulds.

This formula has appeared in each edition of the *Companion* since 1877.

GLYCO-GELATIN (*T.H.*).—Refined Gelatin, 1 oz.; Glycerin (by weight), 2½ oz.; Ammoniacal Solution of Carmine, a sufficiency; Orange-flower Water, 2½ fl. oz. Soak the Gelatin in the Water for 2 hours, then heat in a water-bath till dissolved; add the Glycerin and stir well together. Let the mixture cool, and when nearly cold add the Carmine Solution; mix till uniformly coloured, and set aside to solidify.

This mass is used for making the various medicated **Pastils**; the various substances are rubbed with an equal quantity of Glycerin, and added to the mass when melted over a water-bath.

GELATO-GLYCERIN (*T.H.*).—Refined Gelatin (by weight), 5 oz.; Glycerin (by weight), 6 oz.; Water (by weight), 6 oz. Soak the Gelatin in the Water for 12 hours, with occasional stirring, add the Glycerin, dissolve in a water-bath, and evaporate to produce 15 oz. by weight of the Gelato-glycerin.

(For preparing Nasal Bougies.)

GELSEMII RADIX.

GELSEMIUM ROOT.

The dried rhizome and roots of *Gelsemium nitidum*.

The plant, Carolina Jasmine, grows in the Southern States of North America.

Medicinal Properties.—Antispasmodic and analgesic. Has been used in dental neuralgia, migraine, and especially in tic douloureux (neuralgia of fifth nerve); also in uterine and ovarian pain; spasmodic and asthmatic cough, and in chorea.

This drug should be used with care, and in the event of toxic symptoms presenting themselves, artificial respiration should be carried on.—*Pr.* li. 50.

Dose.—Not given in B.P.; 5 to 30 grains.

Official Preparation.—Tinctura Gelsemii.

Antidotes.—Emetic of Mustard and Water, Atropine, Morphine, Aromatic Spirit of Ammonia, Brandy, and Digitalis. Artificial respiration should be kept up very steadily for at least three hours.

Foreign Pharmacopœias.—Official in Belg., Dutch, Mex., Span., Swiss and U.S.; not in the others.

Description.—In nearly cylindrical pieces of about six inches (fifteen centimetres) or more in length, and varying usually from one quarter to three-quarters of an inch (six to eighteen millimetres) in thickness; occasionally with fibrous roots attached to them. The fracture is splintery; the transverse section exhibits a thin cortex and a porous yellowish wood which is rendered distinctly radiate by the presence of numerous, conspicuous, straight medullary rays. The rhizome has usually a brown or dark brownish-violet cork often much fissured, is nearly straight, and exhibits silky fibres in the bast; the root is yellowish-brown, finely wrinkled, and somewhat tortuous. Taste bitter; odour slightly aromatic.

The principles upon which the drug depends for its activity are absent, or present only in small quantities, in the stem, so that the admixture of any appreciable amount of stem must correspondingly reduce the value of the drug as a medicine.—*A.J.P.*, '97, 235.

The following constituents of Gelsemium have been described.

Gelsemic Acid is not known to have any medicinal properties, but affords reactions, which to some extent serve as a test for Gelsemium preparations, particularly the blue fluorescence which it produces in alkaline solutions.

Gelsemin.—A name given to a resinoid and eclectic remedy. Dose.—$\frac{1}{2}$ to 2 grains.

Gelsemine.—The crystallisable alkaloid forming crystalline salts, described by Gerrard (*P.J.* (3) xiii. 641) and most unfortunately listed by Merck under the name '**Crystallised Gelseminine.**' Dose.—$\frac{1}{120}$ to $\frac{1}{32}$ grain.

When quite free from Gelseminine, with which all early specimens were probably mixed, **Gelsemine** is stated (*Pr.* li. 38) to be without action on *mammals*, even when injected intravenously up to $\frac{1}{2}$ gramme. Gelseminine, on the other hand, is intensely poisonous, causing a descending paralysis of the central nervous system, $\frac{1}{2}$ grain being the calculated lethal dose for an adult. Applied locally it produces dilatation of the pupil, and it is to the action of this alkaloid, modified by the various acid resins, that the action of Gelsemium Tincture is mainly due.

Gelseminine.—An amorphous alkaloid forming amorphous salts, intensely bitter and poisonous.

Preparations.

TINCTURA GELSEMII. Tincture of Gelsemium. (Altered.)

Gelsemium Root, in No. 40 powder, 1; Alcohol (60 p.c.), a sufficient quantity. Moisten the powder with 1 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 10. =(1 in 10).

For an investigation on alkaloidal estimations of this tincture, *see C.D.* '92, ii. 263. The percentage of alkaloids in the tincture may vary between ·02 and ·076; standardisation, however, according to total alkaloid, without the ratio of the two alkaloids, is not likely to be of much value.

Now 1 in 10 instead of 1 in 8, and Alcohol (60 p.c.) used in place of Proof Spirit.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Belg. and Mex., 1 in 5; Dutch and Swiss, 1 in 10; U.S., 15 in 100: all by weight except U.S.; not in the others.

A girl 9 years old was killed in 2 hours by two fl. drm. of the tincture.

GENTIANÆ RADIX.

GENTIAN ROOT.

The dried rhizome and roots of *Gentiana lutea.*

Collected in the mountainous districts of Central and Southern Europe.

The active principle **Gentiopicrin** is a neutral crystalline body, soluble in Water and diluted Alcohol, insoluble in Ether.

Medicinal Properties.—Bitter tonic; used in cases of atonic dyspepsia; the infusion is recommended in the vomiting of pregnancy, along with a mineral acid, or when a general tonic is required, as in convalescence from acute diseases or in nervous debility.

The Extract has been largely used as an excipient to form powders into pills.

Official Preparations. — Extractum Gentianæ, Infusum Gentianæ Compositum, and Tinctura Gentianæ Composita.

Not Official.—Mistura Gentianæ.

Incompatibles.—Ferrous Sulphate, Silver Nitrate, and Lead salts.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Genziana), Jap., Mex. (Genciana), Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—In nearly cylindrical pieces, entire or longitudinally split, varying in length, but seldom exceeding an inch (two and a-half centimetres) in thickness, yellowish-brown externally, and longitudinally wrinkled. The rhizome bears in addition closely approximated encircling leaf scars, and is frequently terminated by a bud. Gentian Root is tough when slightly moist, but brittle when dried. The fractured surface is of a nearly uniform reddish-yellow colour. The central portion consists principally of parenchymatous tissue, is soft and is not distinctly radiate. The odour is characteristic, the taste is at first slightly sweet but afterwards bitter.

An extensive paper on the Gentians.—*C.D.* '97, ii. 198.

Test.—Gentian Root should not yield any definite reactions with the tests for Starch.

Preparations.

EXTRACTUM GENTIANÆ. EXTRACT OF GENTIAN.

Infuse Gentian Root in ten times its weight of Distilled Water for two hours; boil for fifteen minutes; pour off; press; strain; evaporate the liquid to the consistence of a soft extract.

The yield of Extract may be reckoned as 40 p.c. of the Root.

Dose.—2 to 8 grains.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed. and U.S., with cold water; Hung., with hot water; Swiss, with cold water, and purified with Alcohol; U.S., also **Fluid Extract,** 1 in 1.

INFUSUM GENTIANÆ COMPOSITUM. COMPOUND INFUSION OF GENTIAN.

Gentian Root, thinly sliced, ¼; Dried Bitter Orange Peel, cut small,

½; Fresh Lemon Peel, cut small, ½; Distilled Water, boiling, 20. Infuse in a covered vessel for fifteen minutes; strain. =(1 in 80).

Time reduced from 30 to 15 minutes.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in Fr. (Tisane) Gentian Root 1, cold Water, 200; Swed., similar to Brit.; not in the others.

TINCTURA GENTIANÆ COMPOSITA. Compound Tincture of Gentian. (Altered.)

Gentian Root, cut small and well bruised, 2; Dried Bitter Orange Peel, well bruised, ¾; Cardamom Seeds, bruised, ¼; Alcohol (45 p.c.), 20. Prepare by the maceration process. =(1 in 10).

Now 1 in 10, instead of 1 in 13⅓, and Alcohol (45 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Mex., similar to Brit.; Port., twice as strong as Brit.; U.S., 1 in 10; not in the others; Belg., Dan., Dutch, Fr., Ger., Ital., Jap., Mex., Norw., Port., Russ., Span. and Swiss, have a simple Tincture, 1 in 5; all by weight except U.S.

Not Official.

MISTURA GENTIANÆ.

Gentian Root, sliced, ¼ oz.; Bitter Orange Peel, bruised, 30 grains; Coriander, 30 grains; Alcohol (20 p.c.), 10 fl. oz.; macerate the ingredients in the Alcohol for 24 hours, and strain.

Dose.—½ to 1 fl. oz.

Not Official.

LIQUID GLUCOSE.

As met with in commerce, it is clear, almost colourless, devoid of smell, and resembles in consistence Canada Balsam.

Alone, or mixed with equal parts of Treacle, it forms an excellent excipient for pills.

Official Preparation.

SYRUPUS GLUCOSI. Syrup of Glucose. (New).

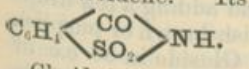
Liquid Glucose, of commerce (by weight), 1; Syrup (by weight), 2; Mix, by the aid of gentle heat.

GLUSIDUM.

GLUSIDE.

B.P.Syn.—Glucusimide.

Gluside, or Benzoyl sulphonimide, is a sweet imide derivable from Toluene. Its constitution is represented by the formula



Gluside is commonly known as 'Saccharin.'

Solubility.—1 in 400 of cold Water; 1 in 28 of boiling Water; 1 in 30 of Alcohol (90 p.c.); 1 in 100 of Ether; 1 in 500 of Chloroform; 1 in 48 of Glycerin.

It is also readily soluble in all alkaline solutions either of Hydrate,

Carbonate, or Bicarbonate, acting the part of an Acid and displacing Carbonic Acid when present. *See* 'Soluble Saccharin.'

Medicinal Properties.—It is used as a substitute for Sugar in diabetes and hepatic diseases and corpulence, and to cover the taste of nauseous drugs; antiseptic in cystitis with decomposing urine. It is eliminated as Saccharin in the urine and saliva.

1 grain sweetens 6 to 8 oz. of fluid.

Dose.—Not given in B.P.; ½ to 2 grains.

Official Preparation.—'Soluble Saccharin.' *See also Not Official.*

Not Official.—Elixir Saccharini and Tabellæ Saccharini, Saccharin Discs.

Foreign Pharmacopœias.—Official in Dan., Fr., Norw. (Saccharinum), Mex. (Sacarina), and Swiss; not in the others.

Description.—A light, white, minutely crystalline powder, having an intensely sweet taste in dilute solutions. When heated it fuses, and then sublimes with partial decomposition.

It is soluble in 400 parts of cold Water, in 24 parts of boiling Water, in 25 parts of Alcohol (90 p.c.), and but slightly in Ether or Chloroform.

It is very soluble in diluted Solution of Ammonia; also in Solution of Sodium Bicarbonate with evolution of Carbonic Anhydride. A warm solution of Sodium Bicarbonate, when neutralised with Gluside and evaporated to dryness, yields 'Soluble Gluside' or 'Soluble Saccharin,' which is very soluble in Water, 100 parts of Gluside yielding nearly 113 parts of neutral 'Soluble Gluside.'

The sweet taste is perceptible in solutions up to 1 in 100,000 of Water.

Although in the *B.P.* the formula $C_6H_4CO.SO_2.NH.$ is attached to the synonym Benzoyl sulphonimide, it is not to be inferred that commercial Saccharin is sufficiently pure to allow of its representation by this or any other formula.

Dr. Fahlberg, the discoverer and patentee, has admitted (*P.J.* (3) xx. 501) that commercial Saccharin is not a pure product, but is 'standardised' to 300 times the sweetening power of Cane Sugar, the pure chemical (Saccharin puriss.) being equal to 500 times its weight of Sugar. Both in this country and on the Continent, however, a considerably lower value is generally assigned to it. The proportion of impurity may be estimated by treatment with Acetone, in which the pure salt is completely soluble.

Tests.—Neither Gluside nor Soluble Gluside is blackened by Sulphuric Acid, even when the mixture is gently warmed for a short time (absence of Sugar, etc.). On evaporating either variety with excess of Solution of Potassium Hydroxide, maintaining the residue in a state of semi-fusion for a few minutes, cooling, dissolving in Water, faintly acidulating with Hydrochloric Acid, and adding a few drops of Test-solution of Ferric Chloride, a reddish-brown or purplish colour is produced. A solution of ·5 gramme of Gluside in 80 c.c. of warm Water, set aside for twelve hours, deposits tabular crystals which melt between 426° F. and 428° F. (218·8° C. and 220° C.), and it should not, even when briskly shaken, deposit crystals melting at a higher temperature (absence of Sulphamido-benzoic Acid).

The melting-point of pure Benzoic Sulphinide is 224° C., and, although that of

commercial Saccharin is generally 8° or 10° lower, commercial samples can be obtained which melt at the former temperature.—*P.J.* '96, ii. 145; *B.M.J.* '95, i. 874.

Fr. Codex Supp. gives the melting-point as 224° C.

Orthobenzoicsulphinide (commercial Saccharin) is put on the market as a white micro-crystalline powder containing a considerable proportion of Parasulphaminebenzoic Acid. It was purified by solution in Acetone, for the purpose of studying its crystallography.—*J.C.S. Trans.* '95, 985.

Not Official.

SACCHARINUM SOLUBILE ('**SOLUBLE GLUSIDE**').—A soluble Sodium Saccharinate, containing about 90 p.c. of Saccharin. It is much more palatable than ordinary Saccharin, which leaves a disagreeable after-taste.

This powder is soluble 1 in 15 of Water.

ELIXIR SACCHARINI (*B.P.C.*).—Saccharin, 480 grains; Sodium Bicarbonate, 240 grains; Alcohol (90 p.c.) 2½ fl. oz.; Distilled Water to make 20 fl. oz. Dissolve the Saccharin and Sodium Bicarbonate in 10 fl. oz. of the Water, add the Alcohol, filter, and wash the filter with Water to make 20 fl. oz. Each fluid drachm contains 3 grains of Saccharin.

Dose.—5 to 20 minims.

TABELLÆ SACCHARINI (**SACCHARIN DISCS**).—Contain ½ grain Saccharin in each. Should be readily soluble in Water and should not contain Starch or Sugar.

GLYCERINUM.

GLYCERIN.

Glycerin, or Glycerol, is a Trihydric Alcohol, $C_3H_5(HO)_3$, eq. 91·37, associated with a small percentage of Water; it is obtained by the interaction of alkalis, or of superheated steam, with fats and fixed oils.

Glycerin is always produced during the alcoholic fermentation of Sugar to the extent of 3 p.c. of the Sugar employed, and consequently is present in all fermented liquids.

Solubility.—Mixes in all proportions with Water and Alcohol, but insoluble in Chloroform, Ether, and Oils.

It possesses great powers as a solvent, and is an excellent excipient for many medicinal substances.

Medicinal Properties.—Undiluted it is an irritant, but when sufficiently diluted with aqueous menstrua it is said to be emollient. It is a mild laxative. Internally it is given in irritating cough, and is recommended as a **rectal injection** for constipation, 1 to 2 drm., or the same diluted with an equal quantity of Water, produces an evacuation very soon after the injection; also combined with Gelatin or Cocoa-nut Stearin to form a **suppository** for the same purpose. It is useful in fermentative dyspepsia, when taken in 1 or 2 drm. doses, and does not hinder digestion.—*L.* '80, ii. 6; '96, ii. 25. It is much employed as a sweetening agent in the place of Syrup, and is largely used in pharmaceutical preparations as a solvent, and being an antiseptic, it also acts as a preservative.

Externally in skin diseases, as pityriasis, eczema, psoriasis, prurigo, and lichen. Used for chilblains and chapped hands, and dryness of the skin or mucous membranes, but it should be diluted with three

parts of water for these purposes. Used in poultices ($\frac{1}{14}$ or $\frac{1}{16}$), it keeps them soft for a long time.

Dose.—1 to 2 fl. drm.

Smaller doses are usually prescribed.

Official Preparation.—Suppositoria Glycerini. Used in the preparation of Extractum Cinchonæ Liquidum, Extractum Sarsæ Liquidum, of all the Glycerina and Lamellæ, Linimentum Potasii Iodidi cum Sapone, Mel Boracis, Pilula Ferri, Pilula Quininæ Sulphatis, Tinctura Kino, Unguentum Iodi, and Unguentum Sulphuris Iodidi.

Not Official.—Dispensing Syrup, Glycerin and Rose Water, Suppositoria Glycerini cum Stearino.

Foreign Pharmacopœias.—Official in Austr. and U.S., sp. gr. 1·250; Belg., sp. gr. 1·240; Dan., Ger., Hung., Norw. and Russ., sp. gr. 1·225—1·235; Dutch, Norw. and Swed., sp. gr. 1·230 to 1·250; Fr., sp. gr. 1·242; Ital., sp. gr. 1·269, also 1·234; Jap., 1·230—1·260; Mex., Port., and Span., sp. gr. 1·260; Swiss, sp. gr. 1·230—1·235.

Description.—A clear, colourless, syrupy liquid, of a sweet taste; inodorous, miscible with Water and Alcohol (90 p.c.); neutral to Litmus; insoluble in Ether, Chloroform, and Fixed Oils. It absorbs moisture when exposed to the air. When decomposed by heat it evolves intensely irritating vapours.

Glycerin is scarcely volatile at the temperature of a water-bath, and cannot be distilled without decomposition except in a current of steam.

Crystallised Glycerin.—*Analyst* '95, 131.

Occurrence of Trimethylene Glycol in Glycerin.—*A.J.P.* '95, 633; *Analyst* '96, 45.

Tests.—Sp. gr. 1·260. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Calcium, Potassium, Sodium, Ammonium, Chlorides, or Sulphates; and no red precipitate with excess of Solution of Potassio-cupric Tartrate on boiling, even when previously acidified and boiled (absence of grape and cane sugars). It should undergo no darkening in colour at ordinary temperatures when mixed with an equal volume of Solution of Ammonia and a few drops of Solution of Silver Nitrate; and when shaken with an equal volume of Sulphuric Acid, the mixture being kept cool, no colouration, or only a very slight straw colouration, should result (absence of foreign organic matter). When gently heated with a mixture, in equal volumes, of Alcohol (90 p.c.) and Diluted Sulphuric Acid, a fruity odour should not be produced (absence of Butyric Acid). 2 c.c. diluted with 5 c.c. of a mixture of 1 part of Hydrochloric Acid and 7 parts of Water, 1 gramme of pure Zinc being added, and the whole placed in a long test-tube, the mouth of which is covered by a piece of filter paper moistened with a drop or two of Test-solution of Mercuric Chloride and dried, should not afford a yellow stain on the paper even after 15 minutes (limit of Arsenium). When heated in an open capsule it yields acrid vapours, and is finally dissipated, leaving no ash (absence of fixed mineral matter).

Preparations.

SUPPOSITORIA GLYCERINI. Glycerin Suppositories.

Gelatin, cut small, ½; Glycerin (by weight), 2½; Distilled Water, a

sufficient quantity. Place the Gelatin in a weighed evaporating dish with sufficient Distilled Water to cover it; let it stand for two minutes; pour off the excess of Distilled Water; set aside until the Gelatin is quite soft; add the Glycerin. Dissolve over a Water Bath; evaporate until the mixture weighs 1563 grains. Pour the product into suppository moulds having capacities equal to 30, 60, or 120 grains of the Suppository, or of such other capacities as may be required.

Each suppository contains 70 p.c. of Glycerin.

A similar preparation has been in use for many years (*Companion*, 1877) as a basis for medicated Pessaries and Suppositories. The formula in the *Companion* arrives at the same result (70 p.c.) *without* evaporation. It is easy by evaporation to obtain a product containing 80 p.c. of Glycerin. The consistency of the mass will vary somewhat with the quality of the Gelatin, *see* p. 314.

Glycerin Suppositories are much more convenient to use when made with **Cocoa-nut Stearin**, *see below*.

GLYCERINUM ACIDI BORICI.
GLYCERINUM ACIDI CARBOLICI.
GLYCERINUM ACIDI TANNICI.
GLYCERINUM ALUMINIS.
GLYCERINUM AMYLI.
GLYCERINUM BORACIS.
GLYCERINUM PEPSINI.
GLYCERINUM PLUMBI SUBACETATIS.
GLYCERINUM TRAGACANTHÆ.

The formulas for these are given under the several names quoted.

Not Official.

DISPENSING SYRUP.—Glycerin, Syrup, Alcohol (90 p.c.), and Mucilage of Acacia, equal volumes.

An **excipient for pills.** Glycerin by itself is too hygroscopic.

GLYCERIN WITH ROSE WATER.—Glycerin, 1; Rose Water, 3: mix.

SUPPOSITORIA GLYCERINI C. STEARINO.—Glycerin, 20 grains; Cocoa-nut Stearin, 40 grains; melt the Stearin, and when just fluid stir in the Glycerin and continue the stirring until the mixture becomes solid. Melt the mass with the least possible heat, and pour into moulds.

They can be used without any lubricant.

UNGUENTUM GLYCERINI.—*See* GLYCERINUM AMYLI.

GLYCYRRHIZÆ RADIX.

LIQUORICE ROOT.

The peeled root and peeled subterranean stem of *Glycyrrhiza glabra*, and other species.

The principle **Glycyrrhizin** is comparatively tasteless, the characteristic sweetness being only developed by combination with alkali. It exists in the drug as a combination with Ammonium.—*P.J.* (3) vi. 54.

Medicinal Properties.—A demulcent and expectorant in bronchial catarrh and cough. The **liquid extract** helps to disguise the taste of nauseous medicines. In the form of **extract** and its solution

it is a domestic remedy for cough. The **compound powder** is chiefly valuable on account of the senna and sulphur it contains, and is an agreeable and mild purgative, well adapted for weak persons and in cases of hæmorrhoids.

Official Preparations of Liquorice.—Of the **Root**, Extractum Glycyrrhizæ, Extractum Glycyrrhizæ Liquidum, Liquor Sarsæ Compositus Concentratus, Pilula Hydrargyri and Pulvis Glycyrrhizæ Compositus; of the **Extract**, Confectio Sennæ and Decoctum Aloes Compositum; of the **Liquid Extract**, Mistura Sennæ Composita, and Tinctura Aloes.

Not Official.—Elixir e Succo Glycyrrhizæ, *seu* Elixir Pectorale and Glycyrrhizinum Ammoniatum.

Foreign Pharmacopœias.—Official in all the Pharmacopœias; Belg., Dutch, Fr. (Réglisse), Ital. (Liquirizia), Jap. (Liquiritia), Mex. (Orozuz), Port. (Alcaçus), Span. (Regaliz), Swiss, and U.S., *G. glabra;* Russ., *G. echinata;* Austr., Dan., Ger., Hung., Norw. and Swed., both.

Description.—In long, nearly cylindrical pieces, before being peeled, dark brown in colour and longitudinally wrinkled, but not scaly; when peeled, yellow, with a nearly smooth fibrous surface. The fracture is coarsely fibrous. A transverse section exhibits a porous distinctly radiate yellow wood and a thick cortex with groups of bast fibres arranged in radial lines. It has a faint odour and a characteristic sweet taste, free from bitterness.

An exhaustive analysis of Anatolian Liquorice Root.—*A.J.P.* '95, 307.

Preparations.

EXTRACTUM GLYCYRRHIZÆ. Extract of Liquorice.

Liquorice Root, in No. 20 powder, 16; Distilled Water, 80: mix the Liquorice Root with 40 of the Distilled Water; set aside for twenty-four hours; strain; press; to the pressed marc add the remainder of the Distilled Water and set aside the mixture for six hours; strain; press; mix the strained liquors; heat to 212° F. (100° C.), strain through flannel, evaporate to the consistence of a soft extract.

Dose.—Not given in B.P.; 5 to 30 grains.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr. (Ext. Réglisse), Hung., Ital., Jap., Mex., Port., Russ. and Span., from root with cold water; Dutch and U.S., from root with Water and Ammonia. The **Crude Extract** in sticks (*Succus Liquiritiæ*) is Official in Austr., Dan., Dutch, Fr., Ger., Hung., Ital., Norw., Russ., Swed., Swiss and U.S.; **Depuratum** from Crude Extract is Official in Austr., Belg., Dan., Ger., Hung., Norw., Swed. and Swiss.

An examination of some commercial Extracts.—*Analyst* '97, 220; *A.J.P.* '98, 23.

EXTRACTUM GLYCYRRHIZÆ LIQUIDUM. Liquid Extract of Liquorice. (Altered.)

Liquorice Root, in No. 20 powder, 20; Distilled Water, 100; Alcohol (90 p.c.), a sufficient quantity. Mix the Liquorice Root with 50 of the Distilled Water; set aside for twenty-four hours; strain; press; to the pressed marc add the remainder of the Distilled Water and set aside for six hours; strain; press; mix the strained liquids; heat to 212° F. (100° C.); strain through flannel; evaporate until the fluid

has acquired, when cold, a sp. gr. of 1·200; add to this one-fourth of its volume of the Alcohol; let the mixture stand for twelve hours; filter.

Alcohol (90 p.c.) now used in place of Rectified Spirit, which has been increased from $\frac{1}{6}$ to $\frac{1}{4}$.

Dose.—$\frac{1}{2}$ to 1 fl. drm.

The finished product is usually acid. Ammonia may be used for preserving the sweet principle, but not for extracting it. So long as the alkalinity is maintained there is no falling of the dirty-looking deposit which is often seen at the bottom of the fluid extract of Liquorice bottle.—*P.J.* '98, i. 188.

Foreign Pharmacopœias.—Mex., Ammonia and Alcohol; U.S., Liquorice Root percolated with a mixture of Ammonia Water and diluted Alcohol.

PULVIS GLYCYRRHIZÆ COMPOSITUS. Compound Powder of Liquorice.

N.O.Syn.—Pulvis Liquiritiæ Compositus, Pulvis Pectoralis Kurellæ.

Senna, in fine powder, Liquorice Root, in fine powder, of each 2; Fennel Fruit in fine powder, Sublimed Sulphur, of each 1; Refined Sugar, in powder, 6. Mix.

Dose.—60 to 120 grains.

A teaspoonful or more for adults, less in proportion for children, as a mild aperient.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Ger., Mex., Russ., and Swiss, formula the same; Belg., Norw. and U.S., almost the same; not in the others.

This preparation made with exhausted Liquorice.—*C.D.* '95, ii. 797.

Not Official.

ELIXIR E SUCCO GLYCYRRHIZÆ, *seu* **ELIXIR PECTORALE,** Dan., Ger., Russ. and Swiss.—Purified Extract of Liquorice, 1; Fennel Water, 3; Anisated Liquid Ammonia (p. 86), 1 (all by weight): mix.

GLYCYRRHIZINUM AMMONIATUM, Fr. and U.S.—A scale preparation made by treating Liquorice Root with Water and Water of Ammonia, and adding Sulphuric Acid to the liquor so long as a precipitate is produced; collect this and wash it with cold Water; redissolve in Dilute Ammonia and spread on glass plates to dry.

An elegant substitute for Liquorice in mixtures which are neither acid nor alkaline.

GOA POWDER.—*See* Araroba.

GOSSYPIUM.

COTTON.

B.P.Syn.—Cotton-wool.

The hairs of the seed of *Gossypium Barbadense*, and of other species of Gossypium, freed from fatty matter.

Cotton wool is medicated with Carbolic Acid, Salicylic Acid, Boric Acid, Eucalyptol, Thymol, Arnica, Glycerin, Iron salts, Mercuric Chloride, Sal Alembroth, Iodine, Iodoform and other substances.

Official Preparation.—Used in the preparation of Pyroxylin.

Foreign Pharmacopœias.—Dutch, Ger., Jap., and Russ., Gossypium Depuratum; Ital., Cotone Assorbente; Mex., Algodon and Algodon hydrofilo; Port., Algo-

doeiro; Span., Algodon; U.S.; Fr., Coton, not washed; not in the others. Medicated Cottons have been inserted in Dutch and Mex.

Description.—In long white soft filaments, each consisting of an elongated cell, appearing, when seen under the microscope, as a flattened twisted band with slightly thickened rounded edges; inodorous and tasteless.

Tests.—It should readily be wetted by Water, to which it should not impart either an alkaline or an acid reaction. On incineration in air it burns leaving less than 1 p.c. of ash. It dissolves in concentrated Solution of Copper Ammonio-Sulphate.

Mouth and Nose Protector.—For use in poisonous and injurious trades. We exhibited this respirator at the International Health Exhibition (1884), and obtained for it a bronze medal. It consists of layers of washed and sterilised cotton wool placed between perforated zinc and perforated cardboard, formed into a pliable respirator which covers the mouth and nose.

Not Official.

GOSSYPII RADICIS CORTEX.

The bark of the root of *Gossypium herbaceum*, and of other species of Gossypium.

Medicinal Properties.—The Tincture and Fluid Extract have been used in America and occasionally in Europe as a substitute for Ergot in labour and to check metrorrhagia.—*L.* '94, ii. 1298.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Preparations.

TINCTURA GOSSYPII.—Dried bark of the root of the cotton plant in powder, 1; percolate with sufficient Alcohol (60 p.c.) to produce 4.

Dose.—1 fl. drm.

EXTRACTUM GOSSYPII FLUIDUM (U.S.), 1 in 1, made with Glycerin and Alcohol.

GRANATI CORTEX.

POMEGRANATE BARK.

The dried bark of the stem and root of *Punica Granatum*.

Medicinal Properties.—Astringent and anthelmintic. It is considered effective in expelling tapeworm; the dose should be preceded by a purgative. The Pelletierine salts are used for the same purpose.

Incompatibles.—Alkalis, Lime Water, Metallic salts, Gelatin.

Official Preparation.—Decoctum Granati Corticis.

Not Official.—Extractum Granati, Pelletierinæ Sulphas, and Pelletierinæ Tannas.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Jap., Fr. (Grenadier), Ger., Hung., Ital. (Melograna to), Port. (Romeira), Mex., Russ. and Span. (Granado), Swiss and U.S. Not in Norw. or Swed.

Description.—Usually in irregular curved or channelled pieces varying from two to four inches (half to one decimetre) in length, and from half an inch to one inch (twelve to twenty-five millimetres) in

width. The outer surface of the root-bark is rough, yellowish-grey, and marked with irregular conchoidal depressions, the stem-bark being smoother and frequently bearing minute lichens; the inner surface is yellow, more or less tinged with brown. The fracture is short, the fractured surface pale in colour. The transverse section exhibits numerous fine radial and tangential lines. The bark has an astringent, very slightly bitter taste, but no odour.

Recent examination has shown that alkaloids in stem bark do not often exceed ·5 p.c. (*P.J.* (3) xviii. 822); but that the root-bark may vary from 1·7 in the black-flowered variety to 2·4 in the red-flowered, and 3·7 in the white.—*P.J.* (3) xxi. 379.

It is said to lose active properties and become inert on keeping, but this is contradicted by De Vrij, who made a very efficient extract from a root-bark eleven years old.—*Y.B.P.* '74, 505; *P.J.* (3) xxi. 758.

The Pomegranate-root alkaloids are Pelletierine (Punicine), Isopelletierine (Isopunicine), Methylpelletierine (Methylpunicine), and Pseudopelletierine (Pseudopunicine). The first two constitute the **Pelletierine** of medicine, the last two are inactive.—*Merck.*

Pelletierine is a volatile liquid, but forms stable salts.

Preparation.

DECOCTUM GRANATI CORTICIS. Decoction of Pomegranate Bark. (Altered.)

Pomegranate Bark, in No. 10 powder, 4; Distilled Water, a sufficient quantity. Boil the Pomegranate Bark with 24 of Distilled Water in a suitable vessel for ten minutes; strain; pour enough Distilled Water over the contents of the strainer to make 20 of the strained Decoction. =(1 in 10).

Twice the strength of B.P. 1885.

Dose.—½ to 2 fl. oz.

Foreign Pharmacopœias.—Official in Belg., 1 and 6, boil to 4; Fr. (Apozème), 1 and 12½, boil to 9; Port. 1, and 7½, boil to 5; Span., 1 in 8; not in the others.

Not Official.

An excellent remedy for tapeworm is as follows:—

Bruised Root-bark of Pomegranate, 2 oz; Boiling Water, 24 fl. oz.: macerate for 24 hours, and then boil till reduced to 18 fl. oz. A third part early in the morning, a third part again in half an hour, and the remainder in another half-hour. A dose of Castor Oil should have been taken the previous morning, and solid food abstained from on that day. This rarely fails to bring away the entire worm in two hours, and the head at the thinnest end should be diligently sought for.

EXTRACTUM GRANATI.—Exhaust Pomegranate Root-bark with Alcohol (60 p.c.), distil off the Alcohol and evaporate to the consistence of an Extract.

10 of Root Bark yield 3½ of Extract.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Fr., Hung., Port., Russ. and Span.; not in the others.

PELLETIERINÆ SULPHAS.—A viscid liquid.

Dose.—6 grains prescribed with 7 grains of Tannic Acid.

PELLETIERINÆ TANNAS.—A yellowish amorphous powder prepared from Pomegranate Bark. Soluble 1 in about 700 of Water, 1 in 80 of Alcohol.

It is given as a remedy for tapeworm.

Dose.—5 to 8 grains followed by Castor Oil.

Not Official.

GRINDELIA.

The leaves and flowering tops of *Grindelia robusta* and *Grindelia squarrosa* from California.

The drug as imported into this country is not *G. robusta*, but *G. squarrosa*, but it is quite equal to that species in the amount of resin it contains, and indeed appears to be one of the richest in medicinal properties of the whole genus.—*P. J.*, (3) viii. 787.

There is no evidence connecting any one of the chemical constituents with the medicinal action of the drug.

Medicinal Properties.—Antispasmodic, expectorant, slightly diuretic. Has been recommended in asthma, hay fever, bronchitis, whooping-cough, laryngismus stridulus, and cystitis.—*M.A.* '95, 30.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Preparations.

EXTRACTUM GRINDELIÆ.—An Alcohol (90 p.c.) percolate, distilled and evaporated to an Extract. 100 of Grindelia yield 15 of Extract.

Dose.—3 grains three times a day.

EXTRACTUM GRINDELIÆ LIQUIDUM (*B.P.C.*).—Grindelia, in No. 20 powder, 20; percolate with Rectified Spirit, reserve the first 17, distil off the Spirit from the remainder, and evaporate to a soft extract, dissolve this in the reserved portion, and add enough Rectified Spirit to make 20.

This is the U.S. P. process, which, however, uses a somewhat stronger Alcohol.

Dose.—10 to 20 minims every half-hour until relief is obtained.

GUAIACI LIGNUM.

GUAIACUM WOOD.

The heart-wood of *Guaiacum officinale*, or of *Guaiacum sanctum*.

Imported from St. Domingo and Jamaica.

Medicinal Properties.—*See* 'Guaiaci Resina.'

Foreign Pharmacopœias.—Official in all except Dan., Dutch and Hung.

Description.—Guaiacum Wood is dark greenish-brown in colour, dense, hard, and heavier than Water. Its taste when chewed is acrid, and when heated its odour is somewhat aromatic.

Yields about 26 p.c. of resin.

Test.—The alcoholic tincture assumes a blue colour on the addition of diluted Test-solution of Ferric Chloride.

GUAIACI RESINA.

GUAIACUM RESIN.

The resin obtained from the stem of *Guaiacum officinale*, or of *Guaiacum sanctum*.

On dry distillation it yields **Guaiacol** similar to that found in Creosote.

Solubility.—About 90 p.c. is soluble in Absolute Alcohol, Ether, Chloroform, Aromatic Spirit of Ammonia, and Alkaline solutions; almost insoluble in Petroleum Spirit.

Medicinal Properties.—Stimulant, diaphoretic, and alterative. It is employed in chronic forms of rheumatism and gout, especially in old people. It is useful in acute tonsillitis, also in dysmenorrhœa, amenorrhœa, and syphilitic affections.

Generally prescribed in combination with other medicines.

Guaiacum is innocuous, and might be taken for an indefinite period of time, and looked upon as a condiment rather than as a drug, as harmless as Ginger or any other condiment. Guaiacum possesses a considerable power, but less than Colchicum, in directly relieving patients suffering from gouty inflammation of any part; it might be given whenever there was but little fever. Guaiacum taken in the intervals of gouty attacks has a considerable power of averting their recurrence; in fact, it is a very powerful prophylactic. Guaiacum does not appear to lose its prophylactic power by long continued use.—*L.* '96, i. 1494; *B.M.J.* '96, ii. 1325.

Dose.—5 to 15 grains.

Prescribing Notes.—Tragacanth is better for Guaiacum in powder, Mucilage of Acacia is best for the Ammoniated Tincture. Mucilage of Acacia, ½ fl. oz.; Ammoniated Tincture, 6 fl. drm.; Water to 6 fl. oz.

Incompatibles.—Mineral Acids, Spirit of Nitrous Ether.

Official Preparations.—Of the **Wood**, used in the preparation of Liquor Sarsæ Compositus Concentratus; of the **Resin**, Mistura Guaiaci, Tinctura Guaiaci Ammoniata, Trochiscus Guaiaci Resinæ; used in the preparation of Pilula Hydrargyri Subchloridi Composita.

Not Official.—Tinctura Guaiaci, and Trochiscus Guaiaci.—*T.H.*

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr. (Gayac Resine), Hung., Ital., Jap. and Norw. (Resina Guajaci), Mex. (Resina de Guayacan), Port., Russ., Span., Swed., Swiss and U.S.; not in Dutch or Ger.

Description.—Usually in large masses, but sometimes in more or less rounded tears. It is brittle, breaking with a clean glassy fracture; thin splinters are transparent, and vary in colour from yellowish-green to reddish-brown. The powder is greyish, but by exposure to light and air becomes green.

Impurities in good block Resin, insoluble in Alcohol, amount to 2·9 to 10 p.c.—*P.J.* '98, i. 508.

Tests.—When warmed the odour is somewhat balsamic, the taste slightly acrid. A solution in Alcohol (90 p.c.) assumes a blue colour on the addition of diluted Test-solution of Ferric Chloride.

When paper moistened with the solution is exposed to the fumes of Nitric Acid it becomes blue.

The blue colour produced by the addition of Ferric Chloride to a solution or mixture containing Guaiacum may be shaken out with Chloroform. This test is very delicate.

An inclusion of the acid-number is an actual necessity owing to the frequent adulteration of this resin with Colophony. Proposed limits, for crude lump 90 to 95, for alcohol purified resin 90 to 100, natural tears 70 to 75. It should also be free from ash.—*C.D.* '98, ii. 130.

Preparations.

MISTURA GUAIACI. Guaiacum Mixture. (Altered.)

Guaiacum Resin, ½ oz.; Refined Sugar, ½ oz.; Tragacanth in powder, 35 grains; Cinnamon Water, 20 fl. oz. Triturate the Guaiacum

Resin with the Refined Sugar and the Tragacanth; add gradually the Cinnamon Water. =(1 in 40).

Tragacanth now used instead of Gum Acacia. As stated in previous editions of the *Companion*, not only does Tragacanth give a more diffusib e mixture but the colour does not change so rapidly, nor to the same extent as it does when Acacia is used.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in Swed. (Emulsio Guaiaci) 1 in 25 with Peppermint Water. Not in the others.

TINCTURA GUAIACI AMMONIATA. Ammoniated Tincture of Guaiacum. (Altered.)

Guaiacum Resin, in powder, 4 oz.; Oil of Nutmeg, 30 minims; Oil of Lemon, 20 minims; Strong Solution of Ammonia, 1½ fl. oz.; Alcohol (90 p.c.) a sufficient quantity. Mix the Strong Solution of Ammonia with 16 fl. oz. of the Alcohol; add the Guaiacum Resin; set aside in a closed vessel for forty-eight hours, shaking frequently; filter; dissolve the Oil of Lemon and Oil of Nutmeg in the filtrate, and pass sufficient Alcohol through the filter to produce 20 fl. oz. of the Tincture. =(1 in 5).

Oils of Nutmeg and Lemon, Strong Solution of Ammonia and Alcohol (90 p.c.) now used in place of Spiritus Ammoniæ Aromaticus.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in U.S., similar to Brit.; Norw. and Swed., Guaiacum Resin 3, Aqua Ammoniæ (sp. gr. ·960) 5, and Spirit 10; Port., Guaiacum Resin 3, Liquid Ammonia (sp. gr. ·916) 3, Spirit 14; by weight; not in the others.

TROCHISCUS GUAIACI RESINÆ. Guaiacum Resin Lozenge. (New.)

Guaiacum Resin, 3 grains; mix with the Fruit Basis to form a Lozenge.

Not Official.

TINCTURA GUAIACI.—Guaiacum Resin, 1; Alcohol (90 p.c.), 5: digest seven days.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Hung., Russ., Span. and U.S. (Resin) 1 in 5; Belg., Jap., Port., Span. and Swiss (Wood) 1 in 5: all by weight except U.S.; not in the others.

Along with Ozonic Ether it is employed as a test for the presence of blood.

TROCHISCUS GUAIACI (*T.H.*).—Made with Black Currant Paste. Each lozenge contains 2 grains of Guaiacum Resin.

Not Official.

GUAIACOL.

A colourless liquid obtained by fractional distillation of Wood Creosote. It can also be obtained from Guaiacum Resin.

Solubility.—About 1 in 80 of water; mixes in all proportions with Alcohol (90 p.c.), Ether, Glycerin, and the fixed Oils (Almond and Olive).

Medicinal Properties.—Used in febrile diseases, phthisis, erysipelas, neuralgia,

painful rheumatic joint affections, sciatica, orchitis, and pleurisy. Disadvantages from continued use are great exhaustion and profuse diaphoresis. Applied externally is antipyretic and analgesic. It has been used in the place of Creosote in the internal treatment of phthisis, in which it is better tolerated than Creosote. Also given in Olive Oil as an intralaryngeal injection.—*B.M.J.* '95, i. 24; '96, i. 586; '96, ii. 1715; *B.M.J.E.* '95, ii. 27, 36, 56, 103; '97, i. 63; *L.* '95, i. 429, 817, 1452; '97, ii. 1649; '98, i. 993; *T.G.* '96, 333, 337, 365, 390; *P.J.* '95, ii. 134, 168, 363, 471.

Hypodermic injection of Guaiacol (undiluted) in phthisis.—*B.M.J.* '96, i. 586.

External application of Guaiacol (undiluted) for the reduction of temperature in typhoid fever.—*T.G.* '96, 365.

Submucous injections in laryngeal tuberculosis.—*L.* '97, ii. 1649.

Administration of large doses (60 minims) in phthisis without toxic effects.—*L.* '98, i. 993.

Dose.—1 to 5 minims.

Prescribing Notes.—It is generally given (mixed with Almond Oil) in **capsules.**

Foreign Pharmacopœias.—Official in Ital., Fr. (Gaiacol), Russ., and Swiss; not in the others.

Tests.—Sp. gr. 1·116 to 1·120. Distils about 200° C. Should leave no residue on evaporation. The addition of a drop of Test-solution of Ferric Chloride to a 5 p.c. solution of Guaiacol in Alcohol (90 p.c.) produces a blue colour fading to green. When shaken with twice its volume of Petroleum Ether, the mixture separates into two clear liquids on standing.

Determination by demethylation.—*Analyst* '97, 245.

A reaction with Solution of Copper Sulphate and Potassium Cyanide, distinguishing between Creosote and Guaiacol.—*Analyst* '98, 99.

GUAIACOL (synthetic).—A crystalline substance which melts at about 28° C. (82·4° F.), but frequently remains liquid much below this temperature. It is said to yield more uniform results than the ordinary medicinal liquid Guaiacol, which is not so definite in composition. Soluble 1 in 50 of Water.

Dose.—1 to 5 grains.

GUAIACOL CARBONATE (**Duotal**).—A white crystalline powder. Insoluble in water; soluble about 1 in 70 of Alcohol (90 p.c.), inodorous and tasteless. It is not acted upon by caustic alkalis.

Recommended as a non-irritating form of administrating Guaiacol in phthisis.—*B.M.J.E.* '92, i. 8; '92, ii. 83; '95, i. 8; *L.* '96, ii. 1374; '98, i. 222, 960.

Dose.—3 to 10 grains, which may be gradually increased to 60 grains.

GUAIACOL BENZOATE (**Benzosol**).—A white crystalline powder having an aromatic taste and odour. Almost insoluble in water. Melts at 50° to 52° C. A non-irritating form of Guaiacol, which has been recommended in phthisis and in diabetes.—*M.P.* '94, i. 269; *L.* '96, ii. 551; *P.J.* '96, ii. 59.

Dose.—5 to 10 grains; usually given in **cachets.**

GUAIACOL VALERIANATE (**Geosote**).—A yellowish, oily liquid. Almost insoluble in water. Has been used in the treatment of tuberculosis, of bronchial affections, and in diarrhœa.—*L.* '97, ii. 932; *B.M.J.E.* '98, i. 75; *P.J.* '97, i. 425.

Dose.—2 to 3 minims or more.

Not Official.

GUARANA.

The Seeds of *Paullinia Cupana* dried in the sun, and then roasted and reduced to a fine powder; this is moistened with a little Water, exposed to the night dew, and when it has become a hard paste is rolled into cylinders; these are further dried in the sun or in the chimneys of the huts. It is exported from Brazil.

True Guarana is very hard, heavy, and, when powdered, is reddish-grey, whilst the sophisticated is much lighter in colour; it contains about 4 p.c. of an alkaloid generally considered to be identical with Caffeine, but producing modified physiological effects.

Medicinal Properties.—Nervine tonic. It is used chiefly for curing sick headache, but is also useful in diarrhœa, dysentery, and as a tonic and stomachic in convalescence.

Dose.—30 to 60 grains infused in boiling water and sweetened, and repeated if necessary in 2 hours.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr., Hung., Ital., Mex., Port., Span., Swiss and U.S.; not in the others.

Preparations.

ELIXIR GUARANÆ (*B.P.C.*).—Guarana, in No. 60 powder, 4 oz.; Light Magnesia, ½ oz.; Oil of Cinnamon, 6 minims; Syrup, 2 fl. oz.; Proof Spirit, a sufficiency. Mix the powders and moisten them with 3 fl. oz. Proof Spirit; after 24 hours, mix with 8 oz. of coarse Sand and percolate with Proof Spirit until 16 fl. oz. are obtained, then press. To the percolate add the Syrup and Oil of Cinnamon, and make up to 20 fl. oz. with expressed liquid previously reduced by evaporation if necessary.

Dose.—30 to 120 minims.

To ascertain the effect of the Magnesia and Sand in percolating Guarana, three quantities were taken and percolated 1 to 4 with Proof Spirit, and tested for total extractive and alkaloid.

I. Guarana alone in impalpable powder.
II. The above with the addition of ⅛ Light Magnesia.
III. No. 2 with 2 parts of Sand mixed in after maceration.

RESULT.	I.	II.	III.
Per cent. of Extract in Proof Spirit percolate	6·93	3·08	2·9
Per cent. of Alkaloid in Proof Spirit Extract .	13·4	40·0	38·6
Per cent. of Alkaloid extracted from Guarana .	3·72	4·92	4·48

From this it would appear that if Guarana is prescribed as a substitute for Caffeine, the Magnesia treatment is rather an advantage; but in all other cases where the astringent extractive may be supposed to take part in the curative effect, the use of Magnesia is strongly contra-indicated. As pointed out (*P.J.* (3) xviii. 348) the addition of Sand is scarcely an advantage.

EXTRACTUM GUARANÆ FLUIDUM (U.S.).—1 equals 1 of Guarana; made with Alcohol (94 p.c.), 3; Water, 1.

TINCTURA GUARANÆ.—Guarana, in fine powder, 1; Alcohol (90 p.c.), 4; macerate the Guarana with 3 of the Alcohol for three days, stirring occasionally; allow it to settle, pour off the clear fluid, transfer the Guarana to a glass funnel plugged with Cotton Wool, allow it to drain, pour on sufficient Alcohol to yield with decanted portion 4. Almost the whole of the Alcohol retained by the Guarana can be recovered by careful displacement with Water.

Dose.—1 to 2 fl. drm. in water.

GUMMI RUBRUM.—*See* EUCALYPTI GUMMI.

Not Official.

GUTTA PERCHA.

The concrete juice of *Dichopsis Gutta*, and of several other trees of the natural order Sapotaceæ.

It was official in B.P. '85, but is replaced in B.P. '98 by Caoutchouc, a solution of which is now used for Charta Sinapis.

Solubility.—Almost entirely soluble in Chloroform, yielding a more or less turbid solution. Entirely soluble in Oil of Turpentine, Carbon Bisulphide, and Benzol. Insoluble in Water, Alcohol, alkaline solutions, or dilute acids.

Medicinal Properties.—Used for making **splints**; as Gutta Percha **tissue** for keeping surgical dressings moist; as a **solution** for mixing with medicaments for chronic skin diseases, and applying like Collodion.

Foreign Pharmacopœias.—Official in Fr., Ger., Hung., Jap., Port., Russ., Span., and Swed.; not in the others.

Description.—In tough somewhat flexible pieces, of a light brown or chocolate colour.

Preparations.

LIQUOR GUTTA PERCHA (*B.P.* '85).—Gutta Percha, in thin slices, 1; Chloroform, 8; Lead Carbonate, in fine powder, 1. Add the Gutta Percha to 6 of the Chloroform in a stoppered bottle, and shake them together frequently until solution has been effected. Then add the Lead Carbonate previously mixed with the remainder of the Chloroform, and having several times shaken the whole together, set the mixture aside, and let it remain at rest until the insoluble matter has subsided. Lastly, decant the clear liquid, and keep it in a well-stoppered bottle.

Foreign Pharmacopœias.—Official in Fr. and Jap.; not in the others.

TRAUMATICINE.—A solution of 1 Gutta Percha tissue in 10 (by weight) of Chloroform. It produces a thin delicate film when painted on the skin, and causes neither tension nor pain. It is used for medicated applications.—*P.J.* (3) xiv. 341. A vehicle for the administration of Mercury in syphilis.—*L.* '94 ii. 590.

UNNA'S PLASTER MULLS consist of a very thin sheet of Gutta Percha coated on one side with an adhesive substance (Aluminium Oleinicum) containing one or more medicinal substances, and backed on the other side with Mull (undressed muslin).—*L.* '86, ii. 575.

Not Official.

GYNOCARDIÆ OLEUM.

CHAULMUGRA OIL.

Obtained from the seeds of *Gynocardia odorata*, a native of the forests of the Malayan Peninsula and Eastern India, as far north as Assam, extending thence along the base of the Himalayas as far west as Sikkim. The oil has been long known and used in India; it is solid, of a light brown colour, with a disagreeable taste and smell, and can be readily melted by a gentle heat.

Medicinal Properties.—It has been recommended in the treatment of leprosy, psoriasis, obstinate eczema, and other skin diseases, chronic rheumatism and gout, and secondary syphilis. Good results have been obtained from its external as well as internal administration in phthisis.—*B.M.J.* '80, ii. 844. In leprosy.—*B.M.J.E.* '93, ii. 4.

Dose.—2 to 15 grains (or minims if fluid); it is best to begin with a small dose, 2 to 3 grains three or four times a day, gradually increasing; should be given after meals in Milk or emulsion with Gum Acacia.

An **ointment** can be made of a strength about 1 in 4, with Unguentum Paraffini, or other basis.

GYNOCARDIC ACID.—Chaulmugra Oil contains about 12 p.c. of an active principle, Gynocardic Acid, the dose of which is ½ grain in **pill** three times daily, gradually increasing to 2 grains.

Magnesium Gynocardate.—A granular powder. Dose.—1 to 3 grains.

HÆMATOXYLI LIGNUM.

LOGWOOD.

The heart-wood of *Hæmatoxylon Campechianum*.

Imported from Campeachy in Central America, from Honduras and Jamaica, that from Campeachy being the most valuable.

Medicinal Properties.—Astringent, without irritating properties, useful in diarrhœa of phthisis and chronic diarrhœa and dysentery, and in passive hæmorrhages; in infantile diarrhœa; it does not tend to cause subsequent constipation. Also as an injection for leucorrhœa.

Incompatibles.—Mineral Acids, metallic salts, Lime Water, Tartar Emetic.

Official Preparation.—Decoctum Hæmatoxyli.

Not Official.—Extractum Hæmatoxyli, Extractum Hæmatoxyli Liquidum and Hamatoxylin.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr. (Bois de Campêche), Mex. (Palo de Campeche), Port. (Campeche), Russ., Swed. (Lignum Campechianum), U.S.; not in the others.

Description.—The wood is hard, heavy, dull orange to purplish-red externally, and internally reddish-brown. The chips or coarse powder, which should be unfermented, have a slight and somewhat agreeable odour, and a sweetish astringent taste. When chewed it colours the saliva pink.

The cherry-red inner wood is the part used.

It is said to be fermented to develop colour before coming into the market, and is recommended to be used *unfermented* for medicinal purposes (*P.J.* (3) xviii. 285), but there is no direct evidence that the latter is therapeutically superior. Whatever reputation Logwood may possess was probably obtained from the fermented wood, in which the Hæmatoxylin would be more or less oxidised. The general view is that the Tannin was responsible for much of the astringency, but Siebold (*loc. cit.*) asserts that Tannin does not exist in the wood in quantity sufficient to be of any importance, and ascribes the whole virtue to Hæmatoxylin. But unoxidised Hæmatoxylin has no astringency whatever, so that if Siebold is correct about the Tannin, one of two things must be true. Either (1) Astringency has nothing to do with the medicinal properties of Logwood; or (2) Siebold's inference is a mistaken one and the *fermented* wood may after all be the best to use.

Preparations.

DECOCTUM HÆMATOXYLI. Decoction of Logwood. (Altered.)

Logwood, in chips, 1 oz.; Cinnamon Bark, bruised, 70 grains;

Distilled Water, a sufficient quantity. Boil the Logwood with 24 fl. oz. of Distilled Water in a suitable vessel for ten minutes, adding the Cinnamon Bark towards the end of the time; strain; pour enough Distilled Water over the contents of the strainer to make 20 fl. oz. of the strained Decoction. =(1 in 20).

Proportion of Cinnamon increased.

Iron vessels should not be used.

Dose.—½ to 2 fl. oz.

(Not in the other Pharmacopœias.)

Not Official.

EXTRACTUM HÆMATOXYLI.—Logwood, in fine chips, 1; boiling Distilled Water, 10: infuse twenty-four hours, boil to 5, strain, and evaporate to dryness by a water-bath, stirring with a wooden spatula. Iron vessels should not be used.

Dose.—10 to 30 grains.

Foreign Pharmacopœias.—Official in Belg. and U.S.; not in the others.

EXTRACTUM HÆMATOXYLI LIQUIDUM (*B.P.C.*).—*Unfermented* Logwood, in No. 16 powder, 10; boil it with 20 of Distilled Water for half an hour and strain; boil it with 20 more of Water for half an hour and strain; repeat the process for the third time, and having mixed the strained liquors, evaporate over a water-bath (or preferably in vacuo) to the measure of 10; allow it to settle for a week, then draw off the clear liquor from the sediment.

The product has a fine red colour and sp. gr. 1·060.—*P.J.* (3) xviii. 285.

Dose.—30 to 120 minims.

HÆMATOXYLIN ($C_{16}H_{14}O_6$).—Sparingly soluble in cold Water, readily in Alcohol and Ether. It has a sweet taste, without astringency. Used in preparing solutions for staining histological specimens.

HAMAMELIDIS CORTEX.

HAMAMELIS BARK.

B.P.Syn.—Witch Hazel Bark.

The dried bark of *Hamamelis Virginiana.*

Medicinal Properties.—A local and a reputed remote astringent and hæmostatic. Given in various forms of passive hæmorrhage, epistaxis, hæmoptysis, hæmatemesis, menorrhagia, and bleeding piles, also for varicose veins.

Official Preparations.—Of the **Bark**, Tinctura Hamamelidis; of the **Dried Leaves**, Extractum Hamamelidis Liquidum; of the **Fresh Leaves**, Liquor Hamamelidis; of the **Liquid Extract**, Unguentum Hamamelidis.

Not Official.—Extractum Hamamelidis, Gossypium Hamamelis, and Hamamelin.

Description.—Usually in curved pieces about one-sixteenth of an inch (one and a half millimetres) thick, and varying from two to eight inches (one-half to two decimetres) in length, sometimes covered with a silvery-grey or dark-grey scaly cork marked with transverse lenticels, but frequently freed from the cork, and then exhibiting a nearly smooth reddish-brown outer surface. The inner surface is pale

reddish-pink in colour, and finely striated longitudinally; the fracture is laminated and coarsely fibrous. The Bark has an astringent taste, but no marked odour. The transverse section exhibits a complete ring of sclerenchymatous cells and numerous tangentially elongated groups of bast fibres.

Preparation.

TINCTURA HAMAMELIDIS. Tincture of Hamamelis. (Altered.)

Hamamelis Bark in No. 20 powder, 2; Alcohol (45 p.c.), a sufficient quantity. Moisten the powder with 1 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 10).

Now made with Alcohol (45 p.c.) in place of Proof Spirit.

Dose.—30 to 60 minims.

Not Official.

EXTRACTUM HAMAMELIDIS.—Hamamelis Bark in powder, percolated with Alcohol (60 p.c.) and the percolate evaporated to the consistence of an extract.

Yield of Extract, 20 to 25 p.c.

Dose.—½ to 2 grains in **pill**; 1½ grains in **suppositories**; 1 drm. in 7 drm. of Soft Paraffin or other diluent, for an **ointment.**

GOSSYPIUM HAMAMELIS (*T.H.*).—Tincture of Hamamelis ½ fl. oz., Glycerin 10 minims, Cotton Wool, in a thin sheet, 60 grains. Mix the Tincture and Glycerin, and saturate the wool evenly with the mixture. Dry by exposure to the air. Astringent and sedative.

HAMAMELIN.—A powdered extractive.

Dose.—1 to 5 grains.

Hamamelin prepared from the leaves with Rectified Spirit was far more efficacious in suppositories than the resinoid from the bark.—*C.D.* '98, i. 86.

HAMAMELIDIS FOLIA.

HAMAMELIS LEAVES.

B.P.Syn.—Witch Hazel Leaves.

The leaves, fresh and dried, of *Hamamelis Virginiana.*

Foreign Pharmacopœias.—Official in Fr., Mex., Norw. and U.S.; not in the others.

Description.—Broadly oval in outline, usually varying in length from three to six inches (seven to fifteen centimetres). The upper surface is dark green or brownish-green in colour, the under surface paler; the apex is obtuse, the margin sinuate. The Leaves are narrowed towards the base, oblique, slightly cordate and shortly petiolate. They are pinnately veined, the veins being prominent on the under surface, where they are furnished with stellate hairs. They have an astringent, slightly bitter taste, but no marked odour.

Preparations.

EXTRACTUM HAMAMELIDIS LIQUIDUM. Liquid Extract of Hamamelis. (Modified.)

Hamamelis Leaves in No. 40 powder, 20; Alcohol (45 p.c.), a sufficient quantity. Moisten the powdered Hamamelis Leaves with about

8 of the Alcohol; pack the moistened powder in a percolator, and add sufficient menstruum to saturate it thoroughly; when the liquid begins to drop, close the lower orifice of the percolator; set aside for forty-eight hours; then allow percolation to proceed, gradually adding menstruum until the Hamamelis Leaves are exhausted; reserve the first 17 of the percolate; remove the Alcohol from the remainder by distillation; evaporate the residue to a soft extract; dissolve this in the reserved portion; add sufficient menstruum to produce 20 of the Liquid Extract. =(1 in 1).

Alcohol (45 p.c.), now used instead of Rectified Spirit and Water.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Norw. and U.S.; not in the others.

LIQUOR HAMAMELIDIS. SOLUTION OF HAMAMELIS. (NEW.)

Fresh Hamamelis Leaves, 50; Water, 100; Alcohol (90 p.c.), 10. Macerate in a still for twenty-four hours; then distil one half.

It probably owes its virtues to the presence of a small quantity of essential Oil. An almost unfailing hæmostatic.—*T.G.* '94, 842.

UNGUENTUM HAMAMELIDIS. HAMAMELIS OINTMENT. (ALTERED.)

Liquid Extract of Hamamelis, ¼; Hydrous Wool Fat, 2¼. Mix. =(1 in 10).

Now made with Hydrous Wool Fat in place of Simple Ointment.

Not Official.

HELLEBORUS.

CHRISTMAS ROSE.

The rhizome and rootlets of *Helleborus niger*.

It contains the glucosides Helleborein and Helleborin.—*J.C.S. Abs.* '98, i. 39.

(It may be noted that 'White Hellebore' is Veratrum Album, and 'Green Hellebore' is Veratrum Viride.)

Medicinal Properties.—A hydragogue cathartic and emmenagogue. Poisonous in large doses.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex. (Eleboro), Port. and Span.; not in the others.

Preparation.

TINCTURA HELLEBORI.—Hellebore Root, 1; percolated with Alcohol (60 p.c.) to obtain 8.

Dose.—20 to 60 minims in water.

Foreign Pharmacopœias.—Official in Port. 1 in 5; not in the others.

HEMIDESMI RADIX.

HEMIDESMUS ROOT.

The dried root of *Hemidesmus Indicus*.

Imported from India.

Medicinal Properties.—Alterative and tonic.

It was brought to England by Dr. Ashburner about the year 1830, and was prescribed for the same purposes as Sarsaparilla, but it did not prove very satisfactory, and is now used chiefly as a flavouring agent.

Official Preparation.—Syrupus Hemidesmi.

Description.—The root is long, rigid, nearly cylindrical, tortuous, and longitudinally furrowed. It seldom exceeds one quarter of an inch (six millimetres) in thickness, and is of a reddish-brown or dark-brown colour. On one side of the root the cork is frequently separated from and raised above the cortex, and is transversely fissured. The transverse section exhibits numerous laticiferous cells in the cortex. The Root has a fragrant odour and a somewhat sweet taste.

(Not in the other Pharmacopœias.)

Preparation.

SYRUPUS HEMIDESMI. Syrup of Hemidesmus.

Hemidesmus Root, bruised, 4; Refined Sugar, 28; Distilled Water, boiling, 20. Infuse the Hemidesmus Root in the Distilled Water, in a covered vessel, for four hours, and strain. Set the infusion aside until clear; then decant the clear liquid, add the Refined Sugar, and dissolve by the aid of gentle heat. The weight of the product should be 42. =(1 in 8).

Dose.—½ to 1 fl. drm.

(Not in the other Pharmacopœias.)

HIRUDO.

LEECHES.

1. *Sanguisuga medicinalis*, the Speckled Leech; and
2. *Sauguisuga officinalis*, the Green Leech.

Description.—Body soft, smooth, two inches (five centimetres) or more in length, tapering to each extremity, plano-convex, marked with from ninety to one hundred fine annulations; back olive-green with six rusty-red longitudinal stripes. The anterior end is terminated by a small sucker surrounding the tri-radiate jaws, and the posterior end by a large sucker. 1. Ventral surface greenish-yellow, spotted with black; 2. Ventral surface olive-green, not spotted.

Imported chiefly from Hamburg. Also collected in large numbers in Spain, France, Italy, and Hungary.

Used for the abstraction of blood from congested parts; in pleurisy, typhlitis, pericarditis, and in cardiac distress.

Bleeding from leech bites is sometimes difficult to stop. The following remedies have been applied with advantage:—Matico, Solution of Ferric Chloride, Silver Nitrate Point, saturated Solution of Alum, and pressure on the part.

Foreign Pharmacopœias.— Official in Austr., Belg., Dan., Dutch, Fr. (Sangsue Medicinale), Ger., Hung., Ital., Jap. (Hirudines), Port. (Sanguesugas), Span. (Sanguijuela), Swed. and Swiss; not in the others.

HOMATROPINÆ HYDROBROMIDUM.

HOMATROPINE HYDROBROMIDE.

Hydrobromate of Homatropine.—*B.P.* Add. '90.

$C_{16}H_{21}NO_3,HBr$, eq. 353·49.

The Hydrobromide of an alkaloid prepared from Tropine.

Atropine, under the action of Barium Hydrate, splits up into Tropic Acid and Tropine; the latter, combined with Amygdalic Acid and acted upon by diluted Hydrochloric Acid, forms Oxytoluyl-tropeine or Homatropine.

Solubility.—1 in 6 of Water; 1 in 18 of Alcohol (90 p.c.).

Medicinal Properties.—Mydriatic. Dilates the pupil as rapidly, though not so energetically as, Atropine, but its effects disappear much sooner. When used with Cocaine the action is quicker and more powerful.

Dose.—$\frac{1}{30}$ to $\frac{1}{20}$ grain.

Official Preparation.—Lamellæ Homatropinæ.

Not Official.—Guttæ Homatropinæ, Homatropina, Oleum Homatropinæ cum Cocaina.

Foreign Pharmacopœias.—Official in Dan., Dutch, Fr., Ger., Russ. and Swiss; not in the others.

Description.—A white crystalline powder or aggregation of minute trimetric crystals.

Tests.—The solutions should be neutral to Litmus. A dilute aqueous solution, when applied to the eye, powerfully dilates the pupil. Heated on platinum foil it fuses and burns without leaving an appreciable residue. If ·2 c.c. of Chloroform be shaken with 1 c.c. of a 10 p.c. aqueous solution, to which Solution of Chlorine has been cautiously added, the Chloroform will assume a brownish colour.

It affords the reactions characteristic of Hydrobromides.

A 2 p.c. aqueous solution yields no precipitate on the cautious addition of Solution of Ammonia previously diluted with twice its volume of Water, but dilute Solution of Potassium Hydroxide produces in it a white precipitate, soluble in excess of the reagent.

A 2 p.c. solution of Atropine Sulphate with solution of Ammonia under the above conditions gives a distinct turbidity, but with Hyoscyamine and Hyoscine Hydrobromides no reaction is visible. A 1 p.c. solution of Atropine Sulphate, however, remains unchanged.

Solution of Iodine causes a brown and Test-solution of Mercuric Chloride a white precipitate.

If about ·01 gramme be dissolved in a little Water, and the solution be rendered alkaline with Solution of Ammonia and shaken with Chloroform, the separated Chloroform will leave on evaporation a residue which will turn yellow, and finally brick-red, when warmed with about 1·5 c.c. of a 2 p.c. solution of Mercuric Chloride in a mixture of five volumes of Alcohol (90 p.c.) and three volumes of Water.

Any salt of Atropine or Hyoscyamine under exactly similar conditions will give the same reaction, but with Hyoscine no formation of Mercuric Oxide appears to take place.

When treated with Fuming Nitric Acid and Potassium Hydroxide, as described under 'Atropin,' no reddish-violet coloration is developed (distinction from Atropine), the residue becoming reddish-yellow.

This is the most characteristic test for Homatropine. Atropine gives a deep purple coloration, as do also Hyoscyamine and Hyoscine, but in the case of the latter two, the colour is less intense and more transient.

Preparation.

LAMELLÆ HOMATROPINÆ. Discs of Homatropine. (New.)

Discs of Gelatin, with some Glycerin, each weighing about $\frac{1}{50}$ grain, and containing $\frac{1}{100}$ grain of Homatropine Hydrobromide.

Not Official.

GUTTÆ HOMATROPINÆ (*L.H.* and *L.O.H.*).—Homatropine Hydrobromide, 4 grains; Distilled Water, 1 fl. oz.

HOMATROPINA.—Colourless crystals, not deliquescent, nearly insoluble in Water, but soluble 1 in 80 of Olive Oil, 1 in 20 of Castor Oil, and combines readily with Oleic Acid.

Used in cases where an oily preparation or an ointment is required.

Foreign Pharmacopœias.—Official in Fr. and Mex.

OLEUM HOMATROPINÆ CUM COCAINA (*L.O.H.*).—Homatropine pure, 10 grains; Cocaine (alkaloid) 10 grains; Castor Oil, 1 fl. oz.: heat together till dissolved.

Not Official.

HORDEUM DECORTICATUM.

PEARL BARLEY.

The dried seed of *Hordeum distichon*, divested of its integuments: from plants cultivated in Britain.

Foreign Pharmacopœias.—Official in Belg., Fr. (Orge Perlé), Ital. (Orzo), Port. (Cevada Santa), Mex. and Span. (Cebada); not in the others.

Preparation.

DECOCTUM HORDEI.—Pearl Barley, 1; wash the Barley with cold Water, and reject the washings; boil the washed Barley with 15 of Distilled Water for twenty minutes in a covered vessel, and strain. Product about 10. =(about 1 in 10).

Foreign Pharmacopœias.—Official in Dutch, 8 in 100; Fr. (Tisane d'Orge), 1 in 50; not in the others.

Medicinal Properties.—Nutritive and demulcent, used in catarrhal conditions of the respiratory and urinary systems; as a drink in febrile diseases, and to dilute cow's milk for feeding children, thus forming a more easily digested curd.

Dose.—1 to 4 fl. oz.

HYDRARGYRUM.

MERCURY.

Hg, eq. 198·80.

A metal obtained from native Mercuric Sulphide.

It becomes solid at —39° F. (—39·4° C.) Sp. gr. 13·5. Boils at 360° C., but volatilises slightly even at the ordinary temperatures.

From China, Almaden in Spain, and Idria in Carniola; also from Peru and California. It is chiefly obtained from its Sulphide (native Cinnabar) by distillation with Calcium Oxide; but it is sometimes found in globules disseminated through the ore.

Mercury, as imported, is, after being squeezed through leather, nearly free from impurities. It was first employed medicinally by the Arabian physicians Avicenna and Rhazes, but they only ventured to use it externally against vermin and cutaneous diseases. We are indebted to that renowned empiric Paracelsus for its administration internally.—*Pereira, Mat. Med.* 1849.

Medicinal Properties.—Mercury as a metal is seldom given alone. In a state of minute sub-division with Chalk, or in pill form, however, it has the effect of increasing the various secretions, its influence upon the salivary glands being the ordinary index of the extent of its action. It is an alterative, indirect cholagogue, purgative, diuretic, and a glandular stimulant. It causes the absorption and prevents the formation of morbid effusions, and is itself absorbed by all the tissues of the body.

Of great use, internally, in primary and secondary, and with iodides in tertiary, syphilis, but the doses should not be such as to cause salivation.

Externally, by means of the **ointment**, oleate or **liniment**, in syphilis, in parasitic skin diseases, and as an absorbent in chronic synovitis, peritonitis and other chronic inflammations, and glandular enlargements.

See also under the various preparations and salts of Mercury.

Official Preparations.—Emplastrum Ammoniaci cum Hydrargyro, Emplastrum Hydrargyri, Hydrargyrum cum Creta, Liquor Hydrargyri Nitratis Acidus, Pilula Hydrargyri, and Unguentum Hydrargyri Nitratis.

Not Official.—Mercury Plaster Mull, Mercury and Carbolic Plaster Mull, Oleum Cinereum, Suppositoria Hydrargyri, Hydrargyri Benzoas, Unguentum Cinereum.

Foreign Pharmacopœias.—Official in all.

Description.—Silver-white, liquid at ordinary temperatures, and easily divisible into spherical globules.

Test.—Readily volatilises at a temperature below that of visible redness, leaving only an insignificant amount of fixed residue.

Preparations.

EMPLASTRUM HYDRARGYRI. Mercurial Plaster.

Mercury (by weight), 3 oz.; Olive Oil, 56 grains; Sublimed Sulphur, 8 grains; Lead Plaster, 6 oz. Heat the Olive Oil; add the Sulphur to it gradually; stir until they are uniformly blended; with this mixture triturate the Mercury until metallic globules are no longer visible; add the Lead Plaster previously melted; mix. =(about 1 in 3).

Foreign Pharmacopœias.—Official in Austr., Dan., Ger., Hung., Ital., Norw., Russ., Swed. and Swiss, 1 in 5; Belg., 1 in 5·25; Dutch, 1 in 4; Fr., 1 in 5·6; Mex., 1 in 5·57; Span., 1 in 7·5; U.S., 3 in 10: the ingredients differ considerably.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO. Ammoniacum and Mercury Plaster. (Modified.)

Ammoniacum, 12 oz.; Mercury (by weight), 3 oz.; Olive Oil, 56 grains;

Sublimed Sulphur, 8 grains. Heat the Olive Oil; add the Sulphur to it gradually, stirring until they are uniformly blended; with this mixture triturate the Mercury until metallic globules are no longer visible; add the Ammoniacum, previously purified by boiling with successive portions of water, passing the resulting emulsions through, while rubbing the residues on a hair sieve, and, after mixing, evaporating the emulsions to a suitable consistence. =(nearly 1 in 5).

The Ammoniacum is now purified by boiling with Water and evaporating the emulsions.

Applied in glandular swellings, in chronic hepatic enlargement, syphilitic nodes, and in chronic synovitis.

Foreign Pharmacopœias.—Official in U.S., resembles Brit.; not in the others.

LINIMENTUM HYDRARGYRI. Liniment of Mercury. (Altered).

Ointment of Mercury, 1 oz.; Strong Solution of Ammonia, 160 minims; Liniment of Camphor, a sufficient quantity. Add the Strong Solution of Ammonia to sufficient of the Liniment of Camphor to produce 1½ fl. oz.; triturate the Ointment of Mercury with sufficient of the Liniment of Camphor to produce 1½ fl. oz.; mix the two liquids. (1 Ointment in 3, or 1 of Mercury in 6).

Strong Solution of Ammonia now used, and the quantity of Liniment of Camphor increased.

A stimulating Liniment, applied as an absorbent to swollen joints; placed with lint in the arm-pits, it is a mode of producing salivation; rubbed into the abdominal wall in tubercular peritonitis it is of the highest value.

(Not in the other Pharmacopœias.)

PILULA HYDRARGYRI. Mercury Pill. *B.P.Syn.*—Blue Pill.

Mercury (by weight), 2; Confection of Roses, 3; Liquorice Root in fine powder, 1: rub the Mercury with the Confection of Roses until metallic globules are no longer visible; add the Liquorice Root; beat together until thoroughly mixed. =(1 in 3).

8 commercial samples examined contained 28 to 41 p. c. of Mercury, and little or no Oxide; 5 of the 8 samples were prepared with Confection of Hips.—*P.J.* (3) xv. 230.

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in Belg., Pilulæ Hydrargyricæ; Fr., Pilules Mercurielles Simples; Jap., Mex., Pildoras Azules; Port., Pilulas Mercurials; Swed., Pilulæ Hydrargyri; U.S., Massa Hydrargyri; all 1 in 3; not in the others.)

UNGUENTUM HYDRARGYRI. Mercury Ointment.

Mercury (by weight), 16; Lard, 16; Prepared Suet, 1: Triturate until metallic globules cease to be visible. =(nearly 1 in 2).

Official Preparations.—Used in the preparation of Linimentum Hydrargyri and Unguentum Hydrargyri Compositum.

8 commercial samples examined contained 38 to 46 p. c. of Mercury; 4 of them contained small proportions of Oleate.—*P.J.* (3) xv. 230.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex. (Unguento de Mercurio Doble), Port. and U.S., 1 in 2; Fr. has also Pommade Mercurielle Faible, 1 in 8; Span. (Pomada Mercurial Doble), and Ital. (Pomata Mercuriale), 1 in 2; Span. (P. M. Terciada), 1 in 3, and (P. M. Simple), 1 in 6; Austr., Ger., Hung., Russ.

and Swiss (Ung. Hydr. Ciner.), 1 in 3; Dutch, 1 in 4; Dan., Jap., Norw. and Swed., 1 in 5.

UNGUENTUM HYDRARGYRI COMPOSITUM. Compound Mercury Ointment. (Altered.)

Mercury Ointment, 10; Yellow Beeswax, 6; Olive Oil (by weight), 6; Camphor, in flowers, 3. Mix the Beeswax, Olive Oil, and Mercury Ointment with the aid of heat; add the Camphor; triturate until cold.

=(1 Mercury in 5).

Contains rather less Mercury Ointment, and the manipulation is modified, as previously suggested in *Companion*.

This is Scott's celebrated absorbent Ointment (Scott's dressing), the Soap Cerate being replaced by the Oil and Beeswax.

It is an admirable Ointment to apply to chronic joint enlargements.

Not Official.

MERCURY PLASTER MULL (UNNA).—Containing 1 grain of Mercury to the square inch.

MERCURY AND CARBOLIC PLASTER MULL (UNNA).—Containing 1 grain of Mercury and $\frac{3}{8}$ grain of Carbolic Acid to the square inch.

OLEUM CINEREUM. 'Grey Oil.'—White Vaseline, 2·5; Mercury Ointment, 1; Mercury, 19·5; triturate in a warm mortar until the Mercury is extinguished; then add White Vaseline, 7; Liquid Vaseline, 20: all by weight.

This preparation contains 40 p. c. of Mercury.—*P.J.* (3) xix. 704.

Medicinal Properties.—For **hypodermic injection** in syphilis. **Dose.**—1 to 2 minims.—*B.M.J.* '88, i. 1296; *T.G.* '94, 319.

SUPPOSITORIA HYDRARGYRI.—Mercury Ointment, 60 grains; Oil of Theobroma, 120 grains: melt the Oil of Theobroma with sufficient heat, add the Mercury Ointment, and stir till well mixed, and without applying more heat, immediately pour into moulds, the capacity of 15 grains each; or the fluid mixture may be allowed to cool and then be divided into 12 equal parts, each of which shall be made into a conical or other convenient form of suppository.

Each suppository contains 5 grains of Mercury Ointment.

UNGUENTUM CINEREUM.—Mercury and Lanoline, of each 1 oz.; best Olive Oil, $\frac{1}{2}$ fl. oz.—*Lock Hospital.*

HYDRARGYRI BENZOAS.—A white crystalline salt. Has been used for injection into buboes.—*B.M.J.* '90, i. 1087; *B.M.J.E.* '97, ii. 55; *L.* '91, ii. 505.

Process for its preparation.—*J.S.C.I.* '97, 255.

Not Official.

HYDRARGYRI CYANIDUM.

$Hg(CN)_2$.

Colourless crystals. Not decomposed by Alkalis.

Solubility.—1 in 13 of Water; 1 in 20 of Alcohol (90 p.c.).

Medicinal Properties.—A powerful antiseptic. Used as a local **application** (5 to 15 grains in 1 fl. oz. of Water) to syphilitic rashes and sores of the throat, tongue, &c.—*Ringer.*

Intravenous injection in syphilis.—*P.J.* '95, ii. '91. $\frac{1}{2}$ p.c. solution as an antiseptic in ophthalmic practice.—*P.J.* '96, ii. 19.

Ph. Ger. maximum single dose, $\frac{1}{2}$ grain; maximum daily dose, $1\frac{1}{2}$ grains.

Foreign Pharmacopœias.—Official in U.S.; Belg., Cyanuretum Hydrargyri; Fr., Cyanure Mercurique; Ger. Hung. and Russ., Hydrargyrum Cyanatum; Port., Cyaneto Mercurico; Mex., Cianuro de Mercurio; Span., Cianuro Mercurico.

Mercury Oxycyanide as an antiseptic in aqueous solution, 1 in 200.—*B.M.J.E.* '95, ii. 104; *T.G.* '96, 405.

MERCURY ZINCO-CYANIDE.—A product which has been found by Lord Lister to have valuable antiseptic properties.—*P.J.* (3) xx. 653; (3) xxii. 769.

There is also a **gauze** prepared with it.—*B.M.J.* '89, ii. 1025; *L.* '89, ii. 943.

Mercurialism resulting from use of the cyanide gauze as a dressing, and experiments dealing with it.—*P.J.* '96, ii. 382.

HYDRARGYRI IODIDUM RUBRUM.

MERCURIC IODIDE.

B.P. Syn.—Biniodide of Mercury.

HgI_2, eq. 450·60.

Precipitated Mercuric Iodide, HgI_2, formed by the interaction of Mercuric Chloride and Potassium Iodide.

Solubility.—Almost insoluble in Water; sparingly soluble in Glycerin; 1 in 300 of Alcohol (90 p.c.); 1 in 70 of Ether; 1 in 280 of Olive or Almond Oil or Lard; 1 in 50 of Castor Oil; insoluble in Paraffinum Molle; freely in an aqueous solution of Potassium Iodide or Mercuric Chloride.

Potassio-Mercuric Iodide will dissolve readily in Oils.—*C.D.* '85, 597.

Medicinal Properties.—Alterative and deobstruent. A powerful irritant poison in over-doses, similar to the Green Iodide, only much more active. It is used internally in the same cases as Corrosive Sublimate, more particularly in chronic glandular enlargements and rheumatism and cutaneous diseases when due to syphilis. As an antiseptic lotion (1 in 5,000) in surgical and obstetric practice.

The Ointment is a most effective application for bronchocele, and a good application for warts and syphilitic nodes and for lupus. If applied to the eyelids, should be diluted ¼ the strength.

In infantile diarrhœa.—*Pr.* lv., 208; *P.J.* '95, ii. 215.

Dose.—$\frac{1}{32}$ to $\frac{1}{16}$ grain.

Prescribing Notes.—Usually given in the form of **Pilules** well triturated with Milk Sugar and Glucose, *q. s.* When prescribed in **Solution** it is dissolved by the aid of Potassium Iodide.

Official Preparation.—Unguentum Hydrargyri Iodidi Rubri. Used in the preparation of Liquor Arsenii et Hydrargyri Iodidi.

Not Official.—Hydrargyri et Potassii Iodidum and Injectio Hydrarg. Biniod.

Foreign Pharmacopœias.—Official in U.S.; Austr. and Hung., Hydrargyrum Bijodatum Rubrum; Belg., Deuto-Ioduretum Hydrargyri; Dan., Iodetum Hydrargyricum Rubrum; Dutch, Iodetum Hydrargyricum; Fr., Iodure Mercurique; Ger., Jap., Russ. and Swiss, Hydrargyrum Bijodatum; Ital., Bijoduro di Mercurio; Mex., Yoduro Mercurico; Port., Iodeto Mercurico; Span., Ioduro Mercurico, Swed., Iodetum Hydrargyricum Præcipitatum; not in Norw.

Description.—A crystalline powder of a vermillion colour, becoming yellow when a film of it spread on a sheet of paper is gently heated over a lamp.

Tests.—Freely and entirely soluble in Ether (absence of Mercurous Iodide), or in Solution of Potassium Iodide. It affords the reactions characteristic of Mercuric compounds and of Iodides. It volatilises at a temperature under redness, leaving not more than a trace of fixed matter. When heated with excess of Copper it should yield 43·5 to 44 p.c. of metallic Mercury.

Preparation.

UNGUENTUM HYDRARGYRI IODIDI RUBRI. Mercuric Iodide Ointment. *B.P.Syn.*—Ointment of Red Iodide of Mercury. (Altered.)

Mercuric Iodide, in fine powder, 20 grains; Benzoated Lard, 480 grains. Mix. =(1 in 25).

Now 1 in 25 instead of 1 in 28¾, and made with Benzoated Lard in place of Simple Ointment.

Foreign Pharmacopœias.—Official in Ital., 1 in 10; Mex., Pomada, 1 in 50; not in the others.

Not Official.

HYDRARGYRI ET POTASSII IODIDUM.—Yellow acicular crystals.

An aqueous **solution** of 1 in 12,000 is a powerful antiseptic.—*T.G.* '85, 826.

INJECTIO HYDRARGYRI BINIODIDI (pro Vagina).—Mercuric Chloride 8 grains, Potassium Iodide 5 grains, Water to 1 fl. oz. 1 fl. drm. to a pint of Water.—(*Lock Hospital.* =(1 in 10,000).

Not Official.

HYDRARGYRI IODIDUM VIRIDE.

GREEN IODIDE OF MERCURY.

HgI, eq. 324·70.

A dull green powder containing excess of Mercury, which decomposes upon exposure to light.

Solubility.—Insoluble in Water, Alcohol, and Ether.

Medicinal Properties.—Given in syphilis and in strumous and rheumatic affections. Employed as an **ointment** (1 part to 8 of Lard) for scrofulous and syphilitic eruptions, chronic skin diseases, enlarged glands and bronchocele.

Dose.—It varies with different prescribers from ½ grain to 2 grains.

Incompatible with soluble Iodides.—*C.D.* '92, ii. 275.

Foreign Pharmacopœias.—Official in U.S.; Austr. and Hung., Hydrargyrum Jodatum flavum; Belg., Proto Joduretum Hydrargyri; Dutch and Swed., Iodetum Hydrargyrosum; Fr., Iodure Mercureux; Ital., Proto-Joduro di Mercurio; Mex. Yoduro Mercurioso; Port., Iodeto Mercuroso; Swiss, Hydrargyrum Jodatum; Span., Ioduro Mercurioso. Not in Jap. or Norw.

Tests.—Entirely volatilised at a red heat. When shaken in a tube with Ether, nothing is dissolved. Is not acted upon by Aniline at a boiling heat, but if Biniodide be present, a magenta colour is produced.

This latter test is stated (*P.J.* (3) xxi. 259) not to give the reaction, while Ether would extract traces of Red Iodide; but (*P.J.* (3) xiv. 989) points out that the Ether

washing decomposes the Green Iodide with formation of Red Iodide, and that although this also happens with Chloroform, yet it is to a much less extent.

Preparations.

PILULA HYDRARGYRI IODIDI VIRIDIS (*B.S.H.*).—Green Iodide of Mercury, ½ grain; Opium, ¼ grain; Extract of Gentian, 2 grains.

UNGUENTUM HYDRARGYRI IODIDI VIRIDIS CUM ATROPINA.—Green Iodide of Mercury, 10 grains; Atropine, 1 grain; Lard, ½ oz.

HYDRARGYRI NITRATIS LIQUOR ACIDUS.

ACID SOLUTION OF MERCURIC NITRATE.

Mercury (by weight), 4; Nitric Acid, 5; Distilled Water, 1½. Mix the Nitric Acid with the Distilled Water in a flask; dissolve the Mercury in the mixture without the application of heat; then boil gently for fifteen minutes; cool, and preserve the solution, which should weigh about three times the quantity of the Mercury employed, in a stoppered bottle not exposed to the light.

Medicinal Properties.—Caustic and antiseptic. Applied to syphilitic warts, ulcers, tubercles, &c.; care should be taken that the surrounding healthy parts are not touched. Used in cancerous growths and in lupus. As a **gargle**, 1 or 2 minims to 1 fl. oz. water. As an **injection** in gonorrhœa, 1 minim to 2 fl. oz. water.

Official Preparations.—Unguentum Hydrargyri Nitratis and Unguentum Hydrargyri Nitratis Dilutum contain Mercuric Nitrate.

Foreign Pharmacopœias.—Official in U.S., sp. gr. 2·100; Belg., Nitras Hydrargyri liquidus, sp. gr. 1·44—1·45; Fr., Azotate Mercurique Liquide, sp. gr. 2·246; Ital., Nitrato Mercurico liquido, sp. gr. 2·250; Port., Soluto de Azotato Mercurico; Span., Nitrato Mercurico Acido, sp. gr. 2·246; Swed., Solutio Nitratis Hydrargyri; Mex., Nitrato Mercurico; not in the others.

Description.—A colourless and strongly acid liquid, which affords the reactions characteristic of Mercuric salts and Nitrates.

Tests.—Sp. gr. about 2·0. It should not yield any characteristic reaction with the tests for Mercurous salts.

Preparations.

UNGUENTUM HYDRARGYRI NITRATIS. Mercuric Nitrate Ointment. *B.P.Syn.*—Ointment of Nitrate of Mercury. *N.O.Syn.*—Citrine Ointment. (Altered.)

Mercury (by weight), 1; Nitric Acid, 3; Lard, 4; Olive Oil (by weight), 7. Dissolve the Mercury in the Nitric Acid without the aid of heat, agitating gently from time to time. Heat the Lard and Olive Oil together on a sand-bath, so that the mixture when transferred to a heated earthenware jar, capable of holding ten times the quantity, shall be at a temperature of about 290° F. (143·3° C.). Add the cold Mercurial Solution very gradually, stirring constantly to promote disengagement of the fumes. After frothing has ceased, the mixture, which should have a temperature of not less than 200° F. (93·3° C.),

must be kept stirred until it is cold. The resulting Ointment should be firm in consistence and have a pale lemon colour.

=(about 1 in 16¼).

Now made with more Lard and less Olive Oil and process altered.

After a large number of experiments in which the Mercuric solution was added to, the mixture of Lard and Oil brought to temperatures varying from 180° to 350° F., and other experiments in which the Lard and Oil were previously oxidised with Nitric Acid, the following process was finally decided upon as yielding an ointment of a fine colour and one which would keep almost unchanged for at least three months. It gave uniform results with different workers. On the other hand, working by the B.P. formula, ointments very different in appearance were produced by different operators, and even by the same operator at different times.

Dissolve, without the aid of heat, the Mercury in the Nitric Acid. Heat the Lard and Oil on a water-bath, until the Lard is dissolved, and when at a temperature of 180°—190° F. add the Mercuric Solution (cold) to the melted fats and stir continuously. When brisk effervescence has commenced continue the heat for ten minutes, then remove from the water-bath and stir till cold.

The product should have a good consistence, and if kept in covered pots should retain its pale lemon colour for several months. In our hands this method has never yielded a 'spongy' product. The heat should not be continued until all action has ceased, for the product will then be of a darker colour and blacken in the course of a week or two.—*P.J.* '97, i. 172; '98, ii. 165, 179, 232, 236; *C.D.* '98, i. 933; *A.J.P.* '97, 208, 232.

Medicinal Properties.—Applied in chronic diseases of the skin as a stimulant and alterative; in tinea tarsi it is diluted with 7 parts of Vaseline and applied by means of a camel's-hair pencil to the eyelids. Diluted with Glycerin and applied by a brush to the nostrils in ozœna.

This Ointment, when diluted with Lard, soon acquires a leaden colour; it changes less with Spermaceti Ointment, and least of all when diluted with Soft Paraffin.

Incompatibles.—All reducing agents, Camphor, Essential Oils, Lard, etc.

Official Preparation.—Unguentum Hydrargyri Nitratis Dilutum.

Foreign Pharmacopœias.—Official in Belg., Mercury 2, Nitric Acid (sp. gr. 1·33) 3, Lard 12, Olive Oil 12: Fr., Mercury 1, Nitric Acid (sp. gr. 1·39) 2, Lard 10, Olive Oil 10; Mex., Mercury 4, Nitric Acid 6, Lard 64: Port., Sol. Mercuric Nitrate 2, Lard 9, Olive Oil 9; Span., Mercury 2, Nitric Acid (sp. gr. 1·32) 3, Lard 16, Olive Oil 16; Swed., Mercury 1, Nitric Acid (sp. gr. 1·5) 2, Lard 12; U.S., Mercury 7, Nitric Acid (sp. g. 1·414) 17·5, Lard Oil 76.

UNGUENTUM HYDRARGYRI NITRATIS DILUTUM. Diluted Mercuric Nitrate Ointment. *B.P. Syn.*—Diluted Ointment of Nitrate of Mercury. (Altered.)

Mercuric Nitrate Ointment, 1; Soft Paraffin, yellow, 4: mix.

Now 1 in 5 instead of 1 in 3.

HYDRARGYRI OLEAS.

MERCURIC OLEATE.

Precipitated Mercuric Oleate, formed by the interaction of Mercuric Chloride and Sodium Oleate.

Now made by precipitation instead of treating Mercuric Oxide with Oleic Acid.

An Oleate containing 20 p.c. is readily made as follows:—Mercuric Oxide (finely powdered), 4; Oleic Acid (by weight), 16; Ether (·720), 1: mix the Oxide of Mercury with the Ether and stir in rapidly the whole of the Oleic Acid, warm to 120° F., stirring frequently till the Oxide is dissolved. The operation should be complete in 1 to 2 hours.

Mercuric Oleate was introduced by Prof. Marshall in 1872, and was made of three different strengths, containing respectively 5 p.c., 10 p.c., and 20 p.c. of Mercuric Oxide.

The 5 p.c. very quickly changed to a black colour owing to reduction of the Mercuric Oxide; the 10 p.c. kept better but not very long without change. It is better to keep the 20 p.c. and dilute it when required for use.

Medicinal Properties.—Similar to those of Mercury Ointment and Liniment, but more easily absorbed. Used with great success in tubercular peritonitis. Has been strongly recommended as an application for persistent inflammation in the joints or other parts near the surface, more particularly when combined with Morphine. It is useful, spread on lint and placed in the axilla, for syphilis; also as an application for non-ulcerated syphilitic indurations. A good application for killing pediculi.

Official Preparation.—Unguentum Hydrargyri Oleatis.

Not Official.—Hydrargyri Oleas c. Morphina.

Foreign Pharmacopœias.—Official in Mex. and U.S.; not in the others.

O.M.P.—Mercuric Chloride, 1 oz.; Hard Soap, powdered, 2 oz.; Oleic Acid, 1 fl. drm.; Distilled Water, boiling, a sufficient quantity. Dissolve the Mercuric Chloride in 10 fl. oz. of the Distilled Water. Triturate the Oleic Acid with the Hard Soap, and dissolve the product in 11 fl. oz. of the Distilled Water. Mix the solutions; boil for ten minutes; set aside for the Mercuric Oleate to deposit; decant the supernatant liquid; wash the precipitated Oleate with hot Distilled Water until the decanted liquid affords little or no reaction for Chloride, and then dry it on a water-bath.

Description.—A substance of unctuous consistence, having a light greyish-yellow colour, liable to darken by keeping. It has a somewhat saponaceous odour.

Preparation.

UNGUENTUM HYDRARGYRI OLEATIS. Mercuric Oleate Ointment. (New.)

Mercuric Oleate, 1; Benzoated Lard, 3. Mix.

Not Official.

HYDRARGYRI OLEAS C. MORPHINA is made by dissolving 1 grain of Morphine Alkaloid in each drm. of the Mercuric Oleate.

HYDRARGYRI OXIDUM FLAVUM.

YELLOW MERCURIC OXIDE.

HgO, eq. 214·68.

Precipitated Mercuric Oxide, HgO, obtained by the interaction of Mercuric Chloride and Sodium Hydroxide.

Solubility.—Practically insoluble in Water or Alcohol (90 p.c.)

Medicinal Properties.—Similar to the Red Mercuric Oxide.

Official Preparation.—Unguentum Hydrargyri Oxidi Flavi.

Foreign Pharmacopœias.—Official in Austr., Hung., Jap. and Swiss, Hydrargyrum oxydatum flavum; Belg., Oxydum Hydrargyri Flavum; Dan. and Dutch, Oxydum Hydrargyricum Flavum; Fr., Oxyde Mercurique Jaune; Ger., Russ. and Swiss, Hydrargyrum oxydatum viâ humidâ paratum; Ital., Ossido Mercurico Giallo; Norw., Oxidum Hydrargyricum; Mex. and Span., Oxido Mercurico Amarillo; Swed., Oxydum Hydrargyricum Præcipitatum; U.S., Hyd. Oxid. Flav.

Description.—A yellow powder, yielding nothing to Water, but being readily dissolved by Hydrochloric Acid, the solution affording the reactions characteristic of Mercuric salts.

Tests.—Gently heated it assumes a red colour. Heated to incipient redness it is resolved into Oxygen and the vapour of Mercury, leaving only an insignificant amount of fixed residue; the proportion of metallic Mercury obtained being 92 to 92·5 p.c.

Preparation.

UNGUENTUM HYDRARGYRI OXIDI FLAVI. Yellow Mercuric Oxide Ointment. (New.)

Yellow Mercuric Oxide, in very fine powder, 10 grains; Soft Paraffin, yellow, 490 grains. Mix. (1 in 50.)

Medicinal Properties.—Used in cases of chronic eczema, pityriasis, ringworm, chronic lichen, and syphilitic eruptions.

Diluted with an equal or twice the quantity of Vaseline, is a most valuable remedy for ophthalmia tarsi, corneal ulceration and all forms of conjunctival inflammation.

Foreign Pharmacopœias.—Official in Dutch, Yellow Oxide 1, White Vaseline 19; Fr. (Pommade avec l'Oxyde Jaune de Mercure) and Mex. (Pomada de Oxido Amarillo de Mercurio), Yellow Oxide 1, Vaseline 15; Jap., Yellow Oxide 1, Vaseline 9; Russ., Yellow Oxide 1, Lard 49; U.S., Yellow Oxide 10, Lard 72, Yellow Wax 18; not in the others.

HYDRARGYRI OXIDUM RUBRUM.

RED MERCURIC OXIDE.

HgO, eq. 214·68.

Obtained by heating Mercurous Nitrate until acid vapours cease to be evolved.

Solubility.—Insoluble in Water and Alcohol 90 p.c.; readily soluble in Hydrochloric Acid.

Medicinal Properties.—A powerful irritant rarely used internally. Employed, either in powder or ointment, as an escharotic to indolent ulcers and fungoid growths. (*See* p. 348.)

Official Preparation.—Unguentum Hydrargyri Oxidi Rubri.

Foreign Pharmacopœias.—Official in U.S.; Belg. Oxydum Hydrargyri Rubrum; Dan., Dutch, Norw. and Swed., Oxydum Hydrargyricum; Fr., Oxide Mercurique Rouge; Ger. and Swiss, Hydrargyrum Oxydatum; Ital., Ossido Mercurico Rosso; Jap., Hydrargyrum Oxydatum Rubrum; Mex., Oxido Mercurico; Port., Oxydo Mercurico; Russ., Hydrargyrum Oxydatum Levigatum; Span., Oxido Mercurico Rojo. Not in Austr. or Hung.

Description.—Orange-red crystalline scales or powder answering to the tests given under 'Hydrargyri Oxidum Flavum.'

Tests.—When gently heated it becomes dark violet, but resumes its orange-red colour on cooling. When heated in a dry test-tube it should not evolve orange fumes (absence of Nitrates).

Preparation.

UNGUENTUM HYDRARGYRI OXIDI RUBRI. Red Mercuric Oxide Ointment. *B.P. Syn.*—Red Precipitate Ointment. (Altered.)

Red Mercuric Oxide, in very fine powder, ¼; Paraffin Ointment, yellow, 2¼. Mix. =(1 in 10).

Now 1 in 10 instead of 1 in 8, and made with Yellow Paraffin Ointment in place of Hard and Soft Paraffin.

Medicinal Properties.—Caustic for chronic ulcers and unhealthy granulations and soft warts. Much diluted, is used for ulcerations of the cornea and chronic ophthalmia, but the Ointment of the Yellow Oxide is preferred by many.

Foreign Pharmacopœias.—Official in Belg., 1 in 50; Dan., Dutch, Norw., Port. and Swiss, 1 in 20; Fr., Mex. and Span., 1 in 16; Ger., Jap. and U.S., 1 in 10; Russ., with Yellow Oxide (p. 347). Not in Austr., Hung., Ital. or Swed.

HYDRARGYRI PERCHLORIDUM.

MERCURIC CHLORIDE.

$HgCl_2$, eq. 269·18.

B.P. Syn.—Bichloride of Mercury; Corrosive Sublimate; Perchloride of Mercury.

A salt, obtained as a sublimate by heating a mixture of Mercuric Sulphate, Sodium Chloride, and a little Black Oxide of Manganese.

Solubility.—1 in 19 of Water; 1 in 5 of Alcohol (90 p.c.); 1 in 3 of Absolute Alcohol; 1 in 6 of Ether, *B.P.* (·735); 1 in 11 of Purified Ether (·720); 8 in 13 of Glycerin.

Medicinal Properties.—Antiseptic, disinfectant, escharotic, alterative; given in very small doses in syphilitic affections, and in syphilitic and non-syphilitic skin diseases. Externally as a **lotion**, 1 grain to the fluid ounce, or **ointment**, 2 to 8 grains in the ounce, in chronic and parasitic skin diseases, and in acne and freckles; 1 in 1000 is used for syphilitic ulcers; as an ordinary surgical dressing and in obstetric practice 1 in 2000 is sufficient; as an **injection**, 1 grain to 8 fl. oz., for chronic discharges, such as leucorrhœa and gonorrhœa; and as a **gargle**, 1 grain in 4 fl. oz., for ulcerated and syphilitic sore

throat; as a **collyrium**, 1 grain in 8 fl. oz. For syphilis by **hypodermic injection**, $\frac{1}{30}$ to $\frac{1}{15}$ grain (with Sodium Chloride), in divided portions in the course of the day. As a local application in diphtheria.

In France it is legal to supply registered nurses (for obstetric purposes) with a lotion containing ·025 gramme Mercuric Chloride and 1 gramme Tartaric Acid per litre, also an ointment containing 1 p.c. in Vaseline.—*A.J.P.* '90, 180.

The disadvantages of Mercuric Chloride as a disinfectant and antiseptic are due (1) to its forming with albumen an inert and insoluble compound, (2) to its corrosive action on metals, and (3) to its being a powerful poison.

To prevent its antiseptic value being destroyed by the formation of an albuminate, five parts of Tartaric or Hydrochloric Acid should be added to each part of Mercuric Chloride.

As a disinfectant of enteric or other infectious stools and urine, an equal quantity of a 1 in 500 acidulated solution should be used. They should be thoroughly mixed and left in contact for at least two hours before they are finally disposed of.

An aqueous solution of 1 in 1000 is employed for disinfecting the hands, towels, sponges, etc. in operative surgery; it corrodes surgical instruments. A solution of the same strength is used for washing infected rooms, furniture and other articles, and for soaking infected linen. The solution is often coloured with aniline blue or methyl violet to guard against its being mistaken for water or other harmless fluid.

Recommended for dysentery in India, $\frac{1}{15}$ grain every 4 hours.—*L.* '89, ii. 901.

Injection of Corrosive Sublimate solution in hydrocele.—*L.* '97, ii. 594.

A case of tetanus treated by injection of Corrosive Sublimate.—*B.M.J.* '97, i. 138.

Hypodermic injections of Sublimate in lupus.—*B.M.J.E.* '96, i. 52.

Injections of Corrosive Sublimate in tuberculosis.—*B.M.J.E.* '96, i. 71.

Is a powerful hepatic, but a feeble intestinal stimulant.

When Calomel and Mercuric Chloride are given together, both the liver and intestinal glands are stimulated.—Dr. Rutherford.

Dose.—$\frac{1}{32}$ to $\frac{1}{8}$ grain.

Prescribing Notes.—Generally prescribed in the form of the **Liquor** or given in **pills** well triturated with Milk Sugar and Glucose *q. s.* **Compressed Discs** are prepared for making an antiseptic solution, 1 in 1000.—*See also Not Official.*

Incompatibles.—Alkalis and their Carbonates, Lime Water, Tartar Emetic, Silver Nitrate, Lead Acetate, Albumen, Potassium Iodide, Soaps, Decoction of of Cinchona, Tannin, alkaline Sulphides.

Official Preparations.—Liquor Hydrargyri Perchloridi, and Lotio Hydrargyri Flava. Used in the preparation of Hydrargyri Oleas, Hydrargyri Oxidum Flavum, and Hydrargyrum Ammoniatum.

Not Official.—Corrosive Sublimate Discs, Sublimate Wood Wool, Sal Alembroth, Injectio Sal Alembroth Hypodermica, Hydrargyrum Carbolicum, and Pilula Hydrargyri Carbolici.

Antidotes.—In case of poisoning by Corrosive Sublimate, raw eggs should be administered in large quantity; flour with milk may also be given; the stomach should then be washed out or an emetic employed.

Foreign Pharmacopœias.—Official in Austr. and Hung., Hydrargyrum Bichloratum Corrosivum; Belg., Sublimatus Corrosivus; Dan., Norw. and Swed., Chloretum Hydrargyricum Corrosivum: Dutch, Chloretum Hydrargyricum; Fr., Chlorure Mercurique; Ger., Jap., Russ. and Swiss, Hydrargyrum Bichloratum;

Ital., Bichloruro di Mercurio; Port., Chloreto Mercurico; Mex. and Span., Cloruro Mercurico; U.S., Hydrargyri Chloridum Corrosivum.

Description.—Heavy colourless masses of prismatic crystals, possessing a highly acrid metallic taste.

Tests.—It affords the reactions characteristic of Mercuric salts and of Chlorides. When heated it sublimes without decomposition, leaving only a trace of fixed residue. When heated with excess of Lime it yields 72·8 to 73·8 p.c. of metallic Mercury.

An aqueous solution when boiled with Copper foil, gives a grey deposit, which assumes a silvery lustre on being rubbed.

In a Glycerin solution Potassium Hydroxide does not cause a precipitate; and when Caustic Alkali and Glycerin are both present, even Alkaline Sulphides will not give a precipitate.

Preparations.

LIQUOR HYDRARGYRI PERCHLORIDI. Solution of Mercuric Chloride. (Altered.)

Mercuric Chloride, 1 grain. Distilled Water, 2 fl. oz. Dissolve. =(1 in 875).

Ammonium Chloride now omitted.

This Solution contains $\frac{1}{7}$ grain of Mercuric Chloride in 1 fl. drm., or ·114 gramme in 100 c.c.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Liquor Sublimati Corrosivi (Van Swieten); Fr., Soluté de Bichlorure de Mercure; Ital., Soluzione Idroalcoolica di Bicloruro di Mercurio; Port., Soluto de Chloreto Mercurico; Swiss, Hydrargyrum Bichloratum Solutum: all 1 in 1000; Mex., Solucion de Van-Swieten, 1 in 1000 containing 10 p.c. of Alcohol, 80°; Span., Solucion Hidro-Alcoholica de Cloruro Mercurico, 1 in 1200. Not in the others.

LOTIO HYDRARGYRI FLAVA. Yellow Mercurial Lotion. *B.P.Syn.* —Yellow Wash. (Altered.)

Mercuric Chloride, 20 grains; Solution of Lime, 10 fl. oz.: mix. =(1 in 240).

Now 2 grains to the fluid ounce.

This lotion owes its efficacy to the precipitated Mercuric Oxide, and is used for the same purposes as Mercuric Oxide Ointment.

Foreign Pharmacopœias.—Official in Belg. and Dutch (Aq. Phagedænica), 1 in 250; Fr. (Eau Phagédénique), 1 in 300; Mex. (Agua Fagédenica Roja), 1 in 600; Span. (Agua Fagédenica), 1 in 350. Not in the others.

Not Official.

CORROSIVE SUBLIMATE DISCS.—Compressed discs containing 8¾ grains of Mercuric Chloride, with an equal weight of Sodium Chloride, and coloured with Methyl Violet.

One disc dissolved in a pint of water forms a solution containing 1 of Mercuric Chloride in 1000.

One pint of London Water with 10 grains of Mercuric Chloride makes a clear solution, also with the addition of 10 grains of Sodium Chloride; but with 10 grains of Ammonium Chloride it is very turbid. The latter, therefore, should not be used in making the discs.

SUBLIMATE WOOD WOOL.—Pinewood almost in a state of powder, containing ½ p.c. of Corrosive Sublimate. It is highly absorbent.

SAL ALEMBROTH. — Mercuric Ammonium Chloride, $2NH_4Cl.HgCl_2,H_2O$; when exposed to dry air the water is given off.

Solubility.—2 in 1 of Water, 1 in 3½ of Alcohol (90 p.c.), 1 in 1 of Glycerin.

Medicinal Properties.—A powerful antiseptic, but it is not so irritating as Corrosive Sublimate. Used in the antiseptic treatment of wounds.

For **hypodermic** injection in syphilis, ⅓ grain dissolved in 10 minims of Water.—*B.M.J.* '88, i. 905.

Alembroth **Gauze**, 1 p.c.; **Wool**, 2 p.c.; they are tinted with aniline blue, and as the colour is bleached by purulent discharge, soakage of the dressing is readily noted.

INJECTIO SAL ALEMBROTH. HYPODERMICA.—Mercuric Chloride 32 grains, Ammonium Chloride 16 grains, Distilled Water 2 fl. oz. Dissolve.

Dose.—10 minims = ⅓ grain of Sal Alembroth to be used for an **injection.**—*Lock Hospital.*

HYDRARGYRUM CARBOLICUM (Mercury Carbolate) (*Schadek*).—Colourless crystals, or a white powder. Obtained by precipitating an alcoholic solution of Mercuric Chloride with an alcoholic solution of Phenol and Potassium Hydroxide, and evaporating nearly to dryness, with subsequent washings.

Nearly insoluble in Water, and soluble with difficulty in cold Alcohol.

Medicinal Properties.—Recommended in secondary syphilis.—*L.* '87, i. 943; *L.* '87, ii. 277; *P.J.* (3) xviii. 605.

Dose.—⅓ to ½ grain three times a day in **pill**; also **hypodermically**, suspended in Mucilage, strength 2 p.c.

PILULA HYDRARGYRI CARBOLICI.—Mercury Carbolate, ⅓ grain; Extract of Liquorice, 1 grain; Powdered Liquorice, 1 grain, in each pill.

Dose.—Two to four pills daily.

Not Official.

HYDRARGYRI PERSULPHAS.

MERCURIC SULPHATE.

Syn.—Hydrargyri Sulphas; Sulphate of Mercury.

$HgSO_4$, eq. 294·14.

A white, heavy, crystalline powder, prepared by dissolving Mercury in strong Sulphuric Acid and evaporating to complete dryness.

It is decomposed by water, forming a yellow oxysulphate called Turpeth Mineral. $HgSO_4.2HgO$, and free Sulphuric Acid.

It is used for working small medical batteries.

Entirely volatilised by heat, but not below redness.

Foreign Pharmacopœias.—Official in Fr., Sulfate Mercurique; Mex., Port. and Span., Sulfato Mercurico; not in the others; Belg., Subsulphas Hydrargyri; Swiss, Hydrargyrum Sulfuricum basicum; U.S., Hydrargyri Subsulphas Flavus; these three are the yellow 'Turpeth Mineral.'

Preparation.

UNGUENTUM HYDRARGYRI SULPHATIS FLAVÆ (*B.S.H.*).—Yellow Sulphate of Mercury, 15 grains; Benzoated Lard, 1 oz. Mix.

Useful in ringworm and seborrhœa capitis.

HYDRARGYRI SUBCHLORIDUM.

MERCUROUS CHLORIDE.

B.P. Syn.—Calomel; Hydrargyri Chloridum. Subchloride of Mercury.

Hg_2Cl_2, eq. 467·98.

A salt obtained as a sublimate when a mixture of Mercurous Sulphate and Sodium Chloride is heated.

Solubility.—Insoluble in Water, Alcohol (90 p.c.), or Ether.

Medicinal Properties.—Alterative, indirect cholagogue, purgative, antiseptic and diuretic.

Calomel stimulates the intestinal glands, but not the liver.—Dr. Rutherford.

It is probable that the cholagogue action of Calomel is due to its having a peculiar stimulant action on the duodenum and ileum, so as to hurry the bile along the intestine and prevent its re-absorption.—*Brunton.*

As an alterative it is used in syphilitic affections, chronic skin diseases, and glandular enlargements.

Useful in chronic hepatitis, catarrhal jaundice, and in chronic pharyngitis; repeated small doses of great benefit in obstinate vomiting; also, in the gastro-intestinal catarrh and diarrhœa of children, for whom the absence of taste renders it convenient.

As a purgative in biliousness, hepatic and cardiac dropsy, apoplexy, gout, and in congested and torpid liver due to free living.

In enteric fever, the stupor, tremor, headache and coma, all of which may be due to intestinal sepsis and ptomaines, are removed, and the entire aspect of the case changed, by 1 to 3 grains of Calomel.—*Broadbent.*

In hiccough, one grain every hour is often successful. Its *local uses* are numerous: as an **insufflation,** or as a **gargle** in syphilitic sore throat; as an **injection** with or without Lime Water, in blenorrhagia; and by **fumigation**; for this latter purpose a spirit lamp under a metal cup containing 20 grains of Calomel is placed under a cane-seated chair on which the patient remains seated for twenty minutes, his body being covered with a blanket; an apparatus contrived by Mr. Lee is still better. In a wide range of skin affections, but especially syphilitic, it is invaluable as an **ointment.**

Should not be applied to the eye when a patient is taking Potassium Iodide, for it will cause severe inflammation.—*M.P.* '80, ii. 294.

Dose.—½ to 5 grains.

Prescribing Notes.—Calomel can be made into **pills** with Glucose, and if the pills be too small, they can be made larger by the addition of Milk Sugar. It is frequently prescribed with Compound Rhubarb Pill or Compound Pill of Colocynth and Henbane.

Incompatibles.—Bromides and Iodides, Nitro-Hydrochloric Acid, Hydrocyanic Acid, Chlorides of the Alkalis. Soap, even when neutral. Solutions of Lime, Potassium Hydroxide, or Sodium Hydroxide.

Official Preparations.—Lotio Hydrargyri Nigra, Pilula Hydrargyri Subchloridi Composita, and Unguentum Hydrargyri Subchloridi.

Not Official.—Calomel Cream, Emplastrum Calomelanos, Pilula Calomelanos

c. Coloc., Pilula Hydrargyri Subchloridi et Jalapæ, Pilula Hydrargyri Subchloridi et Scammonii and Pilula Zittmann.

Foreign Pharmacopœias.—Official in Belg., Calomelas; Dan. and Norw., Calomel; Fr., Protochlorure de Mercure par volatilisation, also Chlorure Mercureux Précipité; Dutch, Chloretum Hydrargyrosum; Swed., Chloretum Hydrargyrosum Precipitatum; Austr. and Hung., Hydrargyrum Chloratum Mite, both the levigated and that sublimed in steam; Ger. and Swiss, Hydrargyrum Chloratum, also Hydrargyrum Chloratum vapore paratum; Ital., Protochloruro di Mercurio; Mex., Cloruro Mercurioso al vapor, also precipitado; Jap., Hydrargyrum Chloratum; Port., Chloreto Mercuroso, also Mercurio Doce; Russ., Hydrargyrum Chloratum Levigatum, also Hydrargyrum Chloratum Vapore præparatum; Span., Cloruro Mercurioso (Sublimado, Por el Vapor, and Precipitado); U.S., Hydrargyri Chloridum Mite.

The following synonyms are applied to Calomel obtained by precipitation:—Fr., Précipité Blanc; Port. and Span., Precipitatum Album. These terms do not mean, as in England, Ammoniated Mercury.

Description.—A dull-white heavy and nearly tasteless powder, sometimes rendered yellowish by prolonged trituration.

Tests.—It affords the reactions characteristic of Mercurous salts and of Chlorides. Hydrocyanic Acid converts it into Mercuric salt and a black powder readily yielding metallic Mercury. It volatilises when sufficiently heated, leaving only a trace of fixed residue. When heated with excess of Lime it should yield 84·4 to 84·9 p.c. of metallic Mercury. Warmed with Solution of Potassium Hydroxide it becomes black and does not evolve Ammonia (absence of Mercuric-ammonium Chloride). Warm Ether with which it has been shaken leaves, on evaporation, no residue (absence of Mercuric Chloride).

This evaporation must be performed at a low temperature, otherwise the Corrosive Sublimate (if present) will volatilise in the Ether vapour.

Preparations.

LOTIO HYDRARGYRI NIGRA. Black Mercurial Lotion. *B.P. Syn.*—Black Wash. (Altered.)

Mercurous Chloride, 30 grains; Glycerin, ½ fl. oz.; Mucilage of Tragacanth, 1¼ fl. oz.; Solution of Lime, a sufficient quantity. Triturate the Mercurous Chloride with the Glycerin and Mucilage of Tragacanth; transfer to a bottle; add 2 fl. oz. of the Solution of Lime; shake well; add sufficient Solution of Lime to produce 10 fl. oz. of the Lotion.

Glycerin and Mucilage of Tragacanth now added. =(about 1 in 146).

Useful application to syphilitic sores and foul ulcers.

Foreign Pharmacopœias.—Official in Mex. (Agua Fagédenica Negra), 1 in 600; not in the others.

PILULA HYDRARGYRI SUBCHLORIDI COMPOSITA. Compound Pill of Mercurous Chloride. *B.P.Syn.*—Compound Calomel Pill; Plummer's Pill. (Altered.)

Mercurous Chloride, 1 oz.; Sulphurated Antimony, 1 oz.; Guaiacum Resin, in powder, 2 oz.; Castor Oil, 180 grains; Alcohol (90 p.c.) 1 fl. drm., or a sufficient quantity. Mix to form a mass. =(1 in 4½).

Castor Oil reduced, and Alcohol (90 p.c.) added.

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in Belg. (Pil. Plummeri), 1 in 3; U.S. (Pil. Antimonii Comp.), 1 in 4; not in the others.

UNGUENTUM HYDRARGYRI SUBCHLORIDI. Mercurous Chloride Ointment. *B.P. Syn.*—Calomel Ointment. (Altered.)

Mercurous Chloride, 1; Benzoated Lard, 9: mix. =(1 in 10).

Now 1 in 10 instead of 1 in 6½.

Useful in the itching of some skin affections, psoriasis and eczema, also in pruritus ani. A good application to syphilitic sores.

Foreign Pharmacopœias.—Official in Fr. (Pommade de Chlorure Mercureux), 1 in 10; Port. (Pomada de Mercurio Doce), 1 in 10; Mex. (Pomada de Cloruro Mercuricso), 1 and 20; Span. (Pomada de Cloruro Mercurioso), 2 in 17; not in the others.

Not Official.

CALOMEL CREAM.—Calomel, 10 grains; Vaseline to 1 oz.—*Lock Hospital.*

EMPLASTRUM CALOMELANOS.—*Syn.*—Emplastrum Album.—Contains 20 p.c. of Calomel, spread on silk or other suitable material.

PILULA CALOMELANOS C. COLOC.—Calomel, 1 grain; Compound Extract of Colocynth, 3½ grains; Ipecacuanha, ½ grain. Dose: One or two pills.—*Middlesex Hospital.*

PILULA HYDRARGYRI SUBCHLORIDI ET JALAPÆ (House pill).—Calomel, 1 grain; Jalap, 3 grains; Treacle, *q.s.*: in one pill.—*St. Bartholomew's Hospital.*

PILULA HYDRARGYRI SUBCHLORIDI ET SCAMMONII.—Calomel, 1 grain; Scammony, 3 grains; Treacle *q.s.*: in one pill.—*St. Bartholomew's Hospital.*

PILULA ZITTMANN.—Calomel, 2 grains; Compound Extract of Colocynth, 5 grains; Extract of Henbane, 2 grains. Make two pills.—*Lock Hospital.*

Not Official.

HYDRARGYRI TANNAS.

A greyish-green or blackish-grey powder, containing 40 to 50 p.c. of Mercury. It is decomposed by Water and solutions of the Alkalis. It is not materially affected by Diluted Hydrochloric Acid.

Medicinal Properties.—Has been found very useful in syphilis.

It is decomposed by the alkali of the intestines, and the Mercury rapidly passes into the system.—*L.* '84, i. 723, *M.T.* '85, ii. 869.

Dose.—1 to 2 grains in a **pill**, 3 times a day, an hour before meals.

Foreign Pharmacopœias.—Official in Austr. contains about 42 p.c. of Mercury; Mex. (Tanato de Mercurio); not in the others.

Process for determining the quantity of Mercury.—*P.J.* '96, i. 82.

HYDRARGYRUM AMMONIATUM.

AMMONIATED MERCURY.

B.P. Syn.—Ammonio-Chloride of Mercury; Mercuric-ammonium Chloride; White Precipitate.

NH_2HgCl, eq. 249·93.

It is known as *infusible white precipitate.*

The *fusible* variety is obtained by adding a solution of Mercuric Chloride to a

mixture of Ammonium Chloride and Ammonia till the precipitate ceases to redissolve. It has the formula $HgCl_2.2NH_3$.

Solubility.—Soluble in Hydrochloric Acid. Insoluble in Water, Alcohol (90 p.c.), and Ether.

Medicinal Properties.—Never given internally. Used in the form of ointment for chronic and parasitic skin diseases, impetigo, herpes, ringworm, and scabies. The ointment is used for pediculi, but the powder can be used alone or mixed with Rose Water, and the unpleasantness of greasing the linen avoided.

Official Preparation.—Unguentum Hydrargyri Ammoniati.

Antidotes.—Stomach-pump or an emetic, preceded by raw eggs and raw flour and water.

Foreign Pharmacopœias.—Official in Austr. and Hung., Hydrarg. Bichloratum Ammoniatum; Belg., Præcipitatum Album; Dan. and Norw., Chloretum Amido-hydrargyricum; Dutch, Chloretum Hydrargyrico-ammonicum; Ger. and Jap., Hydrargyrum Præcipitatum Album; Ital., Cloramiduro di Mercurio; Swed., Chloretoamidetum Hydrargyricum; Russ. and Swiss, Hydrargyrum Amidato-bichloratum; U.S., Hydrargyrum Ammoniatum; Ph. Lond. 1788, Calx Hydrargyri Alba; not in Fr., Port. or Span.

The synonyms, Fr., Précipité Blanc; Port. and Span., Precipitatum Album: apply to Calomel and *not* to Hydrargyrum Ammoniatum.

O.M.P.—Mercuric Chloride, 3; Solution of Ammonia, 4; Distilled Water, a sufficient quantity. Dissolve the Mercuric Chloride in 60 of the Distilled Water with the aid of heat; pour the liquid into the Solution of Ammonia diluted with 20 of Distilled Water, constantly stirring; collect the precipitate on a filter; wash it well with cold Distilled Water until the liquid which passes through is free from Chloride; dry the product at a temperature not exceeding 212° F. (100° C.).

Description.—A white powder on which Water has but little action, and Alcohol (90 p.c.) or Ether no action.

Tests.—Digested with Solution of Potassium Hydroxide it evolves Ammonia, acquiring a pale yellow colour, and the liquid, filtered and acidulated with Nitric Acid, gives a white precipitate with Solution of Silver Nitrate. Boiled with Solution of Stannous Chloride it becomes grey, and yields globules of metallic Mercury. It volatilises at a temperature under redness, without fusing, leaving only an insignificant amount of fixed residue. When heated with excess of Lime it should yield 78 to 79 p.c. of metallic Mercury.

The standard has been raised from 77·5 in *B.P.* '85 to 78—79 p.c. in *B.P.* '98.

Preparation.

UNGUENTUM HYDRARGYRI AMMONIATI. Ammoniated Mercury Ointment. *B.P.Syn.*—White Precipitate Ointment. (Altered.)

Ammoniated Mercury, 1; Paraffin Ointment, white, 9: mix. =(1 in 10).

Now made with White Paraffin Ointment in place of Simple Ointment.

Foreign Pharmacopœias.—Official in Dutch, Ung. Chloreti Hydrargyrico-ammonici, 1 in 10; Ger., Jap. and Swiss, Ung. Hydrargyri Album, and Russ., Ung. Hydrargyri Amidato-bichlorati, 1 in 10; U.S., 1 in 10; not in the others.

HYDRARGYRUM CUM CRETA.

MERCURY WITH CHALK.

B.P.Syn.—Grey Powder.

Solubility.—Insoluble in Water.

Medicinal Properties.—Chiefly given to children as a cathartic; suitable for the prolonged administration of Mercury in syphilis.

Dose.—1 to 5 grains.

Prescribing Notes.—Best given as a **powder** by itself, or with Rhubarb, sometimes in **cachets**; but when required to be made into **pills**, Glucose is the best excipient.

Foreign Pharmacopœias.—Official in Swed., same as Brit.; Mex., Polvo de Mercurio Calcareo; Port., Mercurio com Carbonato de Cal, 3 in 10; U.S., 3·8 in 10; not in the others.

O.M.P.—Mercury (by weight), 1; Prepared Chalk, 2: Rub the Mercury and Prepared Chalk in a porcelain mortar until metallic globules cease to be visible to the naked eye, and the mixture acquires a uniform grey colour.

Description.—A powder of a light-grey colour; free from grittiness; insoluble in Water; partly dissolved by Diluted Hydrochloric Acid, leaving the Mercury in a finely divided state.

Twelve commercial samples examined contained Mercury 21·2 to 35·8 p.c. (and one sample, taken from the bottom of a stock bottle, gave as much as 49·6 p.c., probably owing to the Mercury having shaken down); Mercurous Oxide from a trace to 6 p.c.; Mercuric Oxide from ·65 to 4·6 p.c. The best sample gave 30·3, ·17, and ·65 p.c. respectively.—*P.J.* (3) xv. 230.

Instead of the 2 of Chalk, 1½, with ½ of Milk Sugar, is recommended.—*P.J.* March, 1860, and again *P.J.* (3) vi. 1034.

Magnesium Carbonate as a substitute for Chalk is recommended.—*C.D.* '84, 549.

U.S., rubs the Mercury with Honey and Water previous to adding the Chalk.

Test.—The solution formed with Hydrochloric Acid does not yield any white or grey precipitate on the addition of Solution of Stannous Chloride (absence of Mercuric compounds).

HYDRASTIS RHIZOMA.

HYDRASTIS RHIZOME.

The dried rhizome and roots of *Hydrastis Canadensis*.

Hydrastis contains the alkaloids—**Berberine** (about 4 p.c.), **Hydrastine** (about 2 p. c.), and **Canadine.**

Hydrastine is distinguished from Berberine by giving *no* red colour with Chlorine Water.

Medicinal Properties.—Tonic, nervine stimulant, hæmostatic, astringent, stomachic. Useful in chronic catarrhal conditions of the mucous membranes, especially that of the uterus.

Recommended in uterine hæmorrhage.—*L.* '85, ii. 733; '87, i. 391; '87, ii. 1287; '88, i. 868; '88, ii. 133; *B.M.J.* '87, ii. 1349: '88, ii. 123. The fluid extract is a sovereign remedy as a preventive in spontaneous epistaxis.—*M.A.* '95, 246. It may be used internally or as a 5 p. c. solution in water as a spray; internally also in

aggravated cases of hyperidrosis.—*M.A.* '95, 322. In dyspepsia.—*L.* '85, ii. 885. Used locally in chronic pharyngitis.—*L.* '89, i. 549.

20 to 30 drops of the fluid extract for controlling night sweats.—*Pr.* lv. 624.

In chronic bronchitis.—*B.M.J.E.* '97, i. 84; '97, ii. 60; *Pr.* lx. 224.

Official Preparations.—Extractum Hydrastis Liquidum and Tinctura Hydrastis.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Fr., Ger., Ital., Mex., Norw., Russ., Swiss and U.S.; not in the others.

Description.—The rhizome is tortuous, simple, or branched, from half an inch to an inch and a half (twelve to thirty-eight millimetres) long and from one-eighth of an inch to half an inch (three to twelve millimetres) in thickness. The upper surface bears short ascending branches, which are usually terminated by cup-shaped scars. From the lower surface and sides numerous thin brittle roots are given off. The rhizome is yellowish-brown, becoming darker by age. It breaks with a clean resinous fracture; the smooth fractured surface is of a brownish-yellow or greenish-yellow colour, and exhibits a ring of bright yellow somewhat distant narrow wood bundles. It has a slight but characteristic odour and a bitter taste.

Preparations.

EXTRACTUM HYDRASTIS LIQUIDUM. Liquid Extract of Hydrastis. (Modified.)

Hydrastis Rhizome, in No. 60 powder, 20; Alcohol (45 p.c.), a sufficient quantity. Moisten the powdered Hydrastis with about 8 of the Alcohol; pack the damp powder in a percolator; pour on sufficient menstruum to saturate it thoroughly; when the liquid begins to drop, close the lower orifice of the percolator; set aside for forty-eight hours; then allow percolation to proceed, gradually adding menstruum until the Hydrastis is exhausted; reserve the first 17 of the percolate; remove the Alcohol from the remainder by distillation; evaporate the residue to a soft extract; dissolve this in the reserved portion; add sufficient menstruum to produce 20 of the Liquid Extract. =(1 in 1).

Alcohol (45 p.c.) now used instead of a mixture of Rectified Spirit and Distilled Water equal parts.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Dan., Dutch, Ger., Ital., Russ., Swiss and U.S., all 1 in 1; Austr., 2 in 3; Mex. and Norw.; Fr. and Mex. have a solid extract; not in the others.

Shoemaker has used the fluid extract as a stimulant and astringent application in skin diseases.—*L.* '85, ii. 87.

TINCTURA HYDRASTIS. Tincture of Hydrastis. (Modified.)

Hydrastis Rhizome in No. 60 powder, 2; Alcohol (60 p.c.), a sufficient quantity. Moisten the powder with 2 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 10).

Now made with Alcohol (60 p.c.) in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Fr., 1 and 5; U.S., 1 in 5; not in the others.

Not Official.

HYDRASTIN.—An eclectic remedy has been sold under this name for many years. It is said to consist principally of Berberine Hydrochloride, with some Hydrastine.

It is a moderately powerful stimulant of the liver and a feeble stimulant of the intestines.—Dr. Rutherford.

Dose.—2 to 6 grains.

HYDRASTINA.—An alkaloid ($C_{21}H_{21}NO_6$) crystallising in white prisms. Taste bitter and pungent. 'Hydrastine Cryst.' melts at 132° C.

Solubility.—1 in 120 of Alcohol, 1 in 83 of Ether, 1 in 2 of Chloroform, and 1 in 16 of Petroleum Spirit, which last three solvents do not dissolve Berberine; nearly insoluble in Water.

Dose.—$\frac{1}{4}$ to $\frac{1}{2}$ grain.

Hydrastine with Mono-calcium Phosphate forms a soluble compound which can be made to contain 71 p.c. of Hydrastine.—*A.J.P.* '97, 604; *P.J.* '98, i. 24.

HYDRASTINÆ HYDROCHLORIDUM.—Hydrastine Hydrochloride. Faintly yellow semi-crystalline powder.

Solubility.—Readily in Water and in Alcohol (90 p.c.) (about 1 in 1 of either).

Dose.—$\frac{1}{2}$ to 1 grain.

Notes.—*P.J.* (3) xv. 297; (3) xvii. 427.

Has been used as an ecbolic to induce premature labour; maximum daily dose, $7\frac{1}{2}$ grains internally, 5 grains by hypodermic injection.—*L.* '86, i. 990; its physiological action.—*B.M.J.* '98, ii. 1052.

HYDRASTININE.—An oxidation product ($C_{11}H_{11}NO_3$) of the natural alkaloid Hydrastine. It is crystalline, and has a melting point 116°—117° C. Not readily soluble in Water.

HYDRASTININÆ HYDROCHLORIDUM.—A pale yellow crystalline powder. Soluble in its own weight of Water, 1 in 3 of Alcohol (90 p.c.).

Medicinal Properties.—Useful in endometritis, and uterine fibroid, in which excessive bleeding is a prominent symptom.—*L.* '90, i. 712; *T.G.* '90, 86; '92, 539, 699; *Pr.* xlv. 373. Valuable in menorrhagia.—*L.* '92, ii. 1350; *L.* '94, i. 1521.

Checks uterine hæmorrhage, ameliorates night sweats in phthisis. During labour it undoubtedly strengthens feeble contractions and revives an inert uterus.—*B.M.J.E.* '98, i. 63.

Dose.—$\frac{3}{4}$ to $1\frac{1}{2}$ grains, used **hypodermically** in a 10 p.c. aqueous solution.

Not Official.

HYDROGENII PEROXIDUM.

H_2O_2.

In its purest condition this is a colourless liquid. Sp. gr. 1·452, evolving when heated 475 times its volume of oxygen gas. It is obtained by decomposing Barium Peroxide with Sulphuric Acid, and concentrating the filtered liquid in vacuo over Sulphuric Acid. Commercially it is sold containing 10 or 20 volumes of available oxygen. It is one of the most powerful oxidising agents known, and is used for bleaching hair, and delicate fabrics which might be injured by Chlorine.

Official Preparation.

LIQUOR HYDROGENII PEROXIDI. Solution of Hydrogen Peroxide. (New.)

An aqueous solution of Hydrogen Peroxide, H_2O_2, eq. 33·76, pre-

pared by the interaction of Water, Barium Peroxide, and a dilute mineral acid, at a temperature below 50° F. (10° C.).

Medicinal Properties.—Antiseptic, alterative, recommended in chronic bronchitis, enteric fever, diabetes, and glandular swellings. Used locally as a surgical dressing and for purulent discharges, and as a spray or swab in diphtheria.

B. W. Richardson recommended its use in 5 volume solution as a deodorising **gargle** in scarlet fever, and the following **mixture** in whooping-cough:—Hydrogen Peroxide (10 vols.), 6 fl. drm.; Glycerin, 4 fl. drm.; Water to 3 fl. oz. Dose: Half a fluid ounce in a wineglassful of Water 5 or 6 times a day.—*Asclepiad* '87, 53.

Rapid healing of chancres by spray.—*M.A.* '95, 168. A spray of 10 volume strength is a good application to the throat in scarlet fever.

A bandage soaked with solution of Hydrogen Peroxide and allowed to dry on the wrist gave rise to spontaneous combustion. This is more likely to occur with a solution containing 1 p.c. of Sulphuric Acid, than with a solution previously neutralised.—*A.J.P.* '98, 291; *T.G.* '98, 618.

Dose.—½ to 2 fl. drm.

Should be well diluted.

Foreign Pharmacopœias.—Official in Ital., Acqua Ossigenata, 12 volumes; Fr., Soluté Officinal d'Eau Oxygénée au dixième, 10 volumes; Mex., Agua Oxigenada, sp. gr. 1·452; U.S., Aqua Hydrogenii Dioxidi, 10 volumes; not in the others.

Description.—A colourless and odourless liquid. It has a slightly acid taste, and renders the saliva frothy.

Tests.—When heated it is decomposed into Water and Oxygen. On adding a few drops to 8 or 10 c.c. of Water containing a drop of Solution of Potassium Chromate, 10 drops of Diluted Sulphuric Acid, and 2 or 3 c.c. of Ether, a blue layer will appear between the ethereal and aqueous liquids, and, after agitation, the Ether will also become blue. 1 volume, treated in a brine-charged nitrometer with 10 or 12 times its bulk of a mixture of 1 volume of Sulphuric Acid, 2 volumes of a 5 p.c. solution of Potassium Permanganate, and 7 volumes of Water, should afford, at normal temperature and pressure, not less than 18 and not more than 22 volumes of Oxygen, indicating a yield of 9 to 11 volumes from the Solution of Hydrogen Peroxide. It should give no characteristic reaction with the tests for Barium. Evaporated to dryness on a water-bath, not more than ·5 p.c. of solid residue should remain.

Determination of Hydrogen Peroxide in the presence of various preservative agents. Applied gasometrically, the permanganate method is unreliable in all cases. Kingsett's* thiosulphate method is simple, rapid and accurate, and its accuracy is not lessened by the presence of the usual preservative agents, nor by large quantities of Glycerin. It is applicable in all cases, so far as known.—*A.J.P.* '98, 233.

* Mix 10 c.c. Hydrogen Peroxide with 40 c.c. of a diluted Sulphuric Acid (1·3) and make up to 100 c.c. with Distilled Water. 10 c.c. of this solution is then run into 10 c.c. of a 10 p.c. Potassium Iodide solution; allow the mixture to stand for five minutes and then titrate with $\frac{N}{10}$ Thiosulphate solution. Each 1 c.c. $\frac{N}{10}$ Thiosulphate solution = 1·118 c.c. Oxygen, but this figure must be divided by two to ascertain the volumes of 'available Oxygen.'

Bach's reagent for Hydrogen Peroxide consists of the following: (A) ·03 gramme of Potassium Bichromate and 5 drops of Aniline in 1 litre of Water; (B) 5 p.c. Oxalic Acid solution. On shaking 5 c.c. of the solution to be tested with 5 c.c. of solution (A) and 1 drop of solution (B), a violet-red coloration is produced when Hydrogen Peroxide is present.—*J.C.S. Abs.* '95, ii. 239, 526; *Analyst* '96, 80; *J.S.C.I.* '96, 216; *P.J.* '97, i. 492.

Samples containing Sodium Silicofluoride.—*C.D.* '96, i. 85.

The addition of 2 p.c. of Alcohol or Ether is effective in retarding the decomposition of Hydrogen Peroxide solutions.—*J.C.S.I.* '97, 461.

Not Official.

GUTTÆ HYDROGENII PEROXIDI (*T.H.*).—Hydrogen Peroxide 10 volumes. Two or three drops to be poured into the ear from a warm spoon. Use, for fetid discharges.

HYOSCYAMI FOLIA.

HYOSCYAMUS LEAVES.

B.P.Syn.—Henbane Leaves.

The fresh leaves and flowers, with the branches to which they are attached, of *Hyoscyamus niger;* also the leaves and the flowering tops, separated from the branches and carefully dried. Collected from the flowering biennial plants.

Medicinal Properties.—Hypnotic, mild diuretic, antispasmodic. Similar in action to Belladonna and Stramonium, but milder. Used in insomnia of whatever origin, when Opium, from its constipating and other objectionable properties, is not advisable. It is employed to diminish pain and allay irritability of the bladder, and to prevent the griping of purgative medicines; in visceral neuralgias and in asthma and all spasmodic affections; to allay the irritation of teething and prevent convulsions. Children bear Hyoscyamus well, the aged not so. In large doses it dilates the pupil of the eye. **Hyoscine** is much employed in maniacal delirium.

Incompatibles.—Vegetable Acids, Silver Nitrate, Lead Acetate, Liquor Potassæ or Sodæ.

Official Preparations.—Extractum Hyoscyami Viride, Succus Hyoscyami, and Tinctura Hyoscyami; used in the preparation of Hyoscinæ Hydrobromidum, and Hyoscyaminæ Sulphas. The **extract** is contained in Pilula Colocynthidis et Hyoscyami.

Not Official.—Hyoscyami Radix, Chloroformum Hyoscyami, Linimentum Hyoscyami, Linimentum Hyoscyami Comp., Tinctura Hyoscyami Radicis, Hyoscyamina, and Hyoscina (Scopolamine).

Antidotes.—The same as for Belladonna.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Hung., Ital. (Giusquiamo), Swed., Swiss and U.S., **Leaves**; Jap. **Herb**; Belg., Dan., Fr., (Jusquiame noire), Norw., Port. (Meimendro), Mex. (Beleno Negro), Russ. and Span. (Beleno), **Leaves** and **Seeds.**

Description.—The leaves vary in length, but seldom exceed ten inches (twenty-five centimetres), and are mostly sessile; they are alternate, exstipulate, triangular-ovate or ovate-oblong, acute, undulated, irregularly toothed, sinuate, or pinnatifid; they have a conspicuous midrib, and are pale green, and furnished with glandular hairs, par-

ticularly along the veins and on their under surface. The branches are subcylindrical, and also furnished with glandular hairs. The corolla is yellowish with a network of purplish veins. The mesophyll of the leaf contains small prisms of Calcium Oxalate. The fresh herb has a strong characteristic odour, a bitter and slightly acrid taste.

The biennial plant in the first year presents only a tuft of leaves, which perish in the autumn, and leave not a trace of the plant above ground in the winter; about April the plant grows and produces a stem, the leaves and branches of which are used in medicine.

It has been shewn by Gerrard (*P.J.* (3) xxi. 212) that carefully dried leaves from either—(1) Annual Henbane; (2) Biennial Henbane, first year's growth; (3) Biennial Henbane, second year's growth; scarcely differ in their alkaloidal strength.—*See also P.J.* (3) xxi. 312.

'Annual' Henbane is not much grown in this country, but considerable quantities of dried leaves are imported from abroad.

There is some evidence that dried leaves deteriorate on keeping, but this has not been satisfactorily demonstrated.

The percentage of total alkaloid in Henbane leaf dried at 212° F. is ·06 to ·07, or about $\frac{1}{8}$ that contained in Belladonna.

Its properties are completely extracted by Alcohol. The leaves yield by destructive distillation a very poisonous Oil. From the plant are obtained the crystallisable alkaloids **Hyoscyamine** and **Hyoscine** (Scopolamine); the latter until lately has been regarded as uncrystallisable.

Preparations.

EXTRACTUM HYOSCYAMI VIRIDE. GREEN EXTRACT OF HYOSCYAMUS.

Bruise fresh leaves, flowering tops, and young branches of Hyoscyamus niger; press out the juice and heat it gradually to 130° F. (54·4° C.); separate the green colouring matter by a calico filter; heat the strained liquid to 200° F. (93·3° C.); filter. Evaporate the filtrate to the consistence of a thin syrup; add to it the green colouring matter previously separated and passed through a hair sieve; stir the whole together, and evaporate at a temperature not exceeding 140° F. (60° C.), to the consistence of a soft extract.

Dose—2 to 8 grains.

It is generally used in smaller doses in **pills** to prevent the griping action of aperients.

100 lbs. Leaves produced 50 lbs. juice = 5 lbs. Extract.

100 lbs. Leaves, dried, weighed 15½ lbs.

100 lbs. freshly-picked Leaves, when dried, yielded only 11 lbs.

Foreign Pharmacopœias.—Official in Austr., alcoholic from **dried Leaves**; Belg., juice from **fresh Leaves,** evaporated and mixed with an equal quantity of alcohol, filtered and evaporated; Dan., Norw., and Swed., made from **Leaves** with weak Spirit; Dutch, alcoholic from **fresh herb**; Fr., clarified juice from **fresh Leaves** evaporated, also alcoholic extract from the **Seeds**; Ger. and Jap., made with Water and Spirit from **fresh herb**; Hung., juice from **fresh Leaves,** freed from Albumen and evaporated to a thick fluid, equal parts of Spirit added, filtered and again evaporated; Ital., from **dried Leaves** with dilute Alcohol; Mex., from **dried Leaves** and dilute Alcohol, also **Fluid Extract**; Port., Aqueous from **dried Leaves,** also from **fresh Leaves** with Alcohol; Russ., made from **Leaves** with Water and Spirit; Span., clarified juice from **fresh Leaves,** also aqueous from **dried Leaves** also alcoholic from **dried Leaves**; Swiss, from **dried Leaves** with dilute Spirit,

1 = 2 of Leaves, also **Fluid Extract**, 1 in 1; U.S., alcoholic extract from the **dried Leaves**, also **Fluid Extract** from the same.

SUCCUS HYOSCYAMI. JUICE OF HYOSCYAMUS. (MODIFIED.)

Bruise the fresh leaves, flowering tops, and young branches of *Hyoscyamus niger;* press out the juice; to every three volumes of juice add 1 of Alcohol (90 p.c.); set aside for seven days; filter.

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

TINCTURA HYOSCYAMI. TINCTURE OF HYOSCYAMUS. (ALTERED.)

Hyoscyamus Leaves and flowering tops in No. 20 powder, 1; Alcohol (45 p.c.), a sufficient quantity. Moisten the powder with 1 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 10. =(1 in 8).

Now 1 in 10 instead of 1 in 8 and Alcohol (45 p.c.) used in place of Proof Spirit.

Dose.—30 to 60 minims.

Much larger doses, 4 fl. drm., have been given in insomnia.

Foreign Pharmacopœias.—Official in Belg. and Port., 1 and 5, also fresh herb and Alcohol equal weights; Fr., 1 and 5, also Ethereal, 1 and 5 of Ether, sp. gr. ·758, and Alcoolature with fresh Leaves and Spirit, equal weights; Mex., 1 in 5, also Ethereal 1 in 5; Span., 1 and 5; U.S., by percolation, 15 in 100; all by weight except U.S.; not in the others.

HYOSCINÆ HYDROBROMIDUM and HYOSCYAMINÆ SULPHAS.—*See* separate headings.

Not Official.

HYOSCYAMI RADIX.—The dried root of Hyoscyamus Niger (biennial) collected in the spring. Introduced by the late Author in 1878.

Contain on the average, about ·15 p.c. of total alkaloid.

CHLOROFORMUM HYOSCYAMI.—Hyoscyamus Root, in powder, 20; Chloroform sufficient to percolate, 20.

LINIMENTUM HYOSCYAMI.—Hyoscyamus Root, in powder, 30; Alcohol (90 p.c.), 20; digest 4 days, and pack in a percolator; add Alcohol (90 p.c.), sufficient, with 1 of Camphor, to percolate 30.

LINIMENTUM HYOSCYAMI COMP.—Liniment. Hyoscyami, 7: Chloroform. Hyoscyami, 1: mix.

The Compound Liniment has been found most useful in relieving rheumatism. It is applied on piline as directed for Lin. Bellad. Comp., but is a much weaker preparation.

TINCTURA HYOSCYAMI RADICIS.—Hyoscyamus Root, in powder, 5; Alcohol (60 p.c.), 40: digest 7 days.

Dose.—20 to 60 minims.

HYOSCYAMINA ($C_{17}H_{23}NO_3$).—An Alkaloid obtained from the seeds of *Hyoscyamus niger*, the root of *Scopola carniolica*, and probably other allied plants, isomeric with Atropine but not identical with it.

It **crystallises** in silky needles. Melts at 108·5° C. Only slightly soluble in Water, but freely in Alcohol (90 p.c.), Chloroform, and Ether. Probably constitutes the greater portion of the alkaloid naturally existing in all the mydriatic drugs, and

best obtained from the root of Scopola or Belladonna. Most of the commercial 'Atropine' consists principally of Hyoscyamine.

Dose.—$\frac{1}{120}$ to $\frac{1}{60}$ grain.

An **amorphous Hyoscyamine** also occurs in commerce as a thick syrupy liquid. There is not much difference in price between the pure Amorphous Hyoscyamine and Hyoscyamine in crystals.

Hyoscyamine is converted into Atropine under the influence of a fixed alkali at the ordinary temperature; Ammonia also affects the alteration, but only very slowly. —*P.J.* (3) xviii. 1048.

The same change takes place tolerably easily by simply heating to 110° C.

Conversely Atropine is re-convertible into Hyoscyamine.

As it is only slightly soluble in Water the Sulphate should be ordered when required in aqueous solution.

Foreign Pharmacopœias.—Official in Fr.; not in the others.

HYOSCINA (SCOPOLAMINE).—This name was first applied by Ladenberg to a decomposition product of Hyoscyamine, but when this was found to be identical with Tropine obtained from Atropine, he transferred the name to an amorphous alkaloid contained in the mother liquors from Hyoscyamine, and which he also stated to be isomeric with Atropine. Schmidt, however, has discovered that this alkaloid is really identical with a crystalline alkaloid isolated from a species of Scopola, and to which the name Scopolamine has been given. It is not an isomer of Atropine, having the formula $C_{17}H_{21}NO_4.H_2O$, and Schmidt suggests that the commercial salts of the base which have been used under the name of Hyoscine, should be henceforth known as Scopolamine (*P.J.* (3) xxii. 1021); but Hesse, while corroborating the change in formula, strongly advocates the retention of the old name of Hyoscine (*P.J.* (3) xxiii. 223). It is usually employed medicinally in the form of **Hydrobromide,** which is readily soluble in Water, as is also the **Hydrochloride** and **Hydriodide.**

HYOSCINÆ HYDROBROMIDUM.

HYOSCINE HYDROBROMIDE.

B.P.Syn.—Hydrobromate of Hyoscine: Scopolamine Hydrobromide.

[NEW.]

$C_{17}H_{21}NO_4$, HBr, $3H_2O$, eq. 434·92.

The Hydrobromide of an alkaloid contained in Hyoscyamus Leaves, different species of Scopola and possibly other solanaceous plants.

Solubility.—1 in 4 of Water; 1 in 14 of Alcohol (90 p.c.); very slightly soluble in Chloroform or Ether.

Medicinal Properties.—Highly recommended in all forms of violent mania and cerebral excitement.—*L.* '90, i. 718; '90, ii. 414; '91, ii. 433; *B.M.J.* '91, ii. 694; *T.G.* '94, 449; *M.A.* '95, 332; *Y.B.T.* '95, 88.

In epileptic attacks of an hysterical form.—*M.A.* '95, 244.

As a mydriatic (1 grain to 1 oz.) in cases where Atropine is undesirable.—*B.M.J.* '94, ii. 598.

Dose.—$\frac{1}{200}$ to $\frac{1}{100}$ grain.

Carefully increased to $\frac{1}{75}$ grain, by **hypodermic injection** or by the mouth.

Not Official.—Guttæ Hyoscinæ and Injectio Hyoscinæ Hypodermica.

Antidotes.—Pilocarpine Nitrate, half a grain hypodermically, or ½ grain Morphine; then stomach pump or emetics, followed by stimulants and artificial respiration.

Foreign Pharmacopœias.—Official in Ger., Russ., Swiss and U. S.; not in the others.

Description.—In colourless, transparent rhombic crystals, permanent in the air. It has an acrid, slightly bitter taste, and is odourless.

B.P. states it is 'soluble in 1 part of cold water,' which is incorrect, 1 in 4 is more nearly so.—*P.J.* '98, ii. 196.

Tests.—When heated to 212° F. (100° C.) it loses rather more than 12 p.c. of its weight and fuses to a viscid mass which becomes liquid at a temperature of 379·4° to 381·2° F. (193° to 194° C.). An aqueous solution yields a precipitate with Test-solution of Mercuric Chloride, Solution of Iodine, or Solution of Potassium Hydroxide, but not with Solution of Ammonia or Solution of Potassium Bichromate. It forms with Auric Chloride a crystalline salt having a melting point of 388·4° F. (198° C.). It affords the reactions characteristic of Hydrobromides. Its aqueous solution slightly reddens Litmus. Heated to redness with access of air it leaves no residue.

The melting points given for the dehydrated salt and the Auric Chloride require modification. The pure product as it appears in commerce is a mixture of the stereoisomers, melting at 181° C. It would be interesting to know if the compilers of this test have met with a salt in commerce of the melting point given (193° to 194°). As regards the Auric Chloride, under the conditions described in B.P., an additive compound is formed which melts at 215° C. There is no reason why the salt should not be neutral to Litmus.—*P.J.* '98, ii. 196; *J.C.S. Trans.* '97, 679.

Two chemically equal basic substances, which so far can be distinguished from one another only by their optical activities, are contained in the ordinary Scopolamine Hydrobromide; quite possibly, they exist already formed in the Scopola Root. No difference whatever could be shown between the physiological effects of these two salts. We have been unable so far to discover a feebly rotating preparation obtained from Hyoscyamus seeds (L. Merck).—*J.S.C.I.* '97, 516; *P.J.* '97, ii. 41; *A.J.P.* '97, 593.

Not Official.

GUTTÆ HYOSCINÆ (*L.O.H.*).—Hyoscine Hydrobromide, 2 grains; Distilled Water, 1 fl. oz. Dissolve.

A rapid, powerful, and unirritating dilator of the pupil. Its use is not accompanied by the dryness of the throat that so commonly follows the use of Atropine.—*L.* '86. ii. 1065.

INJECTIO HYOSCINÆ HYPODERMICA.—A convenient solution is made by dissolving Hyoscine Hydrobromide, 1 grain, in Distilled Water, 500 minims, but the strength should always be indicated by the prescriber.

Dose.—2 to 5 minims as a sedative in nervous diseases, especially where there is much violence and excitement. When given by the mouth at least double the dose is required to produce the same effect.—*L.* '89, ii. 736.

HYOSCYAMINÆ SULPHAS.

HYOSCYAMINE SULPHATE.

[NEW.]

$(C_{17}H_{23}NO_3)_2,H_2SO_4,2H_2O$, eq. 707·20.

The Sulphate of an alkaloid contained in Hyoscyamus Leaves, and possibly other solanaceous plants.

Solubility.—2 in 1 of Water; 1 in 4½ of Alcohol (90 p.c.); very slightly soluble in Chloroform or Ether.

Medicinal Properties.—In small doses it is a sedative for mental excitement and insomnia, and in large doses it has been used for calming the excitement of delirium tremens and acute mania, but for this purpose it is superseded by the salts of Hyoscine.

Dose.—$\frac{1}{200}$ to $\frac{1}{100}$ of a grain.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Description.—A crystalline powder, deliquescent, odourless, having a bitter acrid taste.

Tests.—Melting point 402·8° F. (206° C.). It affords the reactions characteristic of Sulphates. A solution in Water acidulated with Hydrochloric Acid yields no precipitate with Solution of Platinic Chloride, but affords with Solution of Auric Chloride a yellow precipitate soluble in boiling Water acidulated with Hydrochloric Acid, and again deposited, as the solution cools, in brilliant, golden-yellow scales (distinction from Atropine). Heated to redness with access of air it leaves no residue.

Commercial Hyoscyamine Sulphate melts at about 200° C. Jowett found the pure salt to melt at 204° C. It is suggested that an official melting point should be given 'not lower than 200° C.' It is distinguished from Atropine by its optical activity and by the melting point of the Auric Chloride (160° C.).—*P.J.* '98, ii. 196.

Not Official.

ICHTHYOCOLLA.

ISINGLASS.

The swimming bladder or sound of various species of *Acipenser*, prepared and cut into fine shreds.

This is included among the Tests of the B.P., its solution being used for Tannic Acid, with which it forms an insoluble compound.

This well-known substance was in the early London Pharmacopœias, and called Ichthyocolla or Fish glue; it was used in medicine as a nutrient. It is still to be found in most of the Continental Pharmacopœias. It is used for fining Wine, for which purpose Gelatin does not answer. Russian Isinglass is reckoned the best quailty. Isinglass is used for Court Plaster and gold-beater's skin.

Isinglass 15 grains to the fl. oz. of Glycerin is useful in some skin diseases.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr., Hung. and U.S.; Dan., Ital., Jap., Norw. and Russ., Colla Piscium; Mex., Cola de Pescada; Port., Gelatina de Peixe; Span., Ictiocola; not in the others.

Test.—Isinglass is not soluble in cold water; Gelatin is.

Not Official.

ICHTHYOL.

AMMONIUM ICHTHYOLSULPHONATE.

It is obtained by the action of Sulphuric Acid on a mineral oil distilled from peculiar fossil deposits, principally fish, and subsequent neutralisation with Ammonia.

A reddish-brown syrupy liquid with igneous bituminous odour and taste. Treated with Potassium Hydroxide Solution it develops an odour of Ammonia. When dried in a water-bath it loses at least half its weight.

Solubility.—Entirely soluble in Water, partly soluble in Alcohol (90 p.c.) and Ether, entirely in a mixture of both.

It mixes readily with Glycerin, Fats, Oils, Soft Paraffin, and Lanoline.

Medicinal Properties.—It is said to have remarkable effects in eczema. May be mixed with Soft Paraffin or Lard in the proportion of 20 to 30 p.c. decreased to 10 p.c. for moist eczema, and 50 p.c. reduced to 20 p.c. for the papular condition The hand requires a stronger preparation than the face, and children a weaker one than adults. It is also used in acne rosacea, and lichen urticaria. (It is not indicated in psoriasis.) It is also applied in rheumatism.

Internally it has been given for eczema, also in acute and chronic rheumatism, and in chronic catarrh of the stomach and intestines.—*L.* '83, i. 334; *B.M.J.* '87, i. 800.

The following formula is recommended for eczema:—Litharge, 10; Diluted Acetic Acid, 30: boil down to 20, add Olive Oil, Lard, and Ichthyol of each 10, all by weight, to make an **ointment.**—*L.* '83, i. 334. It is better to boil down to 13, as Water separates from the Ointment if evaporated only to 20 as directed.

Found useful in every variety of eczema as 5 to 10 p.c. Ointment.—*B.M.J.E.* '93, ii. 68.

As a **gargle** in acute pharyngitis.—*L.* '94, ii. 1113.

As a **paint** (20 p.c. sol.) for foot blisters.—*T.G.* '95, 56.

As 10 p.c. antiseptic injection in vesical catarrh, *M.A.* '95, 139; and in gonorrhœa, *T.G.* '93, 349; *Pr.* lii. 370.

In rheumatism.—*L.* '86, ii. 645; in traumatic erysipelas.—*L.* '87, i. 191; as an application in pruritus and prurigo, also for indolent ulcers.—*B.M.J.* '86, i. 764.

Ichthyol applied so as to cover the healthy skin beyond the affected part modifies and distinctly shortens the duration of, erysipelas; 30 to 60 p.c. Ointment, or 10 p.c. Collodion for sensitive skins.—*T.G.* '91, 862; '92, 294, 684; *M.A.* '95, 249; *B.M.J.E.* '94, i. 24, 43; as a 5 to 10 grain suppository in prostatitis.—*B.M.J.E.* '93, ii. 24.

For uterine affections it is used with Glycerin as a tampon.—*L.* '90, i. 1142; '91, i. 55.

It is not without danger, as an application of 1 Ichthyol and 5 Vaseline to a child four years old produced stupor for twelve hours, but it completely recovered.—*B.M.J.* '84, ii. 1013.

Ichthyol in 3 grain doses recommended in urticaria.—*B.M.J.E.* '95, i. 16.

Ichthyol internally recommended in phthisis.—*L.* '94, i. 1521; *B.M.J.E.* '95, i. 51; '95, ii. 28; *P.J.* '95, ii. 51; '96, ii. 484.

Zinc Oxide, 20; Magnes. Carb., 10; Ichthyol, 1—2; useful for burns of the first degree. Calcii Carb., 10; Zinci Oleatis, 10; Aq. Calcis, 10; Ichthyol, 1—3: for extensive burns.—*B.M.J.E.* '95, ii. 92.

1 to 2 p.c. aqueous solution used as irrigations in gonorrhœa.—*L.* '97, i. 1165; *T.G.* '96, 350.

In small pox as an ointment: Ichthyol, 10; fat, 60; Lanolin, 20.—*B.M.J.E.* '97, i. 99.

Injectio Ichthyol (pro urethra) 2 to 5 p.c.—*Lock Hospital.*

Dose.—15 to 30 grains.

Prescribing Notes.—In **pill** made up with a mixture of Althæa 3, Liquorice powder 3, and Tragacanth 2; also given in **capsules**, and Compressed Tablets.

The Oils of Citronella, Eucalyptus, and Pinus Sylvestris have been suggested for disguising the odour of Ichthyol in external applications. For internal use milk, chocolate, or Oil of Peppermint have been used.—*P.J.* '95, ii. 391. Essence of Almonds is also very good.

Incompatibles.—Alkaloids are incompatible with Ammonium Ichthyolsulphonate, and decompose it with formation of an Ichthyolsulphonate of the alkaloid, and liberation of Ammonia. With alkaloidal salts a double decomposition takes place. —*P.J.* '95, ii. 508.

NATRIUM SULPHO-ICHTHYOLICUM (Sodium Ichthyolsulphonate).—A brownish-black tar-like mass with a bituminous odour.

Solubility.—It makes a somewhat turbid solution with Water; it dissolves in a mixture of equal weights of Alcohol and Ether; it is soluble in Benzol.

No vapour of Ammonia is evolved from the aqueous solution upon warming it with Soda Solution.

Medicinal Properties.—The same as the Ammonium salt.

Foreign Pharmacopœias.—Ital. (Ittiolo) and Russ.; not in the others.

THIOL.—An artificial substitute for Ichthyol prepared by the action of Sulphur on gas oil and subsequent treatment with Sulphuric Acid. It is supplied in two forms, a **powder** and a **liquid**; it is soluble in water and almost odourless.

Useful in acute forms of erythema, in erysipelas, and in inflammatory diseases of women, also in pruritus of the female genitals.—*Fr.* lvi. 565.

A 20 to 40 p.c. solution is used for erysipelas in same manner as Ichthyol.—*B.M.J.E.* '94, i. 103; *T.G.* '94, 627.

ICHTHALBIN.—A combination of Albumen with Ichthyol, is a greyish-brown powder, almost odourless and tasteless. Insoluble in water, decomposed by alkalis. Recommended for internal use. Not so well suited for external use.

Dose.—15 to 30 grains per diem for adults, 15 grains for children.—*P.J.* '97, ii. 4 and 446; *L.* '97, ii. 271.

Tumenol.—A similar body to Ichthyol, is a dark brown thick liquid. It contains both Tumenol oil and Tumenol powder.—*P.J.* (3) xxii. 425.

Not Official.

IGNATIA AMARA.

The seed of *Strychnos Ignatii.*

Medicinal Properties.—Similar in action to Nux Vomica.

Foreign Pharmacopœias.—Official in Fr., Fève de St. Ignace; Mex., Cabalonga; Port., Fava de S. Ignacio; Span., Haba de S. Ignacio.

Preparations.

EXTRACTUM IGNATIÆ AMARÆ.—Prepared by percolating Ignatia beans in fine powder, with Alcohol (90 p.c.), and evaporation.

Tonic, given in debility of the digestive organs.

Dose.—$\frac{1}{8}$ to 1 grain in a **pill** three times a day.

(Not in the other Pharmacopœias.)

TINCTURA IGNATIÆ AMARÆ.—Ignatia beans in fine powder, 1; Alcohol (90 p.c.) sufficient to percolate 10.

Dose.—5 to 20 minims.

Foreign Pharmacopœias.—Official in Mex., Tintura de Cabalongas 1 in 5; not in the others.

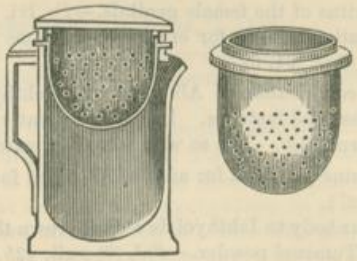
INFUSA.

INFUSIONS.

Infusions, though generally made with boiling water, are in some cases ordered to be made at a lower temperature, as Infusum Calumbæ, the starch of which would be dissolved by boiling water. The mucilage and vegetable albumen present are, however, dissolved by cold water, and these render the infusion liable to change.

The Infusion Pot, invented by the late Author and placed in the Exhibition of 1851, answers well for Infusions, if proper sizes are used for the quantities ordered, so that the ingredients are held by the perforated basin in the upper part of the fluid and *under the surface*. The impregnated fluid becoming of greater density falls to the bottom, thus exposing the ingredients constantly to the continued action of fresh unimpregnated fluid until the action ceases, and the soluble matter is most effectually extracted. *When hot infusions are made, boiling water should be first poured into the pot, to thoroughly warm it; this being thrown out, the ingredients are put into the colander, and the requisite quantity of boiling water poured upon them. The pots have the directions for use enamelled upon them.*

The annexed section of the Infusion Pot will show its construction:—



Infusions are very apt to change in hot weather, and several means have been proposed to preserve them. Small bottles when quite filled with recently made infusion, and kept at the boiling-point for five minutes, then tied over with bladder, or stoppered whilst hot, keep well for several weeks. Inf. Gentian. Co., Inf. Aurant. Co., so treated, kept good for three months.

Concentrated Infusions are very largely used by general practitioners and some chemists; although very convenient and economical they have not the same aroma as the freshly made infusion.

B.P. '98 has included some *Liquores Concentrati*, and the products of their dilution with water may be prescribed by practitioners in place of the corresponding Official Infusions. The diluted *Liquores* differ in minor respects from freshly prepared Decoctions or Infusions, and contain a small quantity of Ethylic Alcohol.

The following are the Infusions of the British Pharmacopœia. The full formulas for these Infusions will be found under the names of the substances from which they are prepared.

It has been thought desirable, for the convenience of the dispenser, to add a table of the ingredients and time required.

Boiling Distilled Water is to be used, unless otherwise stated.

INF. AURANTII (dried peel)	½ oz.	water	10 fl. oz.	infuse ¼ hour	and strain.
INF. AURANTII COMP.	Dried Bitter-Orange Peel ¼ oz.; Fresh Lemon Peel, cut small 55 grains; Cloves (bruised) 28 grains.	10		¼ hour	
INF. BUCHU (leaves freshly broken)	½ oz.	10		¼ hour	
INF. CALUMBÆ (root thinly sliced)	½ oz.	(cold) 10		½ hour	
INF. CARYOPHYLLI (bruised)	¼ oz.	10		¼ hour	
INF. CASCARILLÆ (No. 10 powder)	½ oz.	10		¼ hour	
INF. CHIRATÆ (cut small)	½ oz.	10		¼ hour	
INF. CINCHONÆ ACIDUM.	Red Cinchona Bark in No. 40 powder ½ oz.; Aromatic Sulphuric Acid 1 fl. drm.	10		1 hour	
INF. CUSPARIÆ (No. 20 powder)	½ oz.	10		¼ hour	
INF. DIGITALIS (No. 20 powder)	30 grains	10		¼ hour	
INF. ERGOTÆ (freshly crushed)	½ oz.	10		¼ hour	
INF. GENTIANÆ COMP.	Gentian Root (thinly sliced) 55 grains; Dried Bitter-Orange Peel 55 grains; Fresh Lemon Peel (cut small) ¼ oz.	10		¼ hour	
INF. KRAMERIÆ (bruised)	½ oz.	10		¼ hour	
INF. LUPULI (freshly broken)	½ oz.	10		¼ hour	
INF. QUASSIÆ (wood finely rasped)	44 grains	(cold) 10		½ hour	
INF. RHEI (in thin slices)	½ oz.	10		¼ hour	
INF. ROSÆ ACIDUM (broken petals)	¼ oz.; Dil. Sulph. Acid 1 fl. drm.	10		¼ hour	
INF. SCOPARII (dried and bruised)	1 oz.	10		¼ hour	
INF. SENEGÆ (No. 10 powder)	½ oz.	10		½ hour	
INF. SENNÆ	Senna 1 oz.; Ginger (sliced) 28 grains	10		¼ hour	
INF. SERPENTARIÆ (No 10 pow.)	½ oz.	10		¼ hour	
INF. UVÆ URSI (bruised)	½ oz.	10		¼ hour	

General Directions given in German Pharmacopœia.—Infusions for which the amount of the respective substances is not specified, are prepared so that 10 parts of strained product are obtained from 1 part of substance. In the case of substances for which a limit of dose is given the quantity of substance is to be specified by the physician.

Directions in United States Pharmacopœia.—An ordinary Infusion, the strength of which is not directed by the physician nor specified by the Pharmacopœia, shall be prepared as follows:—Put 10 of the substance into a suitable vessel, provided with a cover, pour upon it 200 of boiling Water, and let it stand half-an-hour; then strain and pass enough Water through the strainer to make the Infusion measure 200 parts. The strength of Infusions of energetic or powerful substances should be specially prescribed by the physician.

Papers on Infusions.—*P.J.* '95, ii. 416, 506.

INJECTIONES HYPODERMICÆ.

HYPODERMIC INJECTIONS.

The following are contained in the British Pharmacopœia, the formulas for which will be found under the names of the substances from which they are prepared :—

INJECTIO APOMORPHINÆ HYPODERMICA.	1 grain in 110 minims.
INJECTIO COCAINÆ HYPODERMICA . . .	10 grains in 110 minims.
INJECTIO ERGOTÆ HYPODERMICA	about 33 ,, 110 ,,
INJECTIO MORPHINÆ HYPODERMICA . .	5 ,, (Tartrate) in 110 mins.

Most of the medicines used hypodermically can be obtained either in the form of **Gelatin lamels**, or **compressed discs.**

Not Official.

INULA.

ELECAMPANE.

The root of *Inula Helenium*.

It contains large quantities of Inulin, a body allied to starch; also a crystalline bitter substance Helenin or Alantcamphor.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Ital., Mex., Port., Span., Swed. and U.S.; not in the others.

HELENINE ($C_6H_{10}O$).—Colourless acicular crystals, almost insoluble in Water, but readily soluble in hot Absolute Alcohol, Ether, and Volatile Oils. Has been found to possess powerful antiseptic properties, and has been given in broncho-pneumonia, tuberculosis, and diphtheria.

Dose.—$\frac{1}{4}$ to 2 grains.

IODOFORMUM.

IODOFORM.

CHI_3, eq. 390·61.

Iodoform or Tri-iodomethane is a product of the action of Iodine on Ethylic Alcohol in the presence of solution of Potassium Carbonate.

Solubility.—Very sparingly soluble in Water; 1 in 7 of Ether; 1 in 14 of Chloroform; 1 in 120 of Alcohol (90 p.c.). It is also soluble in the fixed and volatile oils, and about 1 in 100 of Glycerin; 1 in 30 of Olive Oil; 1 in $3\frac{1}{3}$ of Carbon Bisulphide; sparingly in Petroleum Spirit.

Precipitated Iodoform frequently gives a turbid solution in Chloroform and Carbon Bisulphide, owing to the dampness of the powder, the adhering water being insoluble. It rapidly dries on free exposure to air, and will then form a clear solution.

Medicinal Properties.—Antiseptic, deodorant, alterative, and local anæsthetic. Useful in cleansing foul ulcers, buboes, soft chancres, or syphilitic sores, the **powder** being applied, or an **ointment** (1 drm. to 1 oz. of Lard), or dissolved in Oil of Eucalyptus; also in rheumatic pain, in scaly and parasitic skin diseases and ulcer of anus. Used as a deodorant and to relieve the pain of cancer and abate the progress of

the disease; also to relieve sciatica and neuralgia, goitre, and glandular enlargements; as an **intralaryngeal injection** in **phthisis**; as a **suppository** in chronic prostatitis and hæmorrhoids and anal fissure.

A good **application** is made by dissolving 1 of Iodoform in 10 of Collodion.

Whitehead's Varnish is Compound Tincture of Benzoin, in which Ether (sp. gr. ·735) has been substituted for Alcohol (90 p.c.), containing 10 p.c. of Iodoform.

As a paint, or with an insufflator, in diphtheria, *L.* '86, i. 476, *L.M.R.* '89, 20; on its antiseptic properties, *B.M.J.* '87, ii. 1439, *T.G.* '87, 767; internally in phthisis, *B.M.J.* '88, i. 186, *B.M.J.E.* '94, ii. 39; hypodermically in syphilis, *T.G.* '85, 643; to prevent pitting in smallpox, *L.* '86, ii. 889; injections of Iodoform in goitre, *Pr.* lvi. 334; in tuberculous disease of the knee joint, *B.M.J.* '97, ii. 397.

As an antiseptic, Iodoform in fine powder, also mixed with Boracic Acid or Bismuth, is used as an **insufflation** for ulcerated throat or for ozæna, and as a packing in bone cavities.—*L.* '93, ii. 131.

Eucalyptus Oil, Balsam of Peru, Musk, and Coumarin prepared from Tonka beans have been used to cover the smell of Iodoform.

Oil of Geranium answers the purpose best (5 minims to 2 drm.)

Dose.—½ to 3 grains.

Prescribing Notes.—The Iodoform should be finely powdered, or still better, use precipitated Iodoform, and suspend it with Mucilage of Acacia for a **mixture** or **lotion**; or it may be given in **pills** made with Glucose or ½ of its weight of Compound Powder of Tragacanth and Dispensing Syrup *q. s.*

Incompatible.—Iodoform is incompatible with Calomel.—*P.J.* (3) xvii. 882; *T.G.* '88, 200.

Official Preparations.—Suppositoria Iodoformi, and Unguentum Iodoformi.

Not Official.—Iodoform antiseptic dressings, Bougies of Iodoform and Eucalyptus, Emulsio Iodoformi, Injectio Iodoformi, Insufflatio Iodoformi, Nebula Iodoformi, Pulvis Iodoformi Compositus, Unguentum Iodoformi cum Atropina, Iodoformine, Europhen, Iodo-Salicylic Acid, Di-iodo-salicylic Acid, Di-iodoform, Loretin.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—Shining, lemon-yellow, small hexagonal crystals; somewhat unctuous to the touch; having a persistent and disagreeable odour and taste.

It is also in commerce in the form of **powder** (precipitated), which is more convenient for incorporation with other substances.

Iodoform is slowly volatile at the ordinary temperature of the air.

Tests.—When heated it first melts to a brown liquid, then gives off brown and violet vapours, leaving a black residue which entirely disappears on continued incineration. When warmed with an alcoholic solution of Potassium Hydroxide, and the resulting liquid acidulated with Nitric Acid, Iodine is liberated, the mixture becoming brown, and, when cold, blue on the addition of Mucilage of Starch. Water with which Iodoform has been shaken should be colourless, and not bitter (absence of soluble yellow colouring matters, Picric Acid, &c.), and should not yield any reaction with the tests for Iodides.

Preparations.

SUPPOSITORIA IODOFORMI. Iodoform Suppositories.

Iodoform, 36 grains; Oil of Theobroma, a sufficient quantity for 12 Suppositories. Proceed as directed for Tannic Acid Suppositories.

Each of these suppositories contains 3 grains (or ·2 gramme) of Iodoform.

UNGUENTUM IODOFORMI. Iodoform Ointment. (Altered.)

Iodoform, in fine powder, 1; Paraffin Ointment, yellow, 9. Mix. =(1 in 10).

Now made with Yellow Paraffin Ointment in place of Benzoated Lard.

Foreign Pharmacopœias.—Official in U.S., 1 in 10; Mex., Pomada de Yodoformo; Iodoform 1, Ether 1, Vaseline 9; not in the others.

Not Official.

IODOFORM ANTISEPTIC DRESSINGS.—**Gauze** 5, 10, and 20 p.c., **Wool** and **Lint** 3, 5, and 10 p.c.

BOUGIES OF IODOFORM AND EUCALYPTUS FOR GONORRHŒA (*Cheyne*).—Iodoform, 5 grains; Oil of Eucalyptus, 10 minims; Oil of Theobroma, 35 grains in each bougie, which should be 4 inches long and the diameter of No. 10 catheter.

Treatment.—The patient to pass water, then lie on his back, introduce the bougie (first dipped in Eucalyptus Oil or Carbolic Oil 1 in 20), close the orifice with a pad of Boracic Lint covered with Gutta-percha tissue, secure in position with strapping. The patient should refrain from passing water for four or five hours. If the case be severe the introduction of the bougie is repeated after passing water. The next day use an injection of Zinc Sulphocarbolate, 2 grains to 1 fl. oz., for two or three days; and on the third or fourth day, when the symptoms have entirely subsided, use an injection of Zinc Sulphate, 2 grains to 1 fl. oz. The treatment can be commenced as early as the first day or as late as the seventh day of the disease. The patient must abstain from Alcohol.—*B.M.J.* '80, ii. 125; *L.* '82, ii. 176, 213.

EMULSIO IODOFORMI (*L.H.*).—Iodoform, in minute crystals, 10 parts, Glycerin 70 parts, Water 20 parts. Rub the Iodoform to a smooth paste with the Glycerin, then add the Water. For local use only.

INJECTIO IODOFORMI.—Iodoform 1, Mucilage of Tragacanth 2, Water 7.—*University College Hospital.*

INSUFFLATIO IODOFORMI (AURAL AND NASAL) (*T.H.*).—Iodoform in fine powder, 1; Bismuth Subnitrate, 1: mix. Antiseptic.

NEBULA IODOFORMI (*T.H.*).—Iodoform, 40 grains; Ether (sp. gr. ·735), 1 fl. oz.; dissolve. A strong antiseptic and detergent.

PULVIS IODOFORMI COMPOSITUS.—Iodoform in fine powder 1, Boric Acid 1, Starch 2.—*Victoria Hospital for Children.*

UNGUENTUM IODOFORMI CUM ATROPINA (*L.O.H.*).—Precipitated Iodoform, 60 grains; Atropine, 2 grains; Soft Paraffin, 1 oz.: heat the Atropine and Paraffin till dissolved: stir, and while cooling add the Iodoform.

IODOFORMINE.—A combination of Iodoform with Hexamethylenetetramine containing about 75 p.c. of the former. A white, pale or yellowish powder, insoluble in Water, Absolute Alcohol, and Ether; soluble in Acetone. Boiling Water, acids, and alkalis decompose it.—*J.S.C.I.* '95, 820; '96, 469, '97, 757; *C.D.* '95, ii. 438; *P.J.* '95, ii. 455, '97, ii. 82; *L.* '96, i. 856.

EUROPHEN (Di-isobutyl-orthocresol Iodide).—Introduced as a substitute for

Iodoform. Insoluble in Water or Glycerin; freely soluble in Absolute Alcohol, Chloroform or Ether. Applied as a dusting **Powder**, or 10 p.c. **Ointment.**

Iodo-Salicylic Acid and **Di-Iodo-Salicylic Acid** are Iodine compounds of Salicylic Acid in which one or two atoms of Hydrogen respectively are replaced by Iodine.—*B.M.J.* '97, ii. 734.

Di-iodoform (Ethylene Periodide.)—Yellow prismatic needles. Insoluble in Water, soluble in Chloroform. Introduced as a substitute for Iodoform.—*L.* '93, ii. 1355; *Pr.*, lii. 126; *P.J.* (3) xxiv. 622.

LORETIN (Meta-iod-ortho-oxy-chinolin-ana-sulphonic Acid).—Introduced as a substitute for Iodoform. A pale yellowish powder, odourless, and non-poisonous. Used as a dusting powder, also in the form of Ointment.—*B.M.J.E.* '93, ii. 91; *M.A.* '95, 34; *L.* '94, ii. 31; '95, ii. 183; *Y.B.T.* '95, 458; *M.P.* '94, ii. 25.

Not Official.

IODOL.

TETRAIOD PYRROL.

C_4I_4NH, eq. 566·11.

Prepared by precipitating, with Potassium Iodo-iodide, a moderately pure Pyrrol obtained from 'animal oil.' It forms a light brown microcrystalline powder without taste, having a faint odour, and containing 90 p.c. of Iodine, and giving off Iodine at 212° F. (100° C.).—*P.J.* (3) xvi. 368.

Solubility.—Nearly insoluble in Water; 1 in 18 of Alcohol (90 p.c.), 1 in 150 of Chloroform, 1 in 1½ of Ether, 1 in 155 of Glycerin. It is stated to be soluble 1 in 3 of Absolute Alcohol, but the sample we examined gave 1 in 6½.

Medicinal Properties.—Antiseptic; used for the same purposes as Iodoform, but it is free from the objectionable odour of the latter, and is stated not to be so poisonous.

In ophthalmic surgery.—*B.M.J.* '86, i. 1229; *L.M.R.* '86, 257; '87, 125.

In ear diseases.—*L.* '86, ii. 745; *T.G.* '88, 192. In eczema of the ear.—*M.A.* '94, 232. In anal fissure.—*M.A.* '94, 80.

In diphtheria.—*B.M.J.* '87, i. 789.

In naso-pharyngeal diseases.—*B.M.J.* '87, ii. 1439.

A dusting powder for undue sweating of feet.—*M.A.* '94, 80.

Foreign Pharmacopœias.—Official in Ital., Mex., Russ. and Swiss; not in the others.

IODUM.

IODINE.

I, eq. 125·90.

A solid non-metallic element obtained from the ashes of sea-weeds and from native Iodides and Iodates.

Solubility.—1 in 7000 of Water; 1 in 12 of Alcohol (90 p.c.); 1 in 4 of Ether; 1 in 30 of Chloroform; 1 in 6 of Carbon Bisulphide; 1 in 65 of Glycerin; soluble in a solution of Potassium Iodide.

Medicinal Properties.—Antiseptic, alterative, deobstruent, deodoriser, disinfectant; locally it is irritant or vesicant according to the strength employed. Internally, largely used in form of Iodide,

seldom as Iodine, in chronic rheumatism and in chronic inflammation of various kinds; to promote absorption in hepatic and splenic enlargements, and in dropsies (pleuritic effusion, hydrocele, &c.). In the form of Potassium Iodide (10 to 30 grains three times a day), it is specific in the later stages of syphilis; and in 30 grain doses three times a day it is very useful in aneurism, its most striking effect being the relief of the aneurismal pain; valuable in actinomycosis. Most efficacious in glandular enlargements, as in bronchocele; in all scrofulous conditions, such as enlarged glands of the neck and other regions, in chronically enlarged joints or bones, in many chronic diseases of the eye, nose, and ear, and as an alterative in obstinate mucous discharges; caution, however, is required, as it may, when given in very large doses, occasionally cause wasting of healthy glands, such as the mammæ and testes. Externally the **solution, ointment,** and **tincture** are applied in chronic and parasitic skin diseases, in phthisis, pleurisy, pericarditis and bronchitis as a counter-irritant, and for chilblains; the **tincture** is injected into the scrotal sac to cure hydrocele; Morton's fluid is injected into the sac of spina bifida. A few drops of the **tincture** in half a pint of hot water may, along with Creosote or Volatile Oils, be **inhaled** in some forms of chronic bronchitis and phthisis, and in the throat affection of scarlatina and measles. It is employed as a **gargle,** 1 or 2 of the tincture in 32 of water, for ulceration of the throat. The **Iodide of Starch Paste** is the best form for skin diseases, as it is much less irritating than the other external preparations of Iodine. One or two drops of the tincture in a tablespoonful of water every thirty minutes are often successful in checking vomiting. *See* also under 'Potassii Iodidum.'

Dose.—Not given in B.P.; $\frac{1}{10}$ to $\frac{1}{4}$ grain.

Prescribing Notes.—Very rarely given internally in the solid form, except when loosely combined as in the Alkaloidal Periodides. *See* p. 161; occasionally administered as Tincture which should be well diluted.

Incompatibles.—Alkalis, Metallic salts, Vegetable Alkaloids.

Official Preparations.—Liquor Iodi Fortis, Tinctura Iodi and Unguentum sodi. Used in the preparation of Syrupus Ferri Iodidi. Arsenic, Mercury, Potassium, Sodium, and Sulphur Iodides are official.

Not Official.—Causticum Iodi, Inhalatio Iodi cum Conio, Iodo-Glycerin Solution, Pigmentum Iodi, Pigmentum Mandl, Pigmentum Picis cum Iodo, Tinctura Iodi Decolorata, Vapor Iodi and Iodipin.

Antidotes.—Emetics aided by demulcent drinks, Starch, Flour, etc., diffused in water; Hypodermic Injection of Morphine to relieve pain.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ. Span., Swed., Swiss and U.S.

Description.—In rhombic prisms or octahedrons of the trimetric system, of a peculiar odour, dark colour and metallic lustre, which, even when gently heated, yield a violet-coloured vapour.

It volatilises considerably at ordinary temperatures, and melts at 107° C.

It stains the skin a yellowish-brown, which can be removed by Caustic Alkali, or Sodium Thiosulphate.

In all the preparations containing Iodine, Potassium Iodide is a constant in-

gredient, presumably with the intention of assisting the solution of the Iodine. In the case of aqueous solutions this is necessary, and an excess of Iodide is advantageous. In spirituous solutions, however, where the Iodide is scarcely more soluble than the Iodine, a much smaller quantity (if any) is required.

Tests.—The aqueous solution strikes a deep-blue colour with Mucilage of Starch. It sublimes without residue, and the portion that first comes over does not include any slender colourless prisms emitting a pungent odour (absence of Iodine Cyanide). A solution of Iodine in Chloroform should be perfectly clear (absence of moisture). Each gramme, dissolved in 50 c.c. of Water containing 2 grammes of Potassium Iodide, should require for decoloration at least 78·4 c.c. of the Volumetric Solution of Sodium Thiosulphate.

Commercial resublimed Iodine, if in large dry scales, may be reckoned at 100 p.c.

Preparations.

LIQUOR IODI FORTIS. Strong Solution of Iodine. Liniment of Iodine, *B.P.* '85. (Altered.)

Iodine, $1\frac{1}{4}$; Potassium Iodide, $\frac{3}{4}$; Distilled Water, $1\frac{1}{4}$; Alcohol (90 p.c.), 9. Dissolve the Potassium Iodide and the Iodine in the Distilled Water in a bottle; add the Alcohol and shake.

=(About 1 of Iodine in $8\frac{1}{2}$).

Formerly called Linimentum Iodi. Alcohol (90 p.c.) and Distilled Water replace the Rectified Spirit and Glycerin. The Potassium Iodide is increased.

Foreign Pharmacopœias.—A Liquor Iodi is official in Fr., Soluté d'Iode Ioduré, Iodine 1, Potassium Iodide 1, Alcohol 10, Water 18; Norw. and Swed., Solutio Superiodeti Kalici, Iodine 1, Potassium Iodide 2, Distilled Water 97; Port., Soluto Iodo-iodetado, Tincture of Iodine 6, Potassium Iodide 1, Water 13; U.S., Liquor Iodi Co., Iodine 1, Potassium Iodide 2, Distilled Water 17; all by weight; not in the others.

TINCTURA IODI. Tincture of Iodine. (Altered.)

Iodine, $\frac{1}{2}$; Potassium Iodide, $\frac{1}{2}$; Distilled Water, $\frac{1}{2}$; Alcohol (90 p.c.), a sufficient quantity. Place the Iodine and Potassium Iodide in a bottle with the Distilled Water; when solution has been effected, add a sufficient quantity of the Alcohol to produce 20 of the Tincture.

=(1 of Iodine in 40).

The Iodine and Iodide are dissolved in a small quantity of water, as suggested in the previous edition of *Companion*.

Dose.—2 to 5 minims.

Foreign Pharmacopœias.—Official in the following without the Iodide of Potassium:—Austr., 1 and 15; Belg. and U.S., 1 in 14·3; Fr., Ital., Jap. and Mex., 1 and 12; Dan., Norw., and Swed., Sol. Iodi Spirituosa, 1 in 20; Dutch, 1 in $12\frac{1}{2}$; Ger., Hung., and Russ., 1 and 10; Port. and Swiss., 1 and 9; Span., Solucion Alcoholica de Iodo, 1 and 15. All by weight except U.S.

Test.—If 10 c.c. of the Tincture be diluted with 20 c.c. of Water, it should require, for complete decoloration, 19·6 c.c. of the Volumetric Solution of Sodium Thiosulphate. =(1 of Iodine in 40).

Determination of Alcohol in Liquor Iodi Fortis and Tinctura Iodi.—*P.J.* '98, ii. 330.

UNGUENTUM IODI. Iodine Ointment. (Altered.)

Iodine, 20 grains; Potassium Iodide, 20 grains; Glycerin, 60 grains, Lard, 400 grains. Triturate the Iodine, Potassium Iodide, and Glycerin, in a glass or porcelain mortar; add the Lard gradually; mix.
=(1 of Iodine in 25).

Now 1 in 25 instead of 1 in 31.

Foreign Pharmacopœias.—Fr., Pommade d'Iodure de Potassium Ioduré, Iodine 1, Potassium Iodide 5, Benzoated Lard 40, Water 5; Hung., Tincture of Iodine 1, Simple Ointment 9; Mex., Pomada de Yodo, Iodine 1, Lard 30; Port., Pomada de Iodeto de Potassio Iodada, Iodine 1, Potassium Iodide 4, Water 5, Lard 40; Span., Pomada de Ioduro Potasico Iodado, Iodine 2, Potassium Iodide 6, Water 4, Lard 45; U.S., Iodine 4, Potassium Iodide 1, Water 2, Benzoinated Lard 93; mix. Not in the others.

Not Official.

CAUSTICUM IODI (*B.S.H.*).—Iodine, 180 grains; Potassium Iodide, 60 grains; Alcohol (90 p.c.), 1 fl. oz.: dissolve.

Used in cases of lupus and of indolent (*i.e.* non-phagedænic) tertiary syphilitic ulcers.

INHALATIO IODI C. CONIO.—½ to 1 fl. drm. of Succus Conii being added to Vapor Iodi.

IODO-GLYCERIN SOLUTION (*Morton's Fluid*).—Iodine, 10 grains; Potassium Iodide, 30 grains; Glycerin, 1 fl. oz.: dissolve.

For spina bifida, inject 30 minims, without allowing the fluid contents of the tumour to escape.—*B.M.J.* '85, i. 1098; '86, i. 874; '87, ii. 1275.

PIGMENTUM IODI (*B.S.H.*).—Iodine, 2; Potassium Iodide, 1; Glycerin, 4; dissolve. Used to destroy vegetable parasites.

PIGMENTUM MANDL (*T.H.*).—Iodine, 6 grains; Potassium Iodide, 20 grains; Oil of Peppermint, 5 minims; Glycerin, to 1 fl. oz. Dissolve and mix. Use, in granular pharyngitis.

PIGMENTUM PICIS C. IODO (*B.S.H.*), (*Coster's Paste*).—Iodine, 120 grains; Rectified Oil of Tar, 1 fl. oz.: dissolve cautiously, applying a gentle heat as required.

Specially recommended in cases of ringworm.

LIQUOR AMMONIÆ IODIDI (*Sir J. Y. Simpson*).—Liq. Ammon. Fortis, 2 fl. oz.; Iodine, 10 grains; Potassium Iodide, 20 grains; Alcohol (90 p.c.), 1 fl. oz.: dissolve.

TINCTURA IODI DECOLORATA (*B.P.C.*).—Iodine, 250 grains; Rectified Spirit, 5½ fl. oz.: dissolve with a gentle heat: when cold add Stronger Solution of Ammonia, 10 fl. drm.; keep the mixture in a warm place until decolorised,* after which dilute with Rectified Spirit to make 20 fl. oz.

VAPOR IODI (Inhalation of Iodine).—Tincture of Iodine, 1 fl. drm.; Water, 1 fl. oz.; mix in a suitable apparatus, and having applied a gentle heat, let the vapour that arises be inhaled.

PASTA AMYLI IODIDI.—Starch, 1 oz.; Glycerine, 2 fl. oz.; Water, 6 fl. oz.: boil together, and when nearly cold add Solution of Iodine, B.P. '85, 1 fl. oz.

IODIPIN, an addition—Compound of Iodine with the fatty acid from Sesame Oil.

* B.P.C. states that if not further diluted it may be prescribed as **Tinctura Iodi Decolorata Fortior.**

IPECACUANHÆ RADIX.

IPECACUANHA ROOT.

The dried root of *Psychotria Ipecacuanha.*

The active principle resides in the bark, the inner or woody part contains but little.

From the experiments by Paul and Cownley (*P.J.* (3) xxiv. 61), it would appear (1) that the percentage of *total alkaloid* in Brazilian Ipecacuanha root does not vary much from 2 p.c.; (2) that the stems of the plant, with which the imported root has recently been found mixed, contain about one-half the total alkaloid of the root; (3) the root contains at least three alkaloids, Emetine (amorphous), Cephaeline (crystalline) and a small quantity of another crystalline alkaloid. Rio Ipecacuanha root contains the three alkaloids in the following proportions as compared with Carthagena Ipecacuanha:—

Brazilian (root)—Emetine 1·45 p.c., Cephaeline ·52 p.c., the third Alkaloid ·04 p.c. Total 2·01 p.c.

Brazilian (stem)—Emetine 1·18 p.c., Cephaeline ·59 p.c., the third Alkaloid ·03 p.c. Total 1·80 p.c.

Columbian—Emetine ·89 p.c., Cephaeline 1·25 p.c., the third Alkaloid ·06 p.c. Total 2·20 p.c.—Paul and Cownley, *P.J.* '96, i. 321.

It is also stated by Paul, *P.J.* (3) xxiv. 212, that from so-called deëmetinised Ipecacuanha he had obtained nearly ·5 p.c. of the ordinary alkaloids of Ipecacuanha.

The Histology of Ipecacuanha.—*P.J.* (3) xxv. 685.

The quality of commercial Powder of Ipecacuanha (Greenish).—*P.J.* '95, ii. 137.

Processes for the assay of Ipecacuanha may be found.—*P.J.* (3) xvi., 627; (3) xix., 721; (3) xxiv., 687; (3) xxv.,1093.

Medicinal Properties.—Expectorant, diaphoretic, gastro-intestinal stimulant, cholagogue. Emetic, slow in action (20 to 30 minutes), and depressant in large doses. Used in whooping cough and croup to expel exudation or membrane as well as for its depressing effects on the circulation. Used in acute and chronic bronchitis when the phlegm is thick and scanty, and in winter-cough and phthisis; in gouty dyspepsia and biliousness. Ipecacuanha has long been relied upon in the East for the cure of acute tropical dysentery. When the evacuations are frequent and accompanied with mucus and blood, 20 to 60 grains are given; and if the stomach rejects it, a little Opium is given with it, or a Mustard poultice applied to the epigastric region. It relieves some forms of vomiting, such as that of pregnancy or alcoholism, when given in small doses, 1 or 2 minims of the **Vinum** every half-hour. The diaphoretic effect is best obtained when given in the form of the Compound Powder. In small doses it is commonly added to aperient pills for chronic constipation. A **spray** of the Wine of Ipecacuanha has been strongly recommended by Ringer and Murrell for chronic bronchitis and asthma.

Is a powerful hepatic stimulant, it increases slightly the secretion of intestinal mucus, but has no other apparent stimulant effect on the intestines.—Dr. Rutherford.

Applied to the bites and stings of insects.

Dose.—As an expectorant, ¼ to 2 grains; as an emetic, 15 to 30 grains.

Prescribing Notes.—Prescribed in small doses as an auxiliary in alterative pills. The compound powder is frequently given in the form of a **powder, pill,**

cachet, or Compressed Tablet. A good **pill** can be made by using Dispensing Syrup *q.s.* Children tolerate large doses well.

Incompatibles.—Lead and Mercury salts, vegetable acids, astringent infusions.

Official Preparations.—Of the **Root**, Extractum Ipecacuanhæ Liquidum, Pulvis Ipecacuanhæ Compositus, Trochiscus Ipecacuanhæ, Trochiscus Morphinæ et Ipecacuanhæ; of the **Liquid Extract**, Acetum Ipecacuanhæ and Vinum Ipecacuanhæ; of the **Compound Powder**, Pilula Ipecacuanhæ cum Scilla.

Not Official.—Syrupus Ipecacuanhæ, Syrupus Ipecacuanhæ Aceticus, Tinctura Ipecacuanhæ, Emetine, Emetine Hydrochloride, Emetine Hydrobromide, Cephaeline, Cephaeline Hydrochloride.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—Ipecacuanha occurs in somewhat tortuous pieces not often exceeding six inches (fifteen centimetres) in length, and one quarter of an inch (six millimetres) in thickness. It varies in colour from dark brick-red to very dark brown, and is closely annulated externally, the annulations not taking the form of narrow merging ridges (distinction from Carthagena Ipecacuanha). It breaks with a short fracture, the fractured surface exhibiting a thick greyish cortex, which usually has a resinous but sometimes a starchy appearance, and a small dense central portion. When examined under the microscope the cortex exhibits small compound starch grains and raphides; the wood contains no vessels. The odour is slight, the taste bitter.

Preparations.

ACETUM IPECACUANHÆ. Vinegar of Ipecacuanha. (Altered.)

Liquid Extract of Ipecacuanha, 1; Alcohol (90 p.c.), 2; Diluted Acetic Acid, 17. Mix; filter, and if necessary add sufficient Diluted Acetic Acid to produce 20 of the Vinegar of Ipecacuanha.

Now made with the Liquid Extract, and Alcohol (90 p.c.) is added.

Dose.—10 to 30 minims.

(Not in the other Pharmacopœias.)

EXTRACTUM IPECACUANHÆ LIQUIDUM. Liquid Extract of Ipecacuanhæ. (New.)

A Liquid Extract containing 2 to 2¼ grains of the alkaloids of Ipecacuanha Root in 110 minims (2 to 2·25 grammes in 100 c.c.).

Ipecacuanha Root, in No. 20 powder, 16 oz.; Calcium Hydroxide, 700 grains; Alcohol (90 p.c.) a sufficient quantity. Moisten the powdered Ipecacuanha Root with 6 fl.oz. of the Alcohol; pack firmly in a percolator; add more of the Alcohol, and when the liquid begins to drop, close the lower orifice of the percolator; set aside for twenty-four hours. Then percolate slowly until 13½ fl. oz. have been collected; reserve this portion. Continue percolation until nothing more is extracted; drain well. Mix the Lime with the marc; allow them to remain in contact for twenty-four hours; then continue percolation until exhaustion is complete. Recover the Alcohol from the last two percolates by distillation; dissolve the residual extract in the reserved portion of percolate.

Determine the proportion of alkaloids in the resulting strong liquid

extract by the following analytical process:—Dilute 20 c.c. with an equal bulk of Water. Remove the Alcohol by the aid of a water-bath; add to the warm solution an excess of Solution of Lead Subacetate. Filter; wash the precipitate with water and add the washings to the filtrate. Remove the excess of Lead from the filtrate by precipitation with Diluted Sulphuric Acid; filter; wash the precipitate with water and add the washings to the filtrate. Transfer the filtrate to a separator; add excess of Solution of Ammonia and agitate with 25 c.c. of Chloroform. Separate and set aside the Chloroformic Solution. Twice repeat the agitation with Chloroform and the separation. Mix the Chloroformic Solutions; evaporate; dry at a temperature below 176° F. (80° C.), and weigh the residue of total alkaloids.

From this weight calculate the amount of alkaloids in the bulk of Strong Liquid Extract, and add to the latter sufficient Alcohol (90 p.c.) to produce Liquid Extract of Ipecacuanha containing not less than 2 and not more than 2·25 grammes of alkaloid in 100 c.c., or from 2 to 2¼ grains in 110 minims.

The process by Wilson for the assay of this preparation (*P.J.* '98, ii. 3) gives more accurate results than the new B.P., and can moreover be almost completed whilst the first B.P. Lead precipitate is being filtered and washed. The B.P. Lead precipitate retains alkaloid even after continued washing.

Dose.—As an expectorant, ½ to 2 minims; as an emetic, 15 to 20 minims.

Foreign Pharmacopœias.—Official in Swiss and U.S. 1 in 1; Belg. and Span. have **solid extract.**

PILULA IPECACUANHÆ CUM SCILLA. Pill of Ipecacuanha with Squill. (Modified.)

Compound Powder of Ipecacuanha, 3; Squill, in powder, 1; Ammoniacum, in powder, 1; Syrup of Glucose, a sufficient quantity. Mix to form a mass. =(about 1 of Opium in 20).

Now made with Syrup of Glucose in place of Treacle.

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in Port., similar to Brit.; not in the others.

PULVIS IPECACUANHÆ COMPOSITUS. Compound Powder of Ipecacuanha. *B.P.Syn.*—Dover's Powder.

Ipecacuanha Root, in powder, 1; Opium, in powder, 1; Potassium Sulphate, in powder, 8: mix. =(1 Opium, 1 Ipecac. in 10).

Medicinal Properties.—An admirable diaphoretic and anodyne; it is also most useful in gastric ulceration, dyspeptic vomiting, dysentery and diarrhœa; in the latter case it is sometimes combined with Calomel. In doses of 3 or 4 grains it will often relieve heartburn, probably by allaying gastric irritability.

Dose.—5 to 15 grains.

This Powder contains 10 p.c. of Opium.

Foreign Pharmacopœias.—Official in all, and is the well-known Dover's Powder; Austr., Ger., Russ. and Swiss, Pulvis Ipecacuanhæ Opiatus; Hung., Pulvis Doveri; Dan., Norw. and Swed., Pulv. Ipecac. Thebaicus; Dutch, Pulvis Opii Compositus; Fr., Poudre d'Ipecacuanha Opiacée; Port., Po de Ipecacuanha Composto; Jap., Pulvis Doweri; and U.S., Pulvis Ipecacuanhæ et Opii, with Milk

Sugar; all same strength as Brit.; Span., Polvo de Ipecacuana Opiado, 1 Opium, 1 Ipecacuanha, in 11·4; Belg., 9 *Extract* Opium, 9 Ipecac., in 100; Ital., Polvere di Oppio e di Ipecacuanha, Opium 1, Ipecacuanha 1, Liquorice powder 1, Nitre 2, Potassium Sulphate 2; Mex. (Polvo de Dower), Opium 1, Ipecacuanha 1, Nitre 4, Potassium Sulphate, 4.

The original Powder of Dr. Dover was prepared by fusing together 4 parts of Potassium Nitrate with 4 of Potassium Sulphate, and reducing the product to fine powder; to this was added 1 of Ipecacuanha, 1 of Opium, and 1 of Liquorice; the French Codex has now made it same strength as British; the Belgian still retains the powdered Extract of Opium instead of Opium itself, which nearly doubles the strength.

TROCHISCUS IPECACUANHÆ. IPECACUANHA LOZENGE. (ALTERED.)

Ipecacuanha Root, in powder, ¼ grain. Mix with the Fruit Basis to form a Lozenge.

Now made with Fruit Basis.

Dose.—Not given in B.P.; 1 to 3 lozenges.

Foreign Pharmacopœias.—Official in Belg. and Ital., about ½ grain; Austr., Dutch, Fr., Jap., Mex., Port., Russ., and Swiss, about ⅛ grain; Span., about ½ grain; U.S., about ¼ grain; not in the others.

TROCHISCUS IPECACUANHÆ ET MORPHINÆ. *See* MORPHINÆ HYDROCHLORIDUM.

VINUM IPECACUANHÆ. IPECACUANHA WINE. (ALTERED.)

Liquid Extract of Ipecacuanha, 1; Sherry, 19. Mix; set aside for forty-eight hours; filter. =(1 in 20).

Now made with Liquid Extract in place of Ipecacuanha, Acetic Acid and Water.

Dose.—As an expectorant, 10 to 30 minims; as an emetic, 4 to 6 fl. drm.

Foreign Pharmacopœias.—Official in Belg., 6 in 100 of Malaga; Dutch, 1 and 10 of Malaga; Ger., Jap., Norw., Russ. and Swed., 1 and 10 of Sherry; Port., 1 in 20 of Port; U.S., with fluid Extract, 1 in 10 of Alcohol and White Wine; not in the others.

Not Official.

SYRUPUS IPECACUANHÆ.—

Austr., Ger., and Hung.—Bruised Ipecacuanha, 1; Alcohol (90 p.c.), 5; Water, 40: digest forty-eight hours, and filter 40; add 60 of Sugar, and dissolve to make 100 of Syrup.

Belg.—Tincture of Ipecacuanha, 35; Simple Syrup, 1000.

Dutch.—Tincture of Ipecacuanha, 1; Syrup, 19.

Fr.—Alcoholic Extract of Ipecacuanha, 1; Alcohol (60°), 3; Water, 34; Sugar, 63.

Ital.—Ipecacuanha, 1; Dilute Alcohol, 5, Simple Syrup, 95.

Jap.—Tincture of Ipecacuanha, 1; Simple Syrup, 9.

Mex.—Alcoholic Extract of Ipecacuanha, 1; Alcohol (60°), 4; Syrup, 95.

Port.—Alcoholic Extract of Ipecacuanha, 1; Water, 35; Sugar, 65.

Russ.—Ipecacuanha, 1; Alcohol (90 p.c.), 5; Water, 40; Sugar, 60.

Span.—Alcoholic Extract of Ipecacuanha, 8; Water, 100; Syrup, 1150.

Swiss.—Fluid Extract of Ipecacuanha, 1; Syrup, 99.

U.S.—Fluid Extract of Ipecacuanha, 7; Acetic Acid, 1; Glycerin, 10; Sugar, 70; Water to 100.

All by weight except U.S.

SYRUPUS IPECACUANHÆ ACETICUS (*B.P.C.*).—Vinegar of Ipecacuanha (*B.P.C.*), 20 fl. oz.; Refined Sugar, 36 oz.: dissolve with a gentle heat. Sp. gr. 1·33.

Dose.—15 to 120 minims.

TINCTURA IPECACUANHÆ.—Bruised Ipecacuanha, 1; Alcohol (60 p.c.), 10; digest eight days, press, and make up to 10.

According to a series of experiments, detailed *C.D.* '91, ii. 706, the best menstruum for making the tincture is Rectified Spirit containing 60 minims of Liquor Ammoniæ per 20 fluid ounces. Proof Spirit extracts the alkaloid almost as well as Rectified, but the result does not remain bright.

Foreign Pharmacopœias.—Official in Austr., Dutch, Russ., Swed. and Swiss, 1 in 10; Jap., 1 and 10; Belg., Fr., Hung., Mex., Port. and Span., 1 in 5; all by weight; not in the others.

EMETINE, $C_{15}H_{22}NO_2$ or $C_{30}H_{44}N_2O_4$.—A colourless amorphous base present in varying amount in both Brazilian and Columbian Ipecacuanha Root, as given under Ipecacuanha. According to Paul and Cownley, Emetine melts at about 68° C.; it is strongly alkaline to Litmus and neutralises acids forming crystalline salts. On exposure to light it rapidly acquires a yellow colour. It is readily soluble in Alcohol, Ether, Chloroform, and Benzene; but only sparingly soluble in hot Petroleum Spirit or in Water. Being insoluble in caustic alkalis, it is thus distinguishable from Cephaeline.

The chief salts for medicinal purposes are the Hydrochloride and Hydrobromide.—*P.J.* (3) xxiv. 61; (3) xxv. 111, 373, 690; '97, ii. 451; '98, ii. 98.

EMETINE HYDROCHLORIDE.—Crystallises from water in radiating groups of silky filaments, very soluble in Water, and in Alcohol. Dried at 100° C. the salt has the composition $C_{15}H_{22}NO_2HCl$, and when crystallised from an acid solution $C_{15}H_{22}NO_2,HCl,3H_2O$.

EMETINE HYDROBROMIDE.—Crystallises from Water in beautiful silky tufts of needles. Although readily soluble in Water, it is much less soluble than the Hydrochloride, difficultly so in Absolute Alcohol or in Chloroform. The commercial salt has the composition $C_{15}H_{22}NO_2,HBr,2H_2O$, and contains 67·95 p.c. of alkaloid. It is rendered anhydrous at 100° C. Both salts are permanent, undergoing no alteration in colour after being kept for some months.

Medicinal Properties.—A powerful emetic and expectorant. In acute catarrhal and febrile conditions, as well as an expectorant, and for all the uses of Ipecacuanha where vomiting is not desired, Emetine in small doses seems likely to prove of considerable value; also as an emetic in larger doses of from $\frac{1}{6}$ to $\frac{1}{3}$ of a grain when a more depressing action is required. The powerful local constricting effect upon blood vessels may also prove useful in hyperæmic and inflammatory conditions. The emetic dose of Emetine is about double that of Cephaeline. Emetine caused a flow of watery mucus from the nasal mucous membrane when a full dose was given; this was not noticed after Cephaeline.—*L.* '95, ii. 1276; *P.J.* '95, ii. 435.

Dose.—$\frac{1}{60}$ to $\frac{1}{20}$ grain.

CEPHAELINE.—$C_{14}H_{20}NO_2$ or $C_{28}H_{40}N_2O_4$, the alkaloid discovered by Paul and Cownley in both Brazilian and Columbian Ipecacuanha.—*P.J.* (3) xxv. 111.

Colourless, crystallisable and much less soluble in Ether than Emetine, like Emetine it is rapidly coloured by exposure to light. Melts at 102° C. It is readily soluble in Alcohol and in caustic alkalis. It forms crystalline salts with acids.

CEPHAELINE HYDROCHLORIDE.—Readily soluble in Water. In the dry state it has the formula $C_{14}H_{20}NO_2HCl$, but when crystallising from a slightly acid solution, it approximates to $C_{14}H_{20}NO_2HCl,3H_2O$ (Paul and Cownley, *P.J.* (3) xxv. 373).

Medicinal Properties.—Cephaeline is more powerfully emetic than Emetine, but does not produce depressing effects in doses of $\frac{1}{12}$ to $\frac{1}{6}$ grain, and is slow in action.—*L.* '95, ii. 1274.

Not Official.

IRIS.

The rhizome and roots of *Iris versicolor*.

Medicinal Properties.—The preparations **Iridin** and **Extractum Iridis** are purgative and diuretic. Emetic and cathartic in large doses. Used in biliousness, torpid liver and duodenal dyspepsia.

Preparations.

IRIDIN.—A dark brown powder, obtained from Iris.

Dose.—1 to 5 grains.

Is a powerful hepatic stimulant; it also stimulates the intestines.—Dr. Rutherford.

EXTRACTUM IRIDIS (U.S.).—Prepared by exhausting Iris with Alcohol (94 p.c.), distilling the Alcohol and evaporating to a pilular consistence.

EXTRACTUM IRIDIS FLUIDUM (U.S.).—Strength 1 in 1, prepared by percolation with Alcohol (90 p.c.).

JABORANDI FOLIA.

JABORANDI LEAVES.

The dried leaflets of *Pilocarpus Jaborandi*.

According to Paul and Cownley (*P.J.* '96, ii. 1) it is certain that the drug met with in commerce under the name of Jaborandi is frequently in part the product of various species of Pilocarpus. As to the nature of the basic constituents of these drugs very little is known, and the discrepancies in the results of the pharmacological action of Pilocarpine are very suggestive of doubt whether the alkaloid referred to is always the same substance. The analysis of the several varieties gave the following result:—

	Total alkaloid.	Crystallisable Nitrate.	Recrystallised Nitrate.
P. Jaborandi,	·72 p.c.	·67 p.c., m.p. 161° C.	·37 p.c., m.p. 162·7 C. ·30 ,, ,, 158·3 ,,
P. spicatus,	·16 ,,		·03 ,, ,, 151·5 ,, ·04 ,, ,, 130·5 ,,
P. trachylophus,	·40 ,,	·02 p.c.	
P. microphyllus,	·84 ,,	·45 ,, m.p. 160° C.	·23 p.c., m.p. 162·7 C. ·22 ,, ,, 147·7 ,,

A sample of reputed Jaborandi leaves was found on examination to contain, leaves of P. Jaborandi 12 p.c., P. trachylophus 38 p.c., stalks 50 p.c.

Jaborandi leaves of commerce (Holmes).—*P.J.* '95, ii. 520, 539.

A spurious Maranham Jaborandi.—*P.J.* '96, ii. 2.

Pilocarpus spicatus is the source of Aracati Jaborandi.—*P.J.* '97, ii. 459.

Microscopical distinction between the different varieties of Pilocarpus.—*P.J.* '97, ii. 5.

Medicinal Properties.—Powerful and prompt diaphoretic, sialagogue, and galactagogue. Useful in the dropsy, uræmia and thirst of Bright's disease. It is antagonistic in its action to Belladonna. *See* also Pilocarpinæ Nitras.

Is a very feeble hepatic stimulant.—Dr. Rutherford.

Official Preparations. — Extractum Jaborandi Liquidum, and Tinctura Jaborandi. Used in the preparation of Pilocarpinæ Nitras.

Foreign Pharmacopœias.—Official in Belg., Fr., Ger., Ital., Jap., Mex., Port., Russ., Span. and Swiss; U.S. (Pilocarpus); not in the others.

Description.—Jaborandi leaflets are dull green in colour, oval-oblong or oblong-lanceolate in outline, and usually vary from two and a half to four inches (six to ten centimetres) in length. They are shortly petiolate, obtuse and emarginate at the apex and, for the most part, unequal at the base; the margin is entire and slightly revolute, the texture coriaceous. The mature leaflets are glabrous, or exhibit at most a few scattered hairs on the under surface; on the upper surface the lateral veinlets are distinctly prominent. The mesophyll contains numerous oil-glands readily visible by transmitted light. They emit, when bruised, a slight aromatic odour; the taste is at first somewhat bitter and aromatic, becoming afterwards pungent. When chewed they increase the flow of saliva.

Preparations.

EXTRACTUM JABORANDI LIQUIDUM. Liquid Extract of Jaborandi. (New.)

Jaborandi Leaves, in No. 20 powder, 20; Alcohol (45 p.c.) a sufficient quantity. Moisten the powdered Jaborandi leaves with 10 of the Alcohol; pack the moistened powder in a percolator, and set aside for twelve hours; then percolate with the menstruum, collecting and reserving 17 of percolate; continue percolation until an additional quantity of 50 of percolate is obtained; distil the latter so as to recover the Alcohol, evaporate the residual aqueous liquid to the consistence of a soft extract, adding it to the reserved percolate; to the product add sufficient of the Alcohol to produce 20 of the Liquid Extract.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in U.S., Extractum Pilocarpi Fluidum 1 in 1; Belg. and Fr. have a **Solid Extract**; not in the others.

TINCTURA JABORANDI. Tincture of Jaborandi. (Altered.)

Jaborandi Leaves, in No. 40 powder, 4; Alcohol (45 p.c.) a sufficient quantity. Moisten the powder with 2½ of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 5).

Now 1 in 5 instead of 1 in 4, and Alcohol (45 p.c.) used in place of Proof Spirit.

Dose.—30 to 60 minims.

Foreign Pharmacopœias.—Official in Belg., Fr., and Span., 1 and 5; Mex., 1 in 5; not in the others.

Wright and Farr (*P.J.* (3) xxii. 1) show an enormous variation in the strength of various samples of this tincture, viz., from ·032 to ·148 p.c. of alkaloid, and recommend a standard of ·1 p.c.

This agrees with the manufacturing yield of Pilocarpine Nitrate, viz., ·5 to ·6 p.c. of the leaf employed.—*C.D.* '92, ii. 147.

The best strength of Alcohol to use is 50 p.c. (by volume).

PILOCARPINÆ NITRAS. *See* p. 482.

JALAPA.

JALAP.

The dried tubercules of *Ipomœa Purga*.

As stated in our previous edition, this Jalap contains, as its principal ingredient, a glucoside **Convolvulin**, insoluble in Ether, and constituting all but a small part of Resina Jalapæ B.P.

Tampico Jalap from *Ipomœa simulans*, and Orizaba root (Woody Jalap), from *Ipomœa Orizabensis*, also yield a glucoside **Jalapin**, soluble in Ether, and almost, if not completely, identical with Resina Scammonii B.P. from *Convolvulus Scammonia*.

It is unfortunate that the name Jalapin should have been applied to the resin of *spurious* Jalap, which is identical with the *true* Resin of Scammony, and which is quite distinct from the Official Resin of Jalap.

During 1892, attention was again called to this misleading nomenclature (*P.J.* (3) xxii. 888), and considerable correspondence ensued. It appears that it has been customary in this country to apply the term 'Jalapin' to the true Jalap Resin, but the article imported from Germany under that name is invariably the Ether-soluble Resin from spurious Jalap or Scammony. Several suggestions were made, but none which seemed at all likely to be acceptable both in Britain and Germany. The most feasible proposal is that the term 'Scammonin' should be used to designate the Ether-soluble Resin (shown, *P.J.* (3) xxiii. 86, to be identical from either of the previous named sources), and that the earliest opportunity should be taken to make Official, under the name Jalapin, an Ether-wholly-insoluble Resin from true Jalap.

Medicinal Properties.—A brisk cathartic, operating sometimes painfully, producing copious watery discharges. From its hydragogue powers, it is especially serviceable in dropsy and cerebral congestion, when it is usually prescribed in the form of the Compound Powder; also used in febrile diseases, and as a vermifuge it is an ingredient of Pulvis Scammonii Compositus.

Is a moderately powerful hepatic, and a powerful intestinal stimulant.—Dr. Rutherford.

Dose.—5 to 20 grains.

Prescribing Notes.—The powder can be given in **cachets**, or mixed with Confections. The Resin is given in **pills** made by adding Dispensing Syrup *q.s.*

Official Preparations.—Extractum Jalapæ, Pulvis Jalapæ Compositus, Resina Jalapæ, Tinctura Jalapæ; used in the preparation of Pulvis Scammonii Compositus. The **resin** is contained in Pilula Scammonii Composita.

Not Official.—Sapo Jalapinus.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—Dark brown, irregularly oblong, ovoid, napiform or fusiform roots, varying in length from one to three inches (two and a half to seven and a half centimetres) or more, the larger being frequently incised. They are hard, compact, and heavy. Externally they are furrowed and wrinkled, and marked with small transverse scars; internally they vary in colour from yellowish-grey to dingy brown. The transverse section usually exhibits irregular dark concentric lines, and, when examined under the microscope, numerous compound starch grains, clustered crystals of Calcium Oxalate, and cells con-

taining resin. The odour is characteristic, the taste at first sweet but afterwards acrid and disagreeable.

Test.—Jalap, when assayed by the process described under 'Jalapæ Resina,' should not yield less than 9 nor more than 11 p.c. of Resin having the properties of the official Resin.

The Fr. Codex (1884) fixed the standard at 16—18 p.c. of Resin, U.S. (1880 and 1890) at 12 p.c., but Ger. (1890) has lowered the figure to 7 p.c.

Process for resin-estimation by extraction with Amylic Alcohol and freeing from Water soluble compounds by washing in a separator.—*P.J.* (3) xxiii. 107.

Preparations.

EXTRACTUM JALAPÆ. Extract of Jalap. (Modified.)

Jalap, in coarse powder, 1; Alcohol (90 p.c)., 5; Distilled Water, 10. Macerate the powdered Jalap in the Alcohol for seven days; press out the tincture, filter and then remove the Alcohol by distillation, leaving a soft extract. Again macerate the residue of the Jalap in the Water for four hours; express; strain through flannel; evaporate to the consistence of a soft extract. Mix the two extracts, and evaporate at a temperature not exceeding 140° F. (60° C.) to the consistence of a firm extract.

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

We have found 100 lbs. of Jalap to yield 50 lbs. of Extract. Squibb, *Y.B.P.* '72, 324, states that the total yield varies from 35 to 52 p.c., the alcoholic portion, 9 to 17 p.c., and the aqueous 26 to 40 p.c. Cripps, *P.J.* (3) xxiii. 779, examined a number of commercial samples for Resin and found them to vary from 12 to 50 p.c.; a sample prepared by himself gave 23 p.c. of total Resin.

Dose.—2 to 8 grains.

Foreign Pharmacopœias.—Official in Jap., Russ. and U.S.; not in the others.

PULVIS JALAPÆ COMPOSITUS.—Compound Powder of Jalap.

Jalap in powder, 5; Acid Potassium Tartrate in powder, 9; Ginger in powder, 1: mix. =(1 in 3)

Dose.—20 to 60 grains.

Foreign Pharmacopœias.—Official in Russ., Jalap 1, Potassium Bitartrate 2; Span., Jalap 1, Cream of Tartar 1, Magnesia 1; U.S. Jalap 35, Potassium Bitartrate 65; Mex.; not in the others.

JALAPÆ RESINA.—Jalap Resin.

Jalap in No. 40 powder, 8; Alcohol (90 p.c.) a sufficient quantity; Distilled Water, a sufficient quantity. Digest the Jalap with twice its weight of the Alcohol in a covered vessel, heating gently, for twenty-four hours; transfer to a percolator; when the Tincture ceases to pass, continue the percolation with successive portions of the Alcohol until nothing more is dissolved; add to the Tincture thus produced 4 of the Distilled Water; remove the Alcohol by distillation; transfer the residue while hot to an open dish; allow it to become cold; pour off the supernatant fluid from the Resin; wash this two or three times with hot Distilled Water; dry.

Description.—In dark-brown opaque fragments, translucent at the

edges, brittle, breaking with a resinous fracture, readily reduced to a pale-brown powder, sweetish in odour, acrid to the throat. Easily soluble in Alcohol (90 p.c.), insoluble in Oil of Turpentine.

Tests.—The powder yields little or nothing to warm Water, and not more than 10 per cent. to Ether (indicating absence of Scammony Resin and Resin of Tampico Jalap). A solution in Alcohol (90 p.c.) is not coloured bluish-green by Test-solution of Ferric Chloride (absence of Guaiacum Resin).

Dose.—2 to 5 grains.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

TINCTURA JALAPÆ.—Tincture of Jalap. (Altered.)

Jalap in No. 40 powder, 4; Alcohol (70 p.c.) a sufficient quantity. Moisten the powder with 2 of the Alcohol; pack in a percolator; gradually add more of the Alcohol until 12 of percolate has been collected; subject the marc to pressure; add the expressed liquid to the percolate; set aside for twenty-four hours; filter.

Determine the amount of Jalap Resin present in 10 c.c. of the resulting strong tincture by the process described under 'Jalapæ Resina,' and dilute the remainder of the strong tincture with a sufficient quantity of the Alcohol to produce a Tincture containing 1·5 grammes of the Resin in 100 c.c.

Now made with Alcohol (70 p.c.) in place of Rectified Spirit and standardised.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Fr. and Port., 1 and 5 by weight; Mex. 1 in 5; not in the others. Belg., Fr., Port. and Swiss have a Compound Tincture.

Test.—Treated as described under 'Jalapæ Resina,' 10 c.c. of the Tincture should yield not less than ·145 nor more than ·155 gramme of the Resin.

Not Official.

SAPO JALAPINUS.—

Ger. and Russ.—Resin of Jalap, 4; Soap, 4; Alcohol, 8; evaporate to 9 by weight.

Jap.—Resin of Jalap, 4; Medicated Soap, 4; Dilute Alcohol, 8; evaporate to 9.

Swiss.—Resin of Jalap, 9; Hard Soap, 9; Glycerin, 1; Alcohol, 12; evaporate to 20 by weight.

Not Official.

JAMBUL.

The Seeds of *Eugenia Jambolana*, which have been used in India and this country for diabetes.—*P.J.* (3) xviii. 921; *B.M.J.* '91, ii. 1283. *B.M.J.E.* '92, i. 39; *T.G.* '93, 611; *Pr.* li. 138.

Dose.—5 to 30 grains.

It can be given in the form of **fluid extract**, dose 5 to 15 minims.

Not Official.

JUGLANS, U.S.

The bark of the root of *Juglans cinerea* (Butternut), collected in autumn.

A mild cathartic, used in the form of **Extractum Juglandis U.S.**, which is prepared with Dilute Alcohol, and **Juglandin**, an eclectic remedy, which was found by Rutherford to be a moderately powerful hepatic stimulant, and in doses of 5 to 10 grains is used as a mild purgative.

SPIRITUS NUCIS JUGLANDIS.—A distilled preparation from the Walnut (*Juglans Regia*).

Aromatic bitter, astringent, vermifuge.

Dose.—1 to 4 fl. drm.

JUNIPERI OLEUM.

OIL OF JUNIPER.

The Oil distilled from the full-grown unripe green fruit of *Juniperus communis*.

Sp. gr. ·860 to ·880.

Messrs. Schimmel state that doubly Rectified Oil of Juniper has sp. gr. ·858.

Solubility.—1 in 20 of Alcohol (90 p.c.), but it does not become quite clear: it mixes with equal parts of Absolute Alcohol, but if more Alcohol be added it becomes milky.

Medicinal Properties.—Stimulant, carminative, antispasmodic, and a stimulating diuretic, the latter property constituting its chief medicinal value. Used in cardiac and hepatic dropsical cases, either alone or combined with other diuretics; should not be used in acute Bright's disease.

Dose.—½ to 3 minims.

Official Preparation.—Spiritus Juniperi; contained in Mistura Creosoti.

Foreign Pharmacopœias.—Official in Austr., sp. gr. ·870; Belg., sp. gr. ·853—·911; Dan., sp. gr. ·850—·870; Fr. (Genièvre), Ger., Norw. and Swed., sp. gr. not given; Hung., sp. gr. ·840—·900; Ital. (Essenza di Ginepro), sp. gr. ·850; Jap., sp. gr. ·860—·880; Port. (Essencia de Zimbro), sp. gr. ·855—·879; Russ., sp. gr. ·850—·900; Span. (Esencia de Enebro); Swiss, sp. gr. ·850—·860; U.S., sp. gr. ·850—·890; not in Dutch or Mex.

Description.—Colourless or pale-greenish yellow, with the characteristic odour of the fruit, and a warm, aromatic, bitterish taste.

Test.—Sp. gr. ·865 to ·890. The Oil is soluble, with slight turbidity, in 4 times its own volume of a mixture of equal parts of Absolute Alcohol and Alcohol (90 p.c.).

Preparation.

SPIRITUS JUNIPERI.—Spirit of Juniper. (Altered.)

Oil of Juniper, 1; Alcohol (90 p.c.) a sufficient quantity. To the Oil of Juniper add enough of the Alcohol to form 20 of the Spirit of Juniper. If the solution be not clear, agitate with a little Powdered Talc, and filter. =(1 in 20).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—20 to 60 minims.

This Spirit of Juniper contains two and a half times the proportion of Oil of Juniper present in the Spirit of Juniper of the British Pharmacopœia of 1885.

Foreign Pharmacopœias.—Official in Fr. and Jap., 1 in 50; Russ., 1 in 100; all by weight; U.S., 1 in 20; Austr., Ger. and Swiss, 1 fruit in 4, by distillation; Span., 3 fruit in 19 by distillation; Dutch, Port. and U.S., have a compound spirit; not in the others.

Not Official.

KAMALA.

Syn.—Glandulæ Rottleræ.

A fine, granular, mobile, brick-red powder, consisting of the minute glands and hairs obtained from the surface of the fruits of *Mallotus Philippinensis*.

Solubility.—Scarcely mixing with water, but about 60 p.c. of a sample (containing 6 p.c. of ash) was soluble in, and formed a red-coloured solution with Absolute Alcohol, Chloroform, or Ether; and was for the most part soluble in Liquor Potassæ; sparingly in Petroleum Spirit.

Medicinal Properties.—Anthelmintic and purgative. Successfully given in tænia. *Pr.* lii. 373.

Dose.—30 to 120 grains.

Prescribing Notes.—The powder is usually given suspended in Gruel, Mucilage, Treacle, or Syrup; it will of itself expel the worm, or it may be prescribed along with Liq. Ext. of Male Fern. A purgative should, however, follow.

Foreign Pharmacopœias.—Official in Austr.; Dutch; Ger., Hung.; Jap. (10 p.c. of ash); Russ. and Swiss (6 p.c. of ash); Hung. has also Kamala Depuratum; Ital.; Mex.; Port.; Swed.; U.S. (8 p.c. of ash); not in the others.

Test.—On ignition in air it should yield 4 or 5, or at most 10 p.c. of ash.

The pure drug does not yield more than 2 p.c. of ash, but most commercia samples give from 20 to 50 p.c.—*P.J.* (3) xv. 654; (3) xviii. 678; (3) xxii. 394, 894.

Six commercial samples examined showed a variation in ash from 6·1 to 69·2.—*C.D.* '95, i. 274.

Preparation.

TINCTURA KAMALÆ.—Kamala, 1; Alcohol (60 p.c.) 5: macerate seven days, and strain.

Dose.—1 to 2 fl. drm.

KAOLINUM.

KAOLIN.

[NEW.]

N.O.Syn.—China Clay; Porcelain Clay.

A native aluminium silicate, powdered, and freed from gritty particles by elutriation.

A fine white clay, derived from the decomposition of the felspar of granitic rocks; extensive tracts of it occur in Cornwall. When finely ground and washed it is used as a form of Fuller's Earth.

Has been used in Germany for many years as an **excipient for pills** of the easily

reduced salts of metals, such as Gold Chloride, Silver Nitrate, and Potassium Permanganate; but a mixture of Paraffins answers better. *See* MASSA PARAFFINUM, p. 463. It is also employed for clarifying Wine, Beer, and Syrups.

Official Preparation.—Contained in Pilula Phosphori.

Not Official.—Massa Kaolini and Unguentum Kaolini.

Foreign Pharmacopœias.—Official in Austr., Ger. and Hung., Bolus Alba; Belg., Argilla; Dan. and Norw., Kaolinum; not in the others; Swiss has Alumina.

Description.—A soft, whitish powder, insoluble in Water or in diluted acids.

Test.—The product of its fusion with alkalis, digested in Water, and neutralised with Hydrochloric Acid, affords the reactions characteristic of Aluminium, a gelatinous precipitate of Silica being formed.

Not Official.

UNGUENTUM KAOLINI.—Soft Paraffin, 1; Hard Paraffin, 1: melt, and add Kaolin, 1; stir till cold.

This has been proposed as a basis for pills containing Silver Nitrate or Potassium Permanganate.—*P.J.* (3) xv. 60.

A very great improvement upon it is the following:—

MASSA KAOLINI.—Soft Paraffin, 2; Hard Paraffin (m.p. 120° F.), 1; Kaolin, 1. This will make a good mass with three times its weight of Potassium Permanganate.

A mixture of Hard Paraffin (m.p. 120° F.), 1; with Soft Paraffin, 1½; answers even better, and will make a good mass with four times its weight of Permanganate, *see* MASSA PARAFFINUM, p. 463.

Not Official.

KAVA-KAVA.

The root of *Piper Methysticum*.

Used by the inhabitants of the Polynesian Isles in the preparation of an intoxicating liquor.

Tonic and diuretic; used in chronic catarrhal conditions of the genito-urinary organs.

An alcoholic extract used as a hypnotic, dose ½ grain to 1 grain.—*L.* '87, i. 105.

Lewin has separated an oily green substance (a resin), soluble in Alcohol and Petroleum Spirit, having the characteristic smell of Kava. It produced a marked and prolonged insensibility of the mucous membrane of the mouth, and of the conjunctiva.—*L.* '86, i. 658; *P.J.* (3), xvi. 918.

Not Official.

KERATINE.

A substance introduced by Dr. Unna for coating pills which are intended to pass the stomach and act in the small intestine. It is made by digesting horn shavings, first in artificial gastric juice (acidified Pepsine solution) until all the albuminous substances have been dissolved, and treating the residue with Ammonia Solution. The Ammoniacal Solution, when evaporated, yields a gum-like liquid, which can be used for coating pills. The coating although unaffected by Hydrochloric Acid is soluble to some extent in Acetic and Citric Acids, which should therefore not be given at the same time.—*P.J.* (3) xv. 422.

Foreign Pharmacopœias.—Official in Ger.: not in the others.

Preparation.

LIQUOR KERATINI.—Prepared Keratine, 1; Alcohol (90 p.c.), 5; Strong Solution of Ammonia, 5; mix the Alcohol and Ammonia and dissolve the Keratine.

This makes a good coating, and dries quickly. It is better to give the pills a thin coating of Oil of Theobroma, two coatings of Keratine and then varnish.

KINO.

KINO.

The juice obtained from incisions in the trunk of *Pterocarpus Marsupium*, evaporated to dryness.

Of 100 grains Tellicherry Kino, only 88 grains are dissolved by cold Water, and 35 grains of Isinglass will precipitate the whole of the astringent matter from the solution. Compared with Pale Catechu it is more soluble in Water, and the solution is more astringent.

Medicinal Properties.—A powerful astringent. Employed in obstinate diarrhœa and dysentery in form of compound powder or with chalk; also in passive hæmorrhage and chronic mucous discharges. Externally, as a styptic, and in powder to indolent ulcers.

Dose, *in powder*, 5 to 20 grains.

Prescribing Notes.—Generally given in the form of the **compound powder**, and may be administered in **cachets**. The Tincture is useful in gargles and tooth washes, the Lozenge for throat affections.

Incompatibles.—Mineral Acids, Alkalis and Carbonates, Metallic salts and Gelatin.

Official Preparations.—Pulvis Kino Compositus, and Tinctura Kino. Contained in Pulvis Catechu Compositus.

Not Official.—Trochisci Kino.

Foreign Pharmacopœias.—Official in Belg., Fr., Jap., Port., Russ., Span. (Quino), Swed., Swiss and U.S.; not in the others.

Description. — In small angular glistening opaque reddish-black brittle fragments, which in thin laminæ and at the edges are transparent and ruby-red; inodorous, very astringent, and when chewed tinges the saliva red.

An examination of commercial Kinos.—*C.D.* '96, i. 460; '98, ii. 57.

Tests.—Partially soluble in cold Water; almost entirely soluble in Alcohol (90 p.c.). Yields little or nothing to Ether. Not less than 80 p.c. should be soluble in boiling Water.

Preparations.

PULVIS KINO COMPOSITUS. Compound Powder of Kino.

Kino, in powder, 15; Opium, in powder, 1; Cinnamon Bark, in powder, 4. =(1 Opium in 20).

This powder contains 5 p.c. of Opium.

Keep it in a well-closed vessel.

Dose.—5 to 20 grains.

(Not in the other Pharmacopœias.)

TINCTURA KINO. TINCTURE OF KINO. (MODIFIED.)

Kino, in powder, 2; Glycerin, 3; Distilled Water, 5; Alcohol (90 p.c.) a sufficient quantity. Mix the Glycerin and the Distilled Water; rub the Kino in a mortar with a sufficient quantity of the mixture to form a smooth paste, gradually adding the remainder of the mixture; transfer to a closed vessel; add 10 of the Alcohol; set aside for 12 hours, frequently agitating; filter through a plug of cotton wool; pass sufficient of the Alcohol through the filter to produce 20 of the Tincture. =(1 in 10).

Now made with Alcohol (90 p.c.) instead of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Fr., Russ., and Swiss, 1 in 5, by weight; U.S., 1 in 10; not in the others.

Not Official.

TROCHISCI KINO (*T.H.*).—Containing 2 grains in each lozenge, with Black Currant paste.

Not Official.

KOLA.

The seeds of *Cola acuminata*, a tree whose habitat is the Western Coast of Africa, between Sierra Leone and the Congo. The seeds contain 2 to 2·5 per cent. of Caffeine, to which it owes its virtues. Various preparations have been made from them, *i.e.*, **Kola-chocolate, Kola elixir, Kola wafers, Kola wine,** also **Fluid Extract.**

A tincture of Kola (1 to 5 of Alcohol 60 p.c.) has been made Official in Fr. Codex. Supp.

KOUSSO. *See* CUSSO.

KRAMERIÆ RADIX.

KRAMERIA ROOT.

B.P. Syn.—RHATANY ROOT.

The dried root of (1) *Para Rhatany*, a species of Krameria, attributed to Krameria argentea; or of (2) *Peruvian Rhatany*, Krameria triandra.

It was pointed out by Holmes (*P.J.* (3) xvi. 878), that the Savanilla Rhatany in the London market was really the Para Rhatany of the 'Pharmacographia,' and that the Pharmacopœia (1885) description was somewhat mixed. The error has been corrected in B.P. '98.

Medicinal Properties.—A powerful astringent; tonic. Used in chronic diarrhœa; in passive hæmorrhages and mucous discharges, as menorrhagia and leucorrhœa; and generally where Tannin and Catechu are beneficial. The infusion is used as a **gargle** in relaxed sore throat; one teaspoonful of the tincture in a wineglassful of water is an excellent wash for spongy and inflamed gums, or stomatitis due to Mercury. Locally, in form of suppository with Morphine, it is used in prolapsus ani and anal fissure.

Dose.—Not in B.P.; 20 to 60 grains, in powder.

Incompatibles.—Alkalis, Lime Water, Iron and Lead salts, Gelatin.

Official Preparations.—Extractum Krameriæ, Infusum Krameriæ, Liquor Krameriæ Concentratus, Tinctura Krameriæ, Trochiscus Krameriæ, and Trochiscus Krameriæ et Cocainæ. Contained in Pulvis Catechu Compositus.

Not Official.—Extractum Krameriæ Fluidum, Gossypium Krameriæ, Suppositorium Krameriæ, Syrupus Krameriæ, and Trochiscus Krameriæ et Boracis.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Mex., Crameria; Norw., Russ., Swed. and Swiss, Ratanhia; Hung., Ratanha; Ital., Port. and Span., Ratania; U.S., Krameria.

Description.—(1) Para Rhatany occurs in cylindrical pieces, and is characterised by its purplish-brown colour and smooth, thick bark, marked at intervals by deep transverse cracks, and adhering firmly to the wood, which is of a pale reddish-brown colour. Fracture short. (2) Peruvian Rhatany is characterised by its dark reddish-brown colour and its yellowish woody axis, from which the bark readily separates. The bark is thinner than that of Para Rhatany, bright reddish-brown internally, and rough and scaly except in the smaller pieces. Fracture splintery.

The barks of both kinds of Rhatany have a strongly astringent taste, and when chewed tinge the saliva red.

Preparations.

EXTRACTUM KRAMERIÆ. Extract of Krameria. *B.P. Syn.*—Extract of Rhatany.

Macerate coarsely powdered Krameria Root in twice its weight of Distilled Water for twenty-four hours; pack in a percolator; and percolate with more Distilled Water until the Krameria Root is exhausted. Evaporate the liquid to dryness.

Dose.—5 to 15 grains.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Mex., Port., Russ., Span., Swed., and U.S.; Hung., crude extract purified with warm Water; Swiss, made with boiling Water; Mex. and U.S. have also a **Fluid Extract.** Not in Ger. or Norw.

INFUSUM KRAMERIÆ. Infusion of Krameria. *B.P. Syn.*—Infusion of Rhatany.

Krameria Root, bruised, 1; Distilled Water, boiling, 20. Infuse in a covered vessel for 15 minutes; strain. =(1 in 20).

Time reduced from 30 to 15 minutes.

Dose.—½ to 1 fl. oz.

This Infusion should be freshly prepared, as it deposits when kept.

Foreign Pharmacopœias.—Official in Fr., and Mex., Tisane, 1 in 50; not in the others.

LIQUOR KRAMERIÆ CONCENTRATUS. Concentrated Solution of Krameria. (New.)

Krameria Root, in No. 40 powder, 10; Alcohol (20 p.c.) 25, or a sufficient quantity. Moisten the Krameria with 5 of the Alcohol; pack in a closed percolator; set aside for three days; percolate with

the remaining Alcohol, added in 10 equal portions at intervals of twelve hours; continue percolation with more Alcohol until the product measures 20. =(1 in 2).

Dose.—½ to 1 fl. drm.

TINCTURA KRAMERIÆ. Tincture of Krameria. *B.P.Syn.*—Tincture of Rhatany. (Altered.)

Krameria Root, in No. 40 powder, 4; Alcohol (60 p.c.), a sufficient quantity. Moisten the powder with 2 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and Alcohol (60 p.c.) used in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Mex., Norw., Port., Russ., Swed., Swiss and U.S., 1 in 5; all by weight except U.S. Not in Ital., Jap. or Span.

TROCHISCUS KRAMERIÆ. Krameria Lozenge. *B.P.Syn.*—Rhatany Lozenge. (New)

Extract of Krameria, 1 grain. Mix with the Fruit Basis to form a Lozenge.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

TROCHISCUS KRAMERIÆ ET COCAINÆ. Krameria and Cocaine Lozenge. *B.P.Syn.*—Rhatany and Cocaine Lozenge. (New.)

Extract of Krameria, 1 grain; Cocaine Hydrochloride, $\frac{1}{20}$ grain. Mix with the Fruit Basis to form a Lozenge.

Not Official.

EXTRACTUM KRAMERIÆ FLUIDUM (U.S.).—Rhatany Root, 1; exhausted with Diluted Alcohol and Glycerin, to produce 1 of fluid extract.

GOSSYPIUM KRAMERIÆ (*T.H.*)—Tincture of Rhatany, ½ fl. oz.; Glycerin, 10 minims; mix and saturate evenly with it Cotton Wool, 60 grains, and dry.

SUPPOSITORIUM KRAMERIÆ.—Extract of Rhatany, 8 grains; Morphine Hydrochloride, $\frac{1}{10}$th grain; Stearin, 10 grains.

Foreign Pharmacopœias.—Official in Fr. and Span., 1 gramme in each.

SYRUPUS KRAMERIÆ (*U.S.*).—Fluid Extract of Krameria, 45; Syrup, 55.

Foreign Pharmacopœias.—Official in Swiss, Extract of Rhatany, 2; Water, 5; Syrup, 98; concentrate to 100 by weight.

TROCHISCUS KRAMERIÆ ET BORACIS.—Useful for relaxed throat.

Not Official.

LACTUCA.

Lettuce is the flowering herb of the wild indigenous plant, *Lactuca virosa*.

Has been found to contain a minute quantity of a mydriatic alkaloid recognised as Hyoscyamine, but in commercial Lactucarium not a trace could be detected. *P.J.* (3) xxii. 449.

Medicinal Properties.—Sedative and slightly hypnotic; said also to be

gently laxative, diuretic, and somewhat diaphoretic; allays irritative cough. Employed in dropsy combined with Squill, Digitalis, or other diuretics. The extract makes a suitable pill excipient for purgatives such as Calomel.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr. (Laitue vireuse), Ital. (Lattuga virosa), Mex. (Lechuga), Port. (Alface virosa), Span. (Lachuga) (L. Sativa); not in the others.

Preparations.

EXTRACTUM LACTUCÆ.—The inspissated juice evaporated to a pill consistence, according to the directions given for Extractum Belladonnæ Viride.

100 lbs. of the plant yield 50 to 70 lbs. juice = 60 to 80 oz. of Extract.

Dose.—5 to 15 grains.

Foreign Pharmacopœias.—Official in Belg., with weak Alcohol; Dutch, aqueous extract and alcoholic extract; Fr. and Ital., purified expressed juice evaporated; Mex., aqueous; Port., alcoholic; Span., expressed juice evaporated; not in the others.

The extract from the **root** is stronger than that made from the **leaves.**

LACTUCARIUM.—The juice from the incised flower-stalk of *Lactuca virosa* and other species, collected and dried.

Dose.—2 to 6 grains.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Hung., Jap., Mex., Port., Swed. and U.S.; Belg., Fr. and Swed. use other species also; not in Ger., Ital., Norw., Russ., Span. or Swiss.

SYRUPUS LACTUCARII.—Macerate Lactucarium 1, with Petroleum Spirit 4, for twenty-four hours, decant the Petroleum Spirit solution, dry the residue, mix it with an equal bulk of clean dry sand, and exhaust with Alcohol (60 p.c.) to 8; evaporate this Tincture to 6, add Water enough to regain the measure of 8, then dissolve in it Sugar 14, and add Water to make 20.

Dose.—30 to 120 minims.

Foreign Pharmacopœias.—Official in U.S., 1 of Tincture in 10; not in the others.

TINCTURA LACTUCARII.—Lactucarium, 1; Alcohol (60 p.c.), 10: digest seven days, and filter.

Dose.—20 to 60 minims.

Foreign Pharmacopœias.—Official in U.S., Lactucarium, 1 part, treated with Petroleum Spirit, and then exhausted with a mixture of Alcohol, Glycerin, and Water to produce 2 parts.

LANOLIN. *See* ADEPS LANÆ.

Not Official.

LARICIS CORTEX.

LARCH BARK.

The bark of *Larix Europæa;* collected in spring, deprived of its outer portion and dried. It contains a volatile crystallisable acid, **Larixinic Acid,** which sublimes in vapour of water.

Medicinal Properties.—Similar to those of Oil of Turpentine. Astringent, gently stimulant, useful in chronic bronchitis to diminish excessive secretion.

(Not in the other Pharmacopœias.)

Preparations.

TINCTURA LARICIS.—Larch Bark, in No. 40 powder, 1; Alcohol (90 p.c), 8; macerate forty-eight hours in 6 of the Alcohol, agitating occasionally; pack in a percolator, and when it ceases to drop, pour on the remaining Alcohol; press the marc, filter, mix the liquids, and add sufficient Alcohol to make 8. =(1 in 8).

Dose.—20 to 30 minims.

TEREBINTHINA VENETA or **T. LARICIS.**—A viscid liquid of a yellowish or greenish-yellow colour, obtained from *Larix Europæa*. It does not readily harden on exposure to air, or when mixed with $\frac{1}{16}$ of Magnesia. Soluble in Absolute Alcohol. It is much used on the Continent, and in veterinary practice in this country.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Trementina di Venezia), Norw., Port., Russ., Span. (Trementina de Alerce), Swed. and Swiss; not in the others.

LAUROCERASI FOLIA.

CHERRY-LAUREL LEAVES.

The fresh leaves of *Prunus Laurocerasus*.

Official Preparation.—Aqua Laurocerasi.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr. (Laurier Cerise), Ital. (Lauroceraso), Port. (Loureiro-Cerejeira) and Span.; not in the others.

Description.—Thick, coriaceous, on short strong petioles, oblong or somewhat obovate, from five to seven inches (twelve and a half to seventeen centimetres) in length, tapering towards each end, recurved at the apex, distantly but sharply serrate and slightly revolute at the margins, dark green, smooth, and shining above, much paler beneath, and with a prominent midrib, on either side of which, near the base, are one or two glandular depressions. Inodorous, but emitting when bruised an odour resembling that of bitter almonds.

Preparation.

AQUA LAUROCERASI. CHERRY-LAUREL WATER.

Fresh Cherry-Laurel Leaves, 16; Water, 50. Place the crushed Cherry-Laurel Leaves with the Water in a retort: distil 20 of liquid, shake the product; filter, if necessary; adjust the strength of the finished product, either by adding Hydrocyanic Acid or by diluting the distillate with Distilled Water, so that, when tested as described under 'Acidum Hydrocyanicum Dilutum,' it shall contain $\frac{1}{10}$ p.c. of Hydrocyanic Acid, HCN.

NOTE.—To ascertain if it lost much of its strength by keeping, a sample was taken, which contained ·104 p.c., and placed in a pint bottle about three-quarters full for a month, it then gave ·094 p.c.; the bottle was then kept for a week with only 3 oz. in it, and then gave ·093 p.c.; the same was then kept three days with the cork out, and then gave ·038 p.c.

Notwithstanding the adoption of an Official standard, the strength of this preparation is still very variable, commercial samples of half the official strength being sometimes met with.

The p.c. of Hydrocyanic Acid may be determined by the process described under 'Acidum Hydrocyanicum Dilutum,' using 50 c.c. of the Water.

Medicinal Properties.—Nervine sedative. Similar to Hydrocyanic Acid, but without the nauseous odour of the Acid. Used also as a lotion to allay itching in cutaneous diseases.

Dose.—½ to 2 fl. drms.

20 minims = 1 minim Diluted Hydrocyanic Acid.

Incompatibles.—Same as Hydrocyanic Acid.

Antidotes.—In case of overdose, the antidotes should be as directed under 'Acidum Hydrocyanicum Dilutum.'

Foreign Pharmacopœias.—Official in Austr., Dutch, and Swiss, 1·0 HCN per 1000; Belg., ·5 per 1000; Fr., ·55—·7 per 1000; Span., ·833 per 1000; Port., Leaves, 1 in 2, not standardised; not in the others.

LAVANDULÆ OLEUM.

OIL OF LAVENDER.

The oil distilled from the flowers of *Lavandula vera*.

Solubility.—In all proportions of Alcohol (90 p.c.) and Absolute Alcohol; sparingly soluble in Alcohol (60 p.c.).

Medicinal Properties.—An aromatic stimulant and carminative. Useful in hysteria, hypochondriasis, and allied nervous affections, also in flatulence and colic.

Dose.—½ to 3 minims.

Prescribing Notes.—The **oil** is rarely given alone, it is used as an adjuvant to other medicines. Small doses of the **spirit** are given on sugar. The **Compound Tincture** is a popular colouring for mixtures.

Official Preparations.—Of the **Oil**, Spiritus Lavandulæ, and Tinctura Lavandulæ Composita. Contained in Linimentum Camphoræ Ammoniatum. The Compound Tincture is contained in Liquor Arsenicalis.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Norw. (Ætheroleum Lavandulæ) and Russ., sp. gr. ·885—·895; Belg., sp. gr. ·872—·948; Dan., sp. gr. ·875—·895; Fr.; Hung., sp. gr. ·885—·900; Ital. (Essenza di Lavanda), sp. gr. ·876—·880; Jap., sp. gr. ·870—·900; Port. (Essencia de Alfazema), sp. gr. ·875—·940; Span. (Esencia de Espliego); Swed.; Swiss, sp. gr. ·880—·890; U.S., sp. gr. ·885—·897.)

Description.—Pale yellow or nearly colourless, with the fragrant odour of the flowers, and a pungent bitter taste.

Test.—Sp. gr. not below ·885. It should dissolve in 3 times its volume of Alcohol (70 p.c.).

It is sometimes adulterated with foreign oil from *L. vera*, and the foreign oil is frequently adulterated with Oil of Spike from *L. Spica*. The flavour is stated to be improved by keeping for a year after distillation, and then mixing with an equal volume of Absolute Alcohol.

Oil of Lavender distinguished from Oil of Spike by its optical rotation.—*J.S.C.I.* '96, 919.

This Oil has till lately been looked upon as a mixture of a stearoptene, supposed to be **Borneol**, with 25 p.c. of a lævo-rotatory terpene and some Resin (*Y.B.P.* '80, 83), but later results show the principal constituent to be an alcohol **Linalool**, $C_{10}H_{18}O$, identical with that obtained from Lignum Aloes, and its Acetic ester

(Linalool Acetate) which forms the principal constituent of Oil of Bergamot.—*P.J.* (3) xxii. 894; (3) xxiii. 867.

Samples of English oil examined by us had sp. gr. ·884—·892; samples of Foreign oil, ·881—·897. Rotation—4° to —10°.

Messrs. Schimmel state that genuine oil distilled by them had sp. gr. ·895.

Adulteration with Ethyl Succinate and process for recognition of this substance.—*J.S.C.I.* '97, 563.

The value of the oil depends on its ester contents: a good oil should contain 30 p.c.; very good samples contain 40 p.c.; a process is given for its determination.—*J.S.C.I.* '96, 925; *P.J.* '96, ii. 358.

Preparations.

SPIRITUS LAVANDULÆ. Spirit of Lavender. (Altered.)

Oil of Lavender, 1; Alcohol (90 p.c.), a sufficient quantity. To the Oil of Lavender add enough of the Alcohol to form 10 of the Spirit of Lavender. =(1 in 10).

Now 1 in 10 instead of 1 in 50, and made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—5 to 20 minims.

This Spirit of Lavender contains five times the proportion of Oil of Lavender present in the Spirit of Lavender of the British Pharmacopœia of 1885.

Foreign Pharmacopœias.—Official in Belg., Dutch and Russ., 1 in 100; Dan. and Norw., 2 in 100; Jap., 3 in 100; U.S., 5 in 100; all with the oil, and all by weight except U.S.; Austr., Ger., Port., Swed. and Swiss, from the flowers; not in the others.

TINCTURA LAVANDULÆ COMPOSITA. Compound Tincture of Lavender. (Modified.)

Oil of Lavender, 45 minims; Oil of Rosemary, 5 minims; Cinnamon Bark, bruised, 75 grains: Nutmeg, bruised, 75 grains; Red Sanders Wood, 150 grains; Alcohol (90 p.c.), 20 fl. oz. Prepare by the maceration process, adding the Oils at the completion of the process.

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Jap. and Swed., similar to Brit.; U.S., similar to Brit. but stronger; Dan. (Tinct. Lavand. Rubr.) and Norw. differ considerably from Brit.; not in the others.

Not Official.

LEPTANDRA.

CULVERS ROOT.

The rhizome and rootlets of *Veronica Virginica*.

A cathartic, and stimulates the secretion of bile.

An Alcoholic **Extract**, dose 2 to 4 grains, and **Fluid Extract** (1 in 1), dose 20 to 60 minims, are both official in U.S.

Leptandrin.—An eclectic remedy, used as an alterative, ¼ to ½ grain; as a purgative, 2 to 4 grains.

LIMONIS CORTEX.

LEMON PEEL.

The fresh outer part of the pericarp of the fruit of *Citrus Medica* var. *Limonum*.

Medicinal Properties.—Bitter stomachic and tonic. Added to stomachic medicines. The **Oil** is stimulant and carminative. Chiefly used, however, to impart flavour to other medicines. Externally, stimulant and rubefacient.

Official Preparations.—Of the **peel**, Oleum Limonis, Syrupus Limonis and Tinctura Limonis. Used in the preparation of Infusum Aurantii Compositum and Infusum Gentianæ Compositum. The **oil** is contained in Linimentum Potassii Iodidi cum Sapone, Spiritus Ammoniæ Aromaticus, Tinctura Guaiaci Ammoniata and Tinctura Valerianæ Ammoniata.

Not Official.—Citral.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr. (Citron), Ger., Hung., Ital. (Cedro), Port. (Limao), Russ., Span., Swed., Swiss and U.S.; not in the others.

Description.—Pale yellow and more or less rough on the outer surface from the presence of glands containing volatile oil, which are embedded in the tissue beneath. On its inner surface there should be only a small amount of the white spongy portion of the rind. Odour strong, characteristic, and fragrant; taste warm, aromatic, and bitter.

Preparations.

OLEUM LIMONIS. Oil of Lemon.

The Oil obtained from fresh Lemon Peel.

Contains about 90 p.c. of terpenes (mostly Limonene). The flavour is chiefly due to an aldehyde, present to the extent of 4 to 8 p.c., and known commercially as **Citral.** *See* p. 400.

Solubility.—In all proportions of Glacial Acetic Acid and Absolute Alcohol; 1 in 12 of Alcohol (90 p.c.).

Its flavour and aroma suffer much from keeping; it keeps the aroma much better if mixed (when fresh) with 10 p.c. (by measure) of Absolute Alcohol.

The presence of Ethylic Alcohol can readily be detected by the diminution in volume of the Oil on shaking with Water.

The Oil should evaporate from paper without leaving a stain.

Dose.—½ to 3 minims.

Foreign Pharmacopœias.—Official in Austr. (sp. gr. ·850); Belg., Essentia Citri (sp. gr. ·847—·868); Dan. (sp. gr. ·84—·86), and Norw. (sp. gr. ·850—·865), Aetheroleum Citri; Swed., Aetheroleum Cedro; Dutch (sp. gr. ·840—·855), Ger., Hung. (sp. gr. ·840—·870), Jap. (sp. gr. ·840—·860), Russ. (sp. gr. ·840—·847), and Swiss (sp. gr. ·85—·86), all Oleum Citri; Fr., Huile volatile de Citron; Ital., Essenza di Corteccia di Cedro (sp. gr. ·850); Mex., Aceite Volatil de Limon (sp. gr. .849); Port., Essencia de Limao (sp. gr. ·846—·856); Span., Esencia de Limon; U.S., Oleum Limonis (sp. gr. ·858—·859).

Description.—Pale yellow, with the fragrant odour of the Lemon, and a warm, bitterish, aromatic taste.

Tests.—Sp. gr. ·857 to ·860. It should rotate the plane of a ray of polarised light not less than 59° to the right in a tube 100 millimetres long; and if 100 volumes be fractionally distilled, the 10 volumes first collected should not produce a rotation differing by more than 2° from that produced by the original Oil.

As the value of Oil of Lemon depends largely on the proportion of Citral, a process has been suggested for its estimation by reducing the Citral to the Alcohol Geraniol and determination of the same by acetylisation. (*P.J.* '96, i. 323; *C.D.* '96, i. 599.) But experiments carried out by Messrs. Schimmel on that process, with mixtures of definite composition, lead them to the conclusion that 'there is no hope of a useful application of this method.'—*P.J.* '96, ii. 358.

The proportion of Citral in Lemon Oil may be approximately estimated by its conversion into a Bisulphite and measuring non-aldehydic portion.—*C.D.* '97, i. 25.

Concentrated Lemon Oil (Terpeneless).—*P.J.* '98, ii. 161; *C.D.* '98, ii. 292.

A new constituent of Lemon Oil (Geraniol ester).—*P.J.* '98, ii. 196; *C.D.* '98, ii. 291.

An ester of Geraniol is stated to be present in Messina Oil, and a Linalyl ester in the Palermo variety.—*P.J.* '98, ii. 370.

Messrs. Schimmel consider that the existence of an ester of Geraniol as a constituent of Lemon Oil, though possible, to be still doubtful.—*P.J.* '98, ii. 459.

SYRUPUS LIMONIS. Syrup of Lemon. (Altered.)

Fresh Lemon Peel, in thin slices or grated, 1; Alcohol (90 p.c.), a sufficient quantity; Lemon Juice, 25; Refined Sugar, 38. Macerate the Lemon Peel in 1½ of the Alcohol for seven days; press; filter; add sufficient of the Alcohol to produce 2. In the Lemon Juice, clarified by subsidence, dissolve the Refined Sugar by the aid of gentle heat. When the resulting syrup is cold, mix with it the 2 of Alcoholic liquid. The product should weigh 65.

=(1 Peel and 25 Juice in 65).

Entirely new process.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Syrupus Citri, fresh Lemon Juice filtered 10, Sugar 16; Ital., Bruised Peel 2, Sugar 19, Distilled Lemon Water 12; Mex., Jarabe de Limon, Lemon Juice 10, Syrup 100; Port., Xarope de Casca de Limao, fresh Lemon Peel 1, Boiling Water 35, Sugar 65; Span., Jarabe de Limon, Lemon Juice 5, Sugar 9. For other Pharmacopœias *see* Acidum Citricum.

TINCTURA LIMONIS. Tincture of Lemon. (Altered.)

Fresh Lemon Peel, cut small, 5; Alcohol (90 p.c.) 20. Prepare by the maceration process. =(1 in 4).

Now 1 in 4 instead of 1 in 8, and Alcohol (90 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg. and Dutch (Spiritus Citri), 1 Oil in 100; Fr. (Alcoolature de Citron), 1 fresh Peel to 2 of Alcohol; and (Teinture d'essence de Citron), 1 Oil in 50; Jap. (Spiritus Citri), 1 Oil in 10; Mex. (Alcoholato de Cortezas de Limon), Fresh Peel, 2; Alcohol (80°), 10; Water, 2; distil; Span. (Alcohol de Corteza de Limon), Peel 1, and Alcohol (80 p.c.) 6, distil; Swiss (Spiritus Citri), fresh Peel, with Alcohol, and Water; all by weight: U.S. (Spiritus Limonis), Oil of Lemon 5, Lemon Peel 5, Deodorized Alcohol to measure 100; not in the others.

Not Official.

CITRAL.—Consists of the high boiling point fractions from the distillation of Lemon Oil, having a flavouring power about 15 times as great as the original Oil.

Sp. gr. ·895—·899; boiling point, 224° to 228° C.

It has the formula $C_{10}H_{16}O$, gives the aldehyde reactions with Bisulphites, and on reduction yields the alcohol **Geraniol**.

It may be used to increase the flavour of Oil of Lemon, by mixing it with the latter, in the proportion of 1 to 14.

LIMONIS CORTEX SICCATUS.—*See* Appendix.

LIMONIS SUCCUS.

LEMON JUICE.

The freshly expressed juice of the ripe fruit of *Citrus Medica*, var. *Limonum*.

Medicinal Properties.—Refrigerant; when diluted, a particularly useful beverage in prevention and treatment of scurvy; relieves thirst in febrile and inflammatory affections. In acute Rheumatism, ½ to 1 pint daily.

Dose.—Not given in B.P.; 1 to 2 fl. oz.

Official Preparation.—Syrupus Limonis. Used in the preparation of Acidum Citricum.

Foreign Pharmacopœias.—Official in Fr.; Mex., Jugo de Limones; Span., Zumo de Limon; U.S., about 7 p.c. of Citric Acid, ·5 p.c. of ash; Swiss, Succus Citri facticius, Citric Acid 10, Water 89, Spirit of Lemon 1.

Description.—A slightly turbid yellowish liquid, with a sharply acid taste. One fluid ounce contains 30 to 40 grains or 100 c.c. contain 7 to 9 grammes of Citric Acid.

Lemon Juice is extremely liable to fermentation, and requires the addition of 30 p.c. of Proof Spirit (or its equivalent) to keep it.—*P.J.* (3) xiii. 607.

Lemon Juice is rather a variable quantity, but it is generally understood that the Official standard is too high for an average by about 5 grains per fluid ounce.

The more recent analyses, *P.J.* (3) xxi. 611, show a maximum of acidity (42 grains) in December, gradually diminishing to 32 grains in August, with a more rapid rise to the next maximum.

It not unfrequently happens that during summer the acidity falls much below the average figures.

Tests.—Sp. gr. 1·030 to 1·040. When Lemon Juice is evaporated to dryness, and the residue is incinerated, it should yield not more than 3 p.c. of ash.

110 minims (or 100 c.c.) of Lemon Juice are neutralised by about 11½ grains (or 11·4 grammes) of Potassium Bicarbonate, by about 9½ grains (or 9·5 grammes) of Sodium Bicarbonate, and by about 16½ grains (or 16·5 grammes) of Sodium Carbonate.

ACIDUM CITRICUM.—*See* ACIDUM CITRICUM.

LINIMENTA.

LINIMENTS.

Under this heading are placed external applications which are usually applied by rubbing or painting, or on piline, to produce local stimulation or to relieve pain.

The following are the Liniments of the British Pharmacopœia, the formulas of which will be found under the names of the substances from which they are prepared :—

		Proportion of the active ingredient to the whole.
LINIMENTUM ACONITI		1 in 1½.
LINIMENTUM AMMONIÆ	Solution of Ammonia.	1 in 4.
LINIMENTUM BELLADONNÆ		1 in 2.
LINIMENTUM CALCIS	Solution of Lime.	1 in 2.
LINIMENTUM CAMPHORÆ		about 1 in 5.
LINIMENTUM CAMPHORÆ AMMONIATUM	Strong Ammonia	1 in 4.
LINIMENTUM CHLOROFORMI		1 in 2.
LINIMENTUM CROTONIS		1 in 8.
LINIMENTUM HYDRARGYRI	Mercury	1 in 6.
LINIMENTUM OPII	Tincture of Opium	1 in 2.
LINIMENTUM POTASSII IODIDI CUM SAPONE		about 1 in 9.
LINIMENTUM SAPONIS		about 1 in 10½.
LINIMENTUM SINAPIS	Oil of Mustard	about 1 in 27.
LINIMENTUM TEREBINTHINÆ		about 1 in 1½.
LINIMENTUM TEREBINTHINÆ ACETICUM		1 in 2¼.

LINUM.

LINSEED.

The dried ripe seeds of *Linum usitatissimum*.

The envelope or testa abounds in a peculiar gummy matter or mucilage, readily imparted to hot Water.

Medicinal Properties.—Demulcent. Employed in faucial, pharyngeal and bronchial catarrh, dysentery, diarrhœa, and inflammatory affections of the urinary passages.

Official Preparations.—Linum Contusum and Oleum Lini.

Not Official.—Carron Oil.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Lin), Ger., Hung., Ital., Jap. (Lini), Mex (Linaza), Norw., Port. (Linho), Russ., Span. (Lino), Swed., Swiss and U.S.

Description.—Small, brown, glossy, nearly flat seeds varying in length from about one-sixth to one-fourth of an inch (four to six millimetres). They are ovate in outline and somewhat obliquely pointed; the surface is glabrous and minutely pitted. Internally they are yellowish-white and contain a narrow oily endosperm and two large oily cotyledons. They are inodorous but have a mucilaginous oily taste.

Preparation.

OLEUM LINI.—Linseed Oil.

The Oil expressed from Linseed at ordinary temperatures.

Solubility.—Of a freshly expressed sample, 1 in 40 of Absolute Alcohol; 1 in 1¼ of Ether.

Foreign Pharmacopœias.—Official in (Belg. sp. gr. ·930; Dan., Dutch, and U.S. (sp. gr. ·930—·940); Fr., Ger., Hung., and Russ. (sp. gr. ·936—·940); Jap. (sp. gr. ·935—·940); Ital. (sp. gr. ·935); Norw.; Port., Oleo de Linhaça (sp. gr. ·930); Span., Aceite de Linaza; Swed.; Swiss; Hung. also Oleum Lini Lotum; not in Austr. or Mex.

As an **enema** a pint of Linseed Oil removes impacted fæces with less pain and spasm than gruel or other aqueous enemata.

Description.—Viscid, yellow, with a faint but distinct odour, and bland taste. Sp. gr. ·930 to ·940. It is soluble in 10 parts of Alcohol (90 p.c.), and in Oil of Turpentine. It gradually thickens by exposure to the air, forming, when spread in a thin layer on glass, a hard, transparent varnish. It does not congeal above —4° F. (—20° C.)

Linseed Oil, when issuing from the seed whilst pressing, has scarcely any of the odour or taste of the Linseed Oil of the shops, but acquires it in a very short time by exposure to the air. For medicinal purposes it should be procured as fresh as possible.

Boiled Linseed Oil is used in the Arts as a drying oil, and for certain purposes Litharge is added during the boiling. The *boiled* oil may, therefore, contain Lead.

Dutch Oil should be avoided, as it is optically active, this being due to presence of Rosin Oil.—*C.D.* '95, i, 797.

Not Official.

CARRON OIL.—Equal parts of Linseed Oil and Lime Water, shaken to form a cream.

One of the best **applications** to burns or scalds.

LINUM CONTUSUM.

CRUSHED LINSEED.

Linseed reduced to a coarse powder.

Not Official.—Cataplasma Lini.

Foreign Pharmacopœias.—Official in Belg., Fr. and Ital. should contain 30 p.c. of oil; Port., U.S. not less than 25 p.c. of oil; not in the others.

Description.—It should be recently prepared, and have a bland, not pungent or rancid odour when mixed with warm Water.

Tests.—It should yield not less than 30 p.c. of oil when exhausted by Carbon Bisulphide, and should not yield the characteristic reactions with the tests for Starch; when incinerated with free access of air it should leave not more than 5 p.c. of Ash.

Not Official.

CATAPLASMA LINI.—Linseed Meal, 4; boiling Water, 10: mix the Linseed Meal with the Water gradually, with constant stirring.

Applied to inflamed parts.

Foreign Pharmacopœias.—Official in Belg., Fr., Port. and Span.; not in the others.

LIQUORES.

SOLUTIONS.

The following are the Solutions of the British Pharmacopœia, the formulas of which will be found under the names of the substances from which they are prepared:—

		Proportions of active ingredient to the whole.
LIQUOR ACIDI CHROMICI	Chromic Anhydride about	1 in 4.
LIQUOR AMMONIÆ	Liquor Fort.	1 in 3.
LIQUOR AMMONIÆ FORTIS	Ammonia about	1 in 3.
LIQUOR AMMONII ACETATIS.		
LIQUOR AMMONII CITRATIS	Ammon. Cit. about	1 in 6·9.
LIQUOR ARSENICALIS	Arsenious Anhydride.	1 in 100.
LIQUOR ARSENICI HYDROCHLORICUS	Arsenious Anhyd.	1 in 100.
LIQUOR ARSENII ET HYDRARGYRI IODIDI	Arsenious and Mercuric Iodide each	1 in 100.
LIQUOR ATROPINÆ SULPHATIS	Atrop. Sulph.	1 in 100.
LIQUOR BISMUTHI ET AMMON. CITRATIS	Bism. Oxide about	1 in 18.
LIQUOR CALCIS	Lime about	1 in 900.
LIQUOR CALCIS CHLORINATÆ	Calx Chlorinat.	1 in 10.
LIQUOR CALCIS SACCHARATUS	Lime.	1 in 50.
LIQUOR CALUMBÆ CONCENTRATUS	Calumba Root.	1 in 2.
LIQUOR CAOUTCHOUC	India Rubber about	1 in 20.
LIQUOR CHIRATÆ CONCENTRATUS	Chiretta.	1 in 2.
LIQUOR CUSPARIÆ CONCENTRATUS	Cusparia Bark.	1 in 2.
LIQUOR EPISPASTICUS	Cantharides.	1 in 2.
LIQUOR ETHYL NITRITIS	Ethyl Nitrite about	1 in 35.
LIQUOR FERRI ACETATIS	Ferric Oxide.	1 in 38·4.
LIQUOR FERRI PERCHLORIDI	Liquor Fort.	1 in 4.
LIQUOR FERRI PERCHLORIDI FORTIS	Iron.	1 in 4·4.
LIQUOR FERRI PERNITRATIS	Iron.	1 in 30·3.
LIQUOR FERRI PERSULPHATIS	Ferric Oxide.	1 in 4·8.
LIQUOR HAMAMELIDIS	Leaves about	1 in 1.
LIQUOR HYDRARGYRI NITRATIS ACIDUS	Mercury, by weight, about	1 in 3.
LIQUOR HYDRARGYRI PERCHLORIDI	Hyd. Perchlor.	1 in 875.
LIQUOR HYDROGENII PEROXIDI	Oxygen.	9 to 11 volumes.
LIQUOR IODI FORTIS	Iodine about	1 in 8½.
LIQUOR KRAMERIÆ CONCENTRATUS	Krameria Root.	1 in 2.
LIQUOR MAGNESII CARBONATIS	Mag. Carb. about	1 in 48.
LIQUOR MORPHINÆ ACETATIS	Morph. Acet.	1 in 100.
LIQUOR MORPHINÆ HYDROCHLORIDI	Morph. Hydrochl.	1 in 100.
LIQUOR MORPHINÆ TARTRATIS	Morph. Tart.	1 in 100.
LIQUOR PANCREATIS	Pancreas about	1 in 4.
LIQUOR PICIS CARBONIS	Coal Tar.	1 in 5.
LIQUOR PLUMBI SUBACETATIS DILUTUS	Liquor	1 in 80.
LIQUOR PLUMBI SUBACETATIS FORTIS	Plumbi Subacet.	1 in 4.
LIQUOR POTASSÆ	Potassium Hydroxide	1 in 17·7.
LIQUOR POTASSII PERMANGANATIS	Pot. Permang.	1 in 100.
LIQUOR QUASSIÆ CONCENTRATUS	Quassia Wood.	1 in 10.

		Proportions of active ingredient to the whole.
LIQUOR RHEI CONCENTRATUS	Rhubarb Root.	1 in 2.
LIQUOR SARSÆ COMPOSITUS CONCENTRATUS	Sarsaparilla.	1 in 1.
LIQUOR SENEGÆ CONCENTRATUS	Senega Root.	1 in 2.
LIQUOR SENNÆ CONCENTRATUS	Senna.	1 in 1.
LIQUOR SERPENTARIÆ CONCENTRATUS	Serpentary Rhizome.	1 in 2.
LIQUOR SODÆ CHLORINATÆ	Chlorine.	1 in 40.
LIQUOR SODII ARSENATIS	Sod. Arsen. Anhyd.	1 in 100.
LIQUOR SODII ETHYLATIS	Sodium.	1 in 20.
LIQUOR STRYCHNINÆ HYDROCHLORIDI	Strych. Hydrochl.	1 in 100.
LIQUOR THYROIDEI	1 Thyroid Gland	in 100 minims.
LIQUOR TRINITRINI	Trinitroglycerin.	1 in 100.
LIQUOR ZINCI CHLORIDI	Zinci Chlorid.	1 in 1·2.

Liquors not official will be found in the Index.

Not Official.

LITHIUM.

Li, eq. 6·97.

A silver-white, brilliant, ductile metal, having the density of ·59, being therefore the lightest metal if not the lightest solid known.

It is obtained from several minerals — Petalite, Lepidolite, Triphane, and formerly from Triphylline.

The Carbonate and Citrate are the official preparations.

Lithium salts are characterized by communicating a crimson colour to a Bunsen flame, or, with the addition of Hydrochloric Acid, to a spirit flame.

Not Official.

LITHII BENZOAS.

Li $C_7H_5O_2$, eq. 127·10.

A white powder or small shining scales, with a faintly acid reaction; the taste is sweet and somewhat saline.

It can be prepared by boiling in Water, 3 of Lithium Carbonate with 9 of Benzoic Acid, and evaporating.

Solubility.—1 in 2½ of Water; 1 in 15 of Alcohol (90 p.c.).

Medicinal Properties.—Antilithic. A remedy for gout.

Dose.—15 to 30 grains.

Foreign Pharmacopœias.– Official in Fr., Russ. and U.S., Mex., Benzoato de Litio; not in the others.

Not Official.

LITHII BROMIDUM.

Li Br, eq. 86·32.

A white granular deliquescent salt.

Solubility.—1 in 1 of Water; 1 in 4 of Alcohol (90 p.c.).

Medicinal Properties.—Owing to the low atomic weight of Lithium, this salt contains more Bromide than either Potassium or Sodium Bromide, and consequently has been recommended as a hypnotic for gouty patients.—*M.P.* '88, i. 606.

In gouty cases of aural vertigo, especially when preceded by a mercurial purge.—*M.A.* '95, 221.

In the insomnia of neurasthenia (30 grains 3 times a day).—*Pr.*, li. 351.

In Bright's disease.—*L.* '95, ii. 685.

Has been used in epilepsy.

Dose.—5 to 15 grains.

Foreign Pharmacopœias.—Official in Fr., Russ. and U.S.; Mex., Bromuro de Litio; not in the others.

LITHII CARBONAS.

LITHIUM CARBONATE.

Li_2CO_3, eq. 73·49.

It is obtained from native Silicates of Lithium.

Solubility.—About 1 in 70 at 60° F.; in hot Water it is only soluble to about half this extent, a solution saturated in the cold becoming quite turbid on boiling. It should be noticed that using 1 part of Lithium Carbonate to 70 parts of Water solution is very slow, and using these proportions in ounces it requires several weeks' digestion, with frequent shaking, before complete solution is effected.

Medicinal Properties.—Lithium, combined with Carbonic Acid, in a diluted solution, as in Lithia Water, has been given in cases of gout with the view of increasing the alkalinity of the blood, and acting as a solvent of the Sodium Biurate deposits. Luff, however, has shown that the Lithium salts do not exercise any special solvent effect on Sodium Biurate and that their administration to gouty subjects with the object of removing uratic deposits in the joints and tissues appears to be useless.—*L.* '98, i. 1609.

1 grain of Lithium Carbonate and 1 grain Sodium Arsenate given in aërated Water has been recommended by Martineau in the treatment of diabetes.—*L.* '87, i. 650.

Dose.—2 to 5 grains.

Prescribing Notes.—Given in Aërated Water, **cachets**, or Compressed Tablets.

Official Preparation.—Used in the preparation of Lithii Citras.

Not Official.—Liquor Lithiæ Effervescens.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—It occurs in white powder or in minute crystalline grains, soluble in about 70 parts of cold Water, insoluble in Alcohol (90 p.c.).

Tests.—Its aqueous solution turns Red Litmus Paper blue. It is dissolved with effervescence by Hydrochloric Acid; the solution evaporated to dryness leaves a residue, which communicates a crimson colour to flame. This residue redissolved in Water yields a precipitate with Solution of Sodium Phosphate. One gramme

of the salt neutralised with Sulphuric Acid and afterwards heated to redness leaves 1·479 grammes of dry Lithium Sulphate, corresponding to 98·5 p.c. of the pure Carbonate. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Zinc, Magnesium, Sodium, Potassium, Ammonium, or Chlorides, and only the slightest reactions with the tests for Calcium and for Sulphates.

Not Official.

LIQUOR LITHII CARBONATIS (Lithia Water).—Ten fluid ounces of aërated water contain 5 grains of Lithium Carbonate.

LITHII CITRAS.

LITHIUM CITRATE.

$C_3H_4 \cdot OH \cdot (COOLi)_3, 4H_2O$, eq. 280·05.

It is prepared by saturating Citric Acid with Lithium Carbonate.

Solubility.—1 in 2 of Water; almost insoluble in Alcohol (90 p.c.).

The solubility in Water is variously given as 1 in 5 to 1 in 25.

Medicinal Properties.—Similar to those of the Carbonate, but the Citrate being more soluble, it is better adapted for fluid administration.

Dose.—5 to 10 grains.

Prescribing Notes.—Generally given in **solution**, or in the form of Lithii Citras Effervescens.

Official Preparation.—Lithii Citras Effervescens.

Foreign Pharmacopœias.—Official in Fr. and U.S., Mex. Citrato de Litio: not in the others.

Description.—A white crystalline deliquescent salt, entirely soluble in twice its weight of cold Water.

Tests.—It yields the reactions characteristic of Lithium and of Citrates. Heated to redness it blackens, evolving inflammable gases: and the residue neutralised with Hydrochloric Acid, yields with Alcohol (90 p.c.) a solution which burns with a crimson flame. 2 grammes of the salt dried at 212° F. (100° C.) should lose about ·38 gramme, at 240° F. (115·5° C.) an additional ·13 gramme; and, when burned at a low red heat with free access of air, should leave ·77 gramme of white residue, corresponding to 98·5 p.c. of the pure Citrate. It should be free from the impurities mentioned under 'Lithii Carbonas.'

To ensure the whole of the residue being Carbonate, it is better, before weighing, to drench it with solution of Ammonium Carbonate and gently re-ignite.

Preparation.

LITHII CITRAS EFFERVESCENS. Effervescent Lithium Citrate. (New.)

Sodium Bicarbonate, in powder, 58; Tartaric Acid, in powder, 31; Citric Acid, in powder, 21; Lithium Citrate, 5: Mix the Lithium Citrate with the Citric Acid, then add the Tartaric Acid, and, lastly, the Sodium Bicarbonate, triturating thoroughly. Place the

whole in a dish or pan of suitable form heated to between 200° and 220° F. (93·3° and 104·4° C.). When the mixture, by the aid of careful manipulation, has assumed a granular character, separate it by means of suitable sieves, into granules of uniform and convenient size. Dry the granules at a temperature not exceeding 130° F. (54·4° C.). The product should weigh about 100.

Dose.—60 to 120 grains.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Not Official.

LITHII GUAIACAS.

Is prepared by digesting pure Guaiacum Resin in an aqueous solution of Lithium Oxide, decanting the clear solution, evaporating and scaling it.

Composed of Lithium Oxide, 1; Guaiacum Resin, 3.

This salt, introduced by Sir Alfred Garrod, is given for chronic gout and some forms of rheumatism.

Dose.—5 grains twice a day.

Not Official.

LITHII SALICYLAS.

A deliquescent white or greyish-white powder with a faintly acid reaction.

Solubility.—4 in 3 of Water; 1 in 2 of Alcohol (90 p.c.).

Medicinal Properties.—A remedy for gout and rheumatism.

Is much better than Sodium Salicylate in chronic articular rheumatism.—*B.M.J.* '86, i. 38; '87, i. 695.

Dose.—10 to 30 grains.

Foreign Pharmacopœias.—Official in Fr., Ger., Mex. Salicilato de Litio, Swiss and U.S.; not in the others.

Tests.—Its aqueous solution should not effervesce on the addition of an acid (absence of Carbonate). When agitated with 15 parts of concentrated Sulphuric Acid, the salt should not impart any colour to the acid in fifteen minutes (absence of foreign organic matter). Hydrochloric or Sulphuric Acid produces in the aqueous solution a voluminous precipitate of Salicylic Acid, which when separated and washed, should conform to the reactions and tests given under Acidum Salicylicum.

LOBELIA.

LOBELIA.

The dried flowering herb of *Lobelia inflata.*

Imported from North America.

It contains about ·3 p.c. of a non-volatile alkaloid, **Lobeline,** a volatile oil, a fixed oil, and a stearoptene called 'Inflatine'; the alkaloid is a powerful emetic.

Medicinal Properties.—In small doses it is depressant, antispasmodic, diaphoretic, diuretic and expectorant. More freely used, it is cathartic and emetic; but as an emetic it is too distressing as well as too hazardous for general use, as it has a powerful effect on the respiration, and may cause death. It is chiefly used in spasmodic asthma,

also in laryngeal and bronchial catarrh with thick and scanty secretion, severe croup, and for the paroxysmal dyspnœa of chronic bronchitis and of whooping-cough. In some cases a useful adjunct to diuretics. Its action in asthma is promoted by the addition of Bromide or Iodide.

Official Preparation.—Tinctura Lobeliæ Ætherea.

Not Official.—Tinctura Lobeliæ.

Antidotes.—In case of poisoning by Lobelia, the most active stimulants should be employed, as well as the stomach-pump. Recumbent position imperative.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Swed., Swiss and U.S.; not in Span.

Description.—The stems are angular, channelled and furnished with narrow wings. They are often of a purplish tint, and bear one-celled hairs and the scars of alternate leaves. The leaves are irregularly toothed and hairy. The capsules are inflated, two-celled, and, when mature, contain minute, oblong, reticulated brown seeds. The transverse section of the stem exhibits laticiferous vessels in the bast. Odour somewhat irritating; taste at first not marked, but, after chewing, burning and acrid.

In the Tincture or an aqueous solution of the drug, the alkaloid is destroyed by heat. When evaporation is required the solution must be acidified (*P.J.* (3) xvii. 1037; (3) xviii. 135); but Wright and Farr repeatedly exposed their pure alkaloidal residue to 100° C. without loss of weight, and it continued to give the usual alkaloidal reactions.—*C.D.* '93, i. 454.

Preparation.

TINCTURA LOBELIÆ ÆTHEREA. Ethereal Tincture of Lobelia. (Altered.)

Lobelia, in No. 40 powder, 4; Spirit of Ether, a sufficient quantity. Moisten the powder with 2 of Spirit of Ether, and complete the percolation process. The resulting Tincture should measure 20.

=(1 in 5).

Now 1 in 5 instead of 1 in 8.

Dose.—5 to 15 minims.

This preparation is made with rather more than one and a half times the proportion of Lobelia ordered for the corresponding preparation in the British Pharmacopœia of 1885.

Foreign Pharmacopœias.—Official in Mex., 1 and 5; not in the others.

Not Official.

TINCTURA LOBELIÆ.—Lobelia, in No. 40 powder, 1; Alcohol (60 p.c.), a sufficient quantity. Moisten the powder with the requisite quantity of the Alcohol, and complete the percolation process. The resulting Tincture should measure 8.

=(1 in 8).

Dose.—10 to 30 minims; but 1 fl. drm. may be given for asthmatic dyspnœa; repeated every 15 minutes until nausea is produced.

Wright and Farr (*C.D.* '93, i. 454) conclude that extraction of alkaloid depends very little upon strength of Alcohol, and reckon 50 p.c. (by volume) Alcohol to be the least objectionable. Details of estimation process are given, and the figures

show the tincture to vary between ·027 and ·044 (average ·038) p.c. of alkaloid = ·3 p.c. for average drug.

It has been pointed out that on the small scale only 40 p.c. of the drug can be made to pass through a No. 40 sieve, and that a tincture prepared from the portion passing through the sieve is much stronger in extractive and alkaloid than that of the residual stalks.—*P.J.* '95, ii. 141.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Ger., Ital., Jap., Norw., Russ., Swed. and Swiss, 1 in 10; Belg., Fr., Hung., Mex., Port. and U.S., 1 in 5; all by weight except U.S.; not in Span.

LUPULINUM.

LUPULIN.

Glands obtained from the strobiles of *Humulus Lupulus*.

Medicinal Properties.—Aromatic, tonic, sedative, feebly hypnotic, and anaphrodisiac. It allays irritability of the bladder.

Dose.—2 to 5 grains.

Prescribing Notes.—Given in **cachets** or **pills**. A good pill can be made by means of Alcohol (90 p.c.) *q.s.*

Not Official.—Extractum Lupulini, Extractum Lupulini Fluidum, Oleoresina Lupulini and Tinctura Lupulini.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Hung., Ital., Jap., Port., Russ., Span., Swed., Swiss and U.S.; not in the others.

Description.—A granular brownish-yellow powder composed of minute glands, each consisting of a single hemispherical layer of cells, the cuticle of which has been raised by the secretion of the oil or oleoresin contained in the gland. It has a strong hop-like odour and a bitter aromatic taste.

Tests.—It should contain not more than 40 p.c. of matter insoluble in Ether, and yield not more than 12 p.c. of ash when incinerated.

Should not leave more than 10 p.c. of ash.—*U.S.*

The ash of eight samples, as determined by us, gave 28·2, 33·8, 29·9, 27·9, 20·6, 12·1, 18·7, 25·4 p.c.

Not Official.

EXTRACTUM LUPULINI.—Exhaust Lupulin with Alcohol (90 p.c.) and evaporate the strained liquor to a proper consistence. The extract produced is about half the original weight of the Lupulin employed.

Dose.—1 to 5 grains.

EXTRACTUM LUPULINI FLUIDUM (*U.S.*).—Prepared with Alcohol (sp. gr. ·820), so that 1 fl. oz. represents 1 oz. of Lupulin.

OLEORESINA LUPULINI (*U.S.*).—Exhaust Lupulin with Stronger Ether; distil off most of the Ether on a water-bath, and complete by exposure to the air.

Dose.—1 to 5 grains.

TINCTURA LUPULINI.—Lupulin, 1; Alcohol (90 p.c.), 6; macerate till exhausted, pour on a filter, and when drained wash with Alcohol (90 p.c.) to make 8.

Dose.—15 to 60 minims.

LUPULUS.

HOPS.

B.P.Syn.—HUMULUS.

The dried strobiles of *Humulus Lupulus*, collected from cultivated plants.

The ethereal extract obtained from Hop varies from 9 to 15 p.c., and consists of oil, resin, and bitter principle.

Medicinal Properties.—Tonic, stomachic, sedative, and moderately narcotic. It allays irritation of the genito-urinary organs. Has been recommended in the treatment of alcoholism. It sometimes produces sleep when opiates are objectionable. Hops may be used topically as fomentation or poultice, as a resolvent or discutient in painful inflammatory swellings; and for colic and other internal pains. Hop (which has been carefully dried and preserved) is made into a pillow, to induce sleep.

Incompatibles.—Mineral acids, metallic salts.

Official Preparations.—Infusum Lupuli and Tinctura Lupuli. *See also* Lupulinum.

Not Official.—Extractum Lupuli.

Foreign Pharmacopœias.—Official in Belg., Fr. (Houblon), Mex. (Lupulo), Norw., Port., Span., Swed., Swiss and U.S.; not in the others.

Description.—The strobiles are about one inch and a-quarter (three centimetres) long, oblong-ovoid or rounded in form, and consist of a number of imbricated greenish-yellow membranous stipules and bracts, attached to a hairy zigzag axis. Each of the bracts enfolds at its base a small rounded achene which, like the base of the bract, is sprinkled with yellow glands. The odour is aromatic and characteristic, the taste bitter, aromatic, and somewhat astringent.

Preparations.

INFUSUM LUPULI.—INFUSION OF HOPS.

Hops, freshly broken, 1; Distilled Water, boiling, 20. Infuse in a covered vessel for 15 minutes; strain. =(1 in 20).

Time reduced to 15 minutes.

Dose.—1 to 2 fl. oz.

Foreign Pharmacopœias.—Official in Fr., and Mex., 1 in 100; not in the others.

TINCTURA LUPULI.—TINCTURE OF HOPS. *N.O.Syn.*—TINCTURA HUMULI. (ALTERED.)

Hops, 4; Alcohol (60 p.c.) 20. Prepare by the maceration process. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and Alcohol (60 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Mex., Swed. and U.S. 1 in 5; not in the others.

Not Official.

EXTRACTUM LUPULI.—Hop, 8; Alcohol (90 p.c.), 15; Distilled Water, 80; macerate the Hop in the Alcohol for seven days, press out the tincture, filter, and distil off the Alcohol, leaving a soft extract; boil the residual Hop with the Water for one hour, then press out the liquor, strain, and evaporate by a water-bath to the consistence of a soft extract; mix the two extracts, and evaporate at a temperature not exceeding 140° F. (60° C), to a pill consistence.

16 oz. Hops yield 4 to 5 oz. Extract.

Dose.—5 to 15 grains.

Foreign Pharmacopœias.—Belg., Fr., Mex., Port. and Span. have alcoholic Extracts, but not made the same way; U.S. has a **Fluid Extract** from Lupulin.

Not Official.

LYCOPODIUM.

The spores of *Lycopodium clavatum* and other species of *Lycopodium;* a fine powder, pale yellowish, very mobile, inodorous, tasteless, floating upon Water and not wetted by it, but sinking on being boiled with it, and burning quickly when thrown into a flame.

It has been used in dispensing chiefly as powder to envelop hygroscopic pills.

Recommended in this country for incontinence of urine, and irritability of bladder, in the form of **Tincture.** Dose, 15 to 60 minims.—*L.* '87 ii. 605; *B.M.J.*, '90, ii. 1246; and '95, i. 1019. As a dusting powder for eczema, and to prevent chafing of skin.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex. (Licopodio), Norw., Port., Russ., Span., Swed. Swiss and U.S.

Lycopodium should be free from pollen, starch, sand, and other impurities, any of which are easily detected by the microscope.

When ignited with free access of air, it should not leave more than 5 p.c. of ash.

Not Official.

LYSIDINE.

ETHYLENE-ETHENYL-DIAMINE.

A reddish-white crystalline substance, very hygroscopic, with a peculiar odour. Commercially it is sold in the form of a 50 p.c. solution.

A diuretic recommended in the treatment of gout and as a solvent of Uric Acid deposits.—*B.M.J.* '96, ii. 901.

It has an influence in increasing the solvent power of serum for Sodium Biurate and of urine for uratic deposit.—*L.* '98, ii. 203.

Dose (of the liquid).—30 to 60 minims, well diluted with Water or Aërated Water.

Lysidine Acid Tartrate, a white powder soluble in Water.

Not Official.

MAGNESIUM.

MAGNESIUM.

Mg, eq. 24·18.

Magnesium, the metallic base of Magnesian salts, does not exist native. It may be obtained artificially. When set on fire it produces a powerful actinic light, and is used by photographers on this account.

It is a brilliant grey metal (sp. gr. 1·750), slightly resembling Silver, malleable, fusible at a low temperature, and convertible into Magnesia by the combined action of air and moisture.

It is preferable to Zinc for Marsh's test, and particularly when Arsenic-free Zinc is not obtainable.

Magnesium Sulphate was first artificially obtained in England by Dr. Crew in 1675, by evaporation from the water of Epsom spring (whence the name of Epsom Salts). The chief source of the Magnesia now sold is Magnesian Limestone, Magnesium Calcium Carbonate, called Dolomite, and is obtained by a process discovered by Dr. Henry, of Manchester. Magnesia was first chemically distinguished from Lime by Dr. Black, in 1755, who also showed the difference between Magnesia and its Carbonate. From the mode of procuring it, it is frequently termed Calcined Magnesia.

There are two kinds of Magnesia admitted into the B.P., the Heavy and the Light. The former is that which is commonly used in pharmacy, it being smoother, more readily miscible with Water, and more compact. It is probably from these causes that it is preferred in medicine, and in the B.P. it is clearly meant to be used, unless the Light is expressly ordered.

The forms in which Magnesia is used are:—Magnesia Levis, Magnesia Ponderosa, Magnesii Carbonas Levis, Magnesii Carbonas Ponderosus, and Magnesii Sulphas.

MAGNESIA LEVIS.

LIGHT MAGNESIA.

B.P.Syn.—Light Calcined Magnesia; Light Magnesium Oxide.

MgO, eq. 40·06.

Light Magnesium Oxide is prepared by exposing Light Magnesium Carbonate to a dull red heat.

Medicinal Properties.—Same as Magnesia Ponderosa.

Dose.—5 to 30 grains, for repeated administration; for a single administration, 30 to 60 grains.

Prescribing Notes.—In **cachets** or **mixtures**, also taken in Milk. Frequently given in the form of Mistura Alba.

Official Preparation.—Contained in Pulvis Rhei Compositus.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span. Swed., Swiss and U.S.

Description. — A bulky white powder, differing from Heavy Magnesia only in its greater lightness, the volumes corresponding to the same weight being to each other in the ratio of 3½ to 1.

MAGNESIA PONDEROSA.

HEAVY MAGNESIA.

B.P.Syn.—Heavy Calcined Magnesia; Heavy Magnesium Oxide.

MgO, eq. 40·06.

Heavy Magnesium Oxide is prepared by exposing heavy Magnesium Carbonate to a dull red heat.

Solubility.—1 in about 6000 of cold Water, 1 in about 36000 of hot Water; like Lime, it is more soluble in cold than in hot Water.

Medicinal Properties.—Antacid, laxative, diuretic, and antilithic. Much used in dyspepsia, and to relieve vomiting, heartburn, sick headache, rheumatic, and gouty conditions, and other complaints attended with acidity, and in larger doses for constipation. As a laxative, it may often be used with advantage when other medicines occasion nausea; generally combined with other purgatives. It is an excellent and mild purgative for children.

Prescribing Notes.—It frequently becomes aggregated into a solid mass when prescribed in mixtures, especially with the Sulphate.

Although the heavy powder is preferred by many for its smoothness, the light powder is said to be quicker in its action.

Dose.—5 to 30 grains, for repeated administration; for a single administration, 30 to 60 grains.

Incompatibles.—All acids.

Official Preparation.—Permitted in Pulvis Rhei Compositus.

Foreign Pharmacopœias.—Official in Norw. and Swed., Oxydum Magnesicum ponderosum; U.S.; not in the others.

Description.—A white powder, insoluble in Water, but readily dissolved by Acids, the solution affording the reactions characteristic of Magnesium.

Tests.—It should yield no characteristic reaction with the tests for Iron, Aluminium, Calcium, or Carbonates; and only the slightest reactions with the tests for Chlorides or Sulphates. When heated to dull redness it should loose little or no weight.

MAGNESII CARBONAS LEVIS.

LIGHT MAGNESIUM CARBONATE.

$3(MgCO_3)$, $Mg(HO)_2$, $4H_2O$, eq. 380·65.

O.M.P.—Magnesium Sulphate 10; Sodium Carbonate 12; Distilled Water a sufficient quantity. Dissolve the Magnesium Sulphate and the Sodium Carbonate each in 80 of cold Distilled Water; mix the two solutions; boil the mixture for fifteen minutes; transfer the precipitate to a calico filter; pour upon it boiling Distilled Water until the washings are free from Sulphates; dry at a temperature not exceeding 212° F. (100° C.).

Solubility.—1 in 2500 of cold Water, 1 in 9000 of hot Water.

Medicinal Properties.—Same as Magnesia Ponderosa.

Dose.—5 to 30 grains, for repeated administration; for a single administration, 30 to 60 grains.

Official Preparation.—Used to prepare Magnesia Levis.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Port., Russ., Span., Swed., Swiss and U.S.

Description.—A very light powder, which, when examined under the microscope, is found to consist of amorphous particles, with numerous slender prisms intermixed. The other characters and tests are the same as those of Heavy Magnesium Carbonate.

One ounce occupies about the space of 6 fluid ounces of Water.

MAGNESII CARBONAS PONDEROSUS.

HEAVY MAGNESIUM CARBONATE.

$3(MgCO_3)$, $Mg(HO)_2$, $4H_2O$, eq. 380·65.

O.M.P.—Magnesium Sulphate 10; Sodium Carbonate 12; Distilled Water, boiling, a sufficient quantity. Dissolve the Magnesium Sulphate and the Sodium Carbonate each in 20 of the Distilled Water; mix the solutions, and evaporate to dryness; digest the residue for half an hour with 40 of the Distilled Water, and having collected the insoluble matter on a calico filter, wash it repeatedly with the Distilled Water, until the washings are free from Sulphates; dry the product at a temperature not exceeding 212° F. (100° C.).

Medicinal Properties.—Same as Magnesia Ponderosa.

Dose.—5 to 30 grains, for repeated administration; for a single administration, 30 to 60 grains.

Prescribing Notes.—In **cachets, lozenges** or **mixture**, or as Liquor Magnesii Carbonatis.

Official Preparations.—Liquor Magnesii Carbonatis. Used in the preparation of Magnesia Ponderosa and Trochiscus Bismuthi Compositus.

Not Official.—Liquor Magnesii Bromidi. Liquor Magnesii Citratis. Mistura Alba, and Mistura Magnesiæ c. Rheo.

(Not in the other Pharmacopœias.)

Description.—A white granular powder.

Tests.—Dissolves readily, with effervescence, in the diluted mineral Acids, the solutions affording the reactions characteristic of Magnesium. 5 grammes calcined at a red heat should be reduced to 2·1 grammes. It should yield no characteristic reaction with the tests for Iron, Aluminium, or Calcium, and only the slightest reactions with the tests for Chlorides or Sulphates.

Commercial samples sometimes contain a considerable proportion of Chloride.

Preparation.

LIQUOR MAGNESII CARBONATIS. Solution of Magnesium Carbonate. *B.P.Syn.*—Fluid Magnesia.

Magnesium Sulphate, 2; Sodium Carbonate, $2\frac{1}{2}$; Distilled Water, a sufficient quantity. Dissolve the two salts separately, each in 10 of the Distilled Water; heat the solution of Magnesium Sulphate to the boiling point; add to it the solution of Sodium Carbonate; boil them together until Carbonic Anhydride ceases to be evolved; collect the precipitated Magnesium Carbonate on a calico filter; wash it with Distilled Water until the filtrate is free from Sulphate. Mix the washed precipitate with 20 of Distilled Water; place the mixture in a suitable apparatus; force into it pure washed Carbonic Anhydride; let the mixture remain in contact with excess of Carbonic Anhydride, retained under a pressure of about three atmospheres, for twenty-four hours or longer; decant the solution, into which again pass Carbonic Anhydride. Keep the Solution in bottles of convenient sizes, securely closed to prevent the escape of Carbonic Anhydride.

Dose.—1 to 2 fl. oz.

This solution contains nearly 10 grains of the official Magnesium Carbonate in 1 fl. oz., or about 2 grammes in 100 c.c.

Foreign Pharmacopœias.—Official in Belg., Aqua Magnesiæ Aerata; Fr., Eau Magnésienne; not in the others.

Description.—Effervesces slightly, or not at all, when the containing vessel is first opened.

Tests.—It should yield no characteristic reaction with the test for Sulphates. 20 c.c. evaporated to dryness afford a white residue of pure Hydrous Magnesium Carbonate, which after being calcined weighs between ·16 and ·19 gramme. This residue is insoluble in Water, and when dissolved in dilute Acid responds to the tests for Magnesium.

The following volumetric test is suggested (*P.J.* (3) xxiii. 620)—100 c. c. should require not less than 45·5 c. c. of the volumetric solution of Oxalic Acid, which is equal to ·914 MgO p.c., the equivalent of 4 grains of Oxide to the ounce. Litmus is used as the indicator.

Not Official.

MISTURA ALBA.—Magnesium Carbonate, 10 grains; Magnesium Sulphate, 1 drm.; Peppermint Water, to 1 fl. oz.—*King's College Hospital.*

MISTURA MAGNESIÆ C. RHEO.—Rhubarb, 7½ grains; Magnesium Carbonate, 15 grains; Peppermint Water, 1 fl. oz.

LIQUOR MAGNESII BROMIDI.—Neutralise 20 fl. oz. of Dilute Hydrobromic Acid, (10 p.c.), with about 1 oz. of Magnesium Carbonate: filter. Each teaspoonful contains nearly 7 grains of Anhydrous Magnesium Bromide.

Dose.—1 to 2 fl. drm.

Has been used as a sedative in treatment of the insane.—*A.J.P.* '86, 531.

MAGNESII CITRATIS LIQUOR.—Solution of Magnesium Citrate. *Syn.*—Limonade Purgative. Magnesium Carbonate, 100 grains; Citric Acid, 200 grains; Syrup of Lemons, ½ fl. oz.; Potassium Bicarbonate, in crystals, 40 grains; Water, a sufficiency.

Dissolve the Citric Acid in 2 fluid ounces of the Water, and having added the Magnesium Carbonate, stir until it is dissolved. Filter the solution into a strong half-pint bottle, add the Syrup and sufficient Water to nearly fill the bottle, then introduce the Potassium Bicarbonate, and immediately close the bottle with a cork, which should be secured with string or wire; afterwards shake the bottle until the Potassium Bicarbonate is dissolved.

Medicinal Properties.—A pleasant saline aperient and refrigerant draught.

Dose.—5 to 10 fl. oz.

Foreign Pharmacopœias.—Official in the U.S. formula modified. Austr. and Hung., Potio Magnesiæ Citricæ Effervescens; Belg., Limonada Citratis Magnesiæ; Fr., Limonade Purgative; Ital., Limonata Magnesiaca; Mex., Solucion de Citrato de Magnesia; Port., Limonada Citro-Magnesica; Russ., Potio Magnesii Citrici Aërophora; Span., Pocion de Citrato Magnesico Gaseosa; Swiss, Magnesium Citricum effervescens; not in the others.

MAGNESII SULPHAS.

MAGNESIUM SULPHATE.

B.P.Syn.—Epsom Salt.

$MgSO_4.7H_2O$, eq. 244·68.

Magnesium Sulphate may be prepared by the interaction of the

native Magnesium Carbonates and diluted Sulphuric Acid; or by purifying the native Sulphate.

Solubility.—10 in 13 of Water, measures 18; 20 in 3 of boiling Water.

Medicinal Properties.—A mild and safe hydragogue purgative, operating with little pain or nausea. Used in portal congestion and chronic constipation and that of lead poisoning, in inflammatory affections in robust people and in congestion of brain; by reducing blood pressure, it wards off apoplectic attacks; along with Ferrous Sulphate it is given in anæmia.

When given in conjunction with Diluted Sulphuric Acid the dose may be reduced, since the acid increases peristalsis; it also helps to cover the nauseous taste.

Injected subcutaneously in cases in which consciousness has been lost and swallowing is impossible; in gastritis when a purgative is required and the stomach rebels. —*M.A.* '95, 34.

Treatment of tropical dysentery by 60 grain doses of saturated solution of Epsom Salts in conjunction with 10 minims of Diluted Sulphuric Acid, every hour.—*L.* '90, ii. 711; *B.M.J.* '98, i. 554; ii. 877, 887; *T.G.* '98, 534; also ½ fl. oz. doses of saturated solution of Magnesium Sulphate with 15 minims of Diluted Sulphuric Acid every two hours.—*B.M.J.* '98, i. 298; *T.G.* '98, 534.

Stimulates the intestinal glands, but not the liver.—Dr. Rutherford.

Dose.—30 to 120 grains, for repeated administration; for a single administration, ¼ to ½ an oz.

Prescribing Notes.—Usually given in solution (*see* Mistura Alba) or the Effervescent Granules.

Incompatibles.—Potassium and Sodium Carbonates and Bicarbonates, Lime Water, Lead Acetate. Magnesium Sulphate should not be prescribed with Tartarated Soda, for after some time Magnesium Tartrate will precipitate. The following prescription is an example:—℞ Sodæ Tartaratæ, ʒj; Magnes. Sulph., ʒij; Aquæ ad fl. ℥iss.

Official Preparation.—Magnesii Sulphas Effervescens. Contained in Mistura Sennæ Composita. Used in the preparation of Magnesii Carbonas Levis, Magnesii Carbonas Ponderosa and Liquor Magnesii Carbonatis.

Not Official.—Magnesii Salicylas and Magnesii Sulphis.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—In small, colourless, transparent, rhombic prisms, soluble in 1 part of cold Water, and possessing a bitter taste.

Tests.—It affords the reactions characteristic of Magnesium and of Sulphates. ·5 gramme dissolved in 250 c.c. of Water, when set aside for twelve hours with a mixture of Solution of Ammonia, Solution of Ammonium Chloride, and Solution of Sodium Phosphate, yields a precipitate which, when thoroughly washed, dried, and heated to redness, weighs ·22 gramme. Magnesium Sulphate should yield no characteristic reaction with the tests for Iron, Aluminium, Zinc, Calcium, Sodium, Potassium, Ammonium, or Nitrates, and only the slightest reactions with the tests for Chlorides.

Preparation.

MAGNESII SULPHAS EFFERVESCENS.—Effervescent Magnesium Sulphate. *B.P.Syn.*—Effervescent Epsom Salt.

Magnesium Sulphate, in crystals, 50; Sodium Bicarbonate, in powder, 36; Tartaric Acid, in powder, 19; Citric Acid, in powder, 12½; Refined Sugar, in powder, 10½. Dry the Magnesium Sulphate at about 130° F. (54·4° C.) until it has lost 23 p.c. of its weight; powder the product; mix it with the Refined Sugar, and then with the other ingredients. Place the mixture in a dish or pan of suitable form, heated to between 200° and 220° F. (93·3° and 104·4° C.). When the mixture, by aid of careful manipulation, has assumed a granular character, separate it into granules of uniform and convenient size by means of suitable sieves. Dry the granules at a temperature not exceeding 130° F. (54·4° C.). =(About 1 in 2½).

The product should weigh about 100 oz. (or 1000 grammes).

Dose.—60 to 240 grains, for repeated administration; for a single administration, ½ to 1 oz.

Not Official.

MAGNESII SALICYLAS.—Colourless hygroscopic needles. Readily soluble in Water and Alcohol (90 p.c.).

Dose.—50 to 100 grains daily have been given with advantage in typhoid fever.—*L.M.R.* '88, 62; *P.J.* (3) xviii. 823; *T.G.* '88, 390.

Frequently of a pink colour due to trace of Iron which may be removed by the previous treatment of the Magnesium Sulphate as described.—*P.J.* '95, ii. 178; *C.D.* '95, ii. 356.

MAGNESII SULPHIS.—A white crystalline powder, which gradually oxidises to Sulphate on exposure to the air.

Solubility.—1 in 20 of Water; insoluble in Alcohol (90 p.c.). Given in the place of Sodium Sulphite.

Recommended in diphtheria as a **gargle**, 1 in 16 of Water, or by the application of the powder to the fauces by means of a damp brush, leaving as much of the powder on the throat as possible. Successful treatment of diphtheria by insufflations and tabloids of pure Magnesium Sulphite.—*L.* '94, ii. 474; '95, i. 344, 523, 587. The comparatively low solubility of the salt is an advantage in prolonging the action.—*L.* '87, i. 404.

Dose.—20 to 30 grains.

Not Official.

MANGANESII OXIDUM PRÆPARATUM.

Digest finely-powdered commercial Black Oxide in Diluted Hydrochloric Acid for twenty-four hours, frequently shaking the bottle containing them; then pour off the Acid; wash the Oxide thoroughly with Water, pouring off the lighter portions each time for use, and rejecting the heavier and coarser particles; finally dry on a water-bath.

A remedy for gastrodynia, pyrosis, etc. Has been recommended as an emmenagogue.

Dose.—10 to 30 grains.

Not Official.

MANGANESII SULPHAS.

Colourless or pale rose-coloured, right rhombic prisms.

Solubility.—7 in 10 of Water; insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Purgative; it is, however, little used, being uncertain in its action, and apt to cause vomiting; its taste is disagreeably styptic.

Dose.—1 to 5 grains as a tonic; 30 to 60 grains as a purgative.

Does not excite the liver, but is a powerful stimulant to the intestines.—Dr. Rutherford.

Foreign Pharmacopœias.—Official in Dutch, Fr., Mex., Port., Russ., Span. and U.S.; not in the others.

MANGANESII HYPOPHOSPHIS ($MnP_2H_4O_4$).—A pale pink granular powder, soluble 1 in 7 of Water.

Used in the preparation of Syrupus Hypophosphitum Compositus B.P.C.

MANGANESII PHOSPHAS ($Mn_3P_2O_8.7H_2O$).—A whitish powder, prepared by precipitating a Manganous salt with Sodium Phosphate. When freshly precipitated, and dried without heat, it has the above formula, corresponding to 26 p.c. of Water, but commercial samples seldom lose on ignition more than 20 p.c.

Used to replace part of the Iron in Ferrous Syrups.

Not Official.

MANNA.

A concrete saccharine exudation, obtained by transverse incision from the stems of *Fraxinus Ornus*.

It is cultivated for the purpose chiefly in Calabria and Sicily.

Solubility.—1 in 5 of Water; 1 in 150 of Alcohol (90 p.c.).

Medicinal Properties.—A mild laxative; in large doses apt to cause flatulence and griping pain; useful for children and delicate females, given in hot milk or in combination with other purgatives, such as Senna.

Dose.—As a laxative, 60 grains to 1 oz.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Ger., Hung., Ital., Jap., Mex. (Mana), Norw., Port., Russ, Span., Swed., Swiss and U.S.; not in Dutch.

The larger and better kinds are called Flake Manna, and consist principally (60 to 80 p.c.) of Mannite, $C_6H_8(HO)_6$, eq. 180·74; together with common Sugar and extractive matter. Contains about 10 p.c. of moisture.

Pure Mannite is easily crystallised from an alcoholic solution. It cannot be fermented by Yeast. It does not reduce Fehling's Solution, and gives no brown colour with boiling Solution of Potash.

Preparations.

MANNA DEPURATA.—Dissolve Manna, 10, in sufficient Water; strain, and evaporate to 10. It is convenient for dispensing, and keeps good for a long time.

MANNITOL HEXANITRATE.—The nitrate of the Hexatomic Alcohol Mannite (mannitol). In needles, almost insoluble in Water, soluble in Alcohol (90 p.c.). Has been suggested as a vaso-dilator. The crystals explode violently on being struck with a hammer, or on the application of sudden heat.—*B.M.J.* '95, ii. 1213; '98, i. 529; 893.

Dose.—1½ to 2 fl. drm. of a 1 p.c. Alcoholic solution.

Not Official.

MARANTA.

ARROW-ROOT.

The Starch obtained from the roots of *Maranta arundinacea*, a native of the tropical parts of America and the West Indies.

That which comes from Bermuda is considered the best.

Medicinal Properties.—Nutrient and demulcent, frequently taken with milk. It should be first made into a thin paste with cold milk, and boiling milk added to make a thick mucilage.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Mex. (Arroru), Norw., Port. (Araruta), Span. and Swed.; not in the others.

A light white powder, or small pulverulent masses.

Test.—Free from unpleasant odour and taste.

Not Official.

MASTICHE.

MASTICH.

A concrete resinous exudation obtained by incisions in the bark of the stem and large branches of *Pistacia Lentiscus*.

Produced in the island of Scio.

Solubility.—Insoluble in Water; partly soluble in Alcohol (90 p.c.) and Oil of Turpentine; 2 in 1 of Ether; 2 in 1 of Chloroform.

Medicinal Properties.—Stimulant. Rarely used now except in solution as a temporary stopping for teeth.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Norw., Swed. (Resina Mastix), Dutch, Fr., Hung., Port., Mex. and Span. (Almaciga) and U.S.; not in Ger., Ital., Jap., Russ. or Swiss.

Description.—Small irregular pale-yellow tears, brittle and either opaque or far more frequently transparent. Sp. gr. 1·06—1·07.

Preparations.

MASTIC DENTAIRE (Fr.).—Mastic 2, Ether 1: dissolve.

Cotton saturated in this solution is a good stopping for decayed teeth.

MASTIC AND CHLOROFORM.—Mastic 2, Chloroform 1: dissolve. Used for the same purpose as above.

Not Official.

MATICO.

The dried leaves of *Piper angustifolium*. Imported from Peru.

Medicinal Properties.—An agreeable aromatic astringent, tonic and stimulant, used in all forms of inflammation of the urinary passages. The Volatile Oil has a powerful styptic property, and is applied to leech bites and other small bleeding wounds.

Dose.—Of the powder, 30 to 120 grains three times daily.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., Port., and U.S. not in the others.

Preparations.

INFUSUM MATICO.—Matico leaves, cut small, 1; boiling Distilled Water, 20: infuse half an hour, and strain.

Dose.—1 to 4 fl. oz.

(Not in the other Pharmacopœias.)

EXTRACTUM MATICO FLUIDUM (*U.S.*)—Prepared with a mixture of Alcohol (sp. gr. ·820) 3, Water 1, so that 1 fl. oz. equals 1 oz. of Matico.

TINCTURA MATICO.—Matico leaves, in coarse powder, 1; Alcohol (60 p.c.), 5: macerate fourteen days, strain, express, and filter. =(1 in 5).

Astringent. Useful in catarrh of the bladder of the aged.

Dose.—1 to 2 fl. drm.

Foreign Pharmacopœias.—Official in Fr., 1 and 5; Mex., 1 in 5; U.S., 1 in 10; not in the others.

Not Official.

MEDULLA RUBRA.

RED BONE-MARROW.

The marrow of ox bones, being a seat of formation of blood corpuscles, has been introduced in the treatment of pernicious anæmia, chlorosis, and hæmoglobinuria. It may be given fresh or raw, spread as a sandwich, also in the form of 'Glycerin Extract,' or in Gelatin capsules.

Some points in pernicious anæmia with special reference to treatment with Bone Marrow. 'The conclusion to be drawn seems to be that Bone Marrow should not be given unless a thorough course of Arsenic has been given and has failed.' 'It is difficult to explain in what way any good effect could be produced by the administration of Bone Marrow in pernicious anæmia.'—*L.* '96, i. 285.

MEL DEPURATUM.

CLARIFIED HONEY.

Honey of commerce, melted in a water-bath, and strained, while hot, through flannel previously moistened with warm Water.

Medicinal Properties.—Demulcent, laxative, and nutritive, but apt to gripe and occasion flatulence when given in large doses. In the form of **Oxymel** it is a useful addition to gargles and cough mixtures, as it relieves the pain and dryness of the throat and also dysphagia.

Official Preparations.—Mel Boracis, Oxymel, Oxymel Scillæ. Contained in Confectio Piperis.

Foreign Pharmacopœias.—Official in all except Fr. and Mex.; Port., Mellito Simples; Span., Miel Depurado.

Description.—A viscid translucent liquid of a light-yellowish or brownish-yellow colour, gradually becoming partially crystalline and opaque. It has a characteristic odour and very sweet taste.

Tests.—Incinerated it should not yield more than ·25 p.c. of ash, the solution of which in Water acidulated with Nitric Acid should not afford more than a slight turbidity with Solution of Barium Chloride (absence of more than traces of Sulphates). It should yield no characteristic reaction with the Iodine test for Starch.

Analysis of four samples of Australian honey.—*P.J.* '96, i. 165. Detection of 'Starch Syrup' and commercial dextrin in honey.—*Analyst* '96, 287.

Preparation.

OXYMEL. OXYMEL. (MODIFIED).

Clarified Honey, liquefied (by weight), 40; Acetic Acid, 5; Distilled Water, a sufficient quantity. Mix the Clarified Honey with the Acetic Acid and about 5 of Distilled Water, or sufficient to produce Oxymel having the sp. gr. 1·320.

No sp. gr. was given in B.P. '85. Now must be 1·320.

Dose.—1 to 2 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Honey 2, Common Vinegar 1; Fr., Honey 4, White Vinegar 1; Dutch, Honey 19, Acetic Acid (30 p. c.) 1; Hung., Honey 50, Acetic Acid (96 p. c.) 1; Port., Honey 197, Acetic Acid (98 p. c.) 3; Russ., Honey 49, Acetic Acid (95 p. c.) 1; Span., Honey 23, Vinegar 8; Swed., Honey 100, Acetic Acid (29 p. c.) 8; Mex., Honey 100, Acetic Acid 6; not in the others.

MENTHÆ PIPERITÆ OLEUM.

OIL OF PEPPERMINT.

The Oil distilled from fresh flowering Peppermint, *Mentha piperita*.

Solubility.—In all proportions of Absolute Alcohol; 2 in 1 (*or less*) of Alcohol (90 p.c.), becomes turbid on adding more Alcohol.

Medicinal Properties.—A grateful aromatic, stimulant, and carminative. Allays nausea, relieves spasmodic pains in the stomach. Useful in the flatulent colic of children. Covers the taste of nauseous medicines, such as Rhubarb, and mitigates the griping effect of purgatives. Externally applied it acts as a local anæsthetic and relieves neuralgic pain; *see* also Menthol.

Recommended as an antiseptic.—*L.* '88, i. 512.

Dose.—½ to 3 minims.

Prescribing Notes.—The oil is taken on **sugar,** or in **pill.** *See* page 484.

Official Preparations.—Aqua Menthæ Piperitæ and Spiritus Menthæ Piperitæ. Contained in Pilula Rhei Composita and Tinctura Chloroformi et Morphinæ Composita.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital. (Essenza di Menta), Jap. (Oleum Menthæ), Mex. (Aceite Volatil de Menta Piperita), Norw., Port. (Essencia de Hortela Pimenta), Russ., Span., Swed., Swiss and U.S.

Description.—Colourless, pale yellow, or greenish-yellow when recently distilled but gradually becoming darker by age. It has the odour of the herb, and a strong penetrating aromatic taste, followed by a sensation of coldness in the mouth.

The variations in quality of the English Oils depend, (1) upon whether they have been obtained from 'Black Mint' (the ordinary plant), or from 'White Mint'; (2) upon the subsequent rectification. So that from the finest double-rectified White Mint to the first crude distillate from the Black Mint, there are all manner of gradations, each of them 'Ol. Menth. Pip. Ang.'

The principal constituent of this Oil is Menthol. It also contains a small proportion of lower boiling constituents, regarding the composition of which there exists

a difference of opinion; some regard them as unoxygenated terpenes, others as allied to Menthol in the same relation as Laurel Camphor to Borneol and capable of conversion into it by the addition of Hydrogen.

Dementholised Oil of Peppermint is commonly known as 'Menthene' and is used for purposes of adulteration.

A pure Peppermint Oil cooled in a mixture of Ice and Salt should on the addition of one or two Menthol crystals set to a more or less solid crystalline mass.

In America the oil is distilled from the *dried* rather than the *fresh* herb, the yield being practically the same, and it is much more convenient for the distiller. About 350 lbs. fresh plant yield 1 lb. of Oil, and the plant loses about 50 p.c. of its weight in drying.—*J.S.C.I.* '88, 550.

American Oil of Peppermint is also the product of *Mentha piperita* but contains less Menthol.

Japanese Oil of Peppermint is obtained from *Mentha arvensis var. piperascens* and is rich in Menthol.

Japanese contains the largest percentage of Menthol.—*P.J.* (3) xxv, 72, 546.

A comparison of the oils from Black and White Peppermint.—*P.J.* 96, i. 123; *C.D.* '96, i. 250, 290.

The effects of climate and soil on Peppermint Oil.—*P.J.* '96, ii. 103; *C.D.* '96, ii. 199.

Tests.—Sp. gr. ·900 to ·920. It should dissolve in four times its volume of Alcohol (70 p.c.). If a portion of the Oil be cooled to 17° F. (—8·3° C.) and a few crystals of Menthol be added, a considerable separation of Menthol should take place.

Polarising Rotation (200 m. m.) from —50° to —70°.

The Oil of *Mentha piperita* is as a rule distinguished from that of *Mentha arvensis* by developing a blue colour and red fluorescence when mixed with 4 vols. of Glacial Acetic Acid. This colour is not developed if air be excluded, and, depending as it does upon some minor constituent destroyed by prolonged exposure to sunlight, it may not be given by some old samples.

Process for the determination of free and combined Menthol.—*A.J.P.* '97, 191; *P.J.* '97, i. 367; '97, ii. 82. The Menthol determination might have been included in the B.P.

Amylic Alcohol and small quantities of Sulphur compounds (Dimethyl Sulphide) have been detected in American Peppermint Oil.—*J.S.C.I.* '96, 925.

Preparations.

AQUA MENTHÆ PIPERITÆ. Peppermint Water.

Oil of Peppermint, 77 minims; Water, 1½ galls.: distil two-thirds. =(Oil about 1 in 1000).

Dose.—Not given in B.P.; 1 to 2 fl. oz.

Foreign Pharmacopœias.—Official in Belg., ·3 in 1000; Dan. and Russ., 1 in 2000; Dutch, 1 in 1000; U.S. and Jap., 1 in 500; Austr., Fr., Ger., Hung., Ital., Port., Span., Swed. and Swiss, distilled from the **leaves**; Mex., distilled from the **plant**; not in Norw.

SPIRITUS MENTHÆ PIPERITÆ. Spirit of Peppermint. (Altered.)

Oil of Peppermint, 1; Alcohol (90 p.c.), a sufficient quantity. To the Oil of Peppermint add enough of the Alcohol to form 10 of the Spirit of Peppermint. =(1 in 10).

Now 1 in 10 instead of 1 in 50; Alcohol (90 p.c.) used in place of Rectified Spirit.

Dose.—5 to 20 minims.

This Spirit of Peppermint contains five times the proportion of Oil of Peppermint present in the Spirit of Peppermint, and half the proportion of Oil in the Essence of Peppermint, of the British Pharmacopœia of 1885.

An agreeable **Peppermint Syrup** is made by adding 60 minims of the Spirit to 1 fl. oz. of Simple Syrup.

Foreign Pharmacopœias.—Official in Belg. (Spiritus Menthæ) Oil 1, Alcohol 99; Fr. (Teinture d'Essence de Menthe), Oil 2, Alcohol 98; Ger., and Jap. (Spiritus Menthæ), 1 in 10; Swiss, 3 Oil in 100; U.S., from the **leaves** and **oil**, about 1 in 10; Austr. and Span., from **leaves**; not in the others.

MENTHÆ VIRIDIS OLEUM.

OIL OF SPEARMINT.

N.O.Syn.—Menthæ Crispæ Oleum.

The Oil distilled from fresh flowering Spearmint, *Mentha viridis*.

Solubility.—In all proportions of Absolute Alcohol; 1 in 1 (*or less*) of Alcohol (90 p.c.), becomes milky on adding more Alcohol.

Medicinal Properties.—Similar to those of Oleum Menthæ Piperitæ.

Dose.—½ to 3 minims.

Prescribing Notes.—The **oil** is given on **sugar,** or made into **pills** with Liquorice powder and Soap. *See* p. 484.

Official Preparation.—Aqua Menthæ Viridis.

Foreign Pharmacopœias.—Official in Belg., Hung., Norw., Port. (Essencia de Hortela), Russ., Span. and U.S. (sp. gr. ·930—·940); not in the others.

Description.—Colourless, pale yellow or greenish-yellow when recently distilled, but becoming darker by age. It has the odour and taste of the herb.

Tests.—Sp. gr. ·920 to ·940. The Oil forms a clear solution with its own volume of a mixture of equal parts of Absolute Alcohol and Alcohol (90 p.c.)

Preparation.

AQUA MENTHÆ VIRIDIS. Spearmint Water.

Oil of Spearmint, 77 minims.; Water, 1½ galls.: distil two-thirds.
=(Oil about 1 in 1000).

Dose.—Not given in B.P.; 1 to 2 fl. oz.

Foreign Pharmacopœias.—Official in Belg., ·3 in 1000; Russ., 1 in 3000; U.S., 1 in 500; Port. (Agua de Hortela); Span. and Swed., from **leaves**; not in the others.

MENTHOL.

MENTHOL.

$C_6H_9 \cdot OH \cdot CH_3 \cdot C_3H_7$, eq. 154·98.

A crystalline substance obtained by cooling the Oil distilled from the fresh herb of *Mentha arvensis*, vars. *piperascens et glabrata*, and of *Mentha piperita*.

Solubility.—Almost insoluble in Water and Glycerin; soluble

5 in 1 of Alcohol (90 p.c.); 4 in 1 (nearly) of Chloroform; 8 in 3 of Ether; 10 in 7 of Petroleum Spirit; 1 in 4 of Olive Oil.

Medicinal Properties.—Antiseptic, stimulant, carminative, local anæsthetic. Applied in some forms of neuralgia and headache, also in rheumatism, in pruritus and in pleurodynia and toothache; in parasitic cutaneous diseases; a 10 p.c. alcoholic solution as a paint in diphtheria (*B.M.J.E.* '94, ii. 63); a 20 p.c. solution in Olive Oil (with 3 p.c. Guaiacol) as an intralaryngeal injection (20 to 30 minims) in phthisis and bronchiectasis (*Pr.* liii, 276); a good remedy in painful enteritis with mucous diarrhœa.—*M.A.* '95, 239.

Used as a snuff, along with Boric Acid 2 parts, and Ammonium Chloride 3 parts; also dissolved in oil as a spray for influenza, hay fever, coryza and ozæna.

An ethereal or alcoholic **solution** (20 to 30 p. c.) forms a useful local anæsthetic for the mucous membrane, but its effects are transient.—*L.* '85, ii. 128; *B.M.J.* '87, i. 800.

Spray containing 5 to 20 p. c. of Menthol recommended in tubercular laryngitis.—*T.G.* '87, 762.

Menthol and Iodoform equal parts as a **surgical dressing**.—*B.M.J.* '88, i. 933.

Dose.—½ to 2 grains.

Prescribing Notes.—It is best made into **pills** by the addition of Soap and Dispensing Syrup. Usually employed externally. Largely used in the form of **cones** and **pencils**; also as an **ointment.**

Official Preparation.—Emplastrum Menthol.

Not Official.—Mentholeate, Validol and Unguentum Menthol.

Foreign Pharmacopœias.—Official in Austr., Dan., Fr., Ger., Jap. and Norw. (Mentholum), Ital. (Mentolo), Mex. (Mentol), Russ., Swiss and U.S.; not in the others.

Description.—In colourless acicular crystals usually more or less moist from adhering Oil, or in crystalline masses. Melting point 107·6° F. (42° C.); it should not exceed 109·4° F. (43° C.). It has the odour and flavour of peppermint, producing a sensation of warmth on the tongue, and, if air is inhaled, a sensation of coolness. It is very slightly soluble in Water, but readily soluble in Alcohol (90 p.c.), the solutions having a neutral reaction.

Tests.—Boiled with Sulphuric Acid diluted with half its volume of Water, Menthol acquires an indigo-blue or ultramarine colour, the Acid becoming brown. It should be entirely volatilised by the heat of a water-bath.

Preparation.

EMPLASTRUM MENTHOL. Menthol Plaster. (Altered.)

Menthol, 1½; Yellow Beeswax, 1; Resin, 7½; melt the Beeswax and Resin together; when the mixture approaches the temperature of 160° or 170° F. (71·1° or 76·7° C.), stir in the Menthol until dissolved.

The quantity of Menthol is reduced and the Resin slightly increased.

Not Official.

MENTHOLEATE.—A name given to a solution of Menthol in Oleic Acid. Menthol

200 grains, Oleic Acid ½ fl. oz.; heat gently in a test-tube till dissolved. It is recommended as the best form for external application.—*T.G.* '87, 36.

Validol, is stated to be a solution of Menthol in Methyl Valerianate. Has been found useful in the depression of hysteria and neurasthenia.—*C.D.* '98, i. 91; *P.J.* '98, ii. 661.

UNGUENTUM MENTHOL (*T.H.*).—Menthol 5 grains, Vaseline 1 oz.

Not Official.

MENYANTHES.

BUCKBEAN.

The leaves of *Menyanthes trifoliata*, a gentianaceous plant.

Medicinal Properties.—A bitter tonic and cathartic.

Recommended in functional amenorrhœa.—*L.* '85, i. 132, 235.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Hung., and Swiss, Trifolium Fibrinum; Dan., Fr., Norw., Russ., and Swed., Menyanthes; Ital., Trifoglio Fibrino; Port., Trifolio Fibrino; Span., Trebol Acuatico. Not in the others.

Preparation.

EXTRACTUM MENYANTHIS.—Buckbean exhausted with boiling Water, and the liquor evaporated to an Extract.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Ger., Ital., Port., Russ., Swed. and Swiss; not in the others.

Not Official.

METHYL CHLORIDUM.

CH_3Cl, eq. 50·10.

Methyl Chloride is a colourless gas of an ethereal odour and a sweet taste, soluble in Water to the extent of 2·8 volumes. When beet-root molasses are fermented and distilled for their alcohol, the residues yield on destructive distillation compounds of Trimethylamine. When Trimethylamine Hydrochloride is heated to 260° C. it decomposes into Trimethylamine, Ammonia, and Methyl Chloride. The mixed gases are passed through acid to absorb the alkaline vapours, and the Methyl Chloride which passes over is washed and liquefied by cold and pressure.

This liquid is prepared in Paris, and supplied in metal cylinders, some of which are fitted with a valve and a tube for producing a jet; also with a nozzle for running the liquid into a specially designed glass tube for use with tampons.

Medicinal Properties.—It is used as a local anæsthetic for surgical procedures of short duration, producing intense cold by its evaporation. If used incautiously, it may produce blisters or eschars.—*B.M.J.* '85, i. 813; '88, ii. 243; *L.* '89, i. 190.

Used in lumbago, sciatica and neuralgia by stypage, *i.e.*, laying on the painful part a pledget of Cotton Wool or Lint soaked in the remedy.

Not Official.

METHYLAL.

$C_3H_8O_2$.

A colourless volatile liquid (sp. gr. ·855). Boils at 107° F. Readily soluble in Water and Alcohol (90 p.c.).

Medicinal Properties.—Hypnotic. Given in delirium, mania and insomnia; mixed with Oil or Glycerin it is used as a local anæsthetic.

Toleration of the drug is soon established, when the dose must either be increased or discontinued for two or three days.—*B.M.J.* '87, ii. 894; '88, i. 481; '88, ii. 1454; *L.* '90, i. 718.

Dose.—30 to 120 minims in water.

Not Official.

METHYLENE BLUE.

TETRAMETHYLTHIONINE HYDROCHLORIDE.

For medicinal purposes it is prepared chemically pure and free from Zinc.

An analgesic, dose 1 to 5 grains.—*T.G.* '90, 529; *L.* '91, i. 99; its ill-effects and dangers.—*B.M.J.* '98, ii. 1055.

In malaria, dose 1½ grains five times a day.—*T.G.* '91, 859; '92, 471, '94, 163, 843; '93, 50; *L.* '92, i. 817, '93, i. 545, '94, i. 1462; *B.M.J.E.* '93, ii. 107.

In rheumatoid arthritis, 2 grains twice daily after food.—*B.M.J.* '97, i. 781, 1064; *P.J.* '97, i. 426.

Internally, 3 grains three times a day, in gonorrhœa, cuts short the acute stage of the disease before any damage is done to the urethral tissues.—*B.M.J.* '97, i. 140; *P.J.* '97, i. 405.

Methylene Blue must not be confounded with Methyl Blue which gave rise to purging and vomiting.—*P.J.* '98, i. 186.

In malarial fever. In some cases a slight amount of cystitis was observed, but this inconvenience was slight in comparison with radical cure obtained.—*L.* '98, i. 611.

In diabetes mellitus.—*T.G.* '98, 404.

Under the fancy name **Pyoctanin** (blue), Methyl-Violet (another coal-tar colour), has been recommended in the internal and local treatment of malignant tumours.—*T.G.* '94, 706; *B.M.J.E.* '94, ii. 12.

As a local application (10 p.c. sol.) in diphtheria.—*L.* '94, ii. 792; *B.M.J.E.* '93, ii. 12; '94, i. 3; *Y.B.T.* '94, 194; *T.G.* '93, 118.

Locally in corneal ulceration.—*T.G.* '93, 55.

MEZEREI CORTEX.

MEZEREON BARK.

The dried bark of *Daphne Mezereum*, or of *Daphne Laureola*, or of *Daphne Gnidium*.

Medicinal Properties.—A stimulant, alterative, diaphoretic, and vesicant. An ointment of the bark is used as an irritant to keep up discharge. Rarely given alone internally, but it appears as an ingredient in Liquor Sarsæ Compositus Concentratus. It was formerly used in the treatment of syphilis.

Official Preparation.—Used in the preparation of Liquor Sarsæ Compositus Concentratus.

Not Official.—Extractum Mezerei Æthereum and Unguentum Mezerei.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr. (Mézéréon ou Bois gentil) Ital. (Mezereo), Mex. (Mezereón), Port. (Trovisco), Span. (Mecereon), Swed., Swiss and U.S.; not in the others.

Description.—In long, thin, more or less flattened strips, or in quills of various lengths; flexible, very tough and fibrous. The outer surface varies in colour from olive-brown or reddish-brown to deep purplish-brown; the inner surface is nearly white, and silky. The transverse section exhibits numerous groups of bast fibres in the secondary bast. The Bark readily separates into two layers. It has no marked odour, but an acrid burning taste.

Not Official.

EXTRACTUM MEZEREI ÆTHEREUM.—Mezereon Bark, cut small, 4; Alcohol (90 p.c.), 40; Ether, 5: macerate the Mezereon in three-quarters of the Alcohol for three days with frequent agitation; strain and press. To the residue of the Mezereon add the remainder of the Alcohol, and again macerate for three days, with frequent agitation, strain and press, mix and filter the strained liquors; recover the greater part of the Alcohol by distillation, evaporate what remains to the consistence of a soft extract, put this into a stoppered bottle with the Ether, and macerate for twenty-four hours, shaking them frequently, decant the ethereal solution, recover part of the Ether by distillation, and evaporate what remains to the consistence of a soft extract.

Foreign Pharmacopœias.—Official in Belg. (Ext. Mezerei), Ital. (Estratto di Mezereo Eteres), Fr. (Extrait de Garou, from the *Daphne Gnidium*), and Port. (Extracto de Trovisco) with Alcohol only; Swiss and U.S., **Fluid Extract** with Alcohol 1 in 1; not in the others.

UNGUENTUM MEZEREI.

Belg.—Ext. Mezerei, 39; Lard, 865; Yellow Wax, 96; Alcohol (92°), 90.
Dutch.—Ext. Mezerei, 1; Simple Ointment, 10.
Fr.—Ext. Garou, 4; Lard, 90; White Wax, 10; Alcohol, 9.
Ital.—Extract, 1; Alcohol, 1; Benzoated Lard, 27; Wax, 3.
Swiss.—Fluid Extract, 4; Alcohol, 10; White Wax, 10; Lard, 86.

MISTURÆ.

MIXTURES.

The following are the mixtures of the British Pharmacopœia:—

Dose.		Proportions.
½ to 1 oz.	MISTURA AMMONIACI	about 13½ grains in 1 oz.
½ to 1 oz.	MISTURA AMYGDALÆ.	compound powder 1 to 8.
½ to 1 oz.	MISTURA CREOSOTI	1 minim in 1 oz.
½ to 1 oz.	MISTURA CRETÆ	about 13½ grains in 1 oz.
½ to 1 oz.	MISTURA FERRI COMPOSITA	2½ grains in 1 oz.
½ to 1 oz.	MISTURA GUAIACI	about 11 grains in 1 oz.
1 to 2 oz.	MISTURA OLEI RICINI	3 fl. drm. in 1 oz.
1 to 2 oz.	MISTURA SENNÆ COMPOSITA . .	1 oz. Magn. Sulph. in 4 oz.
1 to 2 oz.	MISTURA SPIRITUS VINI GALLICI . .	about 1 Brandy in 2½.

Not Official.

MORI SUCCUS.

MULBERRY JUICE.

The deep purple juice of the ripe fruit of *Morus nigra*. Sp. gr. about 1·060.

Medicinal Properties.—Refrigerant and laxative; serves to prepare a grateful drink well adapted to febrile cases, and as a flavouring and colouring agent.

Foreign Pharmacopœias.—Official in Fr., Suc de Mûre; Port., Amoras; Span., Zumo de Moras.

Preparation.

SYRUPUS MORI.—Mulberry Juice, 20; Refined Sugar, 36; Alcohol (90 p.c.), 2½; heat the Juice to the boiling-point, and when it has cooled filter it; dissolve the Sugar in the filtered liquid by a gentle heat, and add the Alcohol: the product should weigh 54. Sp. gr. 1·330.

Dose.—1 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr. (Sirop de Mûres), Hung., Ital., Mex. (Jugo de Moras), Span. and Swiss; not in the others.

Not Official.

MORPHINA.

$C_{17}H_{19}NO_3$. H_2O, eq. 300·93.

When dried at 230° F. (110° C.) the H_2O is driven off, the equivalent is then 283·05.

The principal alkaloid obtained from Opium.

Solubility.—1 in 1000 of Cold Water; 1 in 100 of Alcohol (90 p.c.); 1 in 10 of Oleic Acid; 1 in 125 of Glycerin; but the solubilities depend very largely on the physical condition of the alkaloid. Insoluble in Ether (thus differing from Narcotin). Aqueous Alkalis, even Lime Water, dissolve it readily when freshly precipitated; Ammonia, however, but sparingly; where a very strong solution is required Hypophosphorous Acid has been suggested as a solvent.

Medicinal Properties.—Similar to the salts of Morphine, but owing to its slight solubility in Water it is rarely given in its purely alkaloidal form. On the Morphine chiefly depends the action of Opium.

Dose.—$\frac{1}{10}$ to $\frac{1}{2}$ grain.

Foreign Pharmacopœias.—Official in Belg., Fr., Hung., Ital., Mex. (Morfina), Port., Span., Swed. and U.S.; not in the others.

Description.—A white crystalline powder, bitter in taste, alkaline in reaction. It forms crystallisable salts with Acids.

Tests.—When dissolved in Sulphuric Acid, and a few drops of Water added to make the mixture hot, the addition of a drop of Nitric Acid produces a red colour. Ferric Chloride gives a blue colour, which, however, is not permanent, and which is interfered with by excess of Acid, heat, or Alcohol.

Preparation.

HEROIN (Di-acetyl ester of Morphine).—A fine white powder, insoluble in Water. Introduced as a substitute for Morphine.—*L.* '98, ii. 1486, 1511; *B.M.J.E.* '98, ii. 63, 92.

Dose.—$\frac{1}{14}$ to $\frac{1}{7}$ grain in pill or powder.

PERONINE (Hydrochloride of Benzylic Ester of Morphine).—A white powder, soluble in Water and weak Alcohol; insoluble in Chloroform and Ether.

Introduced as a narcotic, producing sound sleep without previous excitement and has been found useful in allaying the cough of phthisis, chronic bronchitis, and whooping cough.—*P.J.* '97, i. 217; *B.M.J.E.* '98, ii. 43.

Dose.—$\frac{1}{300}$ to $\frac{1}{150}$ grain two or three times a day in pills.

MORPHINÆ ACETAS.

MORPHINE ACETATE.

$C_{17}H_{19}NO_3$, $C_2H_4O_2$, $3H_2O$, eq. 396·27.

The carefully dried salt, obtained by neutralising Morphine with Acetic Acid.

Solubility.—Theoretically 1 in 2½ of Water, but most samples will require the addition of Acid; 1 in 100 of Alcohol (90 p.c.); 1 in 5 of Glycerin.

Medicinal Properties.—Similar to those of Opium.

The Injectio Morphinæ Hypodermica formerly (*B.P.* 1885) contained one grain of Morphine Acetate in ten minims, now (*B.P.* 1898) it contains one grain of Morphine Tartrate in twenty-two minims.

Recommended in the treatment of diabetes.—*Pr.* xxxviii. 20; *B.M.J.* '89, i. 118.

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

Incompatibles.—Alkalis and alkaline earths, astringent vegetable infusions and decoctions.

Official Preparation.—Liquor Morphinæ Acetatis.

Not Official.—Injectio Morphinæ et Atropinæ Hypodermica.

Antidotes.—*See* Morphine Hydrochloride.

Foreign Pharmacopœias.—Official in Belg., Mex., Norw., Port., Span., Swed. and U.S.; not in the others.

Description—A white crystalline or amorphous powder, almost entirely soluble in 2½ parts of Water and in about 100 parts of Alcohol (90 p.c.). It loses Acetic Acid when exposed to the air.

As it is practically impossible to dry the salt without a slight loss of Acetic Acid, the commercial Acetate generally requires a little added Acetic Acid to make a clear solution.

Aqueous solutions have a strong tendency to deposit basic salts, and to become acid.

Tests.—It affords the reactions for Morphine mentioned under 'Morphinæ Hydrochloridum,' and the reactions characteristic of Acetates. 2 grammes of the salt form with 6 c.c. of warm Morphinated Water a slightly turbid solution, which is rendered clear by the addition of ·1 c.c. of Acetic Acid; and this solution, when mixed with Solution of Ammonia in slight excess yields a precipitate which, after washing and drying as described under 'Morphinæ Hydrochloridum,' weighs 1·42 gramme.

If the salt yield a larger proportion of Morphine than this, it should be re-crystallised from hot Water acidulated with Acetic Acid. Heated to redness with free access of air, it leaves no residue (absence of mineral impurities).

Preparation.

LIQUOR MORPHINÆ ACETATIS. SOLUTION OF MORPHINE ACETATE. (MODIFIED.)

Morphine Acetate, 17½ grains; Diluted Acetic Acid, 38 minims; Alcohol (90 p.c.), 1 fl. oz.; Distilled Water, a sufficient quantity. Mix the

Alcohol with an equal volume of Distilled Water, adding the Diluted Acetic Acid; dissolve the Morphine Acetate in the mixture; dilute with sufficient Distilled Water to produce 4 fl. oz. of the Solution of Morphine Acetate. =(1 in 100).

Alcohol (90 p.c.) now used instead of Rectified Spirit.

Dose.—10 to 60 minims.

110 minims contain 1 grain of Morphine Acetate; 100 c.c. contain 1 gramme.

Not Official.

INJECTIO MORPHINÆ ET ATROPINÆ HYPODERMICA.—Morphine Acetate, 10 grains; Atropine Sulphate, $\frac{1}{4}$ grain; Water, 120 minims: dissolve.

$\frac{1}{2}$ grain of Morphine Acetate and $\frac{1}{80}$ grain of Atropine Sulphate in every 6 minims.

Dose.—1 to 6 minims for each injection.

Atropine combined with Morphine increases its analgesic and hypnotic effects, whilst it lessens its depressing and constipating effects.

MORPHINÆ HYDROCHLORIDUM.

MORPHINE HYDROCHLORIDE.

Hydrochlorate of Morphine.—*B.P.*, '85.

$C_{17}H_{19}NO_3$, HCl, $3H_2O$, eq. 372·88.

The Hydrochloride of an alkaloid obtained from Opium.

Solubility.—1 in 24 of Water; about 1 in 50 of Alcohol (90 p.c.); 1 in 8 of Glycerin; insoluble in Ether.

Medicinal Properties.—This and the other salts of Morphine possess the anodyne, soporific and other actions of Opium. They vary in their solubility in Water, Morphine Acetate being the most soluble, but its solutions are not stable. In B.P. '98, the Tartrate has been selected for making the **hypodermic injection.**

Has no appreciable effect on the secretion of bile, and does not prevent the stimulating effect of such a substance as the Sodium Salicylate.—Dr. Rutherford.

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

Incompatibles.—Alkalis and alkaline earths, astringent vegetable infusions and decoctions.

Official Preparations.—Liquor Morphinæ Hydrochloridi, Suppositoria Morphinæ, Trochiscus Morphinæ and Trochiscus Morphinæ et Ipecacuanhæ. Contained in Tinctura Chloroformi et Morphinæ Composita.

Antidotes.—If taken by the mouth, induce vomiting, and wash out the stomach. Keep the patient walking about, and rouse him in every way. Ammonia or Spirit of Sal Volatile to the nose, inject a pint of strong Coffee into the bowel. Hypodermic injection of Atropine Sulphate $\frac{1}{30}$ grain, repeating in quarter hour if necessary. Tincture of Belladonna, Amyl Nitrite inhalation, artificial respiration.—*Murrell, on Poisons.* $\frac{1}{32}$ grain Strychnine acts as an antidote to $\frac{1}{2}$ grain of Morphine.—*L.* '71, ii. 840, 907; Picrotoxine, $\frac{1}{20}$ grain, *L.* '89, i. 497. Potassium Permanganate is used to wash out the stomach; a solution of 120 minims of Liq. Pot. Permang. in a pint of water is suitable. If quantity of Opium or Morphine taken is unknown 8 to 10 grains Potassium Permanganate in from 4 to 8 fl. oz. of water should be administered at once. The solution may be acidulated with Acid Sulphuricum

Dilutum with advantage.—*B.M.J.* '95, i. 1369; '95, ii. 55, 76; '96, i. 1194; *T.G.* '98, 97.

Value of Oxygen in poisoning by Morphine.—*L.* '98, ii. 545.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.

Description.—Acicular prisms of a silky lustre, or a white powder consisting of minute cubical crystals, unchanged by exposure to the air.

Tests.—It should be without action on Litmus. Solution of Ammonia causes a white precipitate in the aqueous solution, with difficulty soluble in excess; Solution of Potassium Hydroxide a similar precipitate readily soluble in excess. This precipitate yields mere traces to Benzol (absence of other alkaloids). Moistened with Nitric Acid the salt yields an orange-red coloration; with Test-solution of Ferric Chloride a dull greenish-blue coloration. Heated on a water-bath for ten or fifteen minutes with a few drops of Sulphuric Acid, cooled, and treated with a few drops of Diluted Nitric Acid, it gives a violet colour rapidly passing to blood-red. It dissolves without coloration in strong Sulphuric Acid; the addition of a small quantity of Sodium Arsenate to a portion of this solution causes a bluish-green coloration, and a small quantity of Bismuth Oxynitrate added to another portion gives a purplish-brown coloration. It affords the reactions characteristic of Hydrochlorides. 2 grammes of Morphine Hydrochloride dissolved in 250 c.c. of warm Morphinated Water, with Solution of Ammonia added in the slightest possible excess, will give on cooling a crystalline precipitate which, when washed with a little cold Morphinated Water and dried, should weigh 1·51 grammes. The drying should be accomplished, first by pressing the precipitate between sheets of bibulous paper, then by exposing it to a temperature between 131° and 140° F. (55° and 60° C.), and finally to a temperature of 230° F. (110° C.) for twenty minutes. Heated to redness with free access of air, it burns, leaving no residue (absence of mineral impurities).

Preparations.

LIQUOR MORPHINÆ HYDROCHLORIDI. Solution of Morphine Hydrochloride. *B.P.Sym.*—Solution of Hydrochlorate of Morphine. (Modified.)

Morphine Hydrochloride, 17½ grains; Diluted Hydrochloric Acid, 38 minims; Alcohol (90 p.c.), 1 fl. oz.; Distilled Water, a sufficient quantity. Mix the Alcohol with an equal volume of Distilled Water, adding the Diluted Hydrochloric Acid; dissolve the Morphine Hydrochloride in the mixture; dilute with sufficient Distilled Water to produce 4 fl. oz. of the Solution of Morphine Hydrochloride.

=(about 1 in 100).

Alcohol (90 p.c.) now used instead of Rectified Spirit.

Dose.—10 to 60 minims.

110 minims contain 1 grain of Morphine Hydrochloride; 100 c.c. contain 1 gramme.

Foreign Pharmacopœias.—Official in Port. (Soluto de Chlorhydrato de Morphina), 1 in 20, for hypodermic injection; not in the others.

SUPPOSITORIA MORPHINÆ. Morphine Suppositories. (Altered.)

Morphine Hydrochloride, 3 grains; Oil of Theobroma, a sufficient quantity for 12 Suppositories. Proceed as directed for Tannic Acid Suppositories.

Each of these Suppositories contains $\frac{1}{4}$ grain (or ·017 gramme) of Morphine Hydrochloride instead of $\frac{1}{2}$ grain as formerly.

(Not in the other Pharmacopœias.)

TINCTURA CHLOROFORMI ET MORPHINÆ COMPOSITA.

The formula is given under Chloroform. The proportion of Morphine has been much increased, and is now more than four times what it was in B.P. 1885. 10 minims now contain $\frac{3}{4}$ minim of Chloroform, $\frac{1}{2}$ minim of Diluted Hydrocyanic Acid, and $\frac{1}{11}$ grain of Morphine Hydrochloride.

TROCHISCUS MORPHINÆ. Morphine Lozenge.

Morphine Hydrochloride, $\frac{1}{56}$ grain (·0018 gramme). Mix with the Tolu Basis to form a Lozenge.

Dose.—Not given in B.P.; 1 to 6 lozenges. One or two occasionally for cough.

TROCHISCUS MORPHINÆ ET IPECACUANHÆ. Morphine and Ipecacuanha Lozenge.

Morphine Hydrochloride. $\frac{1}{56}$ grain (·0018 gramme); Ipecacuanha Root, in powder, $\frac{1}{18}$ grain (·0054 gramme). Mix with the Tolu Basis to form a Lozenge.

Dose.—Not given in B.P.; 1 to 6 lozenges. One or two occasionally for cough.

Foreign Pharmacopœias.—Official in U.S. contains $\frac{1}{60}$ grain of Morphine Sulphate, and $\frac{2}{15}$ grain of Ipecacuanha in each; Swiss (Pastilli Ipecacuanhæ cum Opio), contains about $\frac{1}{32}$ grain of each, Ipecac. and Opium.

Not Official.

MORPHINÆ LACTAS.

$C_{17}H_{19}NO_3C_3H_6O_3$, eq. 372·42.

A white crystalline salt.

Solubility.—1 in 8 of Water, 1 in 93 of Alcohol (90 p.c.).

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

Not Official.

MORPHINÆ SULPHAS.

Morphine Sulphate.

$(C_{17}H_{19}NO_3)_2$, H_2SO_4, $5H_2O$, eq. 752·84.

Colourless acicular crystals.

Solubility.—1 in 21 of Water, freely in hot Water; sparingly in Alcohol (90 p.c.).

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Jap., Mex., Norw., Port., Russ., Span., Swiss and U.S.; not in the others.

Tests.—Its aqueous solution gives a white precipitate (Morphine) with Solution of Potash, soluble in excess; and with Barium Chloride a white precipitate (Sulphate), insoluble in hot Hydrochloric Acid.

MORPHINÆ TARTRAS.

MORPHINE TARTRATE.

[NEW.]

$(C_{17}H_{19}NO_3)_2C_4H_6O_6,3H_2O$, eq. 768·66.

Morphine Tartrate may be prepared by the combination of Morphine and Tartaric Acid in molecular proportions.

Solubility.—1 in 10 of Water; sparingly in Alcohol (90 p.c.).

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

Official Preparations.—Injectio Morphinæ Hypodermica and Liquor Morphinæ Tartratis.

Description.—A white powder consisting of fine nodular tufts of minute acicular crystals. Efflorescent at 68° F. (20° C.). Soluble in 11 parts of cold Water, almost insoluble in Alcohol (90 p.c.).

Tests.—It affords the reactions characteristic of Morphine and of Tartrates. 2 grammes dissolved in 20 c.c. of warm Morphinated Water, with Solution of Ammonia added in the slightest possible excess, will give, on cooling, a crystalline precipitate, which, after washing and drying as described under 'Morphinæ Hydrochloridum,' should weigh 1·47 grammes. Heated to redness, with free access of air, it burns without leaving any residue (absence of mineral impurities).

Preparations.

INJECTIO MORPHINÆ HYPODERMICA. HYPODERMIC INJECTION OF MORPHINE. (ALTERED.)

Morphine Tartrate, 50 grains; Distilled Water, a sufficient quantity. Dissolve the Morphine Tartrate in sufficient recently boiled and cooled Distilled Water to produce 1100 minims of the Injection.

Now made with Morphinæ Tartras instead of Morphinæ Acetas.

Dose.—*By subcutaneous injection*, 2 to 5 minims.

The Morphine strength of this Injection is slightly less than one-half that of the Hypodermic Injection of Morphine of the British Pharmacopœia of 1885. 110 minims contain 5 grains of Morphine Tartrate; 100 c.c. contain 5 grammes.

Atropine salts are frequently added to Morphine Injection to increase its analgesic and hypnotic effects, and to lessen its depressing and constipating effects.

LIQUOR MORPHINÆ TARTRATIS. SOLUTION OF MORPHINE TARTRATE. (NEW.)

Morphine Tartrate, 17½ grains; Alcohol (90 p.c.), 1 fl. oz.; Distilled Water, a sufficient quantity. Mix the Alcohol with an equal volume of Distilled Water; dissolve the Morphine Tartrate in the mixture; add sufficient Distilled Water to produce 4 fl. oz. of the Solution.

Dose.—10 to 60 minims.

110 minims of this Solution contain 1 grain of Morphine Tartrate; 100 c.c. contain 1 gramme.

MORRHUÆ OLEUM.

COD-LIVER OIL.

N.O.Syn.—Oleum Jecoris Aselli.

The Oil extracted from the fresh liver of the Cod, *Gadus Morrhua*, by the application of a temperature not exceeding 180° F. (82·2° C.); and from which solid fat has been separated by filtration at about 23° F. (−5° C.).

Solubility.—Sparingly in Absolute Alcohol; 1 in 2 of Ether; 1 in 3½ to 4 of Acetic Ether.

A solvent of pure Quinine. 1 fl. oz. at 140° F. will dissolve 4 grains readily.

Medicinal Properties.—Nutritive; nervine and hæmatinic tonic. Most efficient in scrofulous diseases, glandular swellings, tubercular diseases of the joints and bones, tabes mesenterica, rickets, chronic rheumatism and tertiary syphilis; chronic bronchitis and neuralgias; and generally in all cases of impaired nutrition and nervous debility due to over-work, exhaustion and under-feeding. In pulmonary consumption it deservedly possesses a high reputation: sometimes given in emulsion with Malt Extract. It is contra-indicated in hæmoptysis and diarrhœa. It is easily assimilated, and is best given after meals; sometimes administered by inunction.

Dose.—1 to 4 fl. drm.

Prescribing Notes.—Given on Orange Juice, Water, or a mixture of Tincture of Orange with Diluted Nitric Acid and Syrup; sometimes given in flexible **capsules**, also prescribed in the form of Emulsion or with Malt Extract.

Not Official.—Emulsio Olei Morrhuæ and Morrhuol.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Ger., Hung., Norw., Russ., Swed. and Swiss, Ol. Jecoris Aselli; Fr., Huile de Foie de Morue; Ital., Olio di Fegato di Merluzzo; Jap., Ol. Jecoris; Port., Oleo de Bacalhau; Mex. and Span., Aceite de Higado de Bacalao; U.S., Oleum Morrhuæ.

Description.—Pale yellow, with a slight fishy, but not rancid, odour.

Tests.—Sp. gr. ·920 to ·930. Readily soluble in Ether and Chloroform, and slightly soluble in Alcohol (90 p.c.). A drop of Sulphuric Acid added to a few drops of the Oil on a porcelain slab develops a violet coloration. When Nitric Acid is carefully poured into some of the Oil contained in a test-tube, a precipitate of coagulated albumen should be formed at the surface of contact of the two liquids. No solid fat should separate on exposure of the Oil for two hours to a temperature of 32° F. (0° C.).

The alkaloids Morrhuine and Aselline have been isolated from the oil.—*P.J.* (3) xxv. 585; *C.D.* '94, ii. 247; *Allen*.

The result of the analysis of ten samples of Cod Liver Oil of undoubted purity showed a sp. gr. ranging from ·922 to ·929, free acid from ·34 to ·6 p.c., and an Iodine absorption of from 153·5 to 168·4 p.c.—*P.J.* '95, ii. 119; *C.D.* '95, ii. 201. Five samples examined in our laboratory gave sp. gr. ·926 to ·928. Iodine absorption from 159 to 168·2 p.c. This latter test might with advantage have been included in the B.P.

Probably the most important character is the acidity, varying from 0 in a very fine colourless Oil to 9 p.c. in dark coloured samples altered by heat and long keeping.

Upon the acidity also depends the presence or absence of Albumens; fine Oils with little acid show an Albumen ring on being floated upon Nitric Acid, sp. gr. 1·400.

Not Official.

EMULSIO OLEI MORRHUÆ (*B.P.C.*). — Cod-Liver Oil, 8 fl. oz.; the yolks of 2 Eggs; Tragacanth in powder, 16 grains; Elixir of Saccharin, 60 minims; Simple Tincture of Benzoin, 60 minims; Spirit of Chloroform, ½ fl. oz.; Essential Oil of Bitter Almonds, 8 minims; Distilled Water to produce 16 fl. oz. Measure 5 fl. oz. of the Water; place the Tragacanth in a dry mortar and triturate with a little of the Cod-Liver Oil; then add the yolks of Eggs, and stir briskly, adding Water as the mixture thickens. When of a suitable consistence, add the remainder of the Oil and Water alternately, with constant stirring, avoiding frothing. Transfer to a pint bottle, add the Elixir of Saccharin, Tincture of Benzoin, Spirit of Chloroform, and Oil of Almonds, previously mixed; shake well, and add Distilled Water if necessary to make the product measure 16 fl. oz.

Dose.—2 to 8 fl. drm.

Pancreatised Cod-Liver Oil is prescribed under the impression that it is more easily digested than Cod-Liver Oil alone.

MORRHUOL.—Cod-Liver Oil treated first with aqueous solution of Sodium Bicarbonate to remove the acids, then agitated with Rectified Spirit, which on evaporation yields Morrhuol. Brown Oil yields 4½ to 6 p.c., the straw coloured 2½ to 3 p. c.—*Y.B.P.* '86, 234; *P.J.* '97, ii. 458.

Proposed as a substitute for Cod-Liver Oil, but without the Carbo-hydrates, and owing to its small bulk is adapted for administration in capsules.

Dose.—3 grains.

MOSCHUS.

MUSK.

The dried secretion from the preputial follicles of *Moschus moschiferus*.

The Musk-deer is a native of the mountainous regions of Central Asia. Musk is imported from China and India.

Medicinal Properties.—Stimulant and antispasmodic. Useful in hysteria and epilepsy and spasmodic asthma, and as a stimulant in pneumonia and febrile diseases.

Dose.—5 to 10 grains.

Prescribing Notes.—Usually prescribed in a **mixture** or in **pills**. *See* formulas given below.

Not Official.—Mistura Moschi, Moschus Exsiccatus, Tinctura Moschi, and Pilula Moschi.

Foreign Pharmacopœias.—Official in all except Austr.; Fr., Musc; Port., Almiscar; Mex. and Span., Almizcle.

Description.—In irregular somewhat unctuous grains which have a dark reddish-brown or reddish-black colour, a characteristic penetrating persistent odour, and a somewhat bitter taste. The grains are contained in an oval sac, from about one and a half to two inches (three and a half to five centimetres) in diameter, which is nearly smooth on one side, and covered on the other or outer side by

brownish-yellow or greyish appressed bristle-like hairs, concentrically arranged around a nearly central orifice.

Test.—Musk should be free from earthy impurities and should on incineration yield not more than 8 p.c. of ash.

Sample of Musk adulterated with Cinnabar.—*P.J.* '96. ii. 474.

There may be considerable moisture in Musk, amounting to about 30 p. c.

Dan. and Ger. specify that it should be practically free from moisture and yield not more than 8 p.c. of ash; Ital., 6 p.c. of ash; U.S., 8 p.c. of ash.

Not Official.

MISTURA MOSCHI.—Musk, 3; Acacia, 3; Sugar, 3; Rose Water, 160; triturate the Musk with the Sugar, then with the Acacia; add the Rose Water gradually.

Dose.—1 to 2 fl. oz.

MOSCHUS EXSICCATUS.—Musk which has been dried over Strong Sulphuric Acid. It keeps better than that which is usually supplied as 'grained Musk.' It is easily made into pills by the addition of Dispensing Syrup.

PILULA MOSCHI.—Musk, 12; Powdered Acacia, 3; Powdered Liquorice, 3; Mix.

TINCTURA MOSCHI.—Musk, 60 grains; Alcohol (90 p.c.), 10 fl. oz.: digest seven days, and strain.

Belg., Fr., Ital., Mex., and Port.—Musk, 1; Spirit, 10.

Dan., Dutch, Ger., Russ., and Swiss.—Musk, 1; Spirit, 25; Water, 25.

Span.—Musk, 1; Spirit, 25.

U.S.—Musk, 5; Water, 45; Alcohol, 45; Diluted Alcohol to measure 100.

All by weight except U.S.

MUCILAGINES.

MUCILAGES.

Mucilages are employed more as vehicles than as remedies. Mucilage of Acacia is sometimes given to relieve irritating cough, but more generally to render Oils and solutions of Resins miscible with Water; *see* ACACIA. Mucilage of Tragacanth is also used for suspending heavy powders in mixtures. The following Mucilages are Official:—

MUCILAGO ACACIÆ.
MUCILAGO TRAGACANTHÆ.

MYRISTICA.

NUTMEG.

The dried seed of *Myristica fragrans*, divested of its testa.

It is cultivated in the Banda Islands of the Malayan Archipelago and imported from Sumatra and the Molucca Islands, and occasionally from the West Indies and the Seychelles.

Nutmegs yield about 5 p. c. of ash.

Medicinal Properties.—Aromatic, stimulant, and carminative. Frequently used to cover the taste of Rhubarb and other medicines. The expressed and Volatile Oils have been much used in chronic rheumatic pains and in lotions for the hair. In large doses it acts as a narcotic poison.

Dose.—Not given in B.P.; usually 5 to 15 grains.

Prescribing Notes.—The **Oil** may be given on Sugar, or in **pill** with Liquorice powder and Soap.

Official Preparation.—Oleum Myristicæ. Used in the preparation of Pulvis Catechu Compositus, Pulvis Cretæ Aromaticus, Spiritus Armoraciæ Compositus and Tinctura Lavandulæ Composita: of the **oil**, Spiritus Myristicæ. Used in the Preparation of Spiritus Ammoniæ Aromaticus, Tinctura Guaiaci Ammoniata, Tinctura Valerianæ Ammoniata and Pilula Aloes Socotrina. Of the **Spirit**, contained in Mistura Ferri Composita.

Not Official.—Oleum Myristicæ Expressum.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Russ., Swed., and Swiss, Semen Myristicæ; Belg. and Hung., Nux Moschata; Fr., Muscade; Ital., Noce Moscata; Port., Noz Moschada; Mex. and Span., Nuez Moscada; U.S., Myristica; not in Dan., Jap. or Norw.

Description.—Oval or rounded, varying in length, but rarely exceeding an inch (twenty-five millimetres); greyish-brown externally, and marked with reticulated furrows; internally greyish-red with darker brownish-red veins, so that the transverse section has a marbled appearance. Odour strong and pleasantly aromatic; taste agreeably aromatic, warm, and somewhat bitter.

Preparations.

OLEUM MYRISTICÆ. Oil of Nutmeg.

The Oil distilled from Nutmeg.

Solubility.—In all proportions of Absolute Alcohol; 1 in 4½ of Alcohol (90 p.c.); sparingly in Alcohol (60 p.c.).

Dose.—½ to 3 minims.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Hung., Russ., and Swiss, Oleum Macidis; Belg., Essentia Macidis; Dan., Norw., and Swed., Ætheroleum Macidis; Port., Essencia de Noz Moschada; U.S., Oleum Myristicæ; not in Fr., Ital., Jap., Mex. or Span.

Description.—Colourless or pale yellow, having the odour and taste of Nutmeg.

Tests.—Sp. gr. ·870 to ·910. The Oil forms a clear solution with its own volume of a mixture of equal parts of Absolute Alcohol and Alcohol (90 p.c.). A little evaporated on a water-bath should not leave a residue which crystallises on cooling (absence of the concrete oil of Nutmeg).

Sp. gr. varies considerably; we have seen it as low as ·880, and as high as ·930.

SPIRITUS MYRISTICÆ. Spirit of Nutmeg. (Altered.)

Oil of Nutmeg, 1; Alcohol (90 p.c.), a sufficient quantity. To the Oil of Nutmeg add enough of the Alcohol to form 10 of the Spirit of Nutmeg. If the solution be not clear, agitate with a little Powdered Talc, and filter. =(1 in 10).

Now 1 in 10 instead of 1 in 50; Alcohol (90 p.c.) used in place of Rectified Spirit.

Dose.—5 to 20 minims.

This Spirit of Nutmeg contains five times the proportion of Oil of Nutmeg present in the Spirit of Nutmeg of the British Pharmacopœia of 1885.

Foreign Pharmacopœias.—Official in U.S., 5 in 100; not in the others.

Not Official.

OLEUM MYRISTICÆ EXPRESSUM. *Syn.*—Myristicæ Adeps.—A Concrete Oil, of a firm consistence and orange colour, obtained from Nutmeg by expression and heat.

Foreign Pharmacopœias.—Official in Austr. and Russ., Ol. Myristicæ Expressum; Belg. and Ger., Ol. Nucistæ; Dutch, Norw., Swed. and Swiss, Oleum Myristicæ; Fr., Beurre de Muscade; Mex., Manteca 'O Aceite concreto de Nuez Moscada; Port, Oleo de Noz Moschada; Span., Aceite de Nuez Moscada; not in the others.

MYRRHA.

MYRRH.

A gum-resin obtained from the stem of *Balsamodendron Myrrha*, and probably other species.

Collected in South-eastern Arabia and Somaliland.

Solubility.—Myrrh contains from 40 to 65 p.c. of gum soluble in Water, the remainder consisting of resin is mostly soluble in Alcohol.

Medicinal Properties.—Stomachic and carminative; emmenagogue. Locally to aphthæ of mouth and spongy gums.

Prescribing Notes.—The tincture mixed with water is used for a gargle, but the addition of Mucilage of Acacia is often necessary; also mixed with Solution of Borax for a mouth wash.

Official Preparation.—Tinctura Myrrhæ. Contained in Decoctum Aloes Compositum, Mistura Ferri Composita, Pilula Aloes et Myrrhæ, Pilula Galbani Composita, and Pilula Rhei Composita.

Not Official.—Gargarisma Myrrhæ, Tinctura Myrrhæ et Boracis.

Foreign Pharmacopœias.—Official in all except Hung.

Description.—In rounded or irregular tears, or masses of agglutinated tears, varying very much in size; reddish-brown or reddish-yellow externally, dry, and more or less covered by a fine powder; brittle, the fractured surface irregular, somewhat translucent, of a rich brown colour, oily, and frequently exhibiting whitish marks. Odour agreeable, aromatic. Taste aromatic, bitter, and acrid.

Distinction from Bisabol Myrrh or perfumed Bdellium.—*P.J.* '97, ii. 459.

An exhaustive paper on Myrrh and Bdellium by Holmes.—*P.J.* '98, ii. 547.

Test.—When moistened with Nitric Acid it assumes a violet colour (distinction from Bdellium and false Myrrh).

Limit of ash and proportion insoluble in Alcohol might have been stated.—*C.D.* '98, ii. 131.

Preparation.

TINCTURA MYRRHÆ. Tincture of Myrrh. (Altered.)

Myrrh, in coarse powder, 4; Alcohol (90 p.c.), a sufficient quantity. Place the Myrrh with 16 of the Alcohol in a closed vessel set aside for seven days, with frequent agitation; filter; when the liquid ceases to drop, pass sufficient of the Alcohol through the filter to produce 20 of the Tincture. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and Alcohol (90 p.c.) used in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S., 1 in 5; all by weight except U.S.; not in Hung.

Not Official.

GARGARISMA MYRRHÆ.—Tincture of Myrrh, 1; Honey, 1; Infusion of Roses, 18: mix.

TINCTURE OF MYRRH AND BORAX.—*See* BORAX.

Not Official.

NAPHTHALINUM.

NAPHTHALENE.

$C_{10}H_8$, eq. 127·10.

Purified Naphthalene occurs in white micaceous scales, with a characteristic odour, melting at 98° C.

Solubility.—Insoluble in Water; soluble 1 in 25 of Alcohol (90 p.c.); 1 in 1½ of Chloroform; 1 in 3 of Ether; 1 in 7½ of Oil of Turpentine; 1 in 8 of Olive Oil; slightly soluble in Glycerin.

Medicinal Properties.—Intestinal antiseptic and parasiticide. Employed locally with success in scabies as a 10 or 20 p.c. **solution** in oil. In other skin diseases, especially those in which large surfaces are exposed, it is to be avoided. —*L.* '82, ii. 909.

In catarrhal conditions of the intestines, also in vesical catarrh. *Adult dose*, 60 to 75 grains daily.—*A.J.P.*, '84, 645; *L.* '85, ii. 404.

In gastric fermentation.—*M.A.* '95, 68.

As an antiseptic for wounds.—*L.* '85, ii. 821; *B.M.J.*, '86, i. 217.

In dysentery, 7 or 8 grains to 1 fl. oz. of water for an enema.—*L.* '88, i. 1327; *T.G.* '85, 412.

In typhoid fever.—*T.G.* '85, 676; *L.* '89, ii. 659, 720.

In doses of 23 grains per diem.—*L.* '86, ii. 745.

In single doses of 15 grains, or daily doses of 75 grains.—*T. G.* '86, 243.

Usual dose 2 to 5 grains every four or six hours. Larger doses may be given, but are apt to upset digestion.—*M.A.* '95, 69.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Ital., Mex., Russ., Swiss and U.S.; not in the others.

Test.—Should dissolve colourless in warm concentrated Sulphuric Acid if quite pure, but a decided pinkish tint is observed if the sample contains 1 p.c. of impurity, and the coloration becomes deeper pink, or even brown, the greater the proportions of foreign matter present.—*Allen.*

Preparations.

NAPHTHALINUM PRÆCIP.—A fine powder, obtained by dissolving the crystals in hot Alcohol and pouring into a quantity of cold Water. Recommended as less irritating than the powdered crystals.

PULVIS NAPHTHALINI (*Rossbach*).—Purified Naphthalene, 75 grains; Sugar, 75 grains; Oil of Bergamot, ½ minim; divide into twenty powders.

In vesical catarrh.—*L.* '85, i. 360.

NAPHTHOL.

BETA-NAPHTHOL.

[NEW.]

$C_{10}H_7OH$, eq. 142·98.

Beta-naphthol, or Beta-mono-hydroxy-naphthalene is usually prepared from Naphthalene-sulphonic Acid.

There are two isomeric Naphthols, α and β, bearing the same relation to Naphthalene as Phenol does to Benzol. When no prefix is attached to the name, Beta-Naphthol should be used. The name is also written Naphtol.

Solubility.—Nearly insoluble in Water; soluble 1 in 2 of Alcohol (90 p.c.); 3 in 4 of Ether; 1 in 24 of Chloroform; 1 in 12 of Olive Oil; 1 in 40 of Glycerin.

Aqueous solution of Boric Acid will dissolve comparatively small quantities of Naphthol.

Medicinal Properties.—A powerful disinfectant and intestinal antiseptic. Has been given in 5 grain doses for summer diarrhœa in children.

It is very effective in parasitic diseases and in chronic eczema.—*M.T.* '82, ii. 505.

In typhoid fever.—*B.M.J.* '88, ii. 1226; '92, i. 442; *L.* '90, i. 1407; *T.G.* '94, 420.

As a vermifuge, 4 grains three times a day.—*L.* '93, i. 377.

For Scabies.—β-Naphthol, 15; Pulv. Cretæ Alb., 10; Sapo virid., 50; Lard, 100.

For Pediculi.—β-Naphthol, 5; Olive Oil, 50.

For Pityriasis Versicolor.—β-Naphthol, 2; Spir. Lavand., 10; Sapo virid., 100.—*M.T.* '82, ii. 505.

Acute nephritis following the use of a 2 p.c. ointment.—*Y.B.T.* '95, 379.

Beta-naphthol and Bismuth Subnitrate as intestinal antiseptics.—*B.M.J.* '95, ii. 1483.

Dose.—3 to 10 grains.

Prescribing Notes.—Given in **cachets** or **pills**. A good Pill can be made by adding Glucose q.s. or a small quantity of Compound Powder of Tragacanth and Dispensing Syrup q.s. Also administered dissolved in Oil which is then emulsified.

Not Official.—Asaprol, Benzonaphthol, Betol, Quinaphthol, Unguentum Naphtholi.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Fr., Ger., Hung., Ital., Mex., Norw., Russ., Swiss and U.S.; not in the others.

Sodium-Naphthol (**microcidin**) readily soluble in Water, **Benzonaphthol**, and **Naphthol Camphor** have also been introduced as possessing similar antiseptic properties to Naphthol; **A-Oxynaphthoic Acid** forms soluble salts with alkalis, which are antiseptics.

Description.—In white or nearly white crystalline laminæ, or in powder. It has a sharp, pungent taste, and an odour resembling Phenol. Very soluble in boiling Alcohol (90 p.c.), Ether, Chloroform, or Solution of Sodium Hydroxide.

Tests.—Melts at 251·6° F. (122° C.). On the addition of 1 drop of Solution of Ammonia to a hot saturated aqueous solution of Beta-naphthol a blue fluorescence is developed. A cold saturated aqueous

solution gives a white turbidity with Solution of Chlorine, which, on the addition of excess of Solution of Ammonia, gives place to a green or brown coloration. ·1 gramme of Beta-naphthol dissolved in 10 c.c. of boiling Water, and treated with 10 drops of a 3 p.c. aqueous solution of Ferric Chloride, gives a white precipitate becoming brown, but not violet (absence of Alpha-naphthol). Beta-naphthol should be neutral to Litmus Paper moistened with Alcohol (90 p.c.), and should leave no residue on heating to redness (absence of mineral impurities).

It is distinguished from its isomer **Alpha-Naphthol** by its melting point; also a solution made with *cold* Water or *cold* Alcohol gives a pale yellow colour with bleaching powder, and a pale green with Test-solution of Ferric Chloride, which are characteristic. Alpha-Naphthol melts at 95° C., gives a dark violet with bleaching powder, and a red with Ferric Chloride.

Detection of traces of Alpha-naphthol.—*J.S.C.I.* '97, 894; *C.D.* '97, i. 422.

Not Official.

UNGUENTUM NAPHTHOLI (*B.S.H.*). *Syn.* — KAPOSI'S OINTMENT. — Beta-Naphthol, 60 grains; Prepared Lard, 1 oz.

BETOL.—Salicylate of β-Naphthol Ester. In tasteless, small white crystals, insoluble in Water, soluble in Alcohol and fixed Oils. Recommended in rheumatism, cystitis and intestinal catarrh.—*P.J.* (3) xviii. 264.

Dose.—2½ to 8 grains as a **powder,** or in **pills** with Glucose.

In **pencils** for gonorrhœa containing 20 p.c. of Betol made with Oil of Theobroma.

ASAPROL (Calcium Beta-naphthol-alpha-monosulfonate).—A white powder soluble in Water. Has been recommended as an antipyretic and analgesic, in sciatica, muscular and chronic rheumatism and in chronic nephritis.—*T.G.* '93, 182; '94, 252; *Pr.* liii, 52; *M.A.* '95, 8; *Y.B.T.* '94, 462; '95, 159.

Dose.—5 to 15 grains.

BENZONAPHTHOL.—Prepared by the action of Benzoyl Chloride on Beta-naphthol. A white odourless tasteless powder, almost insoluble in Water and Ether, soluble in Chloroform; should dissolve with formation of a pale yellow colour in concentrated Sulphuric Acid.

Intestinal antiseptic and disinfectant. Has been found useful in typhoid.—*Pr.*, li. 213.

In tropical dysentery.—*L.* '95, ii. 169; *P.J.* '95, ii. 238.

Dose.—5 to 15 grains.

QUINAPHTHOL (Quinine Beta-naphthol-sulphonate).—A yellow crystalline powder, sparingly soluble in Water and in Alcohol.

Recommended as an intestinal antiseptic. Useful in typhoid.—*P.J.* '97, ii. 83.

Dose.—8 to 10 grains, three or four times a day.

Not Official.

NICKEL.

A metal closely allied to Cobalt, with which it is generally associated in minerals. Commercially it is largely contaminated with Copper, Iron, and sometimes Cobalt. Alloyed with Copper and Zinc, it forms **German silver.** Easily soluble in mineral acids, forming salts of a characteristic green colour.

NICCOLI BROMIDUM.—Soluble in Water, Alcohol, and Ether.

Sedative. Recommended in epilepsy.

Dose.—1 to 5 grains.

In solution, or in **pills**, with powdered Althæa and Extract of Gentian.

SYRUPUS NICCOLI BROMIDI.—Granulated Nickel, 137 grains; Bromine, 377 grains; Water, 12 fl. oz.; digest them in a pint flask at a gentle heat until reaction ceases, filter, add Sugar 24 oz. and sufficient Water to make 32 fl. oz.

Each fluid drachm contains 5 grains of Nickel Bromide, which is an average dose.—*A.J.P.* '86, 592.

NICCOLI SULPHAS.—Greenish blue crystals, readily soluble in Water.

Dose.—$\frac{1}{2}$ to 1 grain two or three times a day given in chlorosis; is best given on a full stomach, as on an empty one it is apt to produce nausea. In somewhat larger doses it has also been given in locomotor ataxy.

Not Official.

NITROGLYCERIN.

Syn.—Glyceryl Trinitrate. Glonoin. Trinitrin. Trinitroglycerin.

$C_3H_5(NO_3)_3$, eq. 225·47.

When pure it is a heavy colourless Oil. Sp. gr. 1·6. Explodes violently on percussion, and under some circumstances spontaneously. It solidifies at 46° F., and is then more dangerous to handle.

A **10 p.c. solution** in Alcohol is commercial, and is used in making the Tabellæ.

Solubility.—Very slightly soluble in Water; readily in Alcohol (90 p.c.); mixes with Ether and Chloroform.

Medicinal Properties.—Chiefly given for angina pectoris associated with aortic disease, spasmodic asthma and the dyspnœa of acute bronchitis; and in headache, neuralgia or hemicrania if associated with pallor. It reduces arterial tension in chronic Bright's disease and acts as a diuretic and diminishes the albuminuria. Its action is more prolonged and less violent than that of Amyl Nitrite.

In optic atrophy, *M.A.* '95, 261; in neuralgia and sciatica, *M.P.*, liv. 515; *M.A.* '95, 37, 445; in uræmic dyspnœa, 497; in all forms of vomiting, 520, and *Pr.* li. 140; in arterio-sclerosis, *T.G.* '93, 736; in warding off, and (hypodermically) during paroxysm of epilepsy, *B.M.J.E.*, '93, ii. 32; in gall-stone colic, *L.* '96, i. 353.

Dose.—$\frac{1}{200}$ to $\frac{1}{50}$ grain, the average dose being $\frac{1}{100}$ grain, generally given as a 1 p.c. solution in Alcohol (90 p.c.).

Prescribing Notes.—The Solution may be given on Sugar or diluted with Water or in the form of Tablets.

The solution is preferable to the tablet.—*L.* '85, ii. 546; *L.* '89, i. 1238.

Official Preparations.—Liquor Trinitrini and Tabellæ Trinitrini.

Antidotes.—Ergot, Atropine, Strychnine, cold applications to the head.

Official Preparations.

LIQUOR TRINITRINI. Solution of Trinitrin. *B.P.Syn.*—Solution of Nitroglycerin. (Modified.)

Trinitroglycerin of commerce, 17½ grains; Alcohol (90 p.c.), a sufficient quantity. Dissolve the Trinitroglycerin in sufficient of the Alcohol to produce 4 fl. oz. of the Solution of Trinitrin. =(1 in 100).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

110 minims contain 1 grain of Trinitroglycerin; 100 c.c. contain 1 gramme.

Dose.—$\frac{1}{2}$ to 2 minims.

In severe cases of angina pectoris or asthma, the dose is sometimes increased.

Description.—A clear and colourless liquid, neutral to test-papers.

Tests.—Sp. gr. ·840. A mixture of 10 c.c. with an equal volume of Water, cooled to 60° F. (15·5° C.), remains clear, but the further admixture of 1 c.c. of Water causes opacity (presence of a due amount of Trinitroglycerin). On further diluting with Water and setting the mixture aside, there is deposited a liquid of oily consistence, one drop of which, absorbed by paper and struck with a hammer on a hard surface, explodes. =(1 in 100).

Foreign Pharmacopœias.—Official in Dutch (Solutio Nitroglycerini), 1 in 100; U.S. (Spiritus Glonoini), 1 in 100; not in the others.

TABELLÆ TRINITRINI. Trinitrin Tablets. *B.P. Syn.*—Tablets of Nitroglycerin. (Modified.)

Tablets of Chocolate, each weighing 5 grains (·324 gramme) and containing one hundredth of a grain (·00065 gramme) of the Trinitroglycerin of commerce.

Now weigh 5 grains instead of $2\frac{1}{2}$, but contain the same amount of Trinitroglycerin as formerly.

Dose.—1 or 2 tablets.

NUX VOMICA.

NUX VOMICA.

The dried ripe seeds of *Strychnos Nux-vomica*.

Imported from India, Ceylon, and Cochin China.

The chief source of Strychnine and Brucine.

The total alkaloids have been found to vary between 1·25 and 3·9 p.c. (some Ceylon Seeds gave 5·3 p.c.), but the value of total alkaloids as a medicinal standard is considerably reduced by the fact that the ratio of Strychnine to Brucine may vary as much as 3 : 1, and 1 : 2.

Medicinal Properties.—In small doses, a general tonic. Useful in paralysis of reflex origin, in peripheral paralysis due to alcohol, lead, tobacco, or to diphtheria; in all chronic paralytic affections, except those in which there is organic lesion of nerve-centres or inflammation of brain or spinal cord. It is recommended in atonic dyspepsia and chronic gastric catarrh, and in debilitated conditions of the alimentary canal. It stimulates peristalsis, and therefore is a frequent and valuable ingredient in medicines for chronic constipation. Generally prescribed in the form of **Extract** and **Tincture**.

Dose.—*In powder*, 1 to 4 grains.

Official Preparations.—Of the **seeds**, Extractum Nucis Vomicæ Liquidum and Strychnina; of the **Liquid Extract**, Extractum Nucis Vomicæ and Tinctura Nucis Vomicæ.

Not Official.—Brucine.

Antidotes.—Emetic of Zinc Sulphate, Mustard, or Ipecacuanha, or hypodermic injection of Apomorphine; Animal Charcoal; Potassium Bromide or Chloral; Amyl Nitrite inhalations; Chloroform or Ether to relax the muscles; hypodermic injection of Curare.—*Murrell.*

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Jap., Swiss and Russ., Semen Strychni; Belg., Dan., Fr. (Noix Vomique), Hung., Ital. (Noce Vomica), Mex. and Span. (Nuez Vomica), Norw., Port. (Noz Vomica), Swed. and U.S.

Description.—Nearly disc-shaped, ash-grey, or greenish-grey seeds, three-quarters of an inch to one inch (two to two and a-half centimetres) in diameter, and a quarter of an inch (six millimetres) in thickness. They are concavo-convex, nearly flat, but sometimes irregularly bent, rounded or somewhat acute at the margin, where there is a small prominence from which a raised line passes to the central hilum. The surface is covered with short, satiny, radiately arranged and closely appressed hairs. The endosperm is large and horny, the cotyledons small and leafy. The seeds have an extremely bitter taste. Unbroken, they have no odour.

Preparations.

EXTRACTUM NUCIS VOMICÆ. Extract of Nux Vomica. (Altered.)

An Extract containing 5 p.c. of Strychnine.

Liquid Extract of Nux Vomica, 11 fl. oz.; Milk Sugar, in fine powder, a sufficient quantity.

Ascertain the proportion of Milk Sugar required for 10 fl. oz. of the Liquid Extract by the following experiment on 1 fl. oz.

Evaporate 1 fl. oz. of the Liquid Extract of Nux Vomica in a counterpoised dish on a water-bath to a moderately firm extract, and weigh. The difference between the weight of the extract and 131¼ grains, multiplied by 10, will give the amount of Milk Sugar required for the remaining 10 fl. oz. of the Liquid Extract of Nux Vomica.

Distil the Alcohol from 10 fl. oz. of the Liquid Extract of Nux Vomica; to the residue add the quantity of Milk Sugar shown to be required by the above experiment; mix; evaporate; to the consistence of a firm extract, which should weigh 3 oz.

Now made from Liquid Extract evaporated, and Milk Sugar.

Dose.—¼ to 1 grain.

Often prescribed with Aloes and Ipecacuanha.

This Extract has about two-thirds the total alkaloidal strength of the Extract of Nux Vomica of the British Pharmacopœia of 1885.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Ger., Hung.; Russ., Swiss and U.S. use 68 to 70 p.c. Alcohol; Fr., Ital., Mex. and Span., 80 p.c.; Norw. and Swed., 65 p.c.; Port., 90 p.c.; Jap., 60 p.c. by weight.

EXTRACTUM NUCIS VOMICÆ LIQUIDUM. Liquid Extract of Nux Vomica. (New.)

A Liquid Extract containing 1½ grains of Strychnine in 110 minims.

Moisten 16 of Nux Vomica, in No. 20 powder, with 8 of Alcohol (70 p.c.); set aside in a covered vessel for six hours; pack firmly in a percolator; pour over the powder sufficient of the menstruum to saturate

it and to leave a stratum above it; when the liquid begins to flow, close the lower orifice; set aside for twenty-four hours; continue slow percolation, adding more menstruum as required, until 12 have been collected; reserve this strong percolate. Change the receiver; continue the percolation until about sixty of the menstruum have been employed, or until the powder is exhausted; press the marc; add the expressed liquid to the weaker percolate; remove the Alcohol by distillation; evaporate the residue to 1; add 3 of Alcohol (90 p.c.). Add this mixture to the reserved portion; set aside for twenty-four hours; pour off the clear liquid; filter the remainder.

Determine the proportion of Strychnine in the resulting strong liquid extract by the following analytical process:—Evaporate 10 c.c. to a thick syrupy consistence on a water-bath; dissolve the residue in 20 c.c. of Water, heating if necessary; place the solution in a separator, and add 5 grammes of Sodium Carbonate dissolved in 25 c.c. of Water, together with 10 c.c. of Chloroform; agitate thoroughly; set aside; separate the clear Chloroformic solution. Twice repeat the agitation with Chloroform, and the separation. Mix 6 c.c. of Diluted Sulphuric Acid with 25 c.c. of Water; divide this into 3 parts, and shake the mixed Chloroformic solutions with each in turn. Dilute the united acid liquids with Water to 175 c.c.; transfer to a stoppered flask, adding 25 c.c. of Solution of Potassium Ferrocyanide; shake well and frequently during half an hour; allow to stand for six hours. Transfer the precipitate to a small filter, rinsing out the last portions with Water containing one-fortieth of its volume of Diluted Sulphuric Acid, and wash until the washings are free from bitterness. Rinse the precipitate into a separator. Add 5 c.c. of Solution of Ammonia, and shake well; then add 15 c.c. of Chloroform in two successive portions, shaking well after each addition; separate the Chloroformic solutions, mix and allow the Chloroform to evaporate in a counterpoised dish in a current of warm air; dry the residue for one hour on a water-bath, covering the dish to avoid loss of Strychnine from decrepitation; weigh.

From this weight calculate the amount of Strychnine in the strong liquid extract, and add to the latter sufficient Alcohol (70 p.c.) to produce a Liquid Extract of Nux Vomica containing 1·5 grammes of Strychnine in 100 c.c., or 1½ grains in 110 minims.

Dose.—1 to 3 minims.

Foreign Pharmacopœias.—Official in Mex. and U.S.; not in the others.

TINCTURA NUCIS VOMICÆ. TINCTURE OF NUX VOMICA. (ALTERED.)

N.O.Syn.—TINCTURA STRYCHNI.

Liquid Extract of Nux Vomica, 2; Distilled Water, 3; Alcohol (90 p.c.), a sufficient quantity. Mix the Liquid Extract of Nux Vomica with the Distilled Water; add sufficient of the Alcohol to produce 12 of the Tincture; filter.

Now made with Alcohol (90 p.c.) in place of Rectified Spirit; prepared from the Liquid Extract and standardised.

Dose.—5 to 15 minims.

This preparation contains about twice the proportion of Strychnine present in the Tincture of Nux Vomica of the British Pharmacopœia of 1885.

Foreign Pharmacopœias.—Official in Austr., Dan., Ger., Ital., Jap., Norw., Russ., Swed. and Swiss, 1 in 10; Belg., Fr., Hung., Mex., Port. and Span., 1 in 5; prepared from the **seeds.** Dutch, 1 Extract in 100; U.S., 1 Extract in 50; all by weight except U.S.

Tests.—Treated by the assay process given under 'Extractum Nucis Vomicæ Liquidum,' 100 c.c. should yield not less than ·24 nor more than ·26 gramme of Strychnine, corresponding to about $\frac{1}{8}$ grain in 1 fl. drm. or $\frac{1}{4}$ grain in 110 minims.

STRYCHNINE.—*See* STRYCHNINA.

Not Official.

BRUCINE ($C_{23}H_{26}N_2O_4.4H_2O$).—Colourless crystals, containing about 15 p. c. of Water, which quickly effloresce in dry air.

The presence of 5 p. c. of Strychnine in Brucine can be detected by the reaction with Sulphuric Acid and Potassium Bichromate.—*P.J.* (3) xxiv. 2.

Solubility.—But slightly soluble in Water; 1 in 20 of Alcohol (90 p.c.), 1 in 2 of Chloroform, with separation of the combined Water. Its salts are bitter, and most of them crystallisable. They are distinguished by giving a deep red with strong Nitric Acid, changing to violet on the addition of Stannous Chloride.

It possesses powerful analgesic properties, in 5 p.c. solutions of the Sulphate or Nitrate applied locally.—*T.G.* '85, 376; '86, 18.

A very sensitive reaction for Brucine is the Nitrite test.—*P.J.* '96, ii. 378.

OLEA.

OILS.

The following are the Oils of the British Pharmacopœia; they will be found under the names of the substances from which they are derived; an average percentage yield is also given:—

	Per cent.
OLEUM AMYGDALÆ. Expressed from the seed	42
OLEUM ANETHI. Distilled from the fruit	2·8 to 3
OLEUM ANISI. Distilled from the fruit	2
OLEUM ANTHEMIDIS. Distilled from the flowers	·75
OLEUM CADINUM. Destructive distillation of the Wood.	
OLEUM CAJUPUTI. Distilled from the leaves.	
OLEUM CARUI. Distilled from the fruit	5
OLEUM CARYOPHYLLI. Distilled from the flower-bud	16
OLEUM CINNAMOMI. Distilled from the bark.	
OLEUM COPAIBÆ. Distilled from Copaiba	35 to 45
OLEUM CORIANDRI. Distilled from the fruit	·6
OLEUM CROTONIS. Expressed from the seeds	25
OLEUM CUBEBÆ. Distilled from the unripe fruit	11
OLEUM EUCALYPTI. Distilled from the fresh leaves.	
OLEUM JUNIPERI. Distilled from the unripe fruit	·8
OLEUM LAVANDULÆ. Distilled from the flowers	1·5
OLEUM LIMONIS. From the fresh peel.	
OLEUM LINI. Expressed from the seeds without heat.	

	Per cent.
OLEUM MENTHÆ PIPERITÆ. Distilled from the fresh herb.	
OLEUM MENTHÆ VIRIDIS. Distilled from the fresh herb.	
OLEUM MORRHUÆ. Extracted from the fresh liver by heat . . .	42
OLEUM MYRISTICÆ. Distilled from the seed kernel	5·5
OLEUM OLIVÆ. Expressed from the ripe fruit and imported.	
OLEUM PHOSPHORATUM.	
OLEUM PIMENTÆ. Distilled from the dried unripe fruit	4
OLEUM PINI. Distilled from the fresh leaves.	
OLEUM RICINI. Expressed from the seeds.	
OLEUM ROSÆ. Distilled from the fresh flowers	
OLEUM ROSMARINI. Distilled from the flowering tops	·5
OLEUM SANTALI. Distilled from the wood . . . 2 to 4, sometimes	4½
OLEUM SINAPIS VOLATILE. Distilled from the seeds of Black Mustard after maceration with Water.	
OLEUM TEREBINTHINÆ. Distilled from Turpentine.	
OLEUM THEOBROMATIS. Expressed with heat from the seeds .	25

Foreign Pharmacopœias.—The term **Oleum** is applied to an Oil (whether expressed or distilled) in Austr., Dutch, Ger., Hung., Jap., Russ. and U.S.; the other names for fixed and volatile Oils respectively are:—Belg., **Oleum** and **Essentia**; Dan., Norw. and Swed., **Oleum** and **Aetheroleum**; Fr., **Huile** and **Huile Volatile**; Ital., **Olio** and **Essenza**; Mex., **Aceite** and **Aceite Volátil**; Port., **Oleo** and **Essencia**; Span., **Aceite** and **Esencia.**

Not Official.

OLEATES.

Some of these preparations have come into general use. They were originally made by dissolving the oxide of the metal, or an alkaloid, in an excess of Oleic Acid; but later Dr. Shoemaker proposed the method of precipitation by double decomposition between a salt of the base and Solution of Castile Soap (Sodium Oleate with a little Palmitate); Solution of Potassium Oleate may be used with advantage in place of the Solution of Castile Soap, when the pure Oleate is required. The Oleate can also be purified from Palmitate by solution in Petroleum Spirit.

The various Oleates will be found under the headings of their respective bases.

OLIVÆ OLEUM.

OLIVE OIL.

The Oil expressed from the ripe fruit of *Olea Europæa*.

Chiefly obtained from the south of Europe.

Solubility.—1 in 2 of Ether; partially in Alcohol (90 p.c.).

Medicinal Properties.—Nutritious and mildly laxative, demulcent in the form of emulsion; externally as an emollient and protective for burns and certain cutaneous diseases. Has also been successfully given for ascarides, followed by a purge. Valuable in corrosive poisoning; used in laxative enemata, especially for intestinal obstruction. It is most extensively employed in pharmacy, in the preparation of liniments, ointments, and plasters.

Recommended in the treatment of gall st[illegible]es and hepatic colic. 30 fl. oz. taken in five doses.—*B.M.J.* '88, i. 933; '95, i. 11[illegible]; *T.G.* '88, 785; *L.* '95, i. 1453. Internally in muco-enteritis.—*M.A.* '95, 23 Treatment of Lead colic by large doses.—*T.G.* '93, 538.

On the contrary it is stated to favour the production of gall stones.—*L.* '89, ii. 710; 'olive oil has proved useless in my hands' (*Osler*).

In typhoid fever ¼ to ½ pint as an injection at intervals of twelve to twenty-four hours.—*L.* '97, ii. 1383.

Dose.—Not given in B.P.; to 1 oz.

Official Preparations.—Used in the preparation of Emplastrum Ammoniaci cum Hydrargyro, Emplastrum Hydrargyri, Emplastrum Picis, Emplastrum Plumbi, Linimentum Ammoniæ, Linimentum Calcis, Linimentum Camphoræ, Sapo Durus, Sapo Mollis, Unguentum Capsici, Unguentum Hydrargyri Compositum, Unguentum Hydrargyri Nitratis, and Unguentum Resinæ.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex. (Aceite de Olivo), Norw., Port. (Azeite), Russ., Span. (Aceite), Swed., Swiss and U.S.

Description.—Pale yellow or greenish-yellow, with a faint odour, and a bland taste.

Tests.—Sp. gr. ·914 to ·919. At 50° F. (10° C.) it is liable to become of a pasty consistence, and at 32° F. (0° C.) to form a nearly solid granular mass. If 10 c.c. of the Oil be shaken with 2 c.c. of a reagent prepared by dissolving 1 gramme of Silver Nitrate in 100 c.c. of Absolute Alcohol, with the addition of 20 c.c. of Ether and one drop of Nitric Acid, no blackening should occur when the mixture is heated on a water-bath for ten minutes (absence of Cotton-seed Oil).

The congealing point depends greatly upon the length of time to which the Oil is exposed to cold. For instance, an Oil cooled by Ether to 9° F. remained unchanged, but when kept at 32° F. for four hours it partially solidified. Some samples of Oil pressed by ourselves, from Olives grown in the South of France, showed no sign of congelation during six hours at 32° F., or three hours at 15° F.; on the other hand, in the following year an Oil from the same district (guaranteed pure) set at once when cooled quickly to 13° F., and within two hours at 32° F. We have since discovered that the non-freezing oil is only produced when the fruits have been allowed to over-ripen.

Adulteration of Olive Oil is very general, large quantities of Cotton Seed and other oils being used for admixture.

Bechi's Silver Nitrate test is now carried out on the fatty acids of the oil and not on the glycerides. A sensitive reaction for Cotton Seed Oil is described under Adeps.

Detection of Castor Oil.—*J.S.C.I.* '91, 981.

OPIUM.

OPIUM.

The juice obtained by incision from the unripe capsules of *Papaver somniferum*, inspissated by spontaneous evaporation.

Any suitable variety of Opium may be employed as a source of

Tincture of Opium and Extract of Opium of the respective official alkaloidal strengths, provided that when dry it contains not less than 7½ p.c. of Anhydrous Morphine; but, when otherwise used for officially recognised purposes, Opium must be of such a strength that when dried, and powdered, the powder heated to 212° F. (100° C.) until it ceases to lose moisture, and the product tested by the appended method, such dry powder shall yield not less than 9½ p.c., and not more than 10½ p.c., of Anhydrous Morphine. Opium yielding when dried more than 10 p.c. of Anhydrous Morphine may be diluted to that percentage with any Opium containing when dry between 7½ and 10 p.c. of Anhydrous Morphine, or with Milk Sugar.

Medicinal Properties.—As a hypnotic and sedative it is used in insomnia, excitement and delirium of whatever origin, including that of typhoid; as an analgesic to relieve all forms of neuralgic and abdominal pain, the pain of pleurisy, and of gastric ulcer and of cancer, the pain during the passage of biliary and renal calculi, and the after pains of labour; as a hæmostatic in intestinal and pulmonary hæmorrhage; in diabetes; in full doses for acute peritonitis, typhlitis and perityphlitis; in small doses along with other astringents in diarrhœa, dysentery, and the early stages of cholera.

In aortic regurgitation it increases the peripheral blood supply, especially to the brain, it reduces the tendency to syncope, it relieves the neuralgia and angina, and the cardiac dyspnœa, but if the kidneys are affected it should not be given.

As an **expectorant** it is used, guarded by Ammonia, only where the mucous secretion is abundant and not thick or scanty.

As a diaphoretic in form of Dover's powder it is valuable in influenza and coryza.

As an antispasmodic in puerperal convulsions, epilepsy, colic, severe forms of chorea and spasmodic asthma; in spasmodic urethral stricture.

Locally in the form of **liniment, plaster,** or fomentation, it is used in neuralgias, rheumatism, lumbago and sciatica.

To avoid impairment of digestion and to obtain rapid action, it is given subcutaneously (as hypodermic injection of Morphine) in neuralgia and sciatica, near the seat of pain; also in angina pectoris, cardiac paroxysmal pain, and for the dyspnœa caused by intra-thoracic tumours.

In form of Morphine or Lead and Opium **suppository,** it relieves rectal and genito-urinary and other pelvic pains, and is useful after operations on these regions. Opium is preferable to Morphine in peritonitis, enteritis, and other abdominal inflammations, on account of its direct anodyne and astringent effect on the bowel, and, because of its more continued action, it is preferable in delirium and other 'head symptoms.'

Its continued use impairs the appetite, digestion, and intellect; that it is a cardiac depressant should always be borne in mind. Great caution should be exercised in giving Opium to infants and young children, as they are very susceptible to its action, and it is contra-indicated in the pain of chronic dyspepsia, in cases of coma with contracted pupil, in kidney diseases, in nursing females and plethoric

persons, in cerebral hyperæmia, in alcoholic intoxication, and in the last stages of bronchitis and pneumonia or whenever the respiration is seriously embarrassed it is a most dangerous remedy.

A valuable paper on the use of Morphine in Cardiac disease.—*L.* '98, ii. 1393.

Dose.—¼ to 2 grains.

Prescribing Notes.—Powdered Opium can be made into **pills** with Alcohol (60 p.c.).

Incompatibles.—The Alkaline Carbonates, Lime Water, Salts of Lead, Iron, Copper, Mercury, and Zinc, Liquor Arsenicalis, and vegetable astringents.

Official Preparations.—Extractum Opii and Tinctura Opii; used in the preparation of Codeine and of Morphine; of the **Powdered Opium**, Emplastrum Opii, Pilula Plumbi cum Opio, Pulvis Cretæ Aromaticus c. Opio, Pulvis Opii Compositus, and Unguentum Gallæ c. Opio. Contained in Pilula Saponis Composita, Pulvis Kino Compositus, Pulvis Ipecacuanhæ Compositus, and Suppositoria Plumbi Composita. Of the **Compound Powder**, Pilula Ipecacuanhæ cum Scilla; of the **Extract**, Extractum Opii Liquidum. Of the **Tincture**, Linimentum Opii and Tinctura Opii Ammoniata; contained in Tinctura Camphoræ Composita.

Not Official.—Aqua Opii, Solution of Bimeconate of Morphia (Squire), *Syn.* Liquor Meconicus, Meconii Periodida, Liquor Opii Sedativus, Sydenham's Laudanum, Black Drop, Linimentum Opii Ammoniatum, Narceina, Narcotina, Papaverina, and Stypticin.

Antidotes.—In case of poisoning by Opium, the antidotes are an emetic of 10 grains of Copper Sulphate, the stomach pump, external stimulants, cold affusion, Ammonia to the nostrils, compelled exertion, and artificial respiration. Belladonna or hypodermic injection of Atropine should be used; Strychnine; Amyl Nitrite; Gelsemium; Potassium Permanganate. *See* also Morphinæ Hydrochloridum.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Norw., Port., Russ. and Span., not less than 10 p.c.; Mex., 10 p.c.; Swed., 9 to 11 p.c.; Fr., Jap., and Swiss, 10 to 12 p.c.; U.S., 13 to 15 p.c.; all calculated on dried Opium.

Description.—Usually in rounded, irregularly formed, or flattened masses, varying in weight, but commonly from about 8 oz. to 2 lbs. (two hundred and fifty to one thousand grammes). When fresh, plastic, and internally somewhat moist, coarsely granular, or nearly smooth, and reddish- or chestnut-brown; but becoming harder on keeping, and darkening to blackish-brown. Odour strong, and characteristic; taste bitter.

Test.—Opium, dried at 212° F. (100° C.) and in No. 50 powder, 14 grammes; Calcium Hydroxide, freshly prepared, 6 grammes; Ammonium Chloride, 4 grammes; Alcohol (90 p.c.); Ether, and Distilled Water, of each a sufficient quantity. Triturate together the Opium, Calcium Hydroxide, and 40 c.c. of Water in a mortar until a uniform mixture results; add 100 c.c. of Water and stir occasionally during half an hour. Filter the mixture through a plaited filter, about 10 centimetres in diameter, into a wide-mouthed bottle having a capacity of about 300 c.c. and marked at exactly 104 c.c., until the filtrate reaches this mark. To the filtered liquid (representing 10 grammes of Opium) add 10 c.c. of Alcohol (90 p.c.) and 50 c.c. of Ether; shake the mixture; add the Ammonium Chloride, shake

well and frequently during half an hour; set aside for twelve hours for the Morphine to separate. Counterbalance two small filters; place one within the other in a small funnel in such a way that the triple fold of the inner filter shall be superposed upon the single fold of the outer filter; wet them with Ether; remove the ethereal layer of the liquid in the bottle as completely as possible by means of a small pipette, transferring the liquid to the filter; rinse the bottle with 20 c.c. of Ether; again transferring the ethereal layer, by means of the pipette, to the filter; wash the filter with a total of 10 c.c. of Ether, added slowly and in portions. Let the filter dry in the air, and pour upon it the contents of the bottle in portions, in such a way as to transfer the granular crystalline Morphine as completely as possible to the filter. When all the liquid has passed through, wash the remainder of the Morphine from the bottle with Morphinated Water, until the whole has been removed. Wash the crystals with Morphinated Water until the washings are free from colour; allow the filter to drain, and dry it, first by pressing between sheets of bibulous paper, afterwards at a temperature between 131° and 140° F. (55° and 60° C.), finally at 230° F. (110° C.) for two hours. Weigh the crystals in the inner filter, counterbalancing by the outer filter. Take ·5 gramme of the crystals and titrate with Decinormal Volumetric Solution of Sulphuric Acid until the liquid, after boiling, slightly reddens Blue Litmus Paper. 1 c.c. of this Volumetric Solution represents ·0283 gramme of pure Anhydrous Morphine. The weight of pure Anhydrous Morphine indicated by the titration, plus ·104 gramme (representing the average loss of Morphine during the process), should amount in total to 1 gramme, that is to say, to a total of not less than ·95 gramme and not more than 1·05 grammes, corresponding to about 10 p.c. of Anhydrous Morphine in the dry powdered Opium.

The part of the test relating to the titration is not very clearly worded. One does not add 'to the weight of Anhydrous Morphine indicated by the titration,' but 'to the total weight of the crystals in the filter, corrected by the titration figure.'

The amount of Morphine stated to be equal to 1 c.c. of Volumetric Solution of Sulphuric Acid was calculated on the old atomic weights and not on those given in B.P. 1898, but has since been altered in the corrigenda.

The following method of assay is recommended by Dott:

10 grammes of powdered Opium is digested with 25 c.c. Water; 1·8 gramme Barium Chloride dissolved in about 12 c.c. water is then added, the solution made up to 50 c.c., well mixed, and after a short time filtered. 22 c.c. (representing 5 grammes Opium) is mixed with dilute Sulphuric Acid in quantity just sufficient to precipitate the Barium. About 1 c.c. is required, and the solution should be warmed to cause the precipitate to subside and the solution to filter clear. To this filtered solution a little dilute Ammonia, about ·5 c.c., should be added to neutralise the free acid, and the solution concentrated to 6 or 7 c.c., and allowed to cool. 1 c.c. Spirit and 1 c.c. Ether are then added, and next Ammonia in slight excess. The Ammonia should be added gradually until there is no further precipitation, and a perceptible odour of Ammonia remains after well stirring and breaking down any lumps with the stirring rod. After three hours the precipitate is collected on counterpoised filters and washed. Before filtering, it should be noted that the

solution has a faint odour of Ammonia; if not, one or two drops of Ammonia solution should be added. The dried precipitate is washed with Benzene or Chloroform, dried and weighed. It is then titrated with $\frac{N}{10}$ Acid, until the Morphine is neutralised, as indicated by the solution reddening Litmus paper. 1 c.c. $\frac{N}{10}$ Acid = ·0303 gramme Morphine Hydrate. That is on the usual acceptation that the Hydrate is $C_{17}H_{19}NO_3 \cdot H_2O$, although (as shown *P.J.* (3) xviii. 701; and '97, i. 21) there is good reason to believe that it has the composition $8C_{17}H_{19}NO_3 \cdot 9H_2O$.—*P.J.* (3) xxiv. 847.

Preparations.

EMPLASTRUM OPII. Opium Plaster.

Opium in very fine powder, 1; Resin Plaster, 9: melt the Resin Plaster on a water-bath; stir in the Opium gradually. =(1 in 10).

Anodyne, to relieve local pain.

Foreign Pharmacopœias.—Official in Belg. and Mex., 1 Opium in 20; Fr., 3 Extract in 4; Port. and Span., 1 Extract in 10; Swiss, 1 Extract in 20; U.S., 1 Extract in 16; not in the others.

EXTRACTUM OPII. Extract of Opium.

An Extract containing 20 p.c. of Morphine.

Opium, sliced, 16; Distilled Water, 120. Set aside the sliced Opium with one-third of the Distilled Water for twenty-four hours; express the liquid; thoroughly mix the residue of the Opium with another third of the Distilled Water; set aside for twenty-four hours; express; repeat the operation with the remaining third of the Distilled Water; mix the liquids; strain through flannel; evaporate to about 8.

Dose.—$\frac{1}{4}$ to 1 grain.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swiss, and U.S.; not in Dan., or Swed.

Test.—Analysed as described under 'Opium,' using 7 grammes of the Extract in place of the 14 grammes of Opium, this Extract should yield 20 p.c. of Morphine.

To obtain Extract of Opium of proper strength and consistence, stronger and weaker extracts may be mixed, and stronger extracts may be diluted with Distilled Water or with Milk Sugar as may be necessary.

In the first issue of B.P. 1885, the extract was directed to be made from 'Opium in powder' and restricted to the Official variety; but the criticism evoked was so strong, that in the later reprints it was permitted to use any variety of Opium as long as the product conformed to the Official standard of Morphine.

This is less stimulating than powdered Opium, and is preferred as a direct sedative.

EXTRACTUM OPII LIQUIDUM. Liquid Extract of Opium. (Altered.)

A Liquid Extract containing $\frac{3}{4}$ grain of Morphine in 110 minims.

Extract of Opium, $\frac{3}{4}$; Distilled Water, 16; Alcohol (90 p.c.), 4. Mix the Extract of Opium with the Distilled Water; set aside for an hour, stirring frequently; add the Alcohol; set aside in a cool place for twenty-four hours; filter. The product should measure 20.

Now contains $\frac{3}{4}$ Extract in 20 instead of 1 in 20; Alcohol (90 p.c.) used in place of Rectified Spirit.

Contains 1 grain of Extract in about 29 minims.

Dose.—5 to 30 minims.

Each fl. oz. of Liquid Extract of Opium represents 16½ grains of Extract of Opium; 20 c.c. represents ·75 gramme.

Test.—Sp. gr. from ·985 to ·995. Analysed as described under 'Tinctura Opii,' this Liquid Extract should yield an amount of Morphine, reckoned as anhydrous, corresponding to not less than ·7 gramme nor more than ·8 gramme in 100 c.c.

LINIMENTUM OPII. LINIMENT OF OPIUM.

Tincture of Opium, 1; Liniment of Soap, 1: mix; set aside for a few days; filter. =(1 in 2).

The addition of the Opium to the Soap Liniment renders it more useful in many cases of rheumatism and local pains.

(Not in the other Pharmacopœias.)

PILULA SAPONIS COMPOSITA. COMPOUND PILL OF SOAP. (ALTERED.)

Opium, in powder, ½; Hard Soap, in powder, 1½; Syrup of Glucose (by weight), ½. Mix to form a mass. =(1 of Powder of Opium in 5).

Now slightly stronger in Opium. Syrup of Glucose used in place of Glycerin, and less Hard Soap employed.

Dose.—2 to 4 grains.

This Pill contains 20 p.c. of Opium.

Foreign Pharmacopœias.—Official in Belg. (Pil. de Cynoglosse), and Fr., 1 Extract in 10, Dan., about 1 in 7; Norw., 1 Opium in 7½; Span., 1 Extract in 11; Port. (Pilulas de Opio Comp.), 1 Extract in 10; U.S. (Pilula Opii), Powdered Opium 6½, Soap 2; Mex. has Píldoras pacíficas each containing ·02 grammes of Opium with other ingredients; not in the others.

PULVIS OPII COMPOSITUS. COMPOUND POWDER OF OPIUM.

Opium, 3; Black Pepper, 4; Ginger, 10; Caraway Fruit, 12; Tragacanth, 1; all in powder. Mix. =(1 of Powder of Opium in 10).

Dose.—2 to 10 grains.

This Powder contains 10 p.c. of Opium.

TINCTURA OPII. TINCTURE OF OPIUM. *B.P.Syn.*—LAUDANUM. *N.O.Syn.*—TINCTURA THEBAICA. (ALTERED).

Opium, 3; Alcohol (90 p.c.), Distilled Water, of each a sufficient quantity. Rub the Opium to a paste with 10 of Distilled Water, previously heated to at least 200° F. (93·3° C.); set aside for six hours; add 10 of the Alcohol; mix thoroughly; set aside in a covered vessel for twenty-four hours; strain; press; mix the liquids; set aside for twenty-four hours; filter.

Process altered and Tincture standardised to contain ·75 gramme of anhydrous Morphine in 100 c.c.

Dose.—5 to 15 minims, for repeated administration; for a single administration, 20 to 30 minims.

Determine the proportion of Morphine in the resulting Strong Tincture by the following process: Pour 80 c.c. of the liquid into a porcelain dish; evaporate on a water-bath until the volume is reduced to 30 c.c.; mix the residual liquid in a mortar with 3 grammes of freshly slaked Lime; dilute the mixture with Water to 85 c.c.; set aside for

half an hour, stirring occasionally. Filter off 50 c.c. of the liquid (representing 50 c.c. of the Strong Tincture) through a plaited filter, having a diameter of about 1 decimetre, into a wide-mouthed stoppered bottle, having a capacity of 200 c.c.; add 5 c.c. of Alcohol (90 p.c.) and 30 c.c. of Ether; shake the mixture; add 2 grammes of Ammonium Chloride; shake well and frequently during half an hour; set aside for twelve hours for the Morphine to separate. Counterbalance two small filters; place one within the other in a small funnel in such a way that the triple fold of the inner filter shall be superposed upon the single fold of the outer filter; wet them with Ether; remove the ethereal layer of the liquid in the bottle as completely as possible by means of a small pipette, and transfer it to the filter; pour into the bottle 15 c.c. of Ether; rotate the contents and set the bottle aside; transfer the separated ethereal layer carefully, by means of the pipette, to the filter; wash the filter with a total amount of 10 c.c. of Ether added slowly, and in portions; let the filter dry in the air; pour upon it the liquid in the bottle, in portions, in such a way as to transfer the granular crystalline Morphine as completely as possible to the filter. When all the liquid has passed through, wash the remainder of the Morphine from the bottle with Morphinated Water, until the whole has been removed. Wash the crystals with Morphinated Water until the washings are free from colour; allow the filter to drain; dry it, first by gentle pressure between sheets of bibulous paper, afterwards at a temperature between 131° and 140° F. (55° and 60° C.), finally at 230° F. (110° C.) for two hours. Weigh the crystals in the inner filter, counterbalancing by the outer filter. Take ·3 gramme of the crystals, and titrate with Decinormal Volumetric Solution of Sulphuric Acid, as directed under Opium.

Add to the weight of anhydrous Morphine, indicated by the titration, ·05 gramme (or ·1 gramme for every 100 c.c. of the original filtrate, should more than 50 c.c. have been used for the estimation), a proportion representing the average loss of Morphine during the process.

Having ascertained the proportion of Morphine, calculated as anhydrous, present in the 50 c.c. of Strong Tincture, the remainder is to be diluted with sufficient of a mixture of Alcohol (90 p.c.) and Distilled Water, in equal volumes, to produce a Tincture of Opium containing ·75 gramme of Morphine, calculated as anhydrous, in 100 c.c.

The remarks on the test given under 'Opium' apply equally here.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Ger., Hung., Ital., Norw., Russ., Swed., Swiss and U.S., 1 (powder) in 10; Belg., 1 in 11·9; Jap., 1 and 10; Span., 1 in 12; Fr., 1 Extract in 12; Mex., 1 in 8; Port., 1 Extract in 20; all by weight except U.S.

Tests.—Treated by the foregoing process, Tincture of Opium should yield an amount of Morphine, reckoned as anhydrous, corresponding to not less than ·70 gramme, nor more than ·80 gramme, in 100 c.c.

This preparation contains, on an average, the soluble matter of 32·8 grains of Opium (containing 10 p.c. of Morphine, calculated as anhydrous) in 1 fl. oz., or of about 1 grain of such Opium in 15 minims.

Tincture of Opium may be prepared with any variety of Opium containing a known percentage of Morphine, calculated as anhydrous, provided that the per-

centage be not less than 7½, and provided that the resulting Tincture of Opium respond to the foregoing quantitative test.

B.P. '85 ordered a definite quantity of Opium containing about 10 p.c. of Morphine; only about three-fourths of the Morphine was extracted by the Tincture, but the figure for Morphine was fixed on a different assumption. This difficulty is now removed by fixing a standard for the Morphine content of the Tincture, irrespective of the quantity of Opium employed.

Moist Opiums contain on the average 20 p.c. of Water and 45 to 55 p.c. of dry extractive; consequently it is possible to make Laudanum varying as 3 to 1 in extractive matter, and therefore in appearance, for the best Opiums in the market are, when dried, more than twice richer in Morphine than the B.P. minimum, but about the same in extractive-content.—*C.D.* '98, ii. 707.

TINCTURA OPII AMMONIATA. AMMONIATED TINCTURE OF OPIUM. (ALTERED.)

Tincture of Opium, 3 fl. oz.; Benzoic Acid, 180 grains; Oil of Anise, 1 fl. drm.; Solution of Ammonia, 4 fl. oz.; Alcohol (90 p.c.) a sufficient quantity. Dissolve the Oil of Anise and the Benzoic Acid in 12 fl. oz. of the Alcohol; add the Tincture of Opium and the Solution of Ammonia; mix well; filter; add enough of the Alcohol to form 20 fl. oz. of the Tincture. =(1 grain Powdered Opium in 96 minims).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit; Tinct. Opii used instead of Powdered Opium, Saffron omitted, and Liquor Ammoniæ Fortis replaced by Liquor Ammoniæ.

Dose.—½ to 1 fl. drm.

This preparation contains the soluble matter of nearly ·62 grain of Opium (containing 10 p.c. of Morphine, reckoned as Anhydrous) in 1 fl. drm., or of nearly 5 grains of such Opium in 1 fl. oz.

Foreign Pharmacopœias.—Official in Russ. similar to Brit., but uses Oil of Fennel in place of Oil of Anise; not in the others.

Other preparations containing Opium.	Proportion of Opium.
PILULA IPECACUANHÆ CUM SCILLA	about 1 in 20.
PILULA PLUMBI CUM OPIO	1 in 8.
PULVIS CRETÆ AROMATICUS CUM OPIO	1 in 40.
PULVIS IPECACUANHÆ COMPOSITUS	1 in 10.
PULVIS KINO COMPOSITUS	1 in 20.
SUPPOSITORIA PLUMBI COMPOSITA	1 grain in each.
TINCTURA CAMPHORÆ COMPOSITA	¼ grain in 1 fl. drm.
UNGUENTUM GALLÆ CUM OPIO	1 in 13⅓.
	Proportion of Morphine salt.
INJECTIO MORPHINÆ HYPODERMICA	1 in 20.
LIQUOR MORPHINÆ ACETATIS	1 in 100.
LIQUOR MORPHINÆ HYDROCHLORIDI	1 in 100.
LIQUOR MORPHINÆ TARTRATIS	1 in 100.
SUPPOSITORIA MORPHINÆ	¼ grain in each.
TINCTURA CHLOROFORMI ET MORPHINÆ COMPOSITA	1 in 100.
TROCHISCUS MORPHINÆ	1/12 grain in each.
TROCHISCUS MORPHINÆ ET IPECACUANHÆ	1/12 grain in each.

Not Official.

AQUA OPII.—Opium in powder, 1; Water, 12: distil 6.

Occasionally employed in eye lotions. Aq. Opii, 1: Aq. Sambuci, 7.

TROCHISCUS OPII.—Each lozenge contains $\frac{1}{10}$ grain of Extract of Opium.

Dose.—1 to 6 lozenges.

(U.S., Powdered Opium $\frac{1}{12}$ grain in each; not in the other Pharmacopœias.)

UNGUENTUM OPII.—Extract of Opium, 1; Spermaceti Ointment, 9: rub the Extract with a small quantity of Water to a syrupy consistence, and mix with the Ointment. =(1 in 10).

VINUM OPII.—Opium, in powder, $1\frac{1}{2}$; Sherry, 20: macerate seven days, and filter. Used as a **collyrium**, 1 to 16 of Water. =(1 of powder in $13\frac{1}{3}$).

Dose.—10 to 40 minims.

Foreign Pharmacopœias.—Official in Dan., Ital., Norw., Swed., Swiss and U.S., 1 (powder) in 10: Dutch, 1 and 5; Fr., 1 in 8; Belg., with aromatics, 1 *Extract* in 15, and without 1 strained Opium in 12; Jap. and Norw., 1 and 10; Port., 1 Extract in 20; all by weight except U.S.; for formulæ *see* Sydenham's Laudanum, given below.

SOLUTION OF BIMECONATE OF MORPHIA (*Squire.*) *Syn.*—**Liquor Meconicus.**

This preparation was introduced by Peter Squire in 1839, as a purified Solution of Opium containing the whole of the alkaloids in their natural state of combination. It is now standardised to contain 1 p.c. of Morphine.

It differs from Tincture of Opium in that the volatile and extractive matters, to which the unpleasant secondary effects of Opium have been attributed, are removed in the process of its manufacture.

The Solution of the same name inserted in the B.P. of 1885, though obviously intended to take its place, differed so widely from the original in its properties and method of preparation, that it was no substitute for it, and is now deleted.

Dose.—5 to 30 minims.

MECONII PERIODIDA.—Under this name we have made (by request) a preparation representing the alkaloids of the above preparation in combination with excess of Iodine, on the lines of the other Di-iodo-hydriodides previously introduced by us.

Dose.—$\frac{1}{8}$ to $\frac{1}{2}$ grain.

LIQUOR OPII SEDATIVUS (*Battley*) has enjoyed a reputation for a long time as an anodyne and sedative superior to Tincture of Opium, but it is somewhat stronger.

Dose.—5 to 20 minims.

SYDENHAM'S LAUDANUM.—Contains Saffron, and occurs in the majority of the foreign Pharmacopœias under the following titles; all the preparations are by weight.

Tinctura Opii Crocata. Sydenham's Laudanum.

Austr.—Opium 15, Saffron 2, Alcohol 15, Cinnamon Water to make 150.

Hung.—Opium 15, Saffron 15, Cinnamon Water, 150.

Ger.—Opium 15, Saffron 5, Cloves 1, Cassia 1, Alcohol (68 p. c.) 75, Water 75

Russ.—Opium 15, Saffron 5, Cloves 1, Cassia 1, Alcohol (70 p. c.) 90, Water 90.

Swiss.—Opium 10, Saffron 3, Cloves 1, Cassia 1, Alcohol (95 p. c.) 45, Water 50.

Laudanum Sydenhami.

Belg.—Extract of Opium 67, Saffron 34, Oil of Cloves $1\frac{1}{4}$, Water 380, Cinnamon Water 90, Alcohol (60 p. c.) to make 1000.

Laudano de Sydenham.

Mex.—Opium 10, Saffron 5, Oil of Cinnamon 8 drops, Oil of Cloves 8 drops, Acetic Acid ·8, Alcohol (30°) 80.

Laudanum de Sydenham.

Fr.—Opium 40, Saffron 20, Cloves 3, Cinnamon 3, Grenache Wine 320.

Vinum Opii.

U.S.—Opium 10, Cassia 1, Cloves 1, Alcohol 15, White Wine to measure 100.

Vinum Opii Aromaticum.

Dutch.—Saffron 4, Cloves 1, Cinnamon 1, Alcohol (70 p. c.) 10, Malaga Wine 90, to 95 of this Liquor add Opium 10.

Jap.—Saffron 1, Cloves 1, Cinnamon 1, Dilute Spirit 7, Sherry 85, Opium 1.

Vinum Opii Crocatum.

Norw.—Opium 15, Saffron 5, Cloves 1, Cinnamon 1, Malaga Wine 150.

Vinho de Opio Composto.

Port.—Extract of Opium 5, Saffron 3, Cloves 1, Cinnamon 1, Madeira Wine 100.

Vino de Opio Compuesto.

Span.—Opium 15, Saffron 7½, Cloves 1, Cinnamon 1, White Wine 135.

Vino Oppiato Composto.

Ital.—Opium 16, Saffron 8, Cinnamon 1, Cloves 1, Marsala Wine 144.

Vinum Thebaicum Crocatum.

Dan.—Opium 100, Saffron 25, Cloves 6, Cinnamon 6, Malaga Wine 1000.

Swed.—Opium 15, Saffron 5, Cloves 1, Cinnamon 1, Malaga Wine 150.

BLACK DROP.—Acetum Opii Crocatum.

1 drop is equal to 4 drops of Tincture of Opium.

Dose.—1 to 8 minims.

LINIMENTUM OPII AMMONIATUM (*B.P.C.*)—Liniment of Soap, 6; Compound Camphor Liniment, 6; Tincture of Opium, 6; Liniment of Belladonna, 1; Stronger Solution of Ammonia, 1: mix and, after standing a week, filter quickly.

NARCEINA.—Discovered by Pelletier, in 1832. In white, silky, acicular crystals: neutral, with a slightly bitter taste. Soluble in 375 parts of cold and in 220 of hot Water, also in Alcohol; insoluble in Ether, and practically insoluble in Chloroform. It is considered by some observers to possess hypnotic properties, to be less constipating, less diaphoretic and to have less tendency to cause headache than Morphine.

Dose.—½ to 1 grain.

Dilute Sulphuric Acid added to Narceine, then concentrated over a water-bath, gives rise to a beautiful violet colour, which changes to cherry red on further heating. If to this red liquid when cooled a trace of Nitric Acid is added, blue violet streaks appear.—*P.R.* '87, 215.

Narceine should not melt under 165° C. Chemically pure Narceine should be free from Acid, and complete fusion should not take place under 170° C.—*P.J.* (3) xix. 1034

Foreign Pharmacopœias.—Official in Belg., Fr.., and Mex.; not in the others.

NARCOTINA.—First noticed by Derosne, in 1803. Crystallises in prisms, reaction neutral. Insoluble in Water; soluble in Ether, in boiling Alcohol, in diluted acids; insoluble in Solution of Potash. Forms a yellow solution with Nitric Acid. It has no narcotic properties, and has therefore been called **Anarcotina**; it has been given as a substitute for Quinine as an antiperiodic in ague.

Dose.—1 to 3 grains.

STYPTICIN.—Is the hydrochloride of Cotarnine, an oxidation product of Narcotine, occurs in yellow crystals, readily soluble in Water.

Valuable in menorrhagia. Contra-indicated in threatened abortion or in any of the hæmorrhages of pregnancy.—*P.J.* '95, ii. 471; *B.M.J.* '96, ii. 17; *B.M.J.E.* '96, i. 7; '98, i. 71, 103.

PAPAVERINA.—Discovered by Merck. In white crystalline needles. Insoluble in Water; sparingly soluble in Alcohol and Ether. According to Merck, when moistened with strong Sulphuric Acid, it becomes dark blue, but Hesse states that pure Papaverine dissolves colourless in that acid cold, but when heated becomes dark violet. Strongly narcotic.

Dose.—$\frac{1}{12}$ to $\frac{1}{3}$ grain.

OXYMEL. *See* MEL.

OXYMEL SCILLÆ. *See* SCILLA.

Not Official.

PANCREATIC ENZYMES.

Pancreatic juice has been found to possess four distinct properties: conversion of starch, conversion of proteids, emulsification of fats, and curdling of milk.

Each of these properties is attributed to a peculiar soluble ferment or enzyme.

The enzymes of the pancreatic juice act only in neutral or alkaline solutions. Their action is suspended in feebly acid solutions, and when digested at 40° C. (104° F.) for an hour in a solution of Pepsine of the normal acidity of the stomach (equal to ·2 p.c. Hydrochloric Acid), or when digested with some gastric juice, they are destroyed. They are also destroyed in solution by heating to 71° C. (160° F.).

Official Preparation.

LIQUOR PANCREATIS. Pancreatic Solution. (New.)

A liquid preparation containing the digestive principles of the fresh pancreas of the pig. The preparation is most active when the animal from which it is obtained has been fed shortly before being killed.

5 oz. of the Pancreas, freed from fat and external membrane and finely divided by trituration with washed sand or powdered pumice-stone, should be digested, in a closed vessel, in 20 fl. oz. of Alcohol (20 p.c.) for seven days, and then filtered.

Test.—If 2 c.c. of the Solution, together with ·2 gramme of Sodium Bicarbonate and 20 c.c. of Water, be added to 80 c.c. of milk, and the mixture be kept at a temperature of 113° F. (45° C.) for one hour, coagulation should no longer occur on the addition of Nitric Acid.

Not Official.

TRYPSIN acts slowly on solid albuminoid masses (boiled egg-albumen), but with great rapidity on soluble albumens, such as the casein of milk. It converts albumens into peptones and subsequently into bodies which are not proteids, Leucin, Tyrosin, &c.

PANCREATIC DIASTASE converts starch into dextrin and maltose.

It is usually stated to be identical with the diastase of Malt, but it cannot be so,

as we find that it is affected quite differently to the latter by acid and alkali. Diastase from either source acts most rapidly in solutions which are practically neutral. The Malt ferment is retarded by acid, but almost stopped by a very small quantity (about ·1 p.c.) of alkali; the Pancreatic ferment on the contrary is retarded by alkali and almost stopped by a minute quantity of acid.

EMULSIVE ENZYME, fresh pancreatic tissue or pancreatic juice, emulsifies fats, but it is very doubtful whether any extract or solution prepared from the pancreas has the same property.—*Sir W. Roberts.*

Foster states that pancreatic juice splits up neutral fats into their respective acids and glycerin, but Roberts has failed to corroborate this with pancreatic tissue or pancreatic extract.

As both pancreatic diastase and trypsin have been shown by Roberts to be destroyed in the stomach, they are useless for internal administration, but they are peculiarly well-suited for peptonising, or artificially digesting, foods for the use of the sick.

Foreign Pharmacopœias. — Official in Fr. and Mex., Pancreatin; U.S. Pancreatinum; not in the others.

PEPTONISED MILK.—A pint of milk is diluted with 4 fl. oz. of water and heated to 140° F. (60° C.).* To this add two teaspoonfuls of Liquor Pancreatis and 20 grains of Sodium Bicarbonate. Place in a jug and cover with a 'cosey' to keep it warm. At the end of an hour, or rather more, boil the contents of the jug. The product can be used like ordinary milk.

Peptonised Milk can also be prepared at about 60° to 65° F. Dilute a pint of Milk with half-a-pint of Lime Water, or with half-a-pint of water containing 20 grains of Sodium Bicarbonate in solution; to this add three teaspoonfuls of Liquor Pancreatis: the mixture is set aside in a jug for three or four hours, by which time the milk will have developed a slightly bitter taste and will be ready for use.

The bitter taste is well covered by Soda Water, or it may be warmed and sweetened for infants.

If it is used when ready it need not be boiled, but if not it must be boiled to prevent the change proceeding far enough to render it unpalatable.

PEPTONISED GRUEL.—Gruel from wheaten flour, oatmeal, arrowroot, sago, pearl barley, pea or lentil flour, should be very well boiled and made thick and strong. It is then poured into a covered jug and allowed to cool to a lukewarm temperature. Liquor Pancreatis is then added, two teaspoonfuls to a pint of gruel. At the end of three hours the product is boiled and strained. The starch of the meal is converted into sugar, and the albuminoid matters are peptonised.

PEPTONISED MILK-GRUEL.—To a good thick gruel, prepared from any of the above-mentioned farinaceous articles, while still hot, add an equal quantity of cold milk; the mixture will be about 125° F. (52° C.). To each pint of this mixture add two teaspoonfuls of Liquor Pancreatis and 20 grains of Sodium Bicarbonate. Set aside in a warm place for two or three hours until a perceptible bitterness is developed and not longer, then heat to the boiling point and strain.

PEPTONISED BEEF-TEA.—Half-a-pound of finely minced lean beef is mixed with a pint of water and 20 grains of Sodium Bicarbonate. This is simmered for two hours in a covered saucepan; the resulting beef-tea is decanted off into a covered jug, the undissolved beef residue is then beaten up with a spoon into a pulp and added to the beef-tea. When it has cooled down to about 140° F. (60° C.) a tablespoonful of the Liquor Pancreatis is stirred in. The mixture is kept warm for

* If a thermometer is not handy, the proper temperature may be obtained by boiling one-half of the mixture and adding it to the other half which is cold.

two or three hours and occasionally stirred. At the end of this time the contents of the jug are boiled briskly for two or three minutes and finally strained. Beef-tea prepared in this way is rich in peptone, and when seasoned with salt is scarcely distinguishable in taste from ordinary beef-tea.

PEPTONISED NUTRITIVE ENEMATA.—The enema may be prepared in the usual way with milk-gruel and beef-tea, and a dessertspoonful of Liquor Pancreatis should be added to it just before administration.

In the warm temperature of the bowel the ferments find a favourable medium for their action on the nutritive materials with which they are mixed.

It must be borne in mind that peptonised foods are very liable to change on keeping, and that fresh quantities should be prepared every twelve hours or they must be re-boiled.—*Sir W. Roberts, Lumleian Lectures*, 1880.

PANCREATISED FAT or **PANCREATIC EMULSION.**

The process of making Purified Pancreatic Emulsion is divided into three parts.—*See Proceedings of the Royal Society*, 1867.

1. To make Crude Emulsion:—

Fresh Pancreas of the pig freed from fat and all extraneous matter, 25 lbs.; Lard, 20 lbs.; Water, 3 gallons: bruise the Pancreas in a marble mortar, then add the Lard beat and mix well together, adding the water little by little as it becomes absorbed till 3 gallons are used. Strain by squeezing through muslin.

2. To make Pancreatised Fat:—

Treat the Crude Emulsion with Ether, in the proportion of three parts of Ether to one of Emulsion. Mix well, and allow the mixture to stand till two strata are formed, —(*a*) an ethereal solution of pancreatised fat at the top, (*b*) a watery stratum at the bottom. Decant the ethereal stratum and filter, put it into a proper still, and recover the Ether by distillation. The result is Pancreatised Fat.

3. To make Purified Pancreatic Emulsion:—

Pancreatised Fat, 2; Rectified Spirit, 1; Distilled Water, 3; Oil of Cloves, a sufficiency: mix gradually in a marble mortar, adding the Spirit and Water little by little, and enough Oil of Cloves to give a slight flavour.

Tests.—The 'Pancreatised Fat,' when made into Lead Plaster by Lead Oxide, should yield Glycerin.

The 'Watery Stratum' left after decanting the ethereal stratum of pancreatised fat (No. 2) should yield no Glycerin.

The 'Purified Pancreatic Emulsion' should be permanent, and should have an acid reaction.

Dose.—From 1 to 4 fl. drm. mixed in milk or water, from one to four times in twenty-four hours.

Not Official.

PAPAIN.

Syn.—Papayotin.

A digestive ferment extracted from Papaw juice (*Carica Papaya*).

Medicinal Properties.—Its solution (5 p.c.) is stated to dissolve false membranes in croup and diphtheria, and to be a good application to ulcers and warty epitheliomatous growths.—*L.* '85, ii. 86; '87, ii. 164; *B.M.J.* '85, ii. 151; '88, i. 1296; *T.G.* '86, 406; *P.J.* (3) xv. 507; (3) xx. 227. *M.P.* '94, i. 633; *Pr.* li. 372; *B.M.J.E.* '93, ii. 39. Internally in gastric ulcer.—*L.* '94, i. 840; '95, i. 333. In atonic dyspepsia.—*L.* 95, i. 1050. In gastritis.—*B.M.J.E.* '93, ii. 36.

Dose.—2 to 10 grains.

Prescribing Notes.—May be given in **cachets**, **mixture**, or **pills**. A good pill may be made by using 'Dispensing Syrup' *q.s.*

Description.—An amorphous powder, more or less white. Soluble in Glycerin. It dissolves animal proteids, and acts best in neutral or slightly alkaline solutions. The products of the action of Papain on boiled white of egg, in neutral, acid or alkaline solution, are described.—*P.J.* (3) xxiv, 633, 757, 758, 846; (3) xxv. 183; *C.D.* '94, ii. 199. Dried Papaw juice and the Papain prepared from it by purification and precipitation have very little solvent action on albumen either in alkaline or acid solution.—*P.J.* '96, i. 182.

PAPAVERIS CAPSULÆ.

POPPY CAPSULES.

The nearly ripe dried fruits of *Papaver somniferum*.

Medicinal Properties.—Similar to Opium, but much weaker and of uncertain strength. The **decoction** is used as a soothing anodyne fomentation.

Not Official.—Syrupus Papaveris and Extractum Papaveris Liquidum.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Pavot), Ger., Hung., Ital. (Papavero), Mex. (Adormideras), Port. (Dormideiras), Russ., Span. (Adormidera) and Swiss; not in the others.

Description.—Rounded, depressed, or ovoid capsules with a thin, dry, brittle pericarp. They are usually from two to three inches (five to seven and a-half centimetres) in diameter, are suddenly contracted below into a neck, and are crowned above by the stellately arranged stigmas. The pericarp is pale yellowish-brown externally, and frequently marked with dark spots; from its inner surface a number of thin brittle parietal placentas project into the cavity. The seeds are numerous, small, reniform, reticulated and whitish. The fruits are inodorous; the pericarp has a bitter taste.

Not Official.

DECOCTUM PAPAVERIS.—Poppy Capsules, bruised, 2; Distilled Water, 30; boil ten minutes in a covered vessel, and strain; then pour over the contents of the strainer as much Distilled Water as will make the strained product 20.

=(1 in 10.)

An external soothing application, applied warm.

(Span., Infusion, 1 in 35; not in the other Pharmacopœias.)

SYRUPUS PAPAVERIS.—(*B.P.* '85). Poppy Capsules, freed from seeds and reduced to No. 20 powder, 36; Rectified Spirit, 16; Refined Sugar, 64; boiling Distilled Water, a sufficiency. Infuse the Poppy Capsules in 80 of the Water for twenty-four hours, stirring frequently, then pack in a percolator, and adding more of the Water, allow the liquor slowly to pass until 320 have been collected, or the Poppies are exhausted; evaporate the liquor by a water-bath until it is reduced to 60; when quite cold, add the Alcohol, let the mixture stand for twelve hours, and filter. Distil off the Alcohol, evaporate the remaining liquor to 40, and then add the Sugar; the product should weigh 104, and its sp. gr. be about 1·330.

Dose.—1 fl. drm. =(1 in nearly 2¼).

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., and Russ., 1 in 10; Belg., Syr. Diacodii with alcoholic *extract* and simple syrup, 1 in 100; Dan.,

about 1 in 12; Fr., Sirop de Pavot Blanc, 1 of extract of Poppy in 100; Hung., Syr. Diacodii, 1 in 27; Mex. (Jarabe diacodio), 1 of Ext. Opii in 2000; Port., Xarope de Dormideiras, 1 in 13½; Span., Jarabe de Adormideras, 1 extract in 100; not in Ital., Jap., Norw., Swed., Swiss or U.S.

EXTRACTUM PAPAVERIS LIQUIDUM.—The liquid obtained by the process for making the Syrup (previous to adding the Alcohol and the Sugar), 3; Alcohol (90 p.c.), 1: mix.

Dose.—30 to 60 minims.

PARAFFINUM DURUM.

HARD PARAFFIN.

A mixture of several of the harder members of the Paraffin series of hydrocarbons; usually obtained by distillation from shale, separation of the liquid oils by refrigeration, and purification of the solid product.

Solubility.—Insoluble in Water, sparingly soluble in Absolute Alcohol, 1 in 80 of Ether sp. gr. ·720; 1 in 140 of Ether B.P.

In B.P. 1885 it was stated to be 'freely soluble in Ether,' which is altered in B.P. 1898 to 'almost entirely soluble in Ether.'

Official Preparation.—Unguentum Paraffini. Contained in Unguentum Creosoti and Unguentum Eucalypti.

Not Official.—Massa Paraffinum.

Foreign Pharmacopœias.—Official in Belg., Dutch, Ger., Hung., and Russ., all Paraffinum Solidum (**m.p.** 74° to 80° C.); Fr. Paraffine (**m.p.** 44° to 65° C.); Jap. (**m.p.** 75°); U.S. Petrolatum Spissum (**m.p.** 45° to 51 C°.); not in the others.

Description.—Colourless, semi-transparent, crystalline, inodorous, and tasteless. Slightly greasy to the touch.

Tests.—Sp. gr. ·82 to ·94. An Alcoholic Solution should not redden Litmus. It melts at 130° to 135° F. (54·4° to 57·2° C.), and burns with a bright flame, leaving no residue.

Preparation.

UNGUENTUM PARAFFINI. PARAFFIN OINTMENT. (NEW.)

Hard Paraffin, 3; Soft Paraffin, 7. Melt together in a shallow evaporating dish; as the liquid cools triturate constantly, until, when cold, a uniform plastic Ointment is produced.

When Paraffin Ointment is used as the basis of white ointments, it should be prepared with the white variety of Soft Paraffin; and when used in coloured ointments it should be prepared with the yellow variety of Soft Paraffin. The proportions of Hard and Soft Paraffins in Paraffin Ointment may be modified to meet the exigencies of climate and prevailing temperature.

Official Preparations.—The **White** is used in the preparation of Unguentum Acidi Borici, Unguentum Acidi Carbolici, Unguentum Acidi Salicylici, Unguentum Glycerini Plumbi Subacetatis, Unguentum Hydrargyri Ammoniati, Unguentum Plumbi Acetatis, and Unguentum Plumbi Carbonatis. The **Yellow** is used in Unguentum Hydrargyri Oxidi Rubri, Unguentum Iodoformi, and Unguentum Plumbi Iodidi.

Foreign Pharmacopœias.—An ointment is official in Ger. and Russ.

Not Official.

MASSA PARAFFINUM.—Hard Paraffin (m.p. 120° F.), 1; Soft Paraffin 1½; melt together.

A good mass for making Silver Nitrate and Potassium Permanganate into Pills.

PARAFFINUM LIQUIDUM.

LIQUID PARAFFIN.

[NEW.]

A clear oily liquid, obtained from Petroleum, after the more volatile portions have been removed by distillation.

Solubility.—It mixes with Chloroform, Ether, and the fixed and volatile Oils. It dissolves Bromine, Iodine, Iodoform, and Phosphorus.

Medicinal Properties.—It has been used, alone or mixed with Castor or Olive Oil, as an application in chronic eczema accompanied by desquamation. Has been recommended as a base for the hypodermic administration of those substances which it dissolves.

Foreign Pharmacopœias.—Official in Belg., sp. gr. ·840; Dan. and Norw., sp. gr. ·895—·905; Dutch, sp. gr. ·840—·860; Ger. and Russ., sp. gr. ·880; Mex., sp. gr. ·875—·890; U.S., sp. gr. ·875—·945.

Description.—Colourless, odourless, tasteless, not fluorescent.

Tests.—Sp. gr. from ·885 to ·890. Boiling point not below 680° F. (360° C.). 3 c.c., heated with an equal volume of Sulphuric Acid in a test-tube placed in boiling water for ten minutes, with frequent agitation, should not colour the separated layer of acid of a deeper tint than pale brown. Alcohol (90 p.c.) boiled with Liquid Paraffin should not redden Blue Litmus Paper (absence of acid). A mixture of 4 c.c. with 2 of Absolute Alcohol, and 2 drops of a clear saturated solution of Lead Oxide in Solution of Sodium Hydroxide, should remain colourless when kept at 158° F. (70° C.) for ten minutes (absence of Sulphur compounds).

The B.P. sp. gr. is too high. The purification of the oil from tarry constituents reduces the gravity to ·882, whilst it is generally reduced to ·880. The Foreign Pharmacopœias admit gravities of ·880—·885, and even ·870—·875.—*C.D.* '98, i. 713.

PARAFFINUM MOLLE.

SOFT PARAFFIN.

A semi-solid mixture containing soft members of the Paraffin series of hydrocarbons; usually obtained by purifying the less volatile portions of Petroleum.

Solubility.—Insoluble in Water, slightly soluble in Absolute Alcohol, freely in Ether, Chloroform, Benzol, Oil of Turpentine, the fixed and volatile oils.

Official Preparations.—Unguentum Paraffini. The **White** is used in the preparation of Unguentum Creosoti, Unguentum Eucalypti, and Unguentum Zinci Oleatis. The **Yellow** in Unguentum Hydrargyri Nitratis Dilutum and Unguentum Hydrargyri Oxidi Flavi.

Foreign Pharmacopœias.—Official in Austr., Dan., Jap., Norw., and Swiss, Vaselinum; Belg., Paraffina Mollis; Dutch, Vaselinum Album and V. Flavum; Fr., Pétroléine; Ger. and Russ., Unguentum Paraffini; Hung., Ital., and Span., Vaselina; Mex., Vaselina Solida; U.S., Petrolatum Molle; not in the others.

Description.—White or yellow, translucent, soft, unctuous to the touch; free from acidity, alkalinity, or any unpleasant odour or flavour, even when warmed to 120° F. (48·9° C.).

Tests.—Sp. gr. at the melting point, ·840 to ·870. Melts at 96° to 102° F. (35·5° to 38·9° C.), or even somewhat higher, volatilises without giving off acrid vapours, and burns with a bright flame, leaving no residue. After treating with boiling Solution of Sodium Hydroxide the aqueous liquid yields no precipitate or oily matter on adding excess of acid (absence of fixed oils, fats, and resin).

A comparison of the methods of taking the melting point.—*P.J.* '98, i. 293.

It sometimes shows a strong fluorescence when melted.

PARALDEHYDUM.

PARALDEHYDE.

$C_6H_{12}O_3$, eq. 131·10.

A product of the polymerisation of Aldehyde by various acids and salts.

Solubility.—1 in 8½ of Water at 60° F., the solution becoming very turbid on warming. It is miscible, in all proportions, with Alcohol (90 p.c.) and with Ether.

Medicinal Properties.—Hypnotic. Produces quiet and refreshing sleep more speedily than Chloral; does not depress the heart's action. Has a marked action on the kidneys, increasing the flow of urine. It does not give rise to headache. Is a valuable remedy in the insomnia of cardiac disease, of mania, melancholia, and of other mental diseases.

Paraldehyde is given off by the lungs, and may be detected in the breath twelve or more hours after having been taken.

References.—*B.M.J.* '83, i. 215; '85, ii. 99; '89, i. 119, 515; *L.* '85, i. 201; '87, i. 554; '87, ii. 204; '89, ii. 15; '92, ii. 195.

30 minim doses every half or one hour in spasmodic asthma.—*B.M.J.* '93, i. 65; '96, i. 725.

Dose.—½ to 2 fl. drm.

Prescribing Notes.—May be taken dissolved in 1 to 2 fl. oz. of Water. A small dose repeated in an hour is more effective than a large dose. It has a pungent taste, which may be modified by the addition of Tincture of Orange and Syrup; it is also given in Gin at night. When larger doses than will dissolve are required in mixtures, Compound Tragacanth Powder should be ordered to diffuse it. It is also prescribed in **capsules.**

Not Official.—Metaldehyde, and Mistura Paraldehydi.

Foreign Pharmacopœias.—Official in Dan., Fr., Hung., Ger., Mex. (Paraldeida), Norw., Russ. and U.S.; not in the others.

Description.—A clear colourless liquid having a characteristic ethereal odour and an acrid, and afterwards cool, taste. Soluble in 10 parts of Water at 60° F. (15·5° C.); less soluble in hot Water.

Tests.—Sp. gr. ·998. An aqueous solution should not affect Solution of Litmus. Boiling point 255·2° F. (124° C.). It may be congealed to a clear crystalline mass which melts at about 50° F. (10° C.). It affords no coloration on standing for two hours mixed with Solution of Potassium Hydroxide (absence of Aldehyde), and should yield no characteristic reaction with the tests for Sulphates or for Chlorides.

The tests above given are in the main those to be expected from a good commercial sample. By careful fractionation, Paraldehyde may be obtained **melting** at 54°—55° F., having a **boiling point** 125°—126° C., and **sp. gr.** ·999.

The **Aldehyde reaction** with Solution of Potash is an exceedingly delicate one, almost too delicate, very few samples remaining quite uncoloured for two hours.

An impure Paraldehyde can generally be brought up to the standard by washing with Water containing an excess of Sodium Bicarbonate to remove acidity, and then dehydration over dried Potassium Carbonate. If the melting point be very low it should first be redistilled and the first tenth rejected.

Not Official.

METALDEHYDE.—Like Paraldehyde it is a polymer of Aldehyde (C_2H_4O.), but its formula is uncertain. It is formed under rather uncertain conditions by the influence of cold upon Aldehyde containing a trace of mineral acid. It occurs in colourless acicular crystals insoluble in Water and sparingly soluble in Alcohol and Ether. It sublimes readily, with partial conversion into ordinary Aldehyde. It is said to be a hypnotic.

Dose.—2 to 8 grains.

MISTURA PARALDEHYDI (*L.H.*).—Paraldehyde 1 fl. drm., Glycerin 40 minims, Rectified Spirit 2 fl. drm., Cassia Water to 1 fl. oz.

PAREIRÆ RADIX.

PAREIRA ROOT.

The dried root of *Chondrodendron tomentosum*.

Imported from Rio Janeiro in South Brazil. A spurious Pareira has lately been imported from Bahia in North Brazil, much inferior in alkaloid and extractive. The most marked chemical difference between the two is in the Petroleum Ether Extractive. In the genuine drug this amounts to over 8 p. c. and in the spurious to about ·3 p.c.—*P.J.* (3) xxii. 703, 771.

A good deal of the stem, which closely resembles the root, is also imported, and is said to be much less efficacious. Several drugs have been sold at different times as Pareira Brava.

Medicinal Properties.—Tonic and diuretic. In catarrhal affections of, and discharges from, the genito-urinary passages, such as gonorrhœa and leucorrhœa: strongly recommended by the late Sir B. Brodie for its sedative and astringent action in chronic inflammation of the bladder.

Official Preparation.—Extractum Pareiræ Liquidum.

Foreign Pharmacopœias.—Official in Mex. and Port., Butua; U.S.; not in the others.

Description.—In long and nearly cylindrical more or less twisted pieces, from about three-quarters of an inch to two or more inches (two to five centimetres) in diameter; covered with a thin blackish-brown bark, and marked externally with longitudinal furrows and transverse ridges and fissures. Internally yellowish- or brownish-grey, with well-marked concentric or more or less eccentric crenated zones, the porous wood being separated into wedge-shaped portions by large medullary rays, and when cut presenting a waxy appearance. No odour; taste bitter.

Preparation.

EXTRACTUM PAREIRÆ LIQUIDUM. Liquid Extract of Pareira. (Altered.)

Add to Pareira Root, in No. 40 powder, rather more than an equal bulk of boiling Distilled Water and set aside for twenty-four hours; then pack in a percolator and pass boiling Distilled Water slowly until the percolate amounts to about ten times the weight of the Pareira Root, or until the latter is exhausted. Ascertain the proportion of extractive matter in the percolate by evaporating a small weighed quantity in a counterpoised dish on a water-bath to a firm consistence, and weighing the product. Then evaporate the bulk of the percolate until the residual liquid contains one-third of its weight of such extractive matter; mix with this residual liquid sufficient Alcohol (90 p.c.) to produce from three volumes of the evaporated liquid four volumes of Liquid Extract of Pareira. Filter or otherwise clarify, if necessary.

Alcohol (90 p.c.) now used in place of Rectified Spirit, and made from the Root instead of the Extract.

Dose.—½ to 2 fl. drm.

Incompatibles.—Ferric salts, Lead salts, Tincture of Iodine.

Foreign Pharmacopœias.—Official in U.S., 1 in 1 with glycerin; not in the others.

PEPSINUM.

PEPSIN.

An enzyme obtained from the mucous lining of the fresh and healthy stomach of the pig, sheep, or calf. Tested as described below, it should dissolve 2500 times its weight of hard-boiled white of eggs.

Solubility.—Moderately soluble in Water and almost insoluble in Alcohol (90 p.c.).

Medicinal Properties.—A digestive adjuvant; preferably given with dilute Hydrochloric Acid; used in chronic gastric catarrh, with deficiency of gastric juice or excessive secretion of mucus; in irritability of stomach associated with vomiting and gastralgia. Externally, to stimulate indolent ulcers, and in eczema; in the form of a bougie for gonorrhœa.

Dose.—5 to 10 grains.

Prescribing Notes.—Given in **powders**, or in **pills** with 'Dispensing Syrup,' also in **cachets, capsules**, and compressed **tablets**.

Official Preparation.—Glycerinum Pepsinæ.

Not Official.—Pepsinum Saccharatum.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Mex., Norw., Port., Russ., Span., Swiss and U.S.; not in Jap. or Swed.

The usual solvent for making fluid preparations of Pepsin is a weak Alcohol acidulated with Hydrochloric Acid, to which Glycerin is usually added.

Pepsin is one of the soluble ferments or enzymes of the gastric juice. It dissolves natural proteids, albumens, and fibrin, and converts them into syntonin and subsequently into albumose and Peptone. It is a conversion of the less soluble proteids into those which are more so, Peptone being the most soluble and diffusible of the proteids. Pepsin has no action on starch.

It acts only in acid solution, ·2 p.c. of Hydrochloric Acid being the most favourable.

The action of Pepsin will continue almost indefinitely if the products of its action are removed by dialysis, or if the concentration of the products is reduced by acidified water.

The gastric juice also contains another enzyme 'rennin,' which curdles milk. The curd is formed in acid or neutral solutions in the presence of Calcium Phosphate. The casein is split up into a soluble and an insoluble proteid, the latter of which entangles the fat and forms a curd.

Description.—A light yellowish-brown or white powder or pale-yellow translucent grains or scales, having a faint odour, and a slightly saline taste free from any trace of putrescence, and liable to absorb moisture from the air.

Tests.—If 12·5 grammes of coagulated and firm white of fresh eggs, 125 c.c. of acidulated Water containing about ·2 p.c. of Hydrogen Chloride (**HCl**), and ·005 gramme of Pepsin, be digested together at 105° F. (40·5° C.) for six hours, and shaken frequently, the coagulated white of eggs dissolves, leaving only a few small flakes, in an almost clear solution. The 'white of eggs' should be prepared by boiling quite fresh eggs in Water for fifteen minutes, then immersing them in cold Water, and, as soon as sufficiently cool for handling, separating the whites, washing off any fragments of yolk or membrane with Water, removing the Water with a clean towel, then at once rubbing the whites through a sieve having twelve meshes to a centimetre, and using the product before it has lost moisture. For the 'acidulated Water' mix the official Hydrochloric Acid with Water in the proportion of 1 gramme to 156 c.c.; this will give a solution containing about ·2 p.c. of Hydrogen Chloride (**HCl**).

Allen draws attention to the advantage possessed by the U.S.P. process of employing a standard solution of Pepsin instead of weighing out the very small quantity of ·005 gramme as recommended in the B.P., presumably with an error of not more than ·0001 gramme. The B.P. process closely resembles that of U.S.P., which it follows in the objectionably long time for which the digestion is continued, but the U.S.P. gives precise directions as to the frequency of stirring, which very important condition is ignored by the B.P., nor is any correction made for the solvent action of the acid on the Albumen. By only requiring the Pepsin to dissolve the albumen, no distinction is drawn between its conversion into syntonin and true peptonization.

The real digestive power of a Pepsin is measured by the amount of Peptone which it produces in a given time under certain conditions.—*P.J.* '98, i. 416.

A method of testing Pepsin by determining the amount of Peptone produced.—*P.J.* '97, ii. 561; *Analyst* '97, 258.

Digestive power of Pepsin in presence of Alcohol.—*C.D.* '97, ii. 723.

The following description and improved test occur in U.S.P. (1893):—

A proteolytic ferment or enzyme obtained from the glandular layer of fresh stomachs from healthy pigs, and capable of digesting not less than 3000 times its own weight of freshly coagulated and disintegrated egg albumen, when tested by the process given below. If it be desired to use a diluent for reducing Pepsin of a higher digestive power to that required by the Pharmacopœia, Milk Sugar should be employed for this purpose.

A fine white, or yellowish-white, amorphous powder, or thin, pale yellow or yellowish, transparent or translucent grains or scales, free from any offensive odour and having a mildly acidulous or slightly saline taste, usually followed by a suggestion of bitterness. It slowly attracts moisture when exposed to the air.

Soluble, or for the most part soluble, in about 100 parts of Water, with more or less opalescence; more soluble in Water acidulated with Hydrochloric Acid; insoluble in Alcohol (94 p.c.), Ether, or Chloroform.

On heating a solution of Pepsin in acidulated Water to 100° C. (212° F.), it becomes milky or yields a light, flocculent precipitate, and loses all proteolytic power. In a dry state it can bear this temperature without injury.

Pepsin usually has a slightly acid reaction. It may be neutral, but should never be alkaline.

Valuation of Pepsin.—Prepare, first, the following three solutions:—

(*a*.) To 294 c.c. of Water add 6 c.c. of Diluted Hydrochloric Acid.

(*b*.) In 100 c.c. of solution *a* dissolve ·067 gramme of the Pepsin to be tested.

(*c*.) To 95 c.c. of solution *a* brought to a temperature of 40° C. (104° F.) add 5 c.c. of solution *b*.

The resulting 100 c.c. of liquid will contain ·2 c.c. (·21 gramme) of absolute Hydrochloric Acid, ·00335 gramme of the Pepsin to be tested, and 98 c.c. of Water.

Immerse and keep a fresh hen's egg during fifteen minutes in boiling water; then remove it and place it into cold water. When it is cold, separate the white coagulated albumen, and rub it through a clean sieve having 30 meshes to the linear inch. Reject the first portion passing through the sieve. Weigh off 10 grammes of the second, cleaner portion, place it in a flask of the capacity of about 200 c.c., then add one half of the solution *c*, and shake well, so as to distribute the coherent albumen evenly throughout the liquid. Then add the second half of solution *c*, and shake again, guarding against loss. Place the flask in a water-bath or thermostat kept at a temperature of 38° to 40° C. (100·4° to 104° F.) for six hours, and shake it gently every fifteen minutes. At the expiration of this time the albumen should have disappeared, leaving at most only a few thin, insoluble flakes. (Trustworthy results, particularly in comparative trials, will be obtained only if the temperature be strictly maintained between the prescribed limits, and if the contents of the flasks be agitated uniformly and in equal intervals of time.)

The relative proteolytic power of Pepsin stronger or weaker than that described above may be determined by ascertaining, through repeated trials, how much of solution *b*, made up to 100 c.c. with solution *a*, will be required exactly to dissolve 10 grammes of coagulated and disintegrated albumen under the conditions given above.

Preparation.

GLYCERINUM PEPSINI. Glycerin of Pepsin. (New.)

Pepsin, 800 grains; Hydrochloric Acid, 110 minims; Glycerin, 12 fl. oz.; Distilled Water, a sufficient quantity. Mix the Hydrochloric Acid, Glycerin, and 6 fl. oz. of the Distilled Water; then add the Pepsin; after one week, pour off the clear liquid, or filter; add sufficient Distilled Water to produce 20 fl. oz.

Dose.—1 to 2 fl. drm.

1 fl. drm. of this preparation represents 5 grains of Pepsin.

Not Official.

Pepsinum Saccharatum.—Jap. and U.S., Pepsin (of above strength), 1; Milk Sugar, 9.

PHENACETINUM.

PHENACETIN.

$C_2H_5O{\cdot}C_6H_4{\cdot}NHCOCH_3$, eq. 177·80.

Para-acet-phenetidin, or Phenacetin, is produced by the interaction of Glacial Acetic Acid and Para-phenetidin, a body obtained from Para-nitro-phenol.

In the process of manufacture, Nitro-phenols are formed by the action of Nitric Acid on Carbolic Acid. The Ortho-nitro-phenol having been separated from the Para-nitro-phenol, a Sodium salt of this latter is then formed, the Sodium of which is afterwards (by the action of Ethyl Iodide) replaced by Ethyl. By the reducing action of nascent Hydrogen the Nitro-group (NO_2) of this compound is transformed to an Amido-group (NH_2), forming Para-amidophenetol, otherwise called Para-phenetidin, which finally by treatment with Glacial Acetic Acid yields Para-acet-phenetidin or Phenacetin.

Solubility.—1 in 1700 of Water; 1 in 50 of Boiling Water; 1 in 21 of Alcohol (90 p.c.); 1 in 100 of Alcohol (60 p.c.).

Medicinal Properties.—Analgesic, antipyretic and nervine sedative. It relieves pyrexia of typhoid, pneumonia, and other febrile conditions. The fall and subsequent rise of temperature are gradual. It does not produce nausea. It is the most efficient synthetic analgesic for the relief of neuralgic, rheumatic, locomotor ataxial and other pains.—*L.* '88, i. 489; '88, ii. 322; *B.M.J.* '88, i. 1126; '89 ii. 1417; *B.M.J.* '98, ii. 1054.

Recommended in Influenza to relieve the headache and reduce temperature.—*B.M.J.* '91, i. 1282; '91, ii. 190; *Pr.* liv. 383; *B.M.J.* '94, ii. 1045.

As the result of an enquiry as to the ill-effects of Phenacetin by a Committee of the British Medical Association, it is stated that it appears to have a notable freedom from injurious action, and has great value, especially as an analgesic. Some observers recommend a commencing dose of 5 grains or less, others using doses of 8 to 10 grains.—*B.M.J.* '94, i. 89. Untoward effects, *Pr.* li. 241, liii. 444. Two cases of rash caused by Phenacetin.—*L.* '95, i. 91; *C.D.* '95, i. 797.

A recent digest of the literature on synthetic analgesics by Taylor Grant (*Scot. Med. and Surg. Journ.* '98, iii. 436) shows that Phenacetin and Antipyrine are the most trustworthy and valuable of this class of pain-relieving remedies, and that, if used with due care and judgement, ill-effects following the use of either are exceedingly rare, the principal precaution being to commence with a small dose, of Phenacetin 5 grains and of Antipyrine not more than 10 grains.

Dose.—5 to 10 grains.

Prescribing Notes.—It is given in **cachets,** or **suspended** in Water with Compound Powder of Tragacanth.

Not Official.—Amygdophenine, Kryofin, Lactophenine, Malakin, Paraphenetidin Citrates, Triphenine, Phenocoll Hydrochloridum, and Salocoll.

Foreign Pharmacopœias.—Official in Dan., Fr. Acet-Phenetidine; Ger., Norw., Russ. and Swiss, Phenacetinum; Ital. and Mex.; Fenacetina; not in the others.

Description.—White, tasteless, inodorous, glistening, scaly crystals, neutral to Litmus.

It is also supplied commercially as a powder.

Tests.—Melting point, 275° F. (135° C.). ·1 gramme boiled with 2 c.c. of Hydrochloric Acid for half a minute yields a liquid which, diluted with ten times its volume of Water, cooled, and filtered, assumes a deep-red coloration on the addition of Solution of Chromic Acid. Heated with free access of air, it burns leaving no residue. Sulphuric Acid dissolves it without colour. A cold, saturated aqueous solution should not become turbid on the addition of Solution of Bromine (absence of Acetanilide). A mixture of ·3 gramme of Phenacetin with 1 c.c. of Alcohol (90 p.c.) should not acquire a red tint when diluted with three times its volume of Water, and boiled with one drop of Volumetric Solution of Iodine (absence of Para-phenetidin).

The only test given in B.P. for detecting Acetanilide in Phenacetin is the Solution of Bromine Water; the Iso-nitrile test has been left out. This latter test when carried out according to the modification described under 'Acetanilide,' is capable of detecting readily an addition of 2 p.c. Acetanilide.

Detection of admixture with Acetanilide by the melting point. Pure Phenacetin and pure Acetanilide do not begin to fuse at any temperature approaching 92° C., whereas mixtures containing from 1 to 95 p.c. of Acetanilide all commenced to fuse at this temperature.—*J.S.C.I.* '95, 852.

Unconverted Para-phenetidin may be detected by the following test:—Dissolve ·5 gramme of the sample in Water, add a few drops of Solution of Ferric Chloride and warm gently. A dark red colour is produced if Phenetidin is present.—*C.D.* '94, ii. 144.

Not Official.

AMYGDOPHENINE.—The Amygdalic Acid derivative of Para-phenetidin. A greyish-white voluminous crystalline powder, very sparingly soluble in Water. Anti-rheumatic and anti-neuralgic, but is of little value as an antipyretic.—*P.J.* '96, i. 139, 162; *C.D.* '96, i. 223; *B.M.J.E.* '95, ii. 99.

Dose.—8 to 15 grains.

KRYOFIN.—A condensation product of Para-phenetidin and Methylglycolic Acid. Occurs in white, odourless, tasteless crystals, sparingly soluble in cold Water. Antipyretic and analgesic. Has been found useful in neuralgia. Severe sweating sometimes follows its use.—*B.M.J.E.* '97, i. 83; '97, ii. 88; *L.* '97, ii. 728.

Dose.—8 to 15 grains.

LACTOPHENINE.—The Lactic Acid derivative of Para-phenetidin. A white inodorous bitter crystalline powder, melting at 118° C. Sparingly soluble in Water.

Medicinal Properties.—Antipyretic, analgesic and hypnotic. Used in migraine, erysipelas, nervous headache and the neuralgia of influenza.—*L.* '94, ii. 211; '95, i. 1064; *B.M.J.E.* '94, ii. 63; *T.G.* '95, 44; *Pr.* liii. 51. In typhoid fever.—*B.M.J.E.* '94, i. 68; '94, ii. 92; *T.G.* '94, 42. Cases of jaundice after the use of Lactophenine.—*B.M.J.E.* '95, ii. 80; '96, i. 40; inconstant, uncertain, and may produce collapse.—*B.M.J.* '98, ii. 1056.

Tests.—It should dissolve without colour in strong Sulphuric Acid and leave no ash on ignition. 3 gramme triturated with 2 c.c. of Nitric Acid and the mixture allowed to stand, yields Nitrolactophenine, which on washing with Water and purification with Benzol has a melting point of 96·5° C.—*J.S.C.I.* '95, 196.

MALAKIN.—The Salicylic Acid derivative of Para-phenetidin. Occurs in pale yellow silky needles, insoluble in Water and strong Alcohol.

Antipyretic, analgesic and anti-rheumatic. Used in acute rheumatism, the fever of phthisis, migraine and neuralgia.—*M.P.* '94, i. 268; *B.M.J.E.* '93, ii. 92; '94 i. 84; '94, ii. 88; *T.G.* '95, 325; *Pr.* liii. 45; *Y.B.P.* '95, 89; *Y.B.T.* '95, 89; in every way inferior to Phenacetin and Antipyrine.—*B.M.J.* '98, ii. 1055.

Dose.—10 to 20 grains.

PARA-PHENETIDIN CITRATES.—Two of these derivatives are known. The monobasic variety known as **Apolysin** forms a yellowish-white crystalline powder or large crystals melting at about 72° C.; readily soluble in Water and having an acid reaction.

The dibasic variety known as **Citrophen** is a white powder with an acid reaction only slightly soluble in Water, melting at about 181° C.—*P.J.* '95, ii. 363; '97, i. 24; *C.D.* '96, i. 223.

Both are analgesic, antipyretic, and anti-neuralgic. **Citrophen** causes considerable sweating.—*B.M.J.E.* '95, ii. 87; '95, ii. 95; '96, i. 87; '96, ii. 19; warning against the use of Citrophen.—*B.M.J.* '98, ii. 1056.

Dose.—**Apolysin** 10 to 30 grains. **Citrophen** 7 to 10 grains.

Triphenine.—A derivative of Para-phenetidin and Propionic Acid. Dose, 8 to 15 grains. **Phesine,** a sulpho-derivative of Para-phenetidin, and **Pyrantin,** a derivative of Para-phenetidin and Succinic Acid, dose 5 to 10 grains, have been recommended as antipyretics.

PHENOCOLL HYDROCHLORIDUM.—A compound closely related to Phenacetin, and obtained by the action of Glycocoll on Phenetidin. A white crystalline powder, soluble 1 in 16 of Water, sparingly soluble in Alcohol.

Medicinal Properties.—Antipyretic, yielding good results in rheumatic fever. *L.* '91, i. 1060; '92, ii. 438. As a substitute for Quinine in malaria, *B.M.J.E.* '93, ii. 104, *T.G.* '93, 334, 618; in acute rheumatism, typhoid, malaria, and as an intestinal antiseptic, *B.M.J.E.* '94, i. 79; '96, ii. 83; *L.* '97, i. 1227; *P.J.* '96, i. 178.

Dose.—5 to 10 grains.

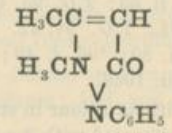
Salocoll, a recent introduction, is Phenocoll Salicylate, given in doses of 15 to 30 grains.

PHENAZONUM.

PHENAZONE.

$C_6H_5(CH_3)_2C_3HN_2O$. eq. 186·77.

Phenazone, or Phenyl-dimethyl-iso-pyrazolone, is obtainable from Phenyl-hydrazine by interaction with Aceto-acetic Ether, and the subsequent interaction of the resulting Phenyl-methyl-iso-pyrazolone with Methyl Iodide. Its constitution is indicated by the following formula:—



Phenazone is commonly known as 'Antipyrine.'

Solubility.—1 in 1 of Water; 3 in 4 of Alcohol (90 p.c.); about 5 in 6 of Chloroform; 1 in 40 of Ether.

Medicinal Properties.—Antipyretic and analgesic, nervine sedative. Given to reduce temperature in all forms of febrile disease, but in case of weak subjects, its depressant effect should be borne in mind.

As an analgesic it is used with great success in neuralgia, migraine, gout, rheumatism, locomotor ataxia and other painful affections, and is frequently given with Sodium Salicylate.

As a pain-relieving remedy it ranks second to Phenacetin; for results of a recent digest on this subject *see under* 'Phenacetin.'

A specific in acute rheumatism, *L.* '85, ii. 642; '86, ii. 876; *B.M.J.* '86, ii. 601. An anodyne for neuralgia, *L.* '87, i. 907; in migraine, *L.* '87, ii. 1163; '89, ii. 790; *B.M.J.* '87, ii. 123; in sciatica, *B.M.J.* '89, i. 610, 710. Relieves ocular pain and ciliary neuralgia in various eye diseases (glaucoma, &c.), *L.* '86, i. 708; *B.M.J.* '88, i. 1360. A uterine sedative, *B.M.J.* '87, ii. 1349. Recommended in hectic fever, *L.* '87, i. 284; *B.M.J.* '85, ii. 602; in hay fever, *B.M.J.* '88, i. 40; in chorea, *L.* '88, i. 39, 157; *L.M.R.* '88, 311; *T.G.* '88, 249; *M.A.* '95, 147; *B.M.J.* '94, ii. 1227; in sunstroke (large doses), *B.M.J.* '87, i. 930; to arrest hæmoptysis, *B.M.J.* '87, ii. 1349; in the early stages of whooping cough, *T.G.* '88, 84, 608; in febrile affections of children, *B.M.J.E.* '95, ii. 35; in laryngismus stridulus, *L.* '88, ii. 961; in kidney diseases, *B.M.J.* '88, i. 1185; *L.* '89, ii. 431; in diabetes, *L.* '89, i. 812. A failure in sea-sickness, *M.P.* '88, i. 541. 10 grains daily as an antigalactagogue, *L.M.R.* '88, 290. 50 p.c. solution hypodermically as a local anæsthetic, *B.M.J.* '88, ii. 1124. Sometimes produces a rash resembling measles, *B.M.J.* '87, i. 111, 210; '93, ii. 944. Toxic effects produced, *B.M.J.* '86, ii. 788; '87, ii. 431; '88, i. 243, 258; *L.* '88, i. 364; *T.G.* '87, 542; as an analgesic in cystitis by intra-vesical injection, *M.A.* '95, 183 and 138; *B.M.J.E.* '94, ii. 36; internally in herpetic dermatitis; *M.A.* '95, 184; as a local anæsthetic in throat and nose affections (30 to 50 p.c. sol.); *Y.B.T.* '94, 429; a 10 p.c. sol. locally in epistaxis; *M.A.* '94, 253; *L.* '93, ii. 453. As a styptic and

antiseptic, *B.M.J.E.* '95, i. 28; *L.* '95, i. 1453; in malaria, *T.G.* '94, 841; in small and repeated doses in puerperal fever, *M.P.* '94, i. 667. In Tannic Acid solution as a styptic, *B.M.J.E.* '95, ii. 90. Cases of poisoning, *B.M.J.* '96, i. 269, 511. In pruritus, *B.M.J.E.* '95, i. 32; *T.G.* '95, 397; *P.J.* '95, ii. 343. One of the most pleasant and rapid remedies for Influenza, *Pr.* liv. 383. In infantile diarrhœa, *P.J.* '95, ii. 175; '96, i. 178; discussion on its benefits and risks as an analgesic, *B.M.J.* '98, ii. 1054.

It is contra-indicated in cardiac weakness, and cases of extreme exhaustion.—*T.G.* '89, 457.

As the result of an enquiry, as to the ill-effects of Phenazone, by a Committee of the British Medical Association, it is stated that the commencing dose should not exceed 10 grains, and should not be repeated too frequently; there is a necessity for watching its action, but ill-effects are not of the frequency or importance ascribed to them by a widespread impression. The large majority of observers agree in stating that they are of no importance whatever, and that, with reasonable and judicious care, they limit in no way the general usefulness of the drug as a therapeutic agent.—*B.M.J.* '94, i. 88.

Dose.—5 to 20 grains.

Prescribing Notes.—Given in **solution, powders, cachets, capsules,** or in the form of effervescent **granules.**

Incompatibles.—Spiritus Ætheris Nitrosi, Tannic Acid in aqueous solutions, Extractum Cinchonæ Liquidum, and other Astringent Decoctions and Infusions. Chloral Hydrate is not incompatible with Phenazone in moderately dilute aqueous solution. Sodium Salicylate is not incompatible with Phenazone in aqueous solution, but forms an oily liquid if the *solids* be mixed, and exposed to the air. *P.J.* (3) xx. 861.

The incompatibility of Antipyrine and Spiritus Ætheris Nitrosi may be overcome by prescribing them with Sodium Bicarbonate.—*A.J.P.* '94, 321; *C.D.* '98, i. 357.

Not Official.—Ferripyrin, Hypnal, Migrainine, Pyramidon, Salipyrin, Tolypyrin and Tussol.

Foreign Pharmacopœias.—Official in Aust., Dan., Dutch, Fr. (Analgesine), Ger., Hung., Ital., Jap., Mex. (Antipirina), Norw., Russ. and Swiss; not in the others.

Description.—In colourless and inodorous scaly crystals with a bitter taste.

Tests.—Melting point about 235·4° F. (113° C.). ·1 gramme of Sodium Nitrite and 12 c.c. of a 1 p.c. aqueous solution of Phenazone yield a nearly colourless liquid which turns deep green on the addition of 1 c.c. of Diluted Sulphuric Acid.

A few drops of Spiritus Ætheris Nitrosi will answer the same purpose as the Sodium Nitrite.

An aqueous solution of the same strength mixed with an equal volume of Nitric Acid assumes a yellow colour passing to crimson on warming. Test-solution of Ferric Chloride produces in a very dilute aqueous solution a deep red colour, which is nearly discharged by excess of Diluted Sulphuric Acid.

A 5 p.c. aqueous solution of Phenazone gives with Test-solution of

Mercuric Chloride a white precipitate which disappears on boiling, but reappears as the liquid cools. The aqueous solution should not affect Solution of Litmus, and should not be affected by Hydrogen Sulphide.

2 c.c. of a 1 p.c. aqueous solution should be coloured green by 2 drops of Fuming Nitric Acid, and the colour should be changed to red by boiling with an additional 3 or 4 drops of the acid.

A colorimetric process for the determination of Antipyrine by means of the Nitrous Acid reaction.—*A.J.P.* '94, 321; *J.S.C.I.* '95, 199, 773; *P.J.* (3), xxiv. 71. Titration of Phenazone by volumetric solution of Iodine.—*J.S.C.I.* '95, 1072; *J.C.S. Abs.* '96, ii. 456; *Analyst* '97, 219.

Chloroform extracts Antipyrine from alkaline solution, but imperfectly from acid solution.

In acidified aqueous solution, it precipitates with Mayer's reagent, and also with Iodo-Potassium Iodide Solution, just like an alkaloid.

Not Official.

FERRIPYRIN.—A compound of Antipyrine and Ferric Chloride containing about 64 p.c. Antipyrine. Occurring as an orange-red powder, soluble in Water. In 20 p.c. solution it has been found useful as a hæmostatic or styptic. Useful in chlorosis and anæmia.—*B.M.J.* '95, i. 1382; *L.* '95, i. 1320; *B.M.J.E.* '95, i. 44; as analgesics, Ferripyrin, Tolypyrin, and Pyramidon appear to be neither beneficial nor harmful, and are therefore of no therapeutic value for the relief of urgent pain.—*Scot. Med. and Surg. Journ.* '96, iii. 442.

HYPNAL.—Is a crystalline compound of Antipyrine with Chloral Hydrate, has been recommended as a hypnotic; used in simple insomnia, delirium tremens and maniacal excitement.—*Pr.* l. 297; in the insomnia due to neuralgia or migraine, or the pyrexia of phthisis.—*M.P.* '94, i. 267. Dose.—15 to 30 grains.

MIGRAININE.—A registered name for a double Citrate of Caffeine and Antipyrine. A white, odourless powder, soluble in Water. Has been found useful in migraine and in neuralgia.—*C.D.* '95, i. 3; *P.J.* '97, ii. 18.

Pyramidon.—A methyl derivative of Antipyrine, is a yellowish-white crystalline powder, soluble in Water. Recommended as an antipyretic and analgesic.—*B.M.J.E.* '97, ii. 7, 84; *P.J.* '97, ii. 299; *see also under* 'Ferripyrin.' Dose.—5 to 20 grains in solution.

Tussol (Antipyrine Amygdalate).—In white granular crystals. Recommended in whooping cough. Dose, for young children, 1 to 2 grains; older children may take as much as 7 grains. It should not be taken with milk.—*L.* '95, i. 1452; *P.J.* (3), xxv. 912, 958.

SALIPYRIN (Antipyrine Salicylate).—A white crystalline powder, almost insoluble in water, soluble 1 in 4 of Alcohol (90 p.c.).

In uterine hæmorrhage, *B.M.J.E.* '93, ii. 82; *L.* '95, i. 1005; *P.J.* '95, ii. 363; a specific for influenza, *Y.B.T.* '95, 454; *B.M.J.E* '93, ii. 103; in peliosis rheumatica.—*B.M.J.E.* '97, i. 44; as an analgesic in painful states of rheumatic origin.—*B.M.J.* '98, ii. 1055.

Dose.—10 to 30 grains.

TOLYPYRIN.—A body allied to Antipyrine (Phenazone), readily soluble in Water.

Antipyretic and analgesic; and useful in acute rheumatism.—*L.* '94, ii. 991; *Pr.* l. 383; *see also under* 'Ferripyrin.'

PHENOL.

See ACIDUM CARBOLICUM.

Not Official.

PHLORIDZIN.

A glucoside obtained from various Rosaceous trees.

A light crystalline powder, whitish or pale yellow, slightly soluble in Water, 1 in 5 of Alcohol (90 p.c.).

It quiets irritability of the stomach. It induces artificial diabetes.

Dose.—5 to 15 grains, in **mixtures,** or in **pills** with Glucose.

PHOSPHORUS.

PHOSPHORUS.

P, eq. 30·80.

A solid non-metallic element obtained from Calcium Phosphate.

Solubility.—Slightly soluble in Absolute Alcohol and in Ether; 1 in 25 of Chloroform; 2 in 1 of Carbon Bisulphide, about 1 in 60 of Olive Oil; 1 in 60 of Oil of Turpentine; also in melted fats; insoluble in Water.

Medicinal Properties.—Given as a nervine tonic, and as a general stimulant. Useful in nervous exhaustion; during convalescence from acute diseases; in chronic neuralgia; in chronic paralysis if seat of lesion be spinal cord; as an aphrodisiac; in chronic scaly skin diseases; but without great success in leucocythemia and in bone diseases such as rickets. Poisonous doses affect principally the liver and kidneys, leading to fatty degeneration. The preparations are **Oleum** and **Pilula,** and it has been combined with Cod-Liver Oil and other menstrua; should be given with caution, as gastritis may be set up.

Sodium and Calcium Hypophosphites are other forms of giving loosely-combined Phosphorus.

In optic nerve atrophy, *M.A.* '95, 261; in pernicious anæmia, *B.M.J.* '95, i. 1084.

Dose, *in pill or solution.*—$\frac{1}{100}$ to $\frac{1}{20}$ grain.

Official Preparations.—Oleum Phosphoratum and Pilula Phosphori. Used in the preparation of Acidum Phosphoricum Concentratum and Calcii Hypophosphis.

Not Official.—Elixir Phosphori, Pilula Phosphori c. Sevo, and Tinctura Phosphori Composita.

Antidotes.—Stomach Tube, Emetics: Copper Sulphate is both emetic and antidote: 3 grains dissolved in Water every 5 minutes till vomiting is induced, then continue it in 1 grain doses every $\frac{1}{4}$ hour, with 10 drops of Solution of Morphine if rejected; also 30 drops of old or French Oil of Turpentine every half hour. Half an ounce of Epsom Salts as a purgative. Demulcent drinks, but avoid oils and fats.

Foreign Pharmacopœias.—Official in Belg., Dan., Dutch, Fr., Ger., Ital., Jap., Mex. (Fosforo), Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Austr. or Hung.

Description.—A semi-transparent waxlike solid, which emits white vapours and is luminous in the dark when exposed to the air.

Tests.—Sp. gr. 1·77. It is soft and flexible at common temperatures, melts at 110° F. (43·3° C.), ignites in the air at a temperature a little above its melting point, burns with a luminous flame and produces dense white fumes. 1 or 2 grammes should be attacked slowly and be dissolved without residue on being boiled with 5 or 10 c.c. of Nitric Acid diluted with an equal volume of Water, and the resulting solution should yield no characteristic reaction with the tests for Arsenium, and only the slightest reactions with the tests for Sulphates.

It should always be handled with caution and be cut under water.

Preparations.

OLEUM PHOSPHORATUM. Phosphorated Oil.

Heat Almond Oil in a porcelain dish to about 300° F. (149° C.), and keep it at this temperature for about fifteen minutes, then let it cool, and filter it through paper. Put 99 parts by weight into a stoppered bottle, capable of holding rather more than this quantity, and add to it 1 part by weight of dry Phosphorus. Immerse the bottle in hot water until the mixture has acquired the temperature of 180° F. (82·2° C.) removing the stopper two or three times to allow the escape of expanded air, then shake until the Phosphorus is entirely dissolved.

Dose—1 to 5 minims. =(about 1 in 100).

Foreign Pharmacopœias.—Official in Belg., 1 and 100 Olive Oil; Fr. and U.S., 1 in 100 Almond Oil and Ether; Mex. (Aceite fosforado), 1 in 100 Sesame Oil; Russ., 1 in 100 Almond Oil; not in the others.

Description.—A clear straw-coloured liquid; phosphorescent in the dark. It contains 1 p.c. of Phosphorus.

PILULA PHOSPHORI. Phosphorus Pill. (Altered.)

Phosphorus, 10 grains; White Beeswax, melted, 125 grains; Lard, melted, 125 grains; Kaolin, 115 grains; Carbon Bisulphide, 33 minims, or a sufficient quantity. Place the melted Wax and Lard in a slightly warmed mortar, and stir until the mixture has the consistence of cream. Dissolve the Phosphorus in the Carbon Bisulphide and carefully mix the solution with the melted fats; add the Kaolin; mix well together. Keep the mixture immersed in cold water in a bottle from which the light is excluded.

When dispensed, every 3 grains of the mixture is to be incorporated with 1 grain of Gum Acacia in powder; and the resulting pills should be varnished. =(1 in 90.)

Balsam of Tolu and Curd Soap now omitted, and Lard, Kaolin, Carbon Bisulphide, and Gum Acacia used.

Dose.—1 to 2 grains.

Phosphorus Pill, including the Gum Acacia, contains 2 p.c. of Phosphorus; hence, is nearly double the strength of the Phosphorus Pill of the British Pharmacopœia of 1885.

Foreign Pharmacopœias.—Official in U.S., about $\frac{1}{100}$th grain of Phosphorus in each pill; not in the others.

Not Official.

PILULA PHOSPHORI CUM SEVO.—(1) Phosphorus, 10 grains; Mutton Suet, 90 grains; Purified Carbon Bisulphide, 40 minims. Dissolve the Phosphorus in the Carbon Bisulphide, and incorporate with the Suet, previously rubbed into a smooth paste. (2) Starch, 60 grains; Powdered Liquorice Root, 60 grains; Powdered Soap, 40 grains; Powdered Tragacanth, 12 grains; Glycerin, 48 minims. Make into a pill mass.

No. 1 should be kept in a stoppered bottle, and incorporated with No. 2 as required for dispensing. One part of No. 1 with 8 parts of No. 2.

Each 3-grain pill will contain $\frac{1}{30}$th of a grain of Phosphorus.

ELIXIR PHOSPHORI (*B.P.C.*).—Compound Tincture of Phosphorus, 1; Glycerin, 4: add the Tincture to the Glycerin, with agitation; should be preserved from the light. Each fluid drachm contains $\frac{1}{30}$ grain of Phosphorus.

Dose.—15 to 60 minims.

U.S. (Elixir Phosphori), contains 21 of Spiritus Phosphori in 100.

TINCTURA PHOSPHORI COMPOSITA (*B.P.C.*).—Phosphorus, 12 grains; Chloroform, 2½ fl. oz.: place in a stoppered bottle and apply the heat of a water-bath until dissolved. Then add the solution to Ethylic Alcohol 12½ fl. oz. Shake well. This tincture should be preserved from the light in accurately stoppered bottles. Each fluid drachm contains $\frac{1}{10}$ grain of Phosphorus.

Dose.—3 to 12 minims.

U.S. (Spiritus Phosphori), 1·2 in 1000.

Not Official.

PHYSALIS ALKEKENGI.

WINTER CHERRY.

The *Solanum Vesicarium* of the old dispensatories.

The ripe berries are full of seeds; they yield half their weight of juice.

Foreign Pharmacopœias.—Official in Fr., Alkékenge; not in the others.

Preparation.

TINCTURA PHYSALIS.—Dried Berries, 2; Alcohol (60 p.c.), 8: digest 7 days.

Dose.—1 to 2 fl. drm. Diuretic and febrifuge.

PHYSOSTIGMATIS SEMINA.

CALABAR BEAN.

The ripe seeds of *Physostigma venenosum*.

Medicinal Properties.—Myotic, antispasmodic, expectorant. Used in chorea and general paralysis of the insane and other spasmodic nervous diseases and in large doses for tetanus; it increases most of the secretions, and is occasionally used in acute pneumonia and bronchitis. The salts of the alkaloid **physostigmine** are used in ophthalmic work; *see under* 'Physostigminæ Sulphas.'

Traumatic Tetanus cured by Calabar Bean, $\frac{1}{8}$ grain of the Extract given every hour, increasing the dose according to symptoms.—*L.* '67, i. 265; '68, i. 434, 463; and by $\frac{1}{12}$ grain injections of Eserine Sulphate; *T.G.* '94, 632.

Stimulates the liver, but not powerfully unless given in large doses.—Dr. Rutherford.

Official Preparation.—Extractum Physostigmatis. Used to prepare Physostigminæ Sulphas.

Not Official.—Tinctura Physostigmatis.

Foreign Pharmacopœias.—Official in Belg., Semen Calabariense; Dutch, and Jap., Semen Physostigmatis; Fr., Fève du Calabar; Mex., Haba de Calabar; Port., Fava do Calabar; Span., Haba del Calabar; Swed., Semina Calabar; U.S., Physostigma; not in the others.

Description.—Large reddish-brown or chocolate-brown, oblong reniform seeds, usually about one inch (twenty-five millimetres) long, three-quarters of an inch (eighteen millimetres) broad, and half an inch (twelve millimetres) thick. A broad dark furrow extends nearly the entire length of the curved margin. The testa is hard, thick, and somewhat rough, and encloses two firm white starchy cotyledons between which there is a large cavity. The Bean has no characteristic taste, and no odour.

Considerable discrepancies exist in the published matter regarding the Calabar Bean.

(1.) In 1876 it was stated that the bean contained two alkaloids, Physostigmine and Calabarine, the latter physiologically antagonistic to the former, differing in Ether solubility, &c. This has never been corroborated, and from the experiments of MacEwan (*C.D.* '87, i. 193) does not seem to apply to beans and extract as met with in commerce.

(2.) According to *P.J.* (3), xv. 594, commercial extracts might contain from 1 to 10·5 p.c. of alkaloid. The probability is that the very low figures are due to the use of a weak Alcohol in preparing the extract, but some of the higher figures point rather to the use of a variety of bean, *P. cylindrospermum*, of great alkaloidal strength, a quantity of which was imported about 1878, but which has not been seen on the market since.

(3.) From *P.J.* (3) xv. 593, it would appear that although (66 p.c.) Alcohol gives an extract of only half the alkaloidal strength of one made with Alcohol (90 p.c.), the yield from the former is 3½ times as much as from the latter, so that nearly twice as much alkaloid is extracted. The inference is that if Extractum Physostigmatis is retained in B.P., a weaker Alcohol than Alcohol (90 p.c.) should be used in its preparation; but perhaps it would be better if the extract were discarded in favour of the crystallised alkaloidal salts.

28 lbs. of Calabar Beans, treated by us with Alcohol (90 p.c.), yielded 2·07 p.c. of extract; this extract yielded 5·74 p.c. of alkaloids, which is equal to nearly ·12 p.c. of alkaloids in the Beans.

The same powder treated with boiling Alcohol (90 p.c.) in an exhaustion apparatus yielded 4·66 p.c. of extract; which extract yielded 3·2 p.c. of alkaloids, which is equal to nearly ·15 p.c. of alkaloids in the Beans.

Preparation.

EXTRACTUM PHYSOSTIGMATIS. Extract of Calabar Bean. (Altered).

Calabar Bean, in No. 40 powder, 16; Alcohol (90 p.c.), 80; Milk Sugar, in fine powder, a sufficient quantity. Mix the powdered Calabar Bean with 20 of the Alcohol; set aside in a closed vessel for forty-eight hours, agitating occasionally; transfer to a percolator;

when the liquid ceases to pass, add the remainder of the Alcohol so that it may slowly percolate through the powder; remove the marc and subject it to pressure, add the expressed liquid to the percolate; filter; recover most of the Alcohol by distillation; transfer the residue to a counterpoised basin, and evaporate to the consistence of a very soft extract; weigh; then add three times its weight of Milk Sugar and mix thoroughly to produce a firm Extract.

Now made with Alcohol (90 p.c.) in place of Rectified Spirit and Milk Sugar added.

This preparation is one-fourth the strength of the Extract of Calabar Bean of the British Pharmacopœia of 1885.

See also note (3) under 'Description of Semina.'

Dose.—$\frac{1}{4}$ to 1 grain.

Foreign Pharmacopœias.—Official in Belg., Fr., Jap., Mex., Port., Span., Swed. and U.S.; Dutch, with 5 p.c. of Glycerin; not in the others.

Not Official.

TINCTURA PHYSOSTIGMATIS.—Calabar Bean, in coarse powder, 1; Alcohol (90 p.c.), 5: digest fourteen days.

Dose.—10 minims, gradually increasing.

Foreign Pharmacopœias.—Official in Fr., 1 and 5; Mex., 1 in 5; U.S., 15 in 100; not in the others.

PHYSOSTIGMINÆ SULPHAS.

PHYSOSTIGMINE SULPHATE.

[NEW.]

B.P.Syn.—Eserine Sulphate.

$(C_{15}H_{21}N_3O_2)_2$, H_2SO_4,H_2O. eq. 643·80.

The Sulphate of an alkaloid obtained from Calabar Bean.

Solubility.—Readily soluble in Water and in Alcohol (90 p.c.).

Medicinal Properties.—It is used to contract the pupil in ciliary paralysis due e.g. to diphtheria; to reduce intra-ocular tension in glaucoma, &c.; to prevent or reduce prolapse of the iris after corneal wounds; to diminish the amount of light in painful affections of the eye; to break down adhesions due to iritis, its use being alternated with that of Atropine; and to remove the prolonged dilatation and paralysis produced by the latter.

Dose.—$\frac{1}{60}$ to $\frac{1}{20}$ grain.

Official Preparation.—Lamellæ Physostigminæ.

Not Official.—Guttæ Physostigminæ, Guttæ Physostigminæ Fortiores, Guttæ Physostigminæ cum Cocaina, Physostigminæ Hydrobromidum, and Physostigminæ Salicylas.

Foreign Pharmacopœias.—Official in Belg., Fr., Ger., Mex. (Sulfato de Eserina), Span., and U.S.; not in the others.

Description.—In yellowish-white, minute crystals, becoming red by exposure to air and light, having a bitter taste, highly deliquescent, very soluble in Water, and soluble in Alcohol (90 p.c.).

Tests.—The aqueous solution is neutral to Litmus, and affords the reactions characteristic of Sulphates; when shaken with dilute Solution of Potassium Hydroxide it becomes red; and when mixed with Solution of Ammonia, and evaporated to dryness on a water-bath, it leaves a bluish residue, the solution of which in very dilute acids is dichroic, being red by reflected and blue by transmitted light. A minute fragment dissolved in a few drops of Fuming Nitric Acid yields a yellow liquid which, on evaporation on a water-bath darkens in colour, the residue when completely dried being of a green colour. A dilute aqueous solution applied to the eye causes contraction of the pupil. It leaves no ash when burned with free access of air.

Preparation.

LAMELLÆ PHYSOSTIGMINÆ. Discs of Physostigmine. (Altered.)

Discs of Gelatin, with some Glycerin, each weighing about $\frac{1}{80}$ grain (·0013 gramme), and containing $\frac{1}{1000}$ grain (·000065 gramme) of Physostigmine Sulphate.

Now made with Physostigmine Sulphate instead of Physostigmine.

Foreign Pharmacopœias.—Official in Ital., Dischi Oftalmici con Eserina; not in the others.

Books of Calabar Bean Paper and of Calabar Bean Gelatin, with divided squares, are also used by oculists to contract the pupil (after the use of Belladonna or Atropine), in order to bring back the vision to the normal state.

Not Official.

GUTTÆ PHYSOSTIGMINÆ (*L.O.H.*). — Physostigmine Sulphate, 2 grains; Water, 1 fl. oz.

GUTTÆ PHYSOSTIGMINÆ FORTIORES (*L.O.H.*).—Physostigmine Sulphate, 4 grains; Water, 1 fl. oz.

GUTTÆ PHYSOSTIGMINÆ CUM COCAINA (*L.O.H.*).—Physostigmine Sulphate, 1 grain; Cocaine Hydrochloride, 5 grains; Water, 1 fl. oz.

PHYSOSTIGMINÆ HYDROBROMIDUM.—In fibrous masses, non-deliquescent, very soluble in Water.

Foreign Pharmacopœias.—Official in Fr.; not in the others.

PHYSOSTIGMINÆ SALICYLAS.—*Syn.*—Eserinæ Salicylas.

Colourless acicular crystals, becoming coloured on exposure to light and air. Soluble 1 in 130 of Water; 1 in 15 of Alcohol (90 p.c.).

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Russ., Swiss and U.S.; not in the others.

Not Official.

PHYTOLACCA.

Both the **fruit** (Poke fruit) and the **root** (Poke root) of *Phytolacca decandra* are Official in U.S.P.

The Fluid Extract has been recommended for inflamed and painful mammæ, internally and as a local application.—*B.M.J.* '87, ii. 844.

It has also been used in orchitis.—*T.G.* '85, 622.

In large doses it is emetic, purgative, and slightly narcotic.

Preparations.

EXTRACTUM PHYTOLACCÆ RADICIS FLUIDUM (*U.S.*).—1 fluid ounce is equal to 1 ounce of the Root.

PHYTOLACCIN.—An eclectic remedy used in rheumatic and syphilitic conditions. Cholagogue and alterative, ¼ to ½ grain; purgative, 2 to 4 grains.

Is a powerful hepatic stimulant; it also slightly stimulates the intestinal glands.—*Dr. Rutherford.*

PICROTOXINUM.

PICROTOXIN.

A neutral principle obtained from the fruits of *Anamirta paniculata*.

Solubility.—1 in 334 of Water; 1 in 13½ of Alcohol (90 p.c.).

Medicinal Properties.—$\frac{1}{30}$ grain has been given as a remedy against immoderate sweating in phthisis.—*B.M.J.* '80, i. 96; '85, ii. 610. $\frac{1}{8}$ to $\frac{1}{4}$ grain given in epilepsy (*L.M.R.* '87, 155) but in this, as in other chronic nervous diseases, it has not been a success. $\frac{1}{114}$th of a grain effected a cure in a case of profuse sweating following influenza.—*L.* '95, ii. 668; *B.M.J.E.* '95, i. 35; *P.J.* '95, ii. 343. Externally used with caution as an **ointment** (1 grain to a drm.) for pediculi.

On account of its bitterness, it has been fraudulently used as a substitute for Hops in Beer, it is the more objectionable because of its poisonous properties.

Dose.—$\frac{1}{100}$ to $\frac{1}{25}$ grain.

Antidote.—Chloral and Picrotoxin are mutually antagonistic.

Foreign Pharmacopœias.—Official in Fr., Mex. and U.S.; not in the others.

Description.—In colourless and inodorous prismatic crystals, possessing a bitter taste.

Tests.—Melts at 378° F. (192·2° C.). It is soluble in 10 parts of Solution of Potassium Hydroxide, and the resulting liquid, on boiling immediately reduces Fehling's Solution.

This test may also be applied to a cold saturated solution in Water, 5 c.c. of which will give a distinct reaction. If to this quantity 1 c.c. Pavy's Solution be added, and the liquid boiled, the blue colour will completely disappear.

According to Meyer, commercial Picrotoxin is not constant in composition, the melting point of samples varying between 193° and 200° C. This should not be, since it is easy to obtain the pure article, melting at 199° to 200° C., by a few recrystallisations from Alcohol and Water. Picrotoxin is stated to be not a simple body but a compound containing 34 p.c. of Picrotin, and 66 p.c. of Picrotoxinin.—*P.J.* '98, i. 45.

Heated on Platinum foil, the crystals melt, forming a yellowish liquid, which, on further heating, becomes charred, and is at length completely dissipated. It dissolves in Sulphuric Acid with a saffron-yellow colour. Its aqueous solution is not precipitated by Test-solution of Mercuric Chloride, Solution of Platinic Chloride, or Solution of Tannic Acid (distinction from alkaloids).

PILOCARPINÆ NITRAS.

PILOCARPINE NITRATE.

$C_{11}H_{16}N_2O_2$, HNO_3, eq. 269·23.

The nitrate of an alkaloid obtained from Jaborandi Leaves.

Solubility.—1 in 8 of Water; 1 in 50 of Alcohol (90 p.c.).

Medicinal Properties.—A powerful diaphoretic and sialagogue. Is useful in the dropsy and thirst of Bright's disease, and to remove pleural and peritoneal effusion. It should be used with caution in cases of dropsy due to weakness or disease of the heart. It contracts the pupil, and has been used in detachment of the retina, glaucoma and intra-ocular hæmorrhage; in bronchitis and asthma; and in chronic poisoning by lead, arsenic or mercury.

$\frac{1}{30}$ grain three times a day given to moisten the mouth in diabetes and diminish thirst.—*L.* '84, ii. 275; *P.J.* (3), xxv. 1219. A case of convulsions during pregnancy treated by hypodermic injections, $\frac{1}{3}$ grain of Pilocarpine Hydrochloride.—*L.* '85, i. 1079; '86, i. 635, 1016. Useful in certain cases of deafness, especially of syphilitic origin, *B.M.J.* '85, i. 1192; '89, i. 471; '89, ii. 220; '90, ii. 86; *L.* '83, ii. 956; '89, ii. 643. On its use in affections of the ear, *L.* '91, i. 10; *B.M.J.* '90, i. 1125, 1300; '90, ii. 1511; '91, i. 49; '93, i. 407; '93, ii. 570. In jaundice, *L.* '89, i. 1157. In uræmia, *B.M.J.* '88, i. 188; caused untoward effects in uræmia, *M.A.* '95, 496; *L.* '97, i. 334; not so useful in Bright's disease when the uræmic stage has set in, *L.* '95, ii. 47; as a galactagogue, *L.* '85, ii. 885. In Menière's disease, *T.G.* '95, 88; *B.M.J.E.* '94, ii. 52; *T.G.* '94, 746. In acute hysterical insanity, *M.A.* '95, 333. In croup and all croupous diseases, *Y.B.T.* '95, 437. Contribution to the study of, *B.M.J.* '94, i. 1291. Dangers of its use, *B.M.J.E.* '94, i. 3. $\frac{1}{8}$ to $\frac{1}{4}$ grain twice daily in chronic eczema with the happiest results, *M.A.* '93, 209. In erysipelas, *T.G.* '94, 289; in acute and chronic urticaria, *T.G.* '94, 849; in acute articular rheumatism, *T.G.* '95, i. 177; hypodermically in labyrinthine disease, *B.M.J.* '94, ii. 1236; and other aural affections, *T.G.* '93, 602; in facial erysipelas, *B.M.J.E.* '94, i. 79. As an ointment containing ·05 to ·1 p.c. of the Nitrate with Vaseline in nephritis.—*L.* '95, ii. 47. In puerperal eclampsia ($\frac{1}{10}$ grain hypodermically).—*B.M.J.* '97, i. 367; '97, ii. 706; *L.* '97, i. 276. In some acute infectious diseases.—*T.G.* '98, 225. Although an ordinary dose of Pilocarpine produces sweating, small doses of $\frac{1}{60}$th to $\frac{1}{30}$th of a grain have the effect of checking excessive sweating.—*L.* '97, i. 334. The Hydrochloride in grippal pneumonia.—*P.J.* '95, ii. 470. Hydrochloride in influenzal pneumonia.—*B.M.J.E.* '95, ii. 104. Stated to be useless in the treatment of pneumonia.—*Pr.* lxi. 401. Various opinions on its value in uræmia; in carefully-selected cases, and as a means of initiating diaphoresis, which can be prolonged by other measures, Dr. Nestor Tirard thinks it is sometimes an extremely valuable drug, that the present relative disuse of it probably results from its former prolonged employment in inordinate doses, and that its sphere of usefulness should not be limited by possible errors of dosage or administration.—*B.M.J.* '98, ii. 1052.

Dose.—$\frac{1}{30}$ to $\frac{1}{2}$ grain.

The **Pilocarpine Hydrochloride** is preferred in all other countries, *see* p. 483, and is most frequently prescribed in London.

Not Official.—Guttæ Pilocarpinæ, Injectio Pilocarpinæ Nitratis, Pilocarpinæ Hydrochloridum, and Pilocarpine Phenate.

Foreign Pharmacopœias.—Official in Mex. and Span.; not in the others. Fr. and Mex. have Pilocarpine.

Description.—A white crystalline powder; soluble in 8 or 9 parts of cold Water; slightly soluble in cold, freely soluble in hot Alcohol (90 p.c.).

Tests.—Strong Sulphuric Acid forms with it a yellowish solution which, on the addition of Potassium Bichromate, gradually acquires an emerald-green colour. A dilute Aqueous Solution applied to the eye causes contraction of the pupil. It leaves no ash when burned with free access of air (absence of mineral impurity).

The B.P. omits to give the melting point of this salt, though it is essential since commercial Pilocarpine (according to Paul and Cownley) varies in composition as shown by the different melting points of several samples, namely 141·7°, 167·2°, 150·5° and 162·7° C. This variation might be expected from the results of the analyses of the different species of leaves (*see* Jaborandi) showing the presence of more than one alkaloid yielding crystalline nitrates. There is as yet no certainty about what is really to be understood by the name Pilocarpine. For example, an injection of 8 drops of a 3 p.c. solution of Pilocarpine Nitrate of a high melting point 167·2° C. produced the unusual effect of intense desire to micturate, with strangury and subsequent vomiting. According to Petit and Polonovski (*Journal Pharm. et de Chimie*, 15 April, 1897) pure Pilocarpine Nitrate melts at 177—178° C., and they state that Pilocarpine Nitrate frequently contains as much as 50 p.c. of a salt melting at 158° C., which they call 'Pilocarpidine' Nitrate, though it is not the same as Harnack's Nitrate, which melts at 129·2° C. The nearly equal solubility of the Pilocarpine Nitrates and Pilocarpidine allow them to crystallise together, with the Hydrochlorides the difference in solubility is much more marked, so that a Pilocarpine Hydrochloride can be obtained containing very little Pilocarpidine. The melting point of Pilocarpine Nitrate is materially lowered by the presence of Pilocarpidine Nitrate. With different species of Jaborandi the yield of Pilocarpidine varied from 5 to 75 p.c. of the total alkaloids, and is found in greater proportion in the stem than in the leaves.—*P.J.* '96, ii. 1; '97, i. 466; *J.S.C.I.* '97, 461; *J.C.S.Abs.* '97, i. 582.

Not Official.

GUTTÆ PILOCARPINÆ (*L.O.H.*).—Pilocarpine Nitrate, 2 grains; Distilled Water, 1 fl. oz.

INJECTIO PILOCARPINÆ NITRATIS (*L.O.H.*).—Pilocarpine Nitrate, 1 grain; Water, 20 minims.

PILOCARPINÆ HYDROCHLORIDUM.—Minute white crystals, deliquescent, neutral.

Very soluble in Water and Alcohol (90 p.c.).

According to Petit and Polonovski Pilocarpine Hydrochloride melts at 200° C. and is a more definite salt than the Nitrate, being more easily separated from accompanying Hydrochlorides of the other bases. It is said to be soluble in the proportion of 10 in 4 of Water and 1 in 10·5 of Alcohol (95 p.c.), whilst their Pilocarpidine Hydrochloride melted (when dehydrated) at 161° C. and was soluble 1 in ·27 of Water and 1 in 2·1 of Alcohol. The hydrated salt melts at 124° C.—*P.J.* '96, ii. 1, 437; '97, i. 466; *J.S.C.I.* '97, 461; *J.C.S.Abs.* '97, i. 582.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Jap., Mex., Norw. (Chloretum Pilocarpicum), Russ., Swiss and U.S.; not in the others.

PILOCARPINE PHENATE (Aseptoline).—A colourless, oily liquid, soluble in Water and in Alcohol, has been recommended in the treatment of phthisis and in intermittent fevers, 1 fl. drm. of a solution of 1 grain in 10 fl. oz. of 2¾ p.c. Carbolic Acid Solution injected into the abdominal wall.—*P.J.* '96, ii. 379; '98, i. 84.

PILULÆ.

PILLS.

This class of medicine, so convenient and portable, was introduced in the earliest Pharmacopœias, and some of the formulas remain almost unchanged. The Pilula Rufi (Pilula Aloes et Myrrhæ) has for at least two hundred years maintained practically the same composition, but in B.P. '98 the Saffron is omitted.

Excipients for pills are of two kinds: (1) those which are more or less fluid, and employed to bind together powders, or to impart the necessary moisture to adhesive substances; (2) those, generally in powder, which are intended to absorb moisture and give solidity to the mass. Of the former, 'Dispensing Syrup' (equal volumes of Alcohol (90 p.c.), Glycerin, Syrup, and Mucilage) and Glucose, are most in request; Alcohol (60 p.c.) also is very useful. Glycerin by itself is distinctly inferior to the foregoing. Glycerin of Tragacanth is much employed, but in the majority of cases where it would be used, we should prefer Glucose, either by itself or mixed with an equal weight of Syrup. Of the powders, that of Liquorice root is most useful when moisture is to be absorbed and no binding power is required. An unexpected exception is the case of Carbolic Acid, which makes a very good plastic mass with twice its weight of Liquorice powder (when well worked together, the result is very satisfactory). When more plasticity is required, the absorbent powder is supplemented with Compound Tragacanth Powder, or powdered Gum Acacia. For Essential Oils this condition is best obtained by the use of powdered Curd Soap; as a rule, one minim of the Oil will require half a grain of the Soap and two grains of the Liquorice. A mixture of Paraffins (Massa Paraffini), with or without Kaolin (Massa Kaolin), is used for substances which are readily reduced by organic matter, such as the Permanganates, and the salts of Gold and Silver. It 'goes without saying' that an excipient must not be chemically incompatible with the other ingredients, but there is not much opportunity for such an occurrence, with those above selected.

Coatings.—Pills have been finished in various ways: rolled in Flour, Starch, Magnesia, Liquorice powder, and in Lycopodium, or a mixture of these; enveloped in Silver or Gold Leaf; coated with Ether-Alcoholic solution of Tolu or better of Sandarach (Ether 2, Absolute Alcohol 6, Sandarach 3), or with Gelatin or French Chalk. Pills containing substances exceedingly soluble in Alcohol should not be varnished, as the varnish may dissolve some part of the pill.

When pills are intended to pass through the stomach, and to be disintegrated in the intestine, they are coated with a solution of Keratine, *see* p. 390.

The following are contained in the British Pharmacopœia, the formulas for which will be found under the names of the substances from which they are prepared:—

	Proportions of active ingredient in the mass.
PILULA ALOES BARBADENSIS	about 1 in 2.
PILULA ALOES ET ASAFETIDÆ	Aloes 1, Asafetida 1 in 4.
PILULA ALOES ET FERRI	Aloes 2, Iron (Exsic.) 1 in 9.
PILULA ALOES ET MYRRHÆ	Aloes 1, Myrrh ½, in 2¼.
PILULA ALOES SOCOTRINÆ	about 1 in 2.

	Proportions of active ingredient in the mass.
PILULA CAMBOGIÆ COMPOSITA	about 1 in 6.
PILULA COLOCYNTHIDIS COMPOSITA	Col. 1, Aloes 2, Scam. 2, in 6.
PILULA COLOCYNTHIDIS ET HYOSCYAMI	{ Pil. Col. Co. 2 / Ext. Hyos. 1. } in 3.
PÍLULA FERRI	Iron Carbonate about 1 in 5.
PILULA GALBANI COMPOSITA	Galb. 1, Asafetida 1 in 3½.
PILULA HYDRARGYRI	Mercury 1 in 3.
PILULA HYDRARG. SUBCHLORIDI COMPOSITA	about 1 Calomel in 4½.
PILULA IPECACUANHÆ CUM SCILLA	about 3 Dover's Powder in 7.
PILULA PHOSPHORI	Phosphorus 1 in 50.
PILULA PLUMBI CUM OPIO	Lead Acetate 6, Opium about 1 in 8.
PILULA QUININÆ SULPHATIS	5 in 6.
PILULA RHEI COMPOSITA	Rhubarb 2, Aloes 1½ in 8.
PILULA SAPONIS COMPOSITA	1 Opium in 5.
PILULA SCAMMONII COMPOSITA	Resin Scam. 1, Resin Jalap 1 in 3½.
PILULA SCILLÆ COMPOSITA	Squill about 1 in 4.

PIMENTA.

PIMENTO.

The dried full-grown unripe fruit of *Pimenta officinalis*.

From the West Indies.

Medicinal Properties.—A warm aromatic stimulant and carminative like Cloves; used as an adjuvant to tonics and purgatives.

Dose.—Not given in B.P.; 10 to 30 grains in powder.

Prescribing Notes.—The **Oil** may be given on **sugar**, or in **pill** with Liquorice powder and soap, *see* p. 484.

Official Preparations.—Aqua Pimentæ and Oleum Pimentæ.

Foreign Pharmacopœias.—Official in Mex., Pimienta Gorda; Port., Pimenta da Jamaica; Span., Pimienta de la Jamaica; U.S.; not in the others.

Description.—Dark reddish-brown, nearly globular, two-celled fruits, varying usually from one-fifth to one-third of an inch (five to eight millimetres) in diameter. The pericarp is rough externally, brittle, and crowned by the remains of the four-toothed calyx in the form of a raised ring, surrounding the remains of the style. Each cell contains a single brownish-black reniform seed. Odour and taste warm and aromatic, characteristic, somewhat resembling those of Cloves.

Preparations.

AQUA PIMENTÆ. PIMENTO WATER. (ALTERED.)

Pimento, bruised, 4; Water, 160: distil one-half. =(1 in 20).

Now 1 in 20 instead of 1 in 11½.

Dose.—Not given in B.P.; 1 to 2 fl. oz.

(Not in the other Pharmacopœias.)

OLEUM PIMENTÆ. OIL OF PIMENTO.

The Oil distilled from Pimento.

Solubility.—In all proportions of Alcohol (90 p.c.); about 1 in 50 of Alcohol (60 p.c.).

Dose.—½ to 3 minims.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Description.—Yellow or yellowish-red when recently distilled, but gradually becomes darker. It has the odour and taste of Pimento.

Tests.—Sp. gr. not below 1·040. It should be converted into a semi-solid mass when shaken with an equal volume of Strong Solution of Ammonia.

1 minim dissolved in 60 minims of Alcohol (90 p.c.), and treated with 1 minim of a very dilute solution of Ferric Chloride, turns a fine indigo blue colour. This is also the case with Oil of Cloves, which Oil of Pimento very much resembles in chemical constitution.

PINI OLEUM.

OIL OF PINE.

[NEW.]

The oil distilled from the fresh leaves of *Pinus Pumilio*.

This is also sold under the names 'Pinol' and 'Pumiline.'

Solubility.—About ⅘ dissolves 1 in 5 of Alcohol (90 p.c.), but the remaining ⅕ is much less soluble.

Medicinal Properties.—The vapour is a mild stimulant and disinfectant in chronic catarrhal affections of the respiratory passages. It is also applied externally in rheumatism. Internally the dose is 1 to 5 minims taken on **sugar**, or in the form of **jujube**.

Dose.—Not given in B.P.; 1 to 5 minims.

Not Official.—Extractum Pini Pumilionis.

Foreign Pharmacopœias.—Official in Austr. and Swiss; not in the others.

Description.—Colourless or nearly so, with a pleasant aromatic odour and pungent taste.

Tests.—Sp. gr. ·865 to ·870. It should rotate the plane of a ray of polarised light from 5° to 10° to the left at 60° F. (15·5° C.) in a tube 100 millimetres long. Not more than 10 p.c. should distil below 329° F. (165° C.).

Not Official.

EXTRACTUM PINI PUMILIONIS.—A liquid extract, of a brown colour, prepared from the young shoots of the Pinus Pumilio. It is used in baths.

Not Official.

PINI SYLVESTRIS OLEUM.

The oil distilled from the fresh leaves of *Pinus sylvestris*.

Solubility.—1 in 7½ of Alcohol (90 p.c.); in all proportions of Absolute Alcohol.

Medicinal Properties.—Similar to those of Oil of Turpentine. It is also used externally in rheumatism, and as an inhalation or spray with hot water in chronic laryngitis, bronchitis and phthisis.

Foreign Pharmacopœias.—Official in Hung., sp. gr. ·872; Russ., Oleum Pini Foliorum, sp. gr. ·870—·880; not in the others.

Description.—Colourless, or nearly so, with an agreeable odour.

Many oils sold as Pinus Sylvestris, yield, on fractionation, 60 to 70 p.c., boiling below 167° C. Rotation varies with the time of year at which the oil is collected, climate and locality. Sp. gr. should not be below ·880, and not more than 15 p.c. should distil below 170° C.—*P.J.* '95, ii. 161, 542; *C.D.* '95, ii. 202.

Preparation.

VAPOR OLEI PINI SYLVESTRIS.—Fir-wool Oil, 40 minims; Light Magnesium Carbonate, 20 grains; Water a sufficiency: rub the Fir-wool Oil with the Magnesium Carbonate and gradually add sufficient Water to produce 1 fluid ounce.

Place 1 fl. drm. of this mixture with half a pint of cold Water and half a pint of boiling Water into an apparatus so arranged that air may be made to pass through the solution and may afterwards be inhaled.

PIPER NIGRUM.

BLACK PEPPER.

The dried unripe fruit of *Piper nigrum*.

Chiefly from the East Indies.

Medicinal Properties.—A warm carminative stimulant and stomachic. Chiefly used to assist gastric digestion and correct flatulence. Acts as a local stimulant on the mucous membrane of the rectum, whence it is useful in hæmorrhoids, ulcer, fistula, and other rectal diseases; also on the mucous membrane of the urethra, similarly to Cubebs. In intermittent fever it may be used as an adjuvant to Quinine.

Official Preparation.—Confectio Piperis. Contained in Pulvis Opii Compositus.

Not Official.—Oleo-Resina Piperis, Piperinum, Piperidine, Piperidine Guaiacolate, Piperidine Tartrate.

Foreign Pharmacopœias.—Official in Belg.; Fr., Poivre Noir; Mex., Pimienta Negra; Port., Pimenta; Span., Pimisuta Nigra; U.S.; not in the others.

Description.—Almost black, nearly globular, inferior, one-celled fruits, usually about one-fifth of an inch (five millimetres) in diameter. The pericarp is deeply and reticulately wrinkled, and contains a single seed that completely fills the cavity. Odour aromatic; taste pungent.

The ash of genuine Black Pepper varies from 4 to 6 p.c.

Preparation.

CONFECTIO PIPERIS. Confection of Pepper.

Black Pepper, in fine powder, 2; Caraway fruit, in fine powder, 3; Clarified Honey (by weight), 15: Mix. =(1 in 10).

Dose.—60 to 120 grains.

(Not in the other Pharmacopœias.)

Not Official.

OLEO-RESINA PIPERIS (*U.S.*)—Obtained from Pepper by exhaustion with Ether, and separation from the Piperine.

Dose.—$\frac{1}{4}$ to 1 minim, given in **pill.**

PIPERINUM (*U.S.*).—A neutral principle obtained from Piper nigrum and also from other plants of the natural order Piperaceæ. It possesses antipyretic properties, but it is not the active principle of Pepper.

In intermittent fever.—*B.M.J.* '86, ii. 449, 613.

Dose.—2 to 8 grains.

PIPERIDINE.—Is produced by the hydrolysis of Piperine, the alkaloid occurring in pepper, or synthetically by the reduction of Pyridine by nascent Hydrogen. Is a colourless limpid liquid boiling and distilling unchanged at 106° C. It is a powerful base.

PIPERIDINE GUAIACOLATE.—A compound of Piperidine and Guaiacol. A yellowish-white crystalline body, having a faint odour of Guaiacol. It melts at 80° C. Soluble in Water. Mineral acids and alkalis decompose it into its constituents. Has been recommended in the treatment of phthisis.—*B.M.J.* '97, i. 136; *J.C.S.Trans.* '98, 145.

Dose.—5 to 30 grains.

PIPERIDINE TARTRATE.—The Acid Tartrate is a white crystalline powder possessing a faint odour. Readily soluble in Water. Has been introduced as a solvent for gouty deposits, uric acid gravel and calculi. It increases the solvent power of serum for sodium biurate to a much larger extent than Piperazine, Lysidine or Urotropine.—*L.* '98, ii. 198, 280, 345, 433, 507.

Dose.—10 to 15 grains.

Not Official.

PIPERAZINE.

$C_4H_{10}N_2$, eq. 85·52.

Piperazine (Diethylene-diamine) is produced by action of Ammonia on Ethylene Bromide or Chloride.

Medicinal Properties.—It has a powerful solvent action on Uric Acid, the Piperazine Urate being about seven times more soluble than Lithium Urate. It has been recommended for gouty affections in general, rheumatoid arthritis, and renal calculus and colic.—*T.G.* '93, 19; '94, 192; '95, 99; *B.M.J.* '94, i. 1291; *B.M.J.E.* '93, ii. 20; *Pr.* li. 134; liii. 265.

Little or no effect in gouty states.—(Sir Wm. Roberts and Bohland) *Pr.* liii. 50; in diabetes.—*B.M.J.E.* '93, ii. 72; action as a Uric Acid solvent.—*B.M.J.* '96, ii. 901.

Dose.—5 to 15 grains.

Prescribing Notes.—Usually given in **mixture,** also in Aërated Water, or as a granular effervescing preparation.

Description.—Colourless deliquescent crystals, readily soluble in Water. When anhydrous it melts at 104° to 107° C., and boils at 145° C.

LYCETOL (Dimethylpiperazine Tartrate).—A white powder, readily soluble in water, possessing an acid taste. Has been recommended in the treatment of chronic gout and rheumatism.

Dose.—5 to 10 grains.

Not Official.

PISCIDIA.

Syn.—JAMAICA DOGWOOD.

The bark of the root of *Piscidia erythrina*.

The shrub is a native of South America and the West Indies, where it has been used for stupefying fish.

Medicinal Properties.—Hypnotic, anodyne. Introduced as a substitute for Opium, but without producing the implied effects of the latter. A sedative in irritant cough; an antispasmodic in asthma.

Has been used in neuralgia and toothache.—*P.J.* (3) xvi. 1014.

Has been found useful in nervous debility and nervous irritability.—*T.G.* '88, 102.

Preparation.

EXTRACTUM PISCIDIÆ LIQUIDUM.—1 fluid ounce is equal to 1 ounce of the root.

Dose.—30 to 120 minims.

PIX BURGUNDICA.

BURGUNDY PITCH.

The resinous exudation obtained from the stem of *Picea excelsa*, melted and strained.

Imported from Germany.

Solubility.—Almost entirely dissolves 1 in 20 of Alcohol (90 p.c.); the greater part dissolves 1 in 1½ of Glacial Acetic Acid.

Medicinal Properties.—The Plaster is applied to the chest in chronic pulmonary complaints, to the loins in lumbago, to the joints in chronic articular affections, and to other parts to relieve local pain of a rheumatic character. It acts as a counter-irritant.

Official Preparation.—Emplastrum Picis.

Foreign Pharmacopœias.—Official in Belg. and U.S., Pix Burgundica; Fr., Poix de Bourgogne; Hung., Resina Pini Burgundica; Ital., Pece di Borgogna; Mex. and Span., Pez de Borgona; Swed., Resina Pini Flava; Port., Pez de Borgonha; Swiss, Resina Pini; not in Austr., Dan., Dutch, Ger., Jap., Norw., or Russ.

It is the Thus or Frankincense of Lond. and Dub. Pharmacopœias. It exudes from the spruce fir, and when melted and strained is called Burgundy Pitch.

Description.—Hard and brittle, yet gradually taking the form of the vessel in which it is kept; somewhat opaque, dull reddish-brown or yellowish-brown, fracture clean and conchoidal. Odour aromatic, especially when heated; taste sweet, aromatic, without bitterness. Readily soluble in Glacial Acetic Acid.

Preparation.

EMPLASTRUM PICIS. PITCH PLASTER. (ALTERED.)

Burgundy Pitch, 26; Frankincense, 13; Resin, 4½; Yellow Beeswax, 4½; Olive Oil (by weight), 2; Distilled Water, 2: add the Olive Oil and the Water to the Frankincense, Burgundy Pitch, Resin, and Beeswax, previously melted together; evaporate with constant stirring to a proper consistence.

The Expressed Oil of Nutmeg is now omitted.

Foreign Pharmacopœias.—Official in U.S., Yellow Wax 3, Olive Oil 1, Burgundy Pitch 16; Belg., Fr., Port., Span. and Swiss, Yellow Wax 1, Burgundy Pitch 3; Dan. (Emplastrum Picis), Pitch 8, Yellow Wax 8, Suet 1, Colophonium 8; Ital. (Empiastro Adesivo), Yellow Wax 3, Burgundy Pitch 7, Diachylon Plaster 40; Mex. (Emplasto Aglutinante), Pitch 74, Elemi 10, Sesame Oil 6, Yellow Wax 10; Swed., Resina Pini Flava 6, Pitch 4, Yellow Wax 2, Venetian Turpentine 1; not in the others.

PIX CARBONIS PRÆPARATA.

PREPARED COAL TAR.

[NEW.]

Prepared by placing commercial Coal Tar in a shallow vessel, and maintaining it at a temperature of 120° F. (48·9° C.) for one hour, stirring frequently.

Official Preparation.—Liquor Picis Carbonis.

Not Official.—Liquor Carbonis Detergens.

Foreign Pharmacopœias.—Official in Fr., Goudron de Houille; not in the others.

Preparation.

LIQUOR PICIS CARBONIS. Solution of Coal Tar. (New.)

Prepared Coal Tar (by weight), 4; Quillaia Bark, in No. 20 powder, 2; Alcohol (90 p.c.), a sufficient quantity. Moisten the powdered Quillaia Bark with 1 of the Alcohol, and complete the percolation process with the remainder of the Alcohol as for Tinctures, 20 being produced. To the resulting percolate add the Prepared Coal Tar, and digest the mixture at 120° F. (48·9° C.) for two days, occasionally stirring. Cool and decant, or filter.

Not Official.

LIQUOR CARBONIS DETERGENS.—An alcoholic solution of Coal Tar, as obtained from the gas-works. It is almost black, smells strongly of Naphthalene, and is of light specific gravity. Used externally in chronic scaly skin diseases diluted about 1 in 20 of Water.

Coal Tar in dermatological practice.—*B.M.J.E.* '94, ii. 88.

PIX LIQUIDA.

TAR.

A bituminous liquid, obtained from the wood of *Pinus sylvestris* and other species of Pinus, by destructive distillation. Known in commerce as Stockholm Tar.

It contains Guaiacol and Creosol. Coal tar yields Phenol and Cresol.

Solubility.—In less than its own bulk of Alcohol (90 p.c.) or Chloroform, and separates on the addition of Water; soluble 1 in 3 of Solution of Soda (4 p.c.); slightly soluble in Olive Oil or Oil of Turpentine.

Medicinal Properties.—Similar to Turpentine. May be used internally as a disinfectant expectorant in chronic bronchitis and winter cough, taken internally or inhaled from hot water. As an ex-

ternal application in cases of lepra, pruritus, and also for some chronic skin diseases, such as eczema and psoriasis.

Dose.—Not given in B.P.; 5 to 10 minims; but larger doses may be given.

Prescribing Notes.—May be given in **capsules**, or in **pills** with Liquorice powder.

Official Preparation.—Unguentum Picis Liquidæ.

Not Official.—Unguentum Picis Molle, Aqua Picis, Capsulæ Picis, Pigmentum Picis Liquidæ, Pilulæ Picis, Syrupus Picis Liquidæ, Black Pitch.

Foreign Pharmacopœias.—Official in all; Dan. Norw. and Swed., Pyroleum Pini; Fr., Goudron Végétal, obtained from *Pinus maritima*; Ital., Catrame vegetale; Mex., Alquitran; Port., Alcatrao; Span., Brea.

Description.—A dark-brown or blackish semi-liquid substance, of a peculiar aromatic odour.

Tests.—Sp. gr. varies from 1·02 to 1·15. Water agitated with it acquires a pale-brown colour, sharp empyreumatic taste, and acid reaction, and with dilute Test-solution of Ferric Chloride assumes a red colour. Tar is completely soluble in 10 times its volume of Alcohol (90 p.c.).

Preparation.

UNGUENTUM PICIS LIQUIDÆ. Tar Ointment.

Tar (by weight), 5; Yellow Beeswax, 2. Melt the Beeswax at a low temperature; add the Tar; stir the mixture until cold.

This ointment is too hard for use. A proper consistence is obtained by replacing half of the Yellow Beeswax with Almond Oil (*see* Ung. Picis Molle).

Applied in cases of psoriasis and in tinea capitis.

Foreign Pharmacopœias.—Official in Belg., Tar 1, Lard 4; Dan., Pitch 9, Lard 6, Potassium Carbonate 3, Water 2; Dutch (Ung. Picis), Pix Solida 3, Resin 3, Yellow Wax 2, Olive Oil 12; Fr. (Pommade de Goudron), and Port., Tar 1, Lard 9; Span., Tar 8, Lard 30; U.S., Tar 4, Yellow Wax 1, Lard 3; not in the others.

Not Official.

UNGUENTUM PICIS MOLLE.—Tar (by weight), 5; Yellow Beeswax, 1; Almond Oil, 1: melt together and stir till cold.

AQUA PICIS (Tar Water).—Stir a pint of Tar with half a gallon of Water for fifteen minutes, and decant.

Dose.—From 1 to 2 pints daily, or may be used as a wash for ulcers and wounds.

Foreign Pharmacopœias.—Official in Belg. (Aq. Picis Concentrata), Tar 50, Sodium Bicarbonate 3, Water 200; and Aqua Picis is made with Aq. Picis Conc. 3, Water 97; Dutch, Tar 1, Water 20; Fr. (Eau de Goudron), Tar 1, Pine Sawdust 3, Water 200; Ger., Tar 1, Pumice 3, Water 10; Dan. and Norw. (Aqua Pyrolei Pini), and Swed. (Infusum P. P.), 1 in 10; Mex. (Agua de Alquitran), Tar 5, Water 1000; Port. (Agua de Alcatrao), 1 in 40; Span. (Agua de Brea), 1 in 24; Swiss, Tar 1, Sawdust 1, Cold Water 10; Russ., Birch Tar 1, Water 30: not in Austr., Hung., Ital., Jap., or U.S.

CAPSULÆ PICIS.—Capsules containing 5 minims.

Dose.—1 or 2 capsules.

PIGMENTUM PICIS LIQUIDÆ (*B.S.H.*).—Tar 1; Alcohol (90 p.c.) 1.

Used as a stimulant in cases of psoriasis and of chronic dry eczema.

Its use in eczema demands caution.

PILULÆ PICIS.—Tar and Liquorice Powder, equal weights mixed, and made into five-grain pills.

Dose.—2 or 3 pills thrice daily.

They are sometimes made of Black Pitch, and have been taken to relieve hæmorrhoids.

SYRUPUS PICIS LIQUIDÆ (*U.S.*).—Mix Tar 15 intimately with about 20 of White Sand, pour on 30 of Water, and stir frequently for 12 hours; pour off the Water and throw it away. Pour boiling Distilled Water 80 upon the residue, stir well and frequently for 15 minutes, add Glycerin 20, and set the vessel aside for 24 hours, occasionally stirring; decant the clear solution and filter. Dissolve Sugar 160 in the filtrate with the aid of a gentle heat; allow the liquid to cool, then strain it, and pass enough Water through the strainer to make the product measure 200: mix thoroughly.

May be prescribed with Syrup of Wild Cherry Bark.—*B.M.J.* '88, i. 463, 569; *M.P.* '89, i. 213.

BLACK PITCH.—There are three kinds, Archangel, Swedish, and that obtained from Gas Tar; the latter is without odour. Pitch **pills** are sometimes recommended to increase the size and weight of the body.

Not Official.

PLUMBUM.

LEAD.

Pb, eq. 205·35.

Sp. gr. 11·3; fuses at about 617° F. (325° C.). Lead occurs in nature as an Oxide, and as a Sulphide called *Galena;* also in saline combination, forming the native Lead Sulphate, Phosphate, Carbonate, Chromate, Molybdate, Tungstate, and Arsenate. The native Oxide is rare, but Galena, the ore from which nearly all the Lead of commerce is extracted, is exceedingly abundant.

Lead salts are distinguished when in solution from those of any other metal, by giving white precipitates with soluble Chlorides and Sulphates, insoluble in any dilute acid; yellow precipitates with Chromates and Iodides; a black precipitate with Sulphuretted Hydrogen from an acid solution. All of these precipiates (except the Sulphides) are soluble in excess of hot caustic alkali.

The Official Tests for the presence of Lead will be found in the Appendix.

Incompatibles.
Antidotes. } Are given after Plumbi Subacetatis Liquor.

PLUMBI ACETAS.

LEAD ACETATE.

$Pb(C_2H_3O_2)_2$, $3H_2O$, eq. 376·15.

A salt obtained by dissolving Lead Oxide or Lead Carbonate in Acetic Acid.

Solubility.—1 in 2 of Water; 6 in 1 of boiling Water; 1 in 20 of Alcohol (90 p.c.); 1 in 2 of Glycerin.

Medicinal Properties.—In small doses it is sedative and astringent, lessening morbid mucous discharges and hæmorrhages in the gastro-intestinal and genito-urinary tracts, and even diminishing natural secretions; whence it is useful in diarrhœa, dysentery,

cholera, and in tubercular and typhoid ulceration. Used in phthisis to check excessive expectoration, and to allay hæmorrhage; in bronchitis to abate profuse secretion. Its prolonged use requires caution, otherwise chronic lead poisoning may be induced. It is often accompanied or followed by a small dose of Acetic Acid, as excess of acid makes it less injurious to the system. Externally, it is sedative, desiccant, and astringent, diminishing profuse discharges of ulcers; used for injection in gonorrhœa and other chronic inflammatory discharges; in ophthalmia and in sprains and bruises and cutaneous inflammations.

In large doses somewhat lessens the secretion of bile, probably by direct action on the liver.—Dr. Rutherford.

Dose.—1 to 5 grains.

Prescribing Notes.—May be given in **pills** with Compound Tragacanth Powder and Dispensing Syrup, q.s., also in **solution,** with excess of Acetic Acid.

Incompatibles.—Sulphuric and Tannic acids, and their salts; Chlorides and Iodides.

Official Preparation.—Unguentum Plumbi Acetatis. Used in the preparation of Glycerinum Plumbi Subacetatis, Liquor Plumbi Subacetatis Fortis. Contained in Pilula Plumbi cum Opio and Suppositoria Plumbi Composita.

Not Official.—Lotio Plumbi Acetatis.

Antidotes.—Same as under Plumbi Subacetatis Liquor.

Foreign Pharmacopœias.—Official in all; Austr., Ger., and Swiss., Plumbum Aceticum; Hung. and Russ., Plumbum Aceticum Depuratum; Dan., Dutch, Norw., and Swed., Acetas Plumbicus; Belg., Acetas Plumbi; Fr., Acétate Neutre de Plomb; Ital., Acetate Neutro di Piombo; Mex., Acetato de Plomo; Port., Acetato de Chumbo; Span., Acetato Plumbico.

Description.—In small white monoclinic prisms, slightly efflorescent, having an acetous odour and a sweet astringent taste. It is soluble in less than 3 parts of cold Water, and in 30 parts of Alcohol (90 p.c.).

Tests.—Its solution in Water slightly reddens Litmus, and is clear, or has only a slight milkiness, which disappears on the addition of Acetic Acid. It affords the reactions characteristic of Lead and of Acetates. It should yield no characteristic reaction with the tests for Silver, Copper, Arsenium, Iron, Zinc, Calcium, Sodium, Potassium, Ammonium, Chlorides, or Nitrates. Each gramme dissolved in Water should require for complete precipitation 53·1 c.c. of the Decinormal Volumetric Solution of Sulphuric Acid.

Dott has shown (*P.J.* (3) xxi. 475) that in a solution containing practically $\frac{1}{3}$ p.c. of Lead Acetate, and Acid equivalent to 6 p.c. of Hydrochloric Acid (not $\frac{1}{3}$ p.c. as reported in *P.J.*), Sulphuretted Hydrogen Gas will produce no precipitate.

Preparations.

PILULA PLUMBI CUM OPIO. Pill of Lead with Opium. (Modified.)

Lead Acetate, in fine powder, 36 grains; Opium, in powder, 6 grains; Syrup of Glucose, 4 grains, or a sufficient quantity. Mix to form a mass.

Now made with Syrup of Glucose in place of Confection of Roses.

Dose.—2 to 4 grains.

This pill contains about 12½ p.c. of Opium.

A four-grain pill contains about 3 grains of Plumbi Acetas and ½ grain Pulvis Opii.

Foreign Pharmacopœias.—Official in Port., Lead Acetate, 5; Extract of Opium, 1; Extract of Liquorice, 14; not in the others.

SUPPOSITORIA PLUMBI COMPOSITA. Compound Lead Suppositories.

Lead Acetate in powder, 36 grains; Opium in powder, 12 grains; Oil of Theobroma, a sufficient quantity for 12 suppositories. Proceed as directed for Tannic Acid Suppositories.

Each of these Suppositories contains 3 grains (or ·2 gramme) of Lead Acetate, and 1 grain (·067 gramme) of Opium.

UNGUENTUM PLUMBI ACETATIS. Lead Acetate Ointment. (Altered.)

Lead Acetate, in fine powder, 20 grains; Paraffin Ointment, white, 480 grains. Mix. =(1 in 25).

Now 1 in 25 instead of 1 in 37½, and made with White Paraffin Ointment in place of Benzoated Lard.

Foreign Pharmacopœias.—Official in Austr. and Hung., Lead Acetate 3, Lard 150, White Wax 50, Water 10; Dan. and Ital., Lead Acetate 1, Benzoated Lard 9; Norw., Lead Acetate 1, Olive Oil 14, Yellow Wax 5; not in the others.

Not Official.

LOTIO PLUMBI ACETATIS (*L.O.H.*).—Lead Acetate, 2 grains. Diluted Acetic Acid, 2 minims, Water to 1 fl. oz.

PLUMBI CARBONAS.

LEAD CARBONATE.

$2PbCO_3$, $Pb(OH)_2$, eq. 768·91.

Lead Carbonate or Hydroxy-carbonate may be prepared by the interaction of Lead, Water, and Carbonic Anhydride in the presence of vapours of Acetic Acid.

Solubility.—Insoluble in water; soluble, with effervescence, in Diluted Nitric Acid and Acetic Acid.

Medicinal Properties.—Employed externally as an astringent and sedative, or as an ointment for ulcers and inflamed and excoriated surfaces.

Official Preparation.—Unguentum Plumbi Carbonatis.

Foreign Pharmacopœias.—Official in Austr., Hung., Jap., and Russ., Plumbum Carbonicum; Belg., Ger., and Swiss, Cerussa; Dan., Norw., and Swed., Hydratocarbonas Plumbicus; Dutch, Carbonas Plumbicus; Fr., Carbonate de Plomb; Mex., Carbonato de Plomo; Port., Alvaiade; Span., Albayalde Cerusa; U.S., Plumbi Carbonas; not in Ital.

Description.—A soft, heavy, white powder.

Tests.—Entirely soluble in diluted Acetic Acid. It affords the reactions characteristic of Lead and of Carbonates. It should yield no characteristic reaction with the tests for Zinc, Calcium, or Magnesium.

Preparation.

UNGUENTUM PLUMBI CARBONATIS. LEAD CARBONATE OINTMENT. (ALTERED.)

Lead Carbonate, in fine powder, ¼; Paraffin Ointment, white, 2¼. Mix. =(1 in 10).

Now 1 in 10 instead of 1 in 8, and White Paraffin Ointment used in place of Simple Ointment.

Foreign Pharmacopœias.—Official in Austr., Hung., Norw., Russ. and Swed., 1 in 3; Belg., 1 in 6¼; Dan., 3½ in 10; Dutch, Mex. (Unguento Blanco simple) and Port., 1 in 5; Ger., 3 in 10; Span. 10 in 28; U.S., 1 in 10; Fr., Pommade de Carbonate de Plomb, 1 in 6; not in Ital., Jap. or Swiss.

PLUMBI IODIDUM.

LEAD IODIDE.

PbI_2, eq. 457·15.

Precipitated Lead Iodide, is obtained by the interaction of Lead Nitrate or Acetate and Potassium Iodide.

Solubility.—Sparingly soluble in cold Water; more soluble in boiling Water; soluble also in solutions of Acetates, and of Ammonium Chloride.

Medicinal Properties.—Used externally as a resolvent to chronic swellings and indolent joint enlargements; also in the form of **pessaries.**

In 'dispersible' tumours of the mamma.—*B.M.J.* '94, ii. 972.

Official Preparations.—Emplastrum Plumbi Iodidi, and Unguentum Plumbi Iodidi.

Not Official.—Pessus Plumbi Iodidi et Atropinæ, and Pessus Plumbi Iodidi et Opii.

Foreign Pharmacopœias.—Official in U.S.; Belg., Ioduretum Plumbi; Fr., Iodure de Plomb; Mex., Yoduro de Plomo; Port., Iodato de Chumbo; Russ. and Swiss, Plumbum Iodatum; Span., Ioduro Plumbico; Swed., Iodetum Plumbicum; not in the others.

Description.—A heavy, bright-yellow powder, soluble in about 2000 parts of cold and in about 200 parts of boiling Water, and deposited in golden-yellow crystalline scales as the latter solution cools, entirely soluble in Solution of Ammonium Chloride.

Tests.—It affords the reactions characteristic of Lead and of Iodides. It should yield no characteristic reaction with the tests for Nitrates or Acetates.

Preparations.

EMPLASTRUM PLUMBI IODIDI. LEAD IODIDE PLASTER.

Lead Iodide, 2; Lead Plaster, 16; Resin, 2. Finely powder the Iodide of Lead; mix it with the Lead Plaster and Resin previously melted together at as low a temperature as possible. =(1 in 10).

UNGUENTUM PLUMBI IODIDI. LEAD IODIDE OINTMENT. (ALTERED.)

Lead Iodide, in fine powder, ¼; Paraffin Ointment, yellow, 2¼. Mix. =(1 in 10).

Now 1 in 10 instead of 1 in 8, and Yellow Paraffin Ointment used in place of Simple Ointment.

Foreign Pharmacopœias.—Official in Fr., Port., Swiss and U.S., 1 and 9; Mex., Pomada, 1 and 9; Span., 4 and 30; not in the others.

An ointment of **Cadmium Iodide** of the same strength has been recommended as a substitute; it is said not to stain the skin.

Not Official.

PESSUS PLUMBI IODIDI ET ATROPINÆ.—Lead Iodide, 10 grains; Atropine Sulphate, $\frac{1}{8}$ grain; (Gelatin) Basis, 60 grains.

PESSUS PLUMBI IODIDI ET OPII.—Lead Iodide, 5 grains; Opium in powder, 2 grains; Oil of Theobroma, 12 grains.

PLUMBI OXIDUM.

LEAD OXIDE.

B.P.Syn.—LITHARGE.

PbO, eq. 221·23.

Lead Oxide is prepared by the action of air on melted Lead.

Official Preparation.—Emplastrum Plumbi. Used in the preparation of Liquor Plumbi Subacetatis Fortis, Plumbi Acetas, and Glycerinum Plumbi Subacetatis. **Lead Plaster** is contained in Emplastrum Hydrargyri, Emplastrum Plumbi Iodidi, Emplastrum Resinæ, and Emplastrum Saponis.

Not Official.—Ung. Diachylon Hebræ, Dr. Pearson's Cerate, and Plumbi Oleas.

Foreign Pharmacopœias.—Official in Austr., Hung., Russ., and Swiss, Plumbum Oxydatum; Belg. and Ger., Lythargyrum; Dan., Norw., and Swed., Oxydum Plumbicum; Dutch, Oxydum Plumbicum Semivitreum; Fr., Oxyde (Proto) de Plomb Fondu; Ital., Protossido di Piombo; Jap., Mex., Oxido de Plomo; Port., Oxydo de Chumbo; Span., Litargirio; U.S., Plumbi Oxidum.

Description.—Heavy scales of a pale yellowish-red colour.

Tests.—Completely soluble in Diluted Nitric Acid and in Acetic Acid. It gives the reactions of Lead, but should yield no characteristic reaction with the tests for Copper, Iron, or Carbonates.

Preparation.

EMPLASTRUM PLUMBI. LEAD PLASTER. *N.O.Syn.*—DIACHYLON PLASTER.

Lead Oxide, in fine powder, 1; Olive Oil (by weight), 2; Distilled Water, 1, or a sufficient quantity. Boil all the ingredients together gently by the aid of a steam-bath; keep them simmering for 4 or 5 hours, stirring constantly until the product acquires a proper consistence for a plaster; add more of the Distilled Water during the process if necessary.

It is practically a Lead Oleate with mechanically included Glycerin.

Equal weights of Lead Plaster and Soap Plaster melted together, form an excellent plaster for corns.

Foreign Pharmacopœias.—Official in Austr. and Hung. (Empl. Diachylon Simplex), Litharge 1, Lard 2; Belg., Litharge 2, Olive Oil 2, Water 1, Lard 2; Dan., Litharge 5, Olive Oil 10, Water 1; Dutch, Ger., Port. and Russ., Litharge 1, Lard 1, Olive Oil 1, Water *q.s.*; Fr., Litharge 1, Lard 1, Olive Oil 1, Water 2; Ital., Norw., Span. and Swed., Litharge 1, Olive Oil 2, Water *q.s.*; Jap., Litharge

I., Olive Oil 1, Lard 1; Mex. (Emplasto Simple), Litharge 2, Lard 4, Water 3; Swiss and U.S. (Empl. Plumbi), Litharge 16, Olive Oil 30, Water *q.s.*

Not Official.

UNG. DIACHYLON. HEBRÆ (modified by Professor Kaposi).—Simple Lead Plaster, 1; Soft Paraffin, 1: melt with heat.

DR. PEARSON'S CERATE.—Lead Plaster 4, Yellow Beeswax 1, Oil of Almonds 3; melt and mix.

PLUMBI OLEAS.—Lead Acetate, 280 grains; dissolve in Distilled Water, 40 fl. oz.; add slowly Solution of Sodium Oleate (1 Castile Soap in 20, p. 650), 20 fl.oz.; warm gently, wash by decantation, collect and dry.

Melted with equal parts of Lard or Lard oil to form an **ointment.**

PLUMBI SUBACETATIS LIQUOR FORTIS.

STRONG SOLUTION OF LEAD SUBACETATE.

B.P.Syn.—Goulard's Extract.

Subacetate of Lead, $Pb_2O(C_2H_3O_2)_2$, eq. 543·74; dissolved in water.

Medicinal Properties.—When largely diluted, it is used externally as an astringent and sedative for inflammation arising from sprains, bruises, &c. As an astringent **gargle** (½ fl. drm. to 6 fl. oz. Rose Water).

Incompatibles.—Hard Water, Mineral acids, vegetable acids, Alkalis, Potassium Iodide, all astringents, preparations of Opium, Mucilage of Acacia.

Official Preparations.—Glycerinum Plumbi Subacetatis, Liquor Plumbi Subacetatis Dilutus, and Unguentum Glycerini Plumbi Subacetatis.

Not Official.—Cremor Lithargyri, Unguentum Plumbi Tannici, and Glycerinum Tannatis Plumbi.

Antidotes.—Sodium Sulphate, Epsom Salts, succeeded by emetics, and afterwards by Opium and liberal libations of Milk, or white of Egg mixed with Water.

A course of Potassium Iodide is useful in eliminating Lead from the system.

L. '81, ii. 779, gives an unusual source of Lead poisoning, from shot found in a bottle full of Port wine; an appreciable quantity of Lead was found in solution.

Foreign Pharmacopœias.—Official in all; U.S., sp. gr. 1·195; Plumbum Aceticum Basicum Solutum, Austr. and Hung., sp. gr. 1·230—1·240, Russ., sp. gr. 1·235—1·240; Belg., Subacetas Plumbi Liquidus, sp. gr. 1·240; Solution Subacetatis Plumbici, Norw. and Swed., sp. gr. 1·170—1·175; Dan., sp. gr. 1·165—1·170; Dutch, Solutio Acetatis Plumbici Basici, sp. gr. 1·235—1·240; Fr., Sous-Acétate de Plomb Liquide, sp. gr. 1·320; Ger., Liquor Plumbi Subacetici, sp. gr. 1·235—1·240; Ital., Acetato Basico di Piombo, sp. gr. 1·260; Jap., sp. gr. 1·23—1·24; Mex., Acetato de Plomo Liquido, sp. gr. not given; Norw., sp. gr. 1·165—1·170; Port., Soluto de Subacetato de Chumbo, sp. gr. 1·260; Span., Acetato (sub) Plumbico Liquido, sp. gr. not given; Swiss, Plumbum Subaceticum Solutum, sp. gr. 1·236—1·240.

O.M.P.—Lead Acetate, 5; Lead Oxide, in powder, 3½; Distilled Water, a sufficient quantity. Boil the Lead Acetate and the Lead Oxide in 20 of Distilled Water for half an hour, constantly stirring, and maintaining the volume of the liquid by occasional addi-

tions of Distilled Water; filter; when the liquid is cold add sufficient Distilled Water to produce 20 of the Strong Solution.

Digestion in the cold for a week answers equally well, if not better, than the half-hour's boiling.

Description.—A clear, colourless liquid, with alkaline reaction and sweet astringent taste. It becomes turbid by exposure to the air.

Tests.—Sp. gr. 1·275. It forms with Mucilage of Gum Acacia an opaque white jelly. It affords the reactions characteristic of Lead and of Acetates. Each gramme should require for complete precipitation 17 c.c. of the Decinormal Volumetric Solution of Sulphuric Acid.

Preparations.

GLYCERINUM PLUMBI SUBACETATIS. Glycerin of Lead Subacetate.

Lead Acetate, 5; Lead Oxide, in powder, 3½; Glycerin, 20; Distilled Water, 12: mix; boil for a quarter of an hour; filter; evaporate at a temperature not exceeding 222° F. (105·5° C.) until the product weighs 32¾, and has a sp. gr. of 1·48.

Foreign Pharmacopœias.—Official in Port., Solution, 1, Glycerin 9; not in the others.

LIQUOR PLUMBI SUBACETATIS DILUTUS. Diluted Solution of Lead Subacetate. *B.P.Syn.*—Goulard's Lotion; Goulard Water. (Modified.)

Strong Solution of Lead Subacetate, 2 fl. drm.; Alcohol (90 p.c.), 2 fl. drm.; Distilled Water, a sufficient quantity. Mix the Alcohol with 19½ fl. oz. of recently boiled and cooled Distilled Water; add the Strong Solution of Lead Subacetate and shake. =(1 in 80).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Foreign Pharmacopœias.—Official in Austr. and Hung. (Aqua Goulardi), Solution 2, Alcohol (70°) 5, Water 100, also (Aqua Plumbica), Solution 1, Water 50; Belg. (Aqua Vegeto-Mineralis Goulardi), Solution 2, Alcohol (92°) 3·5, Water 100; Swed. (Solutio Subacetatis Plumbici Diluta); Dan. (Aqua Saturnini), Solution 2, Alcohol (60°) 8, Water 90; Dutch (Aqua Plumbi), Solution 1, Water 20; Fr. (Lotion dite de Goulard), Solution 2, Alcohol (60°) 8, Water 90; also (Lotion à l'Acetate de Plomb), Solution 1, Water 50; Ger. (Aqua Plumbi), Solution 1, Water 49; Ital. (Acqua con Acetato Basico di Piombo), Solution 1, Water 50; Jap., Solution 2, Water 98; Mex. (Agua de Vegeto), Solution 3, Eau de Cologne 5, Water 92; Norw. (Aqua Saturnina) Solution 2, Dilute Spirit 8, Water 90; Port. (Aqua Saturnina Alcoolisada), Solution 2, Alcohol (85°) 8, Water 90; also (Aqua Saturnina), Solution 1, Water 50; Russ. (Aqua Plumbi Spirituosa), Solution 2, Alcohol (70°) 8, Water 90; also (Aqua Plumbi), Solution 1, Water 49; Span. (Agua Vegeto-Mineral), Solution 4, Alcohol (90°) 7, Water 345; Swiss (Aqua Plumbi), Solution 1, Water 49; U.S., Solution 3, Water 100.

UNGUENTUM GLYCERINI PLUMBI SUBACETATIS. Lead Subacetate Ointment. (Modified.)

Glycerin of Lead Subacetate (by weight), 1; Paraffin Ointment, white, 5. Mix. =(1 in 6).

Now made with White Paraffin Ointment in place of Hard and Soft Paraffin.

Foreign Pharmacopœias.—Official in Belg. (Unguent. Subacetatis Plumbi), 1 in 3; Dutch (Ung. Plumbici Basici), 1 in 2; Fr. (Cérat Saturné), 1 in 10; Ger. and Swiss (Unguentum Plumbi), 1 in 10; Russ. (Ung. Plumbi Acetici), 1 in 12; Swed. (Ung. Subacetatis Plumbici), 3 in 20; U.S. (Ceratum Plumbi Subacetatis), 1 in 5; not in the others.

Not Official.

CREMOR LITHARGYRI.—Solution of Lead Subacetate, 1; Cream, 7: mix. Useful as an application in eczema.

UNGUENTUM PLUMBI TANNICI.

Ger., Tannic Acid 1, Liquor Plumbi 2, Lard 17.

Hung. and Swiss, Tannic Acid 1, Liquor Plumbi 2, Vaseline 17.

Russ., Tannic Acid 1, Glycerin 2, Liquor Plumbi 6, Ung. Cerei 24.

Swed., freshly precipitated Lead Tannate 2, Glycerin 1.

GLYCERINUM TANNATIS PLUMBI.

Belg., freshly precipitated Lead Tannate 3, Glycerin of Starch 2.

This preparation has been recommended for bed-sores and sore nipples.

PODOPHYLLI RHIZOMA.

PODOPHYLLUM RHIZOME.

B.P. Syn.—Podophyllum Root.

The dried rhizome and roots of *Podophyllum peltatum*.

Imported from North America.

Medicinal Properties.—The **resin** is an active cholagogue and in large doses purgative. In doses of $\frac{1}{8}$ to $\frac{1}{4}$ grain it is a common ingredient of pills for habitual constipation associated with torpid liver. Combined generally with Henbane or Belladonna to prevent griping.

It is best given, not in purgative, but in cholagogue dose, combined with purgatives such as Mercury and Colocynth.

Official Preparations.—Podophylli Resina and Tinctura Podophylli.

Not Official.—Tinctura Podophylli Ammoniata.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Ital., Port., Span. and U.S.; not in the others.

Description.—Dark reddish-brown, smooth or only slightly wrinkled, nearly cylindrical pieces, several inches in length, and from about one-fifth to one-third of an inch (five to eight millimetres) in thickness. The rhizome is enlarged at intervals of about two inches (five centimetres) and the upper surface of each enlargement is marked by a depressed circular scar, below which, on the under surface, are rather stout brittle brown roots, or the scars corresponding to them. It breaks with a short fracture, and internally is either nearly white and starch-like, or pale yellowish-brown and horny. The odour is characteristic, the taste slightly bitter and acrid.

It has been suggested that the root of *Podophyllum Kmodi*, growing in Northern India, might also be admitted to the B.P. The earlier examination showed it to be about $2\frac{1}{2}$ times as rich in resin as the ordinary variety, the resin being medicinally active in $\frac{1}{2}$ grain doses.—*P.J.* (3) xix. 585.

A second examination showed the resin to be efficacious in $\frac{1}{4}$ grain doses, but questioned its agreement in solubility with B.P.—*P.J.* (3) xxi. 445.

A detailed analysis has since been made showing the percentage of resin to be nearly double that from *P. peltatum*, but that the proportion of active constituent in the resin was little more than half. Its action was also stated to be very uncertain. —*P.J.* (3) xxiii. 207.

In a comparison of Indian and American Podophyllin it has been more recently shown that the resin obtained from *P. Emodi* is as valuable a purgative as that obtained from *P. peltatum*, but as it gelatinises with Solution of Ammonia it will not conform to the B.P. requirements.—*J.C.S. Trans.* '98, 209; *P.J.* '98, i. 213.

6 grains Resin with 1 fl. drm. of diluted Alcohol and 8 or 10 drops of Liquor Potassæ should not gelatinise on shaking. Indian Resin assumes a semi-solid gelatinous mass, and on this account is unsuitable in the place of *P. peltatum*.—*P.J.* '98, i. 304.

Preparations.

PODOPHYLLI RESINA. Podophyllum Resin. *N.O.Syn.*—Podophyllin.

Podophyllum Rhizome, in No. 40 Powder, 16; Alcohol (90 p.c.), 60, or a sufficient quantity; Distilled Water and Hydrochloric Acid, of each a sufficient quantity. Exhaust the Podophyllum with the Alcohol by percolation; place the resulting tincture in a still; recover the greater part of the Alcohol; acidulate the Distilled Water with one twenty-fourth of its bulk of Hydrochloric Acid, and slowly pour the liquid which remains after the distillation of the tincture into three times its volume of the acidulated Water, constantly stirring; allow the mixture to stand for twenty-four hours to deposit the Resin; wash the Resin on a filter with Distilled Water, and dry it at a temperature not exceeding 100° F. (37·7° C.).

B.P. '67 precipitated in Water containing Hydrochloric Acid 1 in 24; U.S. employs 1 in 100; B.P. '85 omitted the acid altogether, but it is generally admitted that a slight acidification is an advantage, particularly to facilitate the 'settling' and filtration in the collection of the Resin.

Dose.—¼ to 1 grain.

A very powerful stimulant of the liver, and also of the intestine.—Dr. Rutherford.

Foreign Pharmacopœias.—Official in Belg., Dan., Ger., Hung., Russ., and Swiss, Podophyllinum; Dutch, Jap., Norw., Port., and U.S., Resina Podophylli; U.S. has also an Extract and Fluid Extract; Fr., Resine de Podophyllum Peltatum; Ital., Podofillina; Mex. and Span., Podofilina; not in Austr. or Swed.

Description.—An amorphous powder of a bitter taste, varying in colour from pale yellow to deep orange-brown; soluble or nearly so in Alcohol (90 p.c.) and in Solution of Ammonia; precipitated from the former solution by Water, from the latter by acids. Partly soluble in Ether.

Test.—It should not yield more than 1 p.c. of ash upon incineration.

The variations in colour appear to depend upon the heat applied during its preparation; by distilling quickly and drying at a low temperature the lightest tints are obtained. It is difficult to find a commercial sample *perfectly* soluble in cold Alcohol (90 p.c.), and many will not give clear solutions even with addition of Ammonia. The insoluble matter, however, should not exceed 10 p.c.

More than half the weight of Podophyllum Resin should dissolve in cold Chloroform, the residue being generally reckoned as medicinally inert. If the Chloroformic solution be evaporated to small bulk and poured into an excess of Ether another

inert body (Podophyllic Acid) is precipitated. If the Ether-chloroform solution be now added to a large excess of Petroleum Ether there is precipitated a compound called **Podophyllotoxin,** supposed to contain the whole medicinal elements of the resin. For a still further fractionation of Podophyllotoxin, *see P.J.* (3) xii. 217, and *Y.B.P.* '82, 158, and for its laxative action, *L.* '94, ii. 212.

Badly adulterated specimens are frequently detected by a high percentage of ash; it may be as low as ½ p.c. and should not exceed 2 p.c.

TINCTURA PODOPHYLLI. TINCTURE OF PODOPHYLLUM. (ALTERED.).

Podophyllum Resin, 320 grains; Alcohol (90 p.c.), a sufficient quantity. Add the Podophyllum Resin to 18 fl. oz. of the Alcohol, and set aside for twenty-four hours, occasionally agitating; filter; pass sufficient of the Alcohol through the filter to produce 20 fl. oz. of the Tincture.

Now made with Alcohol (90 p.c.) instead of Rectified Spirit.

Dose.—5 to 15 minims.

1 fl. drm. equals 2 grains of Podophyllum Resin.

This Tincture contains twice the proportion of Podophyllum Resin ordered for the corresponding preparation in the British Pharmacopœia of 1885.

(Not in the other Pharmacopœias.)

Not Official.

TINCTURA PODOPHYLLI AMMONIATA. — Podophyllum Resin, 24 grains; Alcohol (90 p.c.), 2 fl. oz.; Solution of Ammonia, 1 fl. oz.: dissolve.

The Resin does not separate on the addition of Water.

Dose.—10 to 30 minims. 1 fl. drm. contains 1 grain of the Resin.

Not Official.

POTASSIUM.

POTASSIUM.

K, eq. 38·83.

Potassium was discovered by Sir Humphrey Davy in 1807. It is a soft metal (sp. gr. ·865), cutting like wax, of a silver-white colour, but tarnishes the instant it is cut, and assumes a leaden colour. It has so great an affinity for Oxygen, that when thrown upon Water it combines with it, evolving heat enough to set the liberated Hydrogen on fire, and a solution of Potassium Hydroxide is the result.

Potassium salts are characterised by the violet colour imparted to a bunsen flame (red through blue glass); in aqueous solution by the formation of crystalline Potassium Hydrogen Tartrate on the addition of Tartaric Acid, Sodium Acetate being also added when the Potassium is combined with a mineral Acid; and by giving a yellow crystalline precipitate with Platinic Chloride, if the Potassium be present as Chloride, if not Hydrochloric Acid must be added.

The best general reagent for Potassium salts is probably a saturated aqueous solution of Picric Acid. With a 1 p.c. solution of Potassium Nitrate a crystalline precipitate is obtained with a few seconds' shaking. With the use of Tartaric Acid no reaction is obtainable in 4 hours.

The Official Tests for the presence of Potassium will be found in the Appendix.

The prolonged use of Potassium salts is apt to lead to a depressant effect on muscular tissue, including that of the heart; in people with weakness of that organ this should be borne in mind.

POTASSA CAUSTICA.

POTASSIUM HYDROXIDE.

B.P.Syn.—Caustic Potash; Potassium Hydrate. Hydrate of Potassium, *B.P.* '85.

Potassium Hydroxide, **KOH**, eq. 55·71, with not more than 10 p.c. of combined water and impurities, prepared by the interaction of Potassium Carbonate with Calcium Hydroxide.

Commercial samples examined (*P.J.* (3) xxii. 393) showed only 60 to 90 p.c. of Hydroxide. We find the general range to be between 78 and 85 p.c.

Solubility.—2 in 1 of Water; 1 in 3½ of Alcohol (90 p.c.); 1 in 3 of Glycerin; 1 in 4 of Alcohol (60 p.c.) (if stronger than this the Alcohol separates).

Medicinal Properties.—A powerful escharotic. Has been much used for the destruction of tumours and the surface of malignant ulcers; to stimulate unhealthy and foul ulcers; and to form issues.

Official Preparation.—Liquor Potassæ; used in the preparation of Potassii Permanganas.

Not Official.—Brandish's Alkaline Solution, and Potassa cum Calce (Vienna Paste).

Foreign Pharmacopœias.—Official in Austr. and Hung., Kalium Hydroxydatum; Belg., Potassa Caustica Fusa; Dan., Norw., and Swed., Hydras Kalicus; Fr., Potasse Caustique à la Chaux, also à l'Alcool; Ger. and Russ., Kali Causticum Fusum; Ital., Potassa Caustica; Jap., Kali Causticum; Mex., Oxido de Potasio; Port., Hydrato de Potassa; Span., Hidrato Potasico, also Potassa Caustica por la Cal; Swiss, Kalium Hydricum; U.S., Potassa; not in Dutch.

Description.—In hard white pencils or cakes, very deliquescent, powerfully alkaline and corrosive.

Commercial Potash as a rule contains 1 or 2 p.c. of Chloride derived from the Carbonate used in its preparation. When required *pure* it is dissolved in Absolute Alcohol, and the solution evaporated as far as practicable without access of air to avoid absorption of Carbonic Acid. No commercial samples, however, are quite free from Carbonate.

Tests.—It affords the reactions characteristic of Potassium. Each gramme dissolved in Water or in Alcohol (90 p.c.) should leave only a trace of sediment, and should require for neutralisation at least 16·1 c.c. of the Volumetric Solution of Sulphuric Acid. It should yield no characteristic reaction with the tests for Lead, Copper, or Arsenium.

The test indicates nearly 90 p.c. KOH, which few commercial samples approach, although such a standard is easy of attainment.—*P.J.* (3) xxiii. 619. *See* above.

Preparation.

LIQUOR POTASSÆ. Solution of Potash.

An aqueous solution containing in 110 minims 6·2 grains, or in 1 fl. oz. 27 grains, of Potassium Hydroxide, KOH.

Medicinal Properties.—Antacid and antilithic. Occasionally employed as an antacid in dyspepsia, accompanied by acidity and

gastralgia. It is apt to irritate the stomach, and so, to obtain all the best internal effects of Potash, the Bicarbonate and Citrate are much to be preferred. Externally as an escharotic against the bite of rabid or venomous animals; diluted, it relieves itching.

Dose.—10 to 30 minims, freely diluted.

Solution of Potash should be preserved in a green glass bottle furnished with an air-tight stopper.

It acts powerfully on all organic matter, converting flannel into a kind of soft jelly after immersion for five or six hours.

Incompatibles.—Acids, acid salts, metallic salts, the preparations of Ammonium, Belladonna, Henbane, and Stramonium.

Antidotes.—Diluted Acetic Acid, Citric Acid, Lemon Juice, or any vegetable acids, fixed oils and demulcents; stimulants; Morphine for pain; neither stomach-tube nor emetics are to be used.

Foreign Pharmacopœias.—Official in U.S., sp. gr. 1·036 (5 p.c.); Belg., Potassa Caustica Soluta, sp. gr. 1·330—1·340; Ger., Liquor Kali Caustici, Russ., Kali Causticum Solutum, sp. gr. 1·126—1·130 (15 p.c.); Span., Solucion de Potassa Caustica, sp. gr. 1·334; Swiss, Kalium Hydricum Solutum, sp. gr. 1·33; not in the others.

Description.—A colourless, odourless, and transparent liquid having a nauseous taste. It is strongly alkaline.

Tests.—Sp. gr. 1·058. It should not yield any characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Calcium, Magnesium, Sodium, or Ammonium, and should be free from more than traces of Carbonates, Chlorides, or Sulphates. 9 c.c. should require for neutralisation 10 c.c. of the Volumetric Solution of Sulphuric Acid, corresponding to ·557 gramme of Potassium Hydroxide, KOH, or to 6·19 grammes in 100 c.c., or to 5·85 grammes in 100 grammes.

When freshly made, Solution of Potash usually contains a little Lime in solution, but as it absorbs Carbonic Acid the Lime will be thrown out.

Not Official.

BRANDISH'S ALKALINE SOLUTION.—American Pearl-ash, 6 lbs.; freshly prepared Quicklime, 2 lbs.; Wood-ashes, 2 lbs.; Boiling Water, 6 gallons; or 6, 2, 2, and 60 parts: add first the Lime, then the Pearl-ash, and lastly the Wood-ashes to the Boiling Water, stir well together, let it stand twenty-four hours, and decant the clear liquor.

Dose.—½ to 2 fl. drm. in Milk. Given for scrofulous conditions.

POTASSA CUM CALCE (Vienna Paste).—Potassium Hydroxide and Calcium Hydroxide, equal weights: powder and mix; it is made into a paste with Alcohol (90 p.c.) or Glycerin.

Foreign Pharmacopœias.—Official in U.S.; Ital., Potassium Hydroxide 5, Lime 6; Mex. (Pasta de Viena) Potassium Hydroxide 1, Lime 1; Russ. (Pasta Caustica) Potassa 3, Lime 1.

The paste is spread on the part to be cauterised, and is allowed to remain for ten or fifteen minutes, while the surrounding skin is protected by adhesive plaster. It is also used in the treatment of lupus.

Potassa cum Calce **in cylinders**, consisting of two parts of Potassa and 1 of Lime was introduced by Dr. Henry Bennet, and is a suitable form for the use of obstetricians.

POTASSA SULPHURATA.

SULPHURATED POTASH.

B.P.Syn.—Liver of Sulphur.

A mixture of salts of Potassium, of which the chief are Potassium Sulphides.

Solubility.—1 in 2 of Water.

Medicinal Properties.—Similar to those of Sulphur, but more energetic. Externally it is a good remedy for scabies and other parasitic cutaneous diseases; used also for chronic eruptions, especially psoriasis and acne. Internally it is occasionally used for chronic rheumatism, bronchitis, and chronic skin diseases.

A hot bath of Sulphurated Potash relieves the itching of jaundice.—*L.* '85, ii. 1220.

Dose.—Not given in B.P.; 2 to 6 grains.

Not Official.—Balneum Sulphuretum.

Foreign Pharmacopœias.—Official in all; U.S.; Austr., Ger., Jap., Russ. and Swiss, Kalium Sulfuratum; Austr. and Hung. have Kalium Sulfuratum pro Balneo; Belg., Sulphuretum Potassii Officiale; Dan., Norw., and Swed., Hepar Sulphuris; Dutch, Trisulphuretum Kalicum; Fr., Sulfure de Potassium Solide; Ital., Solfuro di Potassio; Mex., Sulfuro de Potasio; Port., Potassa Sulfurada; Span., Sulfuro (tri) Potasico.

O.M.P.—Potassium Carbonate, in powder, 2; Sublimed Sulphur, 1. Mix the Potassium Carbonate, previously dried, and the Sulphur, in a warm mortar; introduce them into a crucible; heat this, at first gradually, until effervescence has ceased, and finally to dull redness, so as to produce perfect fusion; pour out the liquid contents of the crucible on a clean flagstone, and cover quickly with an inverted porcelain basin so as to prevent free access of air while solidification is taking place. The solid product thus obtained should, when cool, be broken into fragments, and immediately enclosed in a green-glass bottle furnished with an air-tight stopper.

Description.—Solid greenish fragments, liver-brown when recently broken, alkaline and acrid to the taste.

It was shown, *Y.B.P.* '70, 442, that when well made this preparation really contains 60 p.c. of Sulphide K_2S_3, and about 40 p.c. of Thiosulphate. It is conveniently prepared on a small scale in a Florence flask. A commercial sample examined by us in 1890 yielded 48 p.c. K_2S_3.

Tests.—It readily forms with Water a yellow solution which has the odour of Hydrogen Sulphide, and evolves it freely when excess of Hydrochloric Acid is dropped into it, Sulphur being at the same time deposited. This acid liquid when boiled and filtered gives a yellow precipitate with Solution of Platinum Chloride and a white precipitate with Solution of Barium Chloride. About 50 p.c. of the Sulphurated Potash should be soluble in Alcohol (90 p.c.).

Not Official.

BALNEUM SULPHURETUM.—Sulphurated Potash, 4 oz.; Water, 30 gallons: dissolve.

Used as a solvent and stimulant in cases of psoriasis, &c.

This is not quite so agreeable as the Barèges waters, which may be made artificially as follows:—Sodium Sulphuret, Sodium Carbonate, and Sodium Chloride, of each 20 grains to one gallon. But a much stronger solution is often used.

POTASSII ACETAS.

POTASSIUM ACETATE.

$CH_3 \cdot COOK$, eq. 97·41.

Potassium Acetate is prepared by fusing the product of the interaction of Acetic Acid and Potassium Carbonate.

Solubility.—2 in 1 of Water; 1 in 2 of Alcohol (90 p.c.).

Medicinal Properties.—Used as a diuretic in dropsy, chiefly renal, and in febrile diseases; as an antilithic in gout and the uric acid diathesis.

Dose.—10 to 60 grains.

Prescribing Note.—Best administered in simple solution, with a little Syrup if desired.

Foreign Pharmacopœias.—Official in all except Austr., which contains a *solution*, sp. gr. 1·200; Ger., Hung. and Russ., have also a solution, sp. gr. 1·176—1·180 (33 p.c.); Swed., has also Liquor, 1 in 20; Swiss, has also Liquor, sp. gr. 1·16—1·17.

Description.—Either in white foliaceous satiny masses, or in granular particles, very deliquescent, alkaline to Litmus.

Tests.—It yields the reactions characteristic of Potassium and of Acetates, and should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Calcium, Magnesium, Carbonates or Sulphides, and only the slightest reactions with the tests for Chlorides or Sulphates.

Not Official.

POTASSII BENZOAS.

A crystalline powder.

Solubility.—1 in 1½ of Water; 1 in 18 of Alcohol (90 p.c.).

Medicinal Properties.—Useful in cystitis of the Lithic Acid diathesis.

Dose.—15 to 20 grains.

(Not in the other Pharmacopœias.)

POTASSII BICARBONAS.

POTASSIUM BICARBONATE.

B.P.Syn.—Potassium Hydrogen Carbonate.

$KHCO_3$, eq. 99·38.

May be obtained by saturating a strong aqueous solution of Potassium Carbonate with Carbonic Anhydride.

Solubility.—1 in 3·2 of Water. Insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Antacid, antilithic, and diuretic. Used in dyspepsia as an antacid, and in urinary affections where there is a tendency to deposit Uric Acid; in the acute or inflammatory stage of gonorrhœa there is no better remedy, as it renders the urine alkaline and unirritating. In bronchitis and pneumonia it renders the secretion less tenacious; in influenza it has been given with success.

20 grains are prescribed in effervescence with 15 grains of Citric Acid.

Closely resembles the Carbonate, but without its irritant qualities.

Does not excite the liver, unless it be given in large doses.—Dr. Rutherford.

Dose.—5 to 30 grains.

Foreign Pharmacopœias.—Official in U.S.; Belg., Bi-Carbonas Potassæ; Fr., Carbonates (Bi) de Potasse; Norw. and Swed., Bicarbonas Kalicus; Ger., Jap., Russ. and Swiss, Kalium Bicarbonicum; Ital., Bicarbonato di Potassio; Mex., Carbonato de Potasio acido; Port., Bicarbonato de Potassa; Span., Carbonato (bi) Potasico; not in Austr., Dan., Dutch or Hung.

Description.—Colourless monoclinic prisms, not deliquescent, of a saline feebly alkaline taste.

Tests.—It affords the reactions characteristic of Potassium and of Bicarbonates. Each gramme exposed to a low red heat leaves ·69 gramme of a white residue, which requires for exact neutralisation 10 c.c. of the Volumetric Solution of Sulphuric Acid. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Aluminium, Calcium. Magnesium, Sodium, Nitrates, Sulphates, or Sulphides, and only the slightest reactions with the tests for Iron or for Chlorides.

20 parts by weight of Potassium Bicarbonate are neutralised by 14 parts of Citric Acid, and by 15 parts of Tartaric Acid.

POTASSII BICHROMAS.

POTASSIUM BICHROMATE.

B.P.Syn.—Potassium Dichromate; Red Chromate of Potassium.

K_2CrO_4, CrO_3, eq. 292·30.

It is obtained by roasting Chrome Ironstone with Lime in the presence of air, and by treating the resulting Chromate with a Potassium salt, and subsequently with an acid.

Solubility.—1 in 10 of Water; 5 in 6 of boiling Water.

Medicinal Properties.—A powerful irritant poison in over doses, rarely used in medicine, but extensively in the arts.

Highly recommended by Fraser in dyspepsia and gastric ulcer (*L.* '94, i. 923), and by Bradbury.—*L.* '95, ii. 671.

Dose.—$\frac{1}{10}$ to $\frac{1}{2}$ of a grain.

Official Preparation.—Used in the preparation of Acidum Chromicum.

Antidotes.—Stomach pump or emetics, Magnesium Carbonate or Chalk, albuminous and demulcent drinks.

Description.—In large, orange-red, transparent triclinic crystals, which are soluble in 10 parts of cold Water; fuses below redness;

at a higher temperature is decomposed, yielding green Chromium Oxide and yellow Potassium Chromate, which may be separated by dissolving the latter in Water.

Foreign Pharmacopœias.—Official in Fr., Ger., Ital., Port., Russ., Span., Swiss and U.S.; not in the others.

Tests.—Potassium Bichromate dissolved in Water gives a yellowish-white precipitate with Solution of Barium Chloride, and a purplish-red precipitate with Solution of Silver Nitrate, the filtrate from either solution affording the reactions characteristic of Potassium, and each precipitate being entirely soluble in Diluted Nitric Acid (absence of Sulphates and Chlorides). The aqueous solution digested with Sulphuric Acid and Ethylic Alcohol or with many other organic compounds, acquires an emerald-green colour. 5·66 grammes of Ferrous Sulphate, dissolved in a little Water and acidulated with Sulphuric Acid, should not cease to yield a blue colour with solution of Potassium Ferricyanide until such a quantity of solution as contains 1 gramme of the Potassium Bichromate has been added.

POTASSII BROMIDUM.

POTASSIUM BROMIDE.

KBr, eq. 118·18.

According to B.P. it may be obtained by adding a slight excess of Bromine to a strong solution of Potassium Hydroxide, evaporating the solution of Potassium Bromide and Bromate to dryness, decomposing the Bromate by fusing the mixture with Charcoal, and purifying by crystallisation.

Solubility.—10 in 17 of Water; 1 in 1 of boiling Water; 1 in 95 of Alcohol (90 p.c.); 1 in 17 of boiling Alcohol (90 p.c.).

Medicinal Properties.—Sedative, hypnotic, anaphrodisiac. Very successful in epilepsy, in hysteria, and in convulsions generally. Useful in insomnia, sea-sickness and the sickness of pregnancy, also in head-ache and over-worked brain. It exerts a sedative influence on the generative organs. Useful in some forms of mania and nymphomania. Relieves in some cases of whooping-cough and spasmodic asthma, both in children and adults. This salt, as well as the Ammonium Bromide, is used to produce anæsthesia of the larynx.

On its use combined with Sodium Salicylate in headache.—(Brunton) *Pr.* lii. 101.

By combining with it Arsenic in small doses, the unpleasant effects known as 'Bromism' may be prevented or reduced.

Dose.—5 to 30 grains.

Incompatibles.—Any oxidising agents are liable to set free the Bromine; Spiritus Ætheris Nitrosi.

Official Preparation.—Used in the preparation of Acidum Hydrobromicum Dilutum.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ., and Swiss, Kalium Bromatum; Belg., Bromuretum Potassii; Dan., Dutch, Norw., and

Swed., Brometum Kalicum; Fr., Bromure de Potassium; Ital., Bromuro di Potassio; Mex., Bromuro de Potasio; Port., Brometo de Potassio; Span., Bromuro Potasico; U.S., Potassii Bromidum.

Description.—In colourless cubical crystals, with no odour, but with a pungent saline taste, soluble in 2 parts of cold Water, and in 200 parts of Alcohol (90 p.c.).

Tests.—It affords the reactions characteristic of Potassium and of Bromides. Each gramme, dissolved in Water, requires for complete precipitation not less than 83·7 nor more than 85·4 c.c. of the Volumetric Solution of Silver Nitrate. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Zinc, Calcium, Magnesium, Sodium, Ammonium, Bromates, Iodates, or Cyanides, and only the slightest reactions with the tests for Chlorides, Iodides, or Sulphates. Test-solution of Ferric Chloride should not cause a red coloration in the aqueous cold solution (absence of Thiocyanates).

In the above Silver Nitrate titration, if the figures be calculated into KBr, they would show a percentage of 98·91 to 100·92, as 100 p.c. KBr requires 84·62 c.c.: the excess over the theoretical figure will be due to KCl which may be present from ·1 to 6 p.c. This cannot give a definite Chloride figure unless all impurities unaffected by Silver Nitrate are known to be absent. The only interfering impurity, however, which may be expected to be present is Water, so that if B.P. directed the *dried* salt to be used for titration, the percentage of Chloride might be arrived at by subtracting 84·62 from the number of c.c. used, and dividing the result by ·5.

Some English samples of the salt contain less than ¼ p.c. of Chloride, but U.S.P. allows as much as 3 p.c., and some American samples contain nearly 6 p.c.

POTASSII CARBONAS.

POTASSIUM CARBONATE.

B.P.Syn.—Salt of Tartar.

Potassium Carbonate, K_2CO_3, (eq. 137·21), associated with either one or two molecules of water. May be obtained from the ashes of wood, or by the interaction of crude Potassium Sulphate and crude Calcium Carbonate and Carbon.

Solubility.—4 in 3 of Water. Insoluble in Absolute Alcohol.

Medicinal Properties.—Antacid, diuretic and antilithic. Little used internally on account of its irritant and nauseous properties. Externally it is used as a lotion in eczema and urticaria.

Dose.—5 to 20 grains.

Official Preparations.—Contained in Decoctum Aloes Compositum, Liquor Arsenicalis, Mistura Ferri Composita, Unguentum Potassii Iodidi. Used in the preparation of Iodoform, Liquor Bismuthi et Ammonii Citratis, Potassa Caustica, Potassa Sulphurata, Potassii Acetas, Potassii Bicarbonas, Potassii Citras and Potassii Tartras.

Foreign Pharmacopœias.—Official in all; Austr., Ger., Hung., Jap., Russ., and Swiss, Kalium Carbonicum; Belg., Carbonas Potassæ; Dan., Dutch, Norw., and Swed., Carbonas Kalicus; Fr., Carbonate de Potasse Pur; Ital., Carbonato di

Potassio; Mex., Carbonato de Potasio Neutro; Port., Carbonato de Potassa; Span., Carbonato Potasico; U.S., Potassii Carbonas.

Description.—A white crystalline powder, alkaline and caustic to the taste, very deliquescent, readily soluble in an equal weight of Water, but insoluble in Alcohol (90 p.c.).

Tests.—It affords the reactions characteristic of Potassium and of Carbonates. Each gramme should require for neutralisation at least 11·9 c.c. of the Volumetric Solution of Sulphuric Acid. 2 grammes, after exposure to a red heat, should leave between 1·66 and 1·7 grammes of anhydrous Potassium Carbonate, K_2CO_3. It should yield no characteristic reaction with the tests for Lead, Copper, Aluminium, Calcium, Magnesium, Sodium, Cyanides, Nitrates, Sulphates, Sulphides, or Thiosulphates, only the slightest reactions with the tests for Iron, and no strongly marked reactions with the tests for Chlorides.

This titration figure corresponds to 84 p.c. K_2CO_3. Potassium Carbonate may always be expected to contain 1 to 2 p.c. (at least) of Chloride.

POTASSII CHLORAS.

POTASSIUM CHLORATE.

$KClO_3$, eq. 121·66.

It is obtained by passing Chlorine into water holding Lime or Magnesia in suspension, treating the clarified liquid with Potassium Chloride, and subsequently crystallising the Potassium Chlorate.

Solubility.—1 in 16 of cold Water; 1 in 2 of boiling Water; 1 in 1700 of Alcohol (90 p.c.); 1 in 152 of Alcohol (60 p.c.).

Medicinal Properties.—A local stimulant. A strong solution, 1 or 2 in 40 of Water, is the best **wash** for the mouth when the gums are spongy, inflamed and irritable, and for ulcerative stomatitis; it relieves the tenderness and induces a firmness of the gums; it is also an excellent **gargle** in tonsillitis. A solution of ½ drm. in 4 fl. oz. Water, has been used as an **injection** into the bladder, for vesical catarrh and as a **lotion** for unhealthy ulcers. The powder is applied to aphthæ in the mouth. Internally it is given to prevent the tendency to miscarriage. In young people it should be used with great care and in small doses, if given at all.

Dose.—5 to 15 grains.

As a galactagogue, *T.G.* '93, 322; internally 7 drm. taken by mistake caused death.—*L.* '79, i. 206.

Incompatibles.—Charcoal, Sulphur, and Ferrous salts. Hydrochloric Acid causes the evolution of Chlorine; other mineral acids, of various chlorous-smelling oxy-compounds; organic acids the same but much more slowly.

Official Preparation.—Trochiscus Potassii Chloratis; used in the preparation of Potassii Permanganas.

Not Official.—Gargarisma Potassii Chloratis, Pulvis Potassii Chloratis Compositus, and Sodii Chloras.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ., and Swiss, Kalium Chloricum; Belg., Chloras Potassæ; Dan., Dutch, Norw., and Swed.,

Chloras Kalicus; Fr., Chlorate de Potasse; Ital., Chlorato di Potassio; Mex., Clorato de Potasio; Port., Chlorato de Potassa; Span., Chlorato Potasico; U.S.

Description.—In colourless monoclinic crystals, with a cool saline taste.

Tests.—Moistened with Hydrochloric Acid it evolves a yellow gas consisting of a mixture of Chlorine and Chloric Oxide. When heated it fuses, gives off Oxygen gas, and leaves a white residue soluble in Water, forming a solution which affords the reactions characteristic of Potassium and of Chlorides. It should yield no characteristic reaction with the tests for Lead, Iron, Aluminium, Calcium, Magnesium, Sodium or Nitrates, and only the slightest reactions with the tests for Chlorides or Sulphates.

Potassium Chlorate has caused an explosion when rubbed in a mortar with Sulphur or a Sulphide; also with Tannic Acid, *P.J.* (3) xiii. 1085; also when in compressed tablets with Ammonium Chloride.—*A.J.P.* '90, 385.

Preparation.

TROCHISCUS POTASSII CHLORATIS. Potassium Chlorate Lozenge. (Altered.)

Potassium Chlorate, 3 grains (·1944 gramme). Mix with the Rose Basis to form a Lozenge.

Now made with Rose Basis.

Dose.—Not given in B.P.; 1 to 6 lozenges.

Potassium Chlorate is supplied in **tablets** or **compressed discs,** also combined with Borax and with Cocaine.

Foreign Pharmacopœias.—Official in Belg. (Tabellæ), 1½ grains; Dutch, 1½ grains; Fr. (Tablettes), 1½ grains; Ital. (Pastiglia), 1½ grains; Mex. (Pastillas), 1½ grains; Port. (Pastilhas), 1½ grains; Span. (Tabletas), 1½ grains; Swiss (Pastilli), 1½ grains; U.S., about 4½ grains in each lozenge.

Not Official.

GARGARISMA POTASSII CHLORATIS.—Potassium Chlorate, 1 drm.; Glycerin, ½ fl. oz.; Water to 6 fl. oz.

PULVIS POTASSII CHLORATIS COMPOSITUS.—Potassium Chlorate, 1; Borax, 1; Sodium Bicarbonate, 1; White Sugar, 2; all in powder: mix. A measured teaspoonful to be dissolved in half a tumbler (5 fl. oz.) of tepid water; half the solution to be injected with a syringe along the floor of each nostril night and morning. After use blow the nose freely.—*Central London Throat Hospital.*

SODII CHLORAS (*U.S.*).—Soluble in about its own weight of Water, and in five times its weight of Glycerin.

POTASSII CITRAS.

POTASSIUM CITRATE.

$C_3H_4 \cdot OH \cdot (COOK)_3$, eq. 304·11.

Prepared by the interaction of Citric Acid and Potassium Carbonate.

Solubility.—10 in 6 of Water, 1 in 2 of Glycerin, 1 in 9 of Alcohol (60 p.c.), but if more of the salt is added the Alcohol separates from the watery solution.

Medicinal Properties.—Antacid, mild diaphoretic and diuretic. It is a valuable saline febrifuge, increasing the secretion of the kidneys, rendering it alkaline, and so preventing the precipitation of Uric Acid; its free administration in acute nephritis is strongly advocated by Fothergill. Useful in gout and rheumatism. Given as a drink in scurvy.

Dose.—10 to 40 grains.

Foreign Pharmacopœias.—Official in Port. and U.S.; not in the others.

Various solutions of Potassium Citrate occur as follows: Belg., Hung., and Russ., Potio Riverii; Dan. and Norw., Julapium Salinum; Fr., Potion Gazeuse; Swed., Liquor Citratis Kalici; Port., Soluto de Citrato de Potassa; U.S., Liquor Potassæ Citratis.

Description.—A white powder, of saline feebly acid taste, deliquescent, very soluble in Water.

Tests.—It affords the reactions characteristic of Potassium salts and of Citrates. Each gramme of the dry salt, heated to redness till gases cease to be evolved, should leave an alkaline residue, which when treated with Water, filtered, and well washed, should yield a clear solution requiring for neutralisation at least 9·7 c.c. of the Volumetric Solution of Sulphuric Acid. It should yield no characteristic reaction with the tests for Lead, Iron, Calcium, Magnesium, Sodium, Carbonates or Tartrates, and only the slightest reactions with the tests for Chlorides or Sulphates.

Not Official.

POTASSII CYANIDUM.

KCN, eq. 64·68.

White translucent deliquescent masses, having the odour of Hydrocyanic Acid. It is intensely poisonous. *See also* Appendix.

Solubility.—1 in 2¼ of Water; almost entirely 1 in 100 of Alcohol (90 p.c.).

Ordinary fused Cyanide only contains about 40 p.c. of real Cyanide, but there is no difficulty in obtaining it from 95 to 99 p.c.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., Port., Span. and U.S.; not in the others.

It is useful to remove the black stains on the skin caused by Silver Nitrate.

Entomologists use it with gypsum to make poison bottles for killing insects without injuring their delicate structure; for this purpose dissolve 1 of the Cyanide, in 1½ of Water, and add 2 of Plaster of Paris. This mixture stirred and poured whilst liquid into a wide-mouthed bottle, forms a hard floor, which is constantly giving off vapour.

Not Official.

POTASSII FERROCYANIDUM.

Syn.—Yellow Prussiate of Potash.

$K_4FeC_6N_6$, $3H_2O$, eq. 419·66.

Large yellow crystals. *See also* Appendix.

Solubility.—1 in 4 of Water; insoluble in Alcohol (90 p.c.).

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., Port., Span., and U.S.; not in the others.

POTASSII IODIDUM.

POTASSIUM IODIDE.

KI, eq. 164·73.

This salt may be prepared in the same manner as Potassium Bromide, Iodine being used in place of Bromine.

Solubility.—4 in 3 of Water; 1 in 10 of Alcohol (90 p.c.); 1 in 3 of Glycerin.

Medicinal Properties.—Alterative, deobstruent, diuretic, expectorant. It is useful in cases where Iodine is indicated, and being less irritating is much preferred for internal administration. Useful especially in secondary and in tertiary syphilis and in all diseases associated with syphilis, such for example as locomotor ataxy. For secondary symptoms 60 grains in solution may be given in the twenty-four hours. It reduces chronic inflammation and swellings, effusions and glandular enlargements, and is useful in bronchocele; also in bronchitic asthma, aortic disease, endocarditis, internal aneurism and angina pectoris; chronic rheumatism and gout; lumbago, sciatica, psoriasis and actinomycosis. May be given with Quinine dissolved by Sulphuric or Phosphoric Acid, but not with Nitro-hydrochloric Acid, as the eliminated Chlorine decomposes it and makes an unsightly mixture. Combined with Nux Vomica the system bears it better. It is useful in the elimination of Lead in cases of chronic Lead poisoning; also in treating chronic Mercury poisoning. *See also under* 'Iodum.'

In cretinism, *L.* '93, ii. 1545.

In actinomycosis, *T.G.* '94, 62; *B.M.J.E.* '93, ii. 23; '95, ii. 64; *L.* '96, i. 1553; '97, i. 735.

Has no notable effect on biliary secretion.—Dr. Rutherford.

Dose.—5 to 20 grains.

Prescribing Notes.—It is sometimes prescribed with Tincture of Cinchona, an ounce of which dissolves 30 grains; also with Fowler's Solution to prevent the rash sometimes produced.

It is better borne when given with Potassium Acetate, or when administered alternately with Ferrous Iodide.—*L* '88, i. 1019.

Incompatibles.—Spiritus Ætheris Nitrosi, Bismuthi Subnitras.

Official Preparations.—Linimentum Potassii Iodidi cum Sapone and Unguentum Potassii Iodidi; contained in Liquor Iodi Fortis, Tinctura Iodi and Unguentum Iodi. Used in the preparation of Hydrargyri Iodidum Rubrum and Plumbi Iodidum.

Not Official.—Linimentum Potassii Iodidi cum Sapone (*B.P.* 1867).

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ., and Swiss, Kalium Iodatum; Belg., Ioduretum Potassii; Dan., Dutch, Norw., and Swed., Iodetum Kalicum; Fr. Iodure de Potassium; Ital., Ioduro di Potassio; Mex., Yoduro de Potasio; Port., Iodeto de Potassio; Span., Ioduro Potasico; U.S.

Description.—In colourless, generally opaque, cubic crystals. It commonly has a feebly alkaline reaction.

Tests.—It affords the reactions characteristic of Potassium and of Iodides. Each gramme should require for complete precipitation not less than 59·5 and not more than 61·9 c.c. of the Volumetric Solution of Silver Nitrate. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Calcium, Magnesium, Sodium, Ammonium, Bromates, Iodates, Cyanides, or Nitrates, and only the slightest reactions with the tests for Bromides, Chlorides, Carbonates, or Sulphates.

Preparations.

LINIMENTUM POTASSII IODIDI CUM SAPONE. Liniment of Potassium Iodide with Soap.

Curd Soap, recently prepared and in shavings, 2 oz.; Potassium Iodide, 1½ oz.; Glycerin, 1 fl. oz.; Oil of Lemon, 1 fl. drm.; Distilled Water, 10 fl. oz. Reduce the Curd Soap to fine shreds; mix it with the Distilled Water and Glycerin in a porcelain dish on a water-bath; when the Soap is dissolved, pour the liquid into a mortar in which the Potassium Iodide has previously been powdered; mix briskly by trituration; continue the trituration until the mixture is cold; set aside for an hour; then rub well the Oil of Lemon into the cream-like product.

When first prepared it is very bulky, but after it has been made some time it occupies a much smaller space, and this is apt to cause trouble with patients. The difference is due to the quantity of air incorporated in it by the trituration, and is so great that it would be quite possible at different times for the same weight of Liniment to fill a 1 oz. pot and a 4 oz. pot.

The advantages of this liniment are that it does not stain, nor does it irritate when rubbed on the skin; it is employed in enlargement of the joints, and in indurated glands, especially the cervical glands.

Foreign Pharmacopœias.—Official in Swiss (Opodeldoc Iodatum), Lard or Butter, 50; Alcohol (95 p. c.), 25; Solution of Caustic Soda, 25: saponify and dissolve in Alcohol, 800; Sodium Iodide, 50; Water, 50; Oil of Lemon, 10. Swiss has also Opodeldoc Iodatum Liquidum; not in the others.

UNGUENTUM POTASSII IODIDI. Potassium Iodide Ointment. (Altered).

Potassium Iodide, 50; Potassium Carbonate, 3; Distilled Water (by weight), 47; Benzoated Lard, 400. Dissolve the Potassium Iodide and Potassium Carbonate in the Distilled Water; mix the solution, gradually, with the Benzoated Lard, in a slightly warmed mortar.

Now 1 in 10 instead of 1 in 8¾. =(1 in 10).

Foreign Pharmacopœias.—Official in Dan., Dutch, Fr., Ger., Hung., Norw., Port., Russ., Swed. and Swiss, 1 in 10; Ital. and Span., 1 in 9½; Mex., Pomada de Yoduro de Potasio, 1 in 8½; U.S., 1 in 8½ with Sodium Hyposulphite; not in Austr., Belg., or Jap.

Not Official.

LINIMENTUM POTASSII IODIDI C. SAPONE (*B.P.* 1867).—Hard Soap, 1½ oz.; Potassium Iodide, 1½ oz.; Glycerin, 1 fl. oz.; Oil of Lemon, 1 fl. drm.; Water, 10 fl. oz. 'Put the Glycerin, Iodide, and 3 fl. oz. of Water into a clean 20-oz. wide-mouthed bottle; then dissolve the soap (in shavings) in the 7 fl. oz. of Water in a jar by the heat of a water-bath; strain the solution whilst hot through muslin into the

bottle containing the Iodide, etc.; allow to stand for two or three minutes, until the bottom of the soap solution is a little opaque, then mix by agitation; lastly add the Oil of Lemon, shaking briskly, and, after agitating at intervals for two hours or more, a liniment in the form of a soft white jelly will result, and remain so; if it should not, a small addition of Water will generally perfect it.'

This formula is that of B.P. '67, but the manipulation has been modified; when made properly it gives satisfaction.

POTASSII NITRAS.

POTASSIUM NITRATE.

B.P.Syn.—Nitre, Saltpetre.

KNO_3, eq. 100·41.

It may be obtained by purifying crude Nitre, or by the interaction of Sodium Nitrate and Potassium Chloride.

Solubility.—1 in 4 of cold Water; 2½ in 1 of boiling Water; sparingly in Alcohol (90 p.c.).

Medicinal Properties.—Sometimes given as a diuretic and diaphoretic, but the Acetate and Citrate are much to be preferred. Useful as a gargle in relaxed sore throat. Potassium Nitrate, 5 grains, Potassium Bicarbonate, 20 grains, taken, during effervescence, with Citric Acid, 15 grains, in a small tumbler of cold Water, is a pleasant cooling draught in febrile excitement. Charta Nitrata is used in spasmodic asthma.

In Phlegmasia alba dolens.—*T.G.* '94, 830.

Dose.—5 to 20 grains.

Official Preparations.—Contained in Argenti Nitras Induratus and Argenti Nitras Mitigatus. Used in the preparation of Acidum Nitricum.

Not Official.—Sal Prunella, Charta Nitrata, Charta Nitrata et Chlorata.

Foreign Pharmacopœias.—Official in all; Austr., Ger., Hung., Jap., Russ. and Swiss, Kalium Nitricum; Belg., Nitras Potassæ; Dan., Dutch, Norw. and Swed., Nitras Kalicus; Fr., Azotate de Potasse; Ital., Nitrato di Potassio; Mex., Nitrato de Potasio; Port., Azotato de Potassa; Span., Nitrato Potasico; U.S., Potassii Nitras.

Description.—In white crystalline masses or fragments of striated six-sided rhombic prisms, colourless, having a cool saline taste.

Tests.—It affords the reactions characteristic of Potassium and of Nitrates. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Zinc, Calcium, Magnesium, Sodium, Ammonium, Chlorides, Iodides, or Sulphates.

Not Official.

SAL PRUNELLA.—Potassium Nitrate fused and moulded into small balls.

CHARTA NITRATA (Belg., Dan., Fr., Ger., Ital., Jap., Norw., Port., Russ., Swed., Swiss and U.S.).—Soak porous paper in a saturated solution of Nitre, and dry. Roll it up and burn in a candlestick. Used in asthma.

The paper is sometimes impregnated also with Compound Tincture of Benzoin, Spirit of Camphor, Oils of Cassia, Cinnamon, and Santal, and Tincture of Sumbul.

CHARTA NITRATA ET CHLORATA.—Soak porous paper in a saturated solution of Potassium Nitrate and Potassium Chlorate, and dry. Used in asthma.

POTASSII PERMANGANAS.

POTASSIUM PERMANGANATE.

$K_2Mn_2O_8$, eq. 313·74.

It may be obtained by the interaction of Potassium Chlorate, Potassium Hydroxide, and Manganese Dioxide.

Solubility.—1 in 18 of Water; 1 in 3 of boiling Water.

Medicinal Properties.—A powerful deodorizer and antiseptic. Useful internally in amenorrhœa, and in anæmia; also in typhoid and dysentery. Externally, as a caustic and deodoriser, to foul ulcers and chancres. Useful as a wash in ozæna; and as an antiseptic gargle in throat affections.

Weak solution (1 in 2000) injected in gonorrhœa, *B.M.J.E.* '95, i. 60; *M.P.* '95, i. 431.

A suggested antidote for Morphine, *B.M.J.* '91, i. 649; *Pr.* lii. 122; *T.G.* '94, 260; '98, ii. 97.

Dose.—1 to 3 grains.

Prescribing Notes.—It can be made into a pill with Massa Paraffini. It is not given in solution on account of its disagreeable taste.

Incompatibles.—Animal or vegetable matters, and any reducing agent.

Official Preparation.—Liquor Potassii Permanganatis.

Foreign Pharmacopœias.—Official in U.S.; Austr., Kalium Hypermanganicum crystallisatum; Belg., Permanganas Potassæ; Dan., Norw. and Swed., Hypermanganas Kalicus; Dutch, Permanganas Kalicus; Fr., Permanganate de Potasse; Ger. and Jap., Kalium Permanganicum; Hung., Russ. and Swiss, Kalium Hypermanganicum; Ital., Permanganato di Potassio; Mex., Permanganato de Potasio; Port., Permanganato de Potassa; Span., Permanganato Potasico.

Description.—Dark purple slender prismatic iridescent crystals, with a sweet astringent taste.

Tests.—Soluble in 20 parts of cold Water, without action on Litmus. The crystals heated to redness decrepitate, evolve Oxygen, and leave a black residue from which Water extracts Potassium Hydroxide, the resulting solution affording the reactions characteristic of Potassium. It should yield no characteristic reaction with the tests for Lead, Arsenium, Iron, Aluminium, Calcium, Magnesium, Sodium, Ammonium, Carbonates, Chlorides, or Sulphates. Each gramme dissolved in Water and acidulated with 5 c.c. of Diluted Sulphuric Acid, should require for complete decolorisation 31·2 c.c. of an aqueous solution containing 62·58 grammes of pure crystallised Oxalic Acid per litre.

Preparation.

LIQUOR POTASSII PERMANGANATIS. Solution of Potassium Permanganate.

Dissolve 87½ grains of Potassium Permanganate in sufficient Dis-

tilled Water to produce 20 fl. oz. of the Solution; or 10 grammes to produce 1000 c.c.

Dose.—2 to 4 fl. drm.

110 minims contain 1 grain of Potassium Permanganate; 100 c.c. contain 1 gramme.

If this needs filtration, glass-wool is best for the purpose.

Diluted with 40 to 80 parts of Water, it is useful as a **gargle** or as a cleansing **wash** for foul ulcers, &c.

Foreign Pharmacopœias.—Official in Mex., 1 in 500; Span., 1 in 50; not in the others.

POTASSII SULPHAS.

POTASSIUM SULPHATE.

K_2SO_4, eq. 173·00.

Potassium Sulphate may be obtained by purifying the crude salt, or by the interaction of Sulphuric Acid and Potassium Chloride or certain other Potassium salts.

Potassium Sulphate was long known as **Sal Polychrestum,** and the Bisulphate (the residue from making Nitric Acid) as **Sal Enixum.**

Solubility.—1 in 10 of cold Water, 1 in 4 of boiling Water. Insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Mild saline cathartic, usually operating without irritation. Generally given in combination with Rhubarb. A useful purgative in hepatic and dyspeptic affections.

Is an hepatic and intestinal stimulant of considerable power. Its action on the liver is, however, uncertain.—Dr. Rutherford.

Dose.—10 to 40 grains.

Official Preparations.—Used in the preparation of Pilula Colocynthidis Composita and Pulvis Ipecacuanhæ Compositus. Contained in Pilula Colocynthidis et Hyoscyami and Pilula Ipecacuanhæ cum Scilla.

Foreign Pharmacopœias.—Official in U.S.; Belg., Sulphas Potassæ; Dan., Dutch, Norw. and Swed., Sulphas Kalicus; Fr., Sulfate de Potasse; Ger., Hung., Jap., Russ. and Swiss, Kalium Sulfuricum; Ital., Solfato di Potassio; Mex., Sulfato de Potasio; Port., Sulfato de Potassa; Span., Sulfato Potasico; not in Austr.

Description.—In colourless, hard rhombic prisms, terminated by six-sided pyramids.

Tests.—Decrepitates strongly when heated. The salt affords the reactions characteristic of Potassium and of Sulphates. Each gramme dissolved in Water and acidulated with Hydrochloric Acid, gives, with Solution of Barium Chloride, a white precipitate, which, when washed and dried, should weigh 1·339 grammes. It should not yield any characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Zinc, Calcium, Magnesium, Sodium, Ammonium, or Nitrates, and only the slightest reactions with the tests for Chlorides. The aqueous solution has no action on Litmus (absence of Acid Potassium Sulphate).

POTASSII TARTRAS.

POTASSIUM TARTRATE.

$(CHOH)_2(COOK)_2$, H_2O, eq. 242·46.

Normal Potassium Tartrate is obtained by neutralising Acid Potassium Tartrate with Potassium Carbonate.

Solubility.—10 in 6 of Water. Insoluble in Alcohol (90 p.c.).

Medicinal Properties.—A mild, saline purgative, operating without much pain, and producing watery stools. In smaller doses, antacid, diuretic and alterative.

Dose.—30 to 240 grains.

Foreign Pharmacopœias.—Official in Belg., Tartras Potassæ; Dan., Norw. and Swed., Tartras Kalicus; Fr., Tartrate de Potasse Neutre; Ger., Hung., Jap., Russ. and Swiss, Kalium Tartaricum; Ital., Tartrato Neutro di Potassio; Mex., Tartrato de Potasio Neutro; Port., Tartarato de Potassa; Span., Tartarato Potasico; not in Austr., Dutch or U.S.

Description.—In small colourless four- or six-sided prisms.

Tests.—It affords the reactions characteristic of Potassium and of Tartrates. Each gramme of the dry salt, heated to redness till gases cease to be evolved, should leave an alkaline residue, which, when treated with Water, filtered, and well washed, yields a clear solution requiring for exact neutralisation 8·4 c.c. of the Volumetric Solution of Sulphuric Acid. It should yield no characteristic reaction with the tests for Lead, Copper, or Iron, and only the slightest reactions with the tests for Calcium, Magnesium, Sodium, Chlorides, or Sulphates. The aqueous solution has no action on Litmus (absence of Acid Potassium Tartrate).

POTASSII TARTRAS ACIDUS.

ACID POTASSIUM TARTRATE.

B.P.Syn.—Bitartrate of Potassium; Purified Cream of Tartar.

$(CHOH)_2\,COOH{\cdot}COOK$, eq. 186·75.

It is obtained from the crude Cream of Tartar which is deposited during the fermentation of grape juice, and from the lees of wine.

Solubility.—1 in 200 of cold Water, 1 in 16 of boiling Water. Insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Cathartic, diuretic, and refrigerant. Much used in febrile and dropsical affections; in chronic cardiac and hepatic diseases; combined with Sulphur it is useful in hæmorrhoids.

Dose.—20 to 60 grains.

Official Preparations.—Contained in Confectio Sulphuris, Trochiscus Sulphuris, and Pulvis Jalapæ Compositus. Used in the preparation of Acidum Tartaricum, Antimonium Tartaratum, Ferrum Tartaratum, Potassii Tartras and Soda Tartarata.

Not Official.—Soluble Cream of Tartar.

Foreign Pharmacopœias.—Official in all; Austr. and Hung., Kalium hydrotartaricum; Belg., Bitartras Potassæ depuratus; Dan., Norw. and Swed., Bitartras Kalicus; Dutch, Tartras Kalicus Acidus; Fr., Tartrate de Potasse Acide; Ger. and Swiss, Tartarus depuratus; Ital., Tartrato Acido di Potassio; Jap., Kalium Bitartaricum; Mex., Tartrato de Potasio Acido; Port., Bitartrato de Potassa; Russ. Kali Bitartaricum depuratum and Purum; Span., Cremor Tartaro; U.S., Potassii Bitartras.

Description.—A gritty white powder, or fragments of cakes crystallised on one surface, with an acid taste.

Tests.—It affords the reactions characteristic of Potassium and of Tartrates. Each gramme of the dry salt should require for neutralisation at least 5·2 c.c. of the Volumetric Solution of Sodium Hydroxide. It should yield no characteristic reaction with the tests for Lead, Copper, or Iron, and only the slightest reaction with the tests for Calcium, Magnesium, Sodium, Chlorides, or Sulphates. The total amount of impurities should not exceed 2½ p.c. of the dried salt.

The term 'slightest reaction' appears to be defined in this instance by the total limit of 2½ p.c. on the dried salt. No limit is given to the quantity of moisture. The direct titration of a sample should be supplemented by a determination of the alkalinity of the soluble ash. A sample containing a judicious proportion of Potassium Acid Sulphate might pass the direct titration test, but would show a reduced alkalinity of the soluble ash. In a pure sample the amount of Volumetric Solution of Sodium Hydroxide required for direct titration should be equal to the amount of Volumetric Solution of Sulphuric Acid required to neutralise the soluble ash, working on the same weight of substance in each case.

A process for the exhaustive examination of Cream of Tartar.—*Analyst* '96, 174, 209; *P.J.* '96, ii. 3, 116.

Not Official.

TARTARUS BORAXATUS. TARTRATE BORICO-POTASSIQUE. SOLUBLE CREAM OF TARTAR.—Soluble Cream of Tartar is a white amorphous powder soluble in its own weight of water. The proportions are:—

Belg., Dan., Fr., Norw. and Swed., Potassium Acid Tartrate 2, Borax 1; Dutch, Ger., Swiss. and Russ., Potassium Acid Tartrate 5, Borax 2; dissolve the Borax and the Acid Tartrate in water by the aid of heat, and evaporate to dryness; Span., Potassium Acid Tartrate 4, Boric Acid 1; Mex. (Tartrato borico-potasico), Potassium Bicarbonate 10, Tartaric Acid 10, Boric Acid 5; Port., with Boric Acid and Potassium Acid Tartrate, but no quantities given.

Medicinal Properties.—Same as Cream of Tartar.

PRUNI VIRGINIANÆ CORTEX.

VIRGINIAN PRUNE BARK.

[NEW.]

The bark of *Prunus serotina*, collected in autumn.

In addition to astringent Tannins, this bark contains **Amygdalin** and **Emulsin**, which on treatment with water develop Hydrocyanic Acid (in a similar manner to the Cherry-Laurel), to which the sedative effect of its preparations are probably due.

Medicinal Properties.—Sedative. Highly useful in full doses for resultless hacking cough in phthisis and chronic bronchitis. The Syrup is also useful as a flavouring vehicle for nauseous medicines.

Official Preparations.—Syrupus Pruni Virginianæ and Tinctura Pruni Virginianæ.

Foreign Pharmacopœias.—Official in U.S.; not in the others; U.S. has also an **Infusion** and **Fluid Extract.**

Description.—In curved pieces or irregular fragments one-twelfth of an inch (two millimetres) or more in thickness. Young bark is frequently covered with a smooth, thin, reddish-brown, papery cork, or, if this has been removed, exhibits a greenish-brown inner layer; it is marked with transversely elongated lenticels, and breaks with a short granular fracture. The outer surface of old bark is usually rough and nut-brown in colour. The inner surface is finely striated or fissured and reticulated; the fractured surface is reddish-grey. The bark contains numerous groups of sclerenchymatous cells of characteristic irregular shape. Taste astringent, aromatic, and bitter; the odour, which is developed upon maceration in Water, resembles that of the bitter almond.

Determination of the glucoside by its conversion into Hydrocyanic Acid.—*A.J.P.* '95, 535.

Preparations.

SYRUPUS PRUNI VIRGINIANÆ. SYRUP OF VIRGINIAN PRUNE. (NEW.)

Virginian Prune Bark, in No. 20 powder, 3; Refined Sugar, in coarse powder, 15; Glycerin, 1¼; Distilled Water, a sufficient quantity. Moisten the Virginian Prune Bark with Distilled Water; set aside for twenty-four hours in a closed vessel; pack in a percolator; gradually add Distilled Water until a quantity of 9 of percolate has been collected; dissolve the Refined Sugar in the liquid, by agitation, without heat; add the Glycerin; strain; pour sufficient Distilled Water over the strainer to produce 20 of the Syrup.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in U.S., Wild Cherry 15, Sugar 70, Glycerin 15, Water to make 100.

TINCTURA PRUNI VIRGINIANÆ. TINCTURE OF VIRGINIAN PRUNE. (NEW.)

Virginian Prune Bark, in No. 20 powder, 4; Alcohol (90 p.c.), 12½; Distilled Water, 7½. Mix the powder with the Distilled Water; set aside in a closed vessel for twenty-four hours; add the Alcohol, and complete the maceration process.

Dose.—½ to 1 fl. drm.

PRUNUM.

PRUNES.

The dried ripe fruits of *Prunus domestica*.

Imported from the South of France.

Medicinal Properties.—Nutritious and demulcent. Rarely prescribed, though often used in domestic medicine as a laxative.

Official Preparation.—Contained in Confectio Sennæ.

Foreign Pharmacopœias.—Official in Belg., Pulpa Prunorum; Fr., Prunier Commun; Mex., Ciruelo de Espana; Port., Ameixas Passadas; Span., Ciruelo; U.S.; not in the others.

Description.—Somewhat ovoid or oblong, about one inch and a-quarter (three centimetres) long, black, shrivelled; pulp brownish, without marked odour, but with a sweet and bland acidulous taste.

PTEROCARPI LIGNUM.

RED SANDERS-WOOD.

B.P.Syn.—Red Sandal-Wood.

The heart-wood of *Pterocarpus santalinus*.

From Madras and Ceylon. Used solely as a colouring agent.

Official Preparation.—Used in the preparation of Tinctura Lavandulæ Composita.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Jap. and Swed., Lignum Santali Rubrum; Dutch, Lignum Santalinum; Fr., Santal Rouge; Port., Sandalo Rubro; Span., Sandalo Rojo; U.S., Santalum Rubrum; not in Ger., Hung., Ital., Mex., Norw., Russ. or Swiss.

Description.—Red Sanders Wood is imported in large heavy logs, dark reddish-brown or blackish-brown externally, and internally, if cut transversely, deep blood-red, variegated with zones of a lighter colour. It has a very slight astringent taste, and when warmed exhales a faint aroma. The colouring matter is soluble in Alcohol (90 p.c.), but only sparingly soluble in Water.

Not Official.

PULSATILLA.

The herb of *Anemone Pulsatilla* and *Anemone pratensis* collected soon after flowering. It should be carefully preserved and not kept longer than one year.

Medicinal Properties.—Has been used in dysmenorrhœa with various results. Has been recommended in orchitis and epididymitis, but in experiments at the Lock Hospital it was found to be valueless.—*L.* '89, ii. 216.

Foreign Pharmacopœias.—Official in Fr., Span. and U.S.; not in the others.

Preparation.

TINCTURA PULSATILLÆ.—Carefully dried Herb, 1; Alcohol (60 p.c.) to percolate, 10.

Unless the herb is very finely powdered, it answers better to soak it in warm Water for a day and then add Alcohol to bring the mixture to the strength of Alcohol (60 p.c.).

Dose.—5 to 30 minims.

PULVERES.

POWDERS.

The following Powders are contained in the British Pharmacopœia, the formulas of which will be found under the names of the substances from which they are prepared:—

	Proportions of active ingredients in the whole.
PULVIS AMYGDALÆ COMPOSITUS	8 in 13.
PULVIS ANTIMONIALIS	Oxide 1 in 3
PULVIS CATECHU COMPOSITUS	1 in 2½.
PULVIS CINNAMOMI COMPOSITUS	1 in 3.
PULVIS CRETÆ AROMATICUS	about 1 in 4.
PULVIS CRETÆ AROMATICUS CUM OPIO	Opium 1 in 40.
PULVIS ELATERINI COMPOSITUS	1 in 40.
PULVIS GLYCYRRHIZÆ COMPOSITUS	Senna 1 in 6.
PULVIS IPECACUANHÆ COMPOSITUS	Opium 1 in 10.
PULVIS JALAPÆ COMPOSITUS	1 in 3.
PULVIS KINO COMPOSITUS	Opium 1 in 20.
PULVIS OPII COMPOSITUS	Opium 1 in 10.
PULVIS RHEI COMPOSITUS	1 in 4½.
PULVIS SCAMMONII COMPOSITUS	1 in 2.
PULVIS SODÆ TARTARATÆ EFFERVESCENS	
PULVIS TRAGACANTHÆ COMPOSITUS	1 in 6.

PYRETHRI RADIX.

PYRETHRUM ROOT.

The dried root of *Anacyclus Pyrethrum*.

Collected chiefly in Algeria.

Medicinal Properties.—It is powerfully stimulant to the salivary glands, causing a copious flow of saliva, and, on that account, is used as a masticatory in dryness of the mouth and throat. The Tincture is used on cotton-wool for relieving toothache, or when diluted as a mouth-wash.

Official Preparation.—Tinctura Pyrethri.

Not Official.—Trochisci Pyrethri.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr. (Pyrethre Officinal), Mex. (Peritre de Africa), Port. (Pyrethro), Span. (Pelitre), and U.S., same as Brit.; Dan. and Swed., use the root of *Anacyclus officinarum*; not in the others.

Description.—In unbranched pieces, usually varying from two to four inches (five to ten centimetres) in length, and half an inch (twelve millimetres) or more in thickness; nearly cylindrical or frequently tapering towards both extremities, the crown often bearing a tuft of nearly colourless hairs. The outer surface is brown and longitudinally wrinkled. The fracture is short; the fractured surface shows the wood to be traversed by large medullary rays in which, as in the cortex, numerous dark resin-ducts are scattered. The root has a distinct characteristic odour and pungent taste, exciting, when chewed, a copious flow of saliva.

An investigation into the active constituent of Pellitory.—*J.C.S. Trans.*, '95, 100.

Preparation.

TINCTURA PYRETHRI. Tincture of Pyrethrum. (Modified.)

Pyrethrum Root, in No. 40 powder, 4; Alcohol (70 p.c.) a sufficient quantity. Moisten the powder with 3 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20.

Now made with Alcohol (70 p.c.) in place of Rectified Spirit.

Foreign Pharmacopœias.—Official in Belg., Dan., Fr. and Span., 1 and 5 (by weight); Mex. and U.S., 1 in 5; not in the others.

Not Official.

TROCHISCI PYRETHRI (*T.H.*)—Contain one grain in each.

Not Official.

PYRETHRI FLORES.

Syn.—Insect Powder.

The powder of the flower-heads, obtained in the Caucasus, from *Pyrethrum roseum* and *P. carneum*, and in Dalmatia from *Pyrethrum cinerariæfolium*.

The active principle is an Ether-soluble Resin, not a volatile Oil.—*C.D.* '90, ii. 285.

Foreign Pharmacopœias.—Official in Fr.; Mex. (Péritre del Caucaso); not in the others.

Keeps away troublesome insects.

Preparation.

TINCTURA PYRETHRI FLORUM.—The flower heads, in powder, 1; Alcohol (60 p.c.) to percolate 4.

Diluted 1 to 10 of Water forms a **lotion** to keep away insects.

Not Official.

PYRIDIN.

C_5H_5N, eq. 78·49.

A base obtained from the products of the destructive distillation of bones.

Commercially it always contains Picoline. In its cruder forms it is employed in Germany for 'denaturating' Alcohol, corresponding to 'Methylating' in this country.

Solubility.—It is miscible with Water, Alcohol (90 p.c.), Ether, and the fixed Oils.

Medicinal Properties.—Useful in the treatment of asthma; 4 or 5 grammes (62 to 77 grains) are allowed to evaporate from a flat dish in a small room, the patient being exposed to its vapour for 1½ hours three times a day.—*B.M.J.* '85, ii. 1074; *T.B.T.* '95, 41.

Is most beneficial in cardiac dyspnœa, emphysema and angina pectoris.—*L.* '88, i. 437; '88, ii. 438; *B.M.J.* '93, ii. 856.

If the vapour be inhaled in quantity, it produces headache.

Like Nicotine, it is a good insecticide.

Description.—A colourless volatile liquid with a powerful and a peculiar odour. Its aqueous solution gives a strong alkaline reaction to Litmus, but is best titrated by Methyl-orange. When pure, it has no action on Phenol-phthalein.

It yields a crystalline but deliquescent salt with Hydrochloric Acid.

Tests.—Sp. gr. ·980. Boils about 116° C. Added to a solution of Copper Sul-

phate, it gives a bluish-green precipitate, soluble in excess to a dark blue liquid, similar to that produced by Ammonia.

It should not redden Phenol-phthalein (absence of Ammonia), should have little or no action on Potassium Permanganate. A solution of Pyridine (½ p.c.) should give a crystalline precipitate, becoming almost semi-solid with an equal volume of saturated solution of Picric Acid.

Not Official.

PYRODIN.

An impure Acetylphenylhydrazine. Derived from Coal Tar.

A white crystalline powder, soluble 1 in 50 of Water.

Medicinal Properties.—A powerful antipyretic. It has been given in doses of 8 to 12 grains once in the 24 hours, but great caution must be exercised, as toxic effects have been produced.—*L.* '88, ii. 1149, 1195; *B.M.J.* '88, ii. 1470.

2 grains per diem given as a maximum dose, lest toxic symptoms should arise.—*Y.B.T.* '90, 311; should be reckoned as a poisonous rather than as a therapeutic agent (Stockman).—*B.M.J.* '98, ii. 1054; decidedly harmful (Leech).—*B.M.J.* '98, ii. 1056.

PYROXYLINUM.

PYROXYLIN.

N.O.Syn.—Gossypium Fulminans. Lana Collodii. Colloxylinum.

Pyroxylin is Dinitrocellulose $C_6H_8(NO_2)_2O_5$. Gun Cotton is Trinitrocellulose $C_6H_7(NO_2)_3O_5$ and is not soluble in any mixture of Alcohol and Ether.

O.M.P.—Cotton, 1; Sulphuric Acid, 5; Nitric Acid, 5; Distilled Water, a sufficient quantity. Mix the Acids in a porcelain mortar, immerse the Cotton in the mixture, and after it is thoroughly wetted by the Acids stir it for three minutes with a glass rod; wash the product with Distilled Water until free from acid; drain on filtering paper, and dry the Pyroxylin on a water-bath.

Official Preparations.—Used in the preparation of Collodium, and Collodium Vesicans. Of **Collodium**, Collodium Flexile.

Not Official.—Celloidin, Photoxylin.

Foreign Pharmacopœias.—Official in Belg. (Pyroxylum), no formula given; Dutch, Ger., Ital. (Cotone Collodio), Russ. and Swiss.—Purified Cotton 55, Crude Nitric Acid (sp. gr. 1·380) 400, Crude Sulphuric Acid (sp. gr. 1·830) 1000; Fr. (Fulmicoton).—Cotton Wool 11, Nitric Acid 100, Sulphuric Acid 200; Mex. (Piroxilina).—Cotton 1, Nitre 20, Sulphuric Acid 30; Port. (Algodao Polvora), and Span. (Pyroxilina).—Cotton 1, Nitre 20, Pure Sulphuric Acid (sp. gr. 1·84) 30; Swed., Cotton 1, Crude Nitric Acid (sp. gr. 1·382—1·390) 9, Crude Sulphuric Acid (sp. gr. 1·833) 18; U.S. (Pyroxylinum), Cotton 1, Nitric Acid 14, Sulphuric Acid 22. All by weight except U.S. Not in Austr., Dan., Hung., Jap., or Norw.

Tests.—Readily soluble in a mixture of equal volumes of Ether and Alcohol (90 p.c.). It leaves no residue after ignition (absence of mineral impurity).

It is also soluble in Acetone, which might be used as a cheap and effective solvent for making Collodion; it forms a 10 p.c. solution very easily.

It sometimes decomposes on keeping, with disengagement of Nitrous fumes and becomes insoluble.

The safest and best plan for its preservation is to moisten the dry material with an equal weight of Methylated Spirit and preserve in a well-stoppered jar; when required for use it is quickly and easily dried.—*P.J.* '96, ii. 110; *C.D.* '96, ii. 207.

Not Official.

CELLOIDIN.—Sold in cakes or shavings. When dissolved in a mixture of Absolute Alcohol and Ether it is used for embedding histological specimens previous to cutting sections.

PHOTOXYLIN.—A nitrated wood pulp prepared in St. Petersburg. When made into Collodion it is stated to give a tougher film than Pyroxylin on evaporation.—*L.* '87, i. 1253; *B.M.J.* '88, i. 555.

QUASSIÆ LIGNUM.

QUASSIA WOOD.

The wood of the trunk and branches of *Picræna excelsa*.

From Jamaica.

Medicinal Properties.—Possesses in a high degree the properties of the simple bitters, without astringency. Particularly adapted as a tonic in dyspepsia and in the debility which succeeds acute disease; containing no Tannin, it is a compatible vehicle for Iron preparations. The infusion is also used as an anthelmintic enema in threadworm.

A few chips of Quassia or a weak infusion used in the morning bath is a protection against the annoying insects found in our cornfields.—*L.* '84, ii. 306. A strong infusion to destroy fleas.—*L.* '95, i. 1018.

Official Preparations.—Infusum Quassiæ, Liquor Quassiæ Concentratus, Tinctura Quassiæ.

Foreign Pharmacopœias.—Official in U.S., same as Brit.; Austr., Belg., Dan., Norw., Span., and Swed., use *Quassia amara;* Dutch, Fr., Ger., Ital., Jap., Mex. (Cuasia), Port., Russ. and Swiss, use both; not in Hung.

Description.—Quassia wood is imported in logs of varying length, frequently exceeding six inches (fifteen centimetres) in diameter. The Wood is yellowish-white, tough and dense, but easily split. The longitudinal section exhibits elongated cells containing single crystals of Calcium Oxalate. The transverse section exhibits medullary rays mostly two or three cells in width. The Wood is inodorous, but has an intense, purely bitter taste.

Preparations.

INFUSUM QUASSIÆ. Infusion of Quassia. (Altered.)

Quassia Wood, finely rasped, 88 grains; Distilled Water, cold, 20 fl. oz. Infuse in a covered vessel for fifteen minutes; strain.

=(about 1 in 100).

Now 1 in 100 instead of 1 in 80, and the time is reduced.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in Fr. (Quassia Amara), 1 in 200; Span. (Tinct. Acuosa de Quassia Amarga), 1 in 100; not in the others.

A **solid extract** is official in the following: Fr. (Quassia Amara), Belg, Ital., Mex., Port. and Span., use cold Water; Austr., Dan., Dutch, and Swiss, use boiling Water; U.S., with cold Water; Dan., Mex. and U.S. have also a **fluid extract**; not in the others.

LIQUOR QUASSIÆ CONCENTRATUS. CONCENTRATED SOLUTION OF QUASSIA. (NEW.)

Quassia Wood, in No. 40 powder, 2; Alcohol (20 p.c.) 22, or a sufficient quantity. Mix the Quassia with 2 of the Alcohol; pack in a closed percolator; set aside for three days; percolate with the remaining Alcohol, added in ten equal portions at intervals of twelve hours; continue percolation with more Alcohol until the product measures 20. =(1 in 10).

Dose.—½ to 1 fl. drm.

TINCTURA QUASSIÆ. TINCTURE OF QUASSIA. (ALTERED.)

Quassia Wood, rasped, 2; Alcohol (45 p.c.), 20. Prepare by the maceration process. =(1 in 10).

Now 1 in 10 instead of 1 in 27, and Alcohol (45 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., and Jap., 1 and 5 (by weight); Mex., 1 in 5; U.S., 1 in 10; not in the others.

Not Official.

QUEBRACHO.

The bark of *Aspidosperma Quebracho*, obtained from the Argentine Republic and Brazil (*Quebracho blanco*).

Medicinal Properties.—It is said to possess tonic, febrifuge, and anti-asthmatic properties. Was used rather extensively at one time as a remedy for asthma, cardiac dyspnœa, and spasmodic croup, but is now seldom prescribed.

A **Tincture** is made 1 in 5 of Alcohol (60 p.c.); also Official in Mex. and Swiss.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Ital., Mex. and Swiss; not in the others.

The following alkaloids and salts can be obtained:—Aspidospermine Cryst. and Sulphate (Fraude); Aspidosamine and Hydrochloride (Hesse); Quebrachine Cryst. and Hydrochloride (Hesse), Dose, ¾ to 1½ grains; Quebrachamine and Sulphate (Hesse); Hypoquebrachine and Hydrochloride (Hesse).

Of the alkaloids Quebrachine is more active and more poisonous than Aspidospermine: it has greater antithermic properties.—*L.* '86, i. 804.

Not Official.

QUERCUS CORTEX.

OAK BARK.

The dried bark of the small branches and young stems of *Quercus Robur*, collected in spring from trees growing in Britain.

Medicinal Properties.—An astringent, whether administered internally or applied externally. May be used either generally or topically, in all cases requiring astringents, such as relaxed throat or tenderness of the gums; in leucorrhœa, gonorrhœa, prolapsus ani, &c.

Dose.—Of the **powder**, 30 to 120 grains. Of a **Decoction** (1 to 16), 1 to 2 fl. oz.

Foreign Pharmacopœias.—Official in all except Dutch and Jap.; Fr. (Chêne), Ital. (Quercia), Port. (Corvalho), Mex. and Span. (Encina), U.S. (Quercus alba).

QUILLAIÆ CORTEX.

QUILLAIA BARK.

B.P.Syn.—Panama Bark.

[NEW.]

The inner part of the bark of *Quillaja saponaria*.

Imported from Chili.

Medicinal Properties.—Has been strongly recommended as an expectorant, but it is contra-indicated in ulceration of the throat or alimentary canal, since it is too powerful an irritant.—*Pr.* xxxvi. 29. An infusion has been used by Shoemaker for chronic ulcers, pityriasis and hyperidrosis.

The powder is excessively irritating to the air passages.

It has been found to possess properties allied to Senega, but it contains the two glucosides 'Quillaic Acid' and 'Sapotoxin' in much greater quantity than they exist in Senega.

Official Preparation.—Tinctura Quillaiæ. Used in the preparation of Liquor Picis Carbonis.

Foreign Pharmacopœias.—Official in Fr. (Bois de Panama), Ger. (Quillaia), Mex. (Quillaya), Russ. and U.S. (Quillaja); not in the others.

Description.—Quillaia Bark is usually imported in large flat pieces, about one-sixth of an inch (four millimetres) thick, and two feet (six decimetres) or more long, and four inches (ten centimetres) wide. The outer surface is brownish-white, or, where the outer bark has been imperfectly removed, reddish-brown or blackish-brown; the inner surface is smooth and white or yellowish-white. The fracture is splintery; the fractured surface is laminated, and exhibits under a lens glistening prismatic crystals; the transverse section is marked with fine radial and tangential lines. The taste is astringent and acrid; the odour is not marked but the powder is extremely irritating to the nostrils.

Preparation.

TINCTURA QUILLAIÆ. Tincture of Quillaia. (New.)

Quillaia Bark, in No. 20 powder, 1 oz.; Alcohol (60 p.c.), a sufficient quantity. Moisten the powder with ½ fl. oz. of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20 fl. oz.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Fr. (Teinture de Panama), 1 in 5 (Alcohol 80 p.c.); Mex., 1 in 5; U.S., 1 in 5 (Diluted Alcohol).

Not Official.

QUININA.

$C_{20}H_{24}N_2O_2$, $3H_2O$, eq. 375·48.

This alkaloid is precipitated from solutions of its salts as a Trihydrate, containing 14 p. c. of Water. It is met with as a white, soft, granular powder, slightly damp from adherent moisture, easily soluble in Ether or dilute mineral acids, and melting to a gummy-looking mass at about 140° F.

When separated from its solutions by shaking out with Ether or Chloroform and evaporating to dryness, it still retains a little Water, dried off with difficulty in a water-bath. For determination purposes it should be heated to 250° F. (120° C.) before weighing.

Quinine in the free state may be titrated with $\frac{N}{10}$ Sulphuric Acid and Methyl-Orange, and as the alkaloid has no action on Phenol-phthalein, the acid in its salts may be estimated by $\frac{N}{10}$ Soda with that indicator.

The Official salts of Quinine, (Hydrochloride and Sulphate), are given under separate headings.

Solubility.—Very sparingly in Water; 1 in 1 of Alcohol (90 p.c.); 1 in 3 of Chloroform; 1 in 4 of Ether.

Foreign Pharmacopœias.—Official in Austr., Dutch, Fr., Hung., Ital., Mex., Port., Russ., Span., Swed., Swiss and U.S.; not in the others.

Preparations.

Injectio Quininæ Hypodermica.—Quinine Hydrate, 76 grains; Lactic Acid, 27 minims, or a sufficiency; Distilled Water, a sufficiency; rub the Quinine with 6 fl. drm. of the Water, and add the Lactic Acid so as to dissolve the Quinine, and form a solution neutral or only faintly acid to Litmus paper, and make the measure up to 1 fl. oz. with Distilled Water.

QUININÆ ARSENAS.—The composition of this salt being so variable, according to the method of preparation, the compound ($C_{20}H_{24}N_2O_2.AsH_3O_4H_2O$), containing 66 p.c. of Quinine and 29 p.c. of Arsenic Acid, has been recommended as the most stable and otherwise suitable.—*P.J.* (3) xx. 162.

Dose.—One-tenth of a grain.

Foreign Pharmacopœias.—Official in Mex. and Russ.; not in the others.

QUININÆ CARBOLAS.—The crystalline salt contains 77 p.c. of Anhydrous Quinine. For extemporaneous preparations, the alkaloid may be used, and the best proportions are:—Quinine, 4; Carbolic Acid, 1; melt and cool.

Dose.—2 grains for Diarrhœa.

(Not in the other Pharmacopœias.)

QUININÆ CITRAS.—Crystallises in delicate needles.

Various formulas are given for this salt, $Q\overline{Ci}$; $Q_2\overline{Ci}$; $Q_2\overline{Ci}.7H_2O$; but the commercial salt corresponds more closely with $(C_{20}H_{24}N_2O_2)_2H_3C_6H_5O_7.3H_2O$, eq. 887·94, containing 72·5 p.c. of Quinine.

Solubility.—1 in 1600 of Water; not soluble in Lemon Juice; slightly in Chloroform.

Foreign Pharmacopœias.—Official in Dutch, Mex. and Port.; not in the others.

QUININÆ ETHYLCARBONAS (Euquinine, Euchinine).—Is produced by the action of Ethyl Chlor-carbonate on Quinine. It is a crystalline body sparingly soluble in Water, soluble in Alcohol, Ether, and Chloroform. Melts at 95° C. Has

been recommended as a substitute for Quinine. Dose, 5 to 10 grains.—*P.J.* '97, ii. 82; *B.M.J.E.* '96, ii. 104; *B.M.J.* '97, ii. 1734; *L.* '97, ii. 728.

QUININÆ GLYCEROPHOSPHAS.—There are two Quinine Glycerophosphates, one basic and one neutral. The basic salt is the one in general use. In slender white needles melting at 154° C, soluble in Water, more readily in Alcohol. It should yield no free Glycerin when shaken with Absolute Alcohol, and subsequent evaporation of the solvent; should give no reaction for free Phosphoric Acid.—*P.J.* '98, ii. 410; *J.S.C.I.* '98, 485.

QUININÆ HYDRIODIDUM.—The neutral salt has about the same solubility in Water as the Sulphate, and dissolves freely in Alcohol and Ether. It is generally found as an amorphous powder. $C_{20}H_{24}N_2O_2.HI$, eq. 448·74.

QUININÆ HYDRIODIDUM ACIDUM ($C_{20}H_{24}N_2O_2.2HI.5H_2O$, eq. 665·04). Crystallises in large laminæ of a fine yellow colour, and is soluble 1 in 20 of Water.

QUININÆ HYDROBROMIDUM.—Colourless silky crystals, neutral or slightly alkaline.

It is given (*P.J.* (3) v. 303) with H_2O, and soluble 1 in 5. Codex with H_2O, soluble 1 in 60. Our stock (May 1893) corresponded with $C_{20}H_{24}N_2O_2.HBr.H_2O$, containing 76·5 p.c. of Quinine, and soluble about 1 in 55 of Water; after drying at 125° C., its original moisture was again absorbed rapidly from the atmosphere. U.S. (1882) gave the formula with $2H_2O$, and solubility 1 in 16 of Water; U.S. (1893) gives it with H_2O, and soluble 1 in 54 of Water.

Foreign Pharmacopœias.—Official in Dutch, Fr., Mex., Port., Russ., Span., Swiss and U.S.; not in the others.

QUININÆ HYDROBROMIDUM ACIDUM ($C_{20}H_{24}N_2O_2.2HBr.3H_2O$, eq. 536·18), containing 60 p.c. of Quinine.—Colourless crystals.

Solubility.—1 in 6 of Water.

Foreign Pharmacopœias.—Official in Fr., Bromhydrate de Quinine Neutre; Mex.; not in the others.

QUININÆ HYPOPHOSPHIS ($C_{20}H_{24}N_2O_2.H_3PO_2$, eq. 386·40).—Generally supplied as an amorphous powder, but it can be crystallised.

Solubility.—1 in 250 of Water; 1 in 40 of Alcohol (90 p.c.).

(Not in the other Pharmacopœias.)

QUININÆ LACTAS ($C_{20}H_{24}N_2O_2.C_3H_6O_3$. eq. 411·21).—A white crystalline powder, soluble about 1 in 6 of Water, but there is much disagreement about its solubility. A **solution**, 1 in 4, can be made by neutralising Quinine with Lactic Acid, p. 527.

Foreign Pharmacopœias.—Official in Fr. and Mex.; not in the others.

QUININÆ PHOSPHAS.—It is stated (*P.J.* (3) xxiii. 234) that the English-made salt has the formula $3C_{20}H_{24}N_2O_2.2H_3PO_4.6H_2O$, and the German salt $2C_{20}H_{24}N_2O_2H_3PO_4.4H_2O$; the former containing 76 p.c. and the latter 79 p.c. of Quinine. Sample containing Barium as an impurity.—*P.J.* '96, i. 337; *C.D.* '96, i. 578.

Solubility.—1 in 420 of Water; 1 in 110 of Alcohol (90 p.c.).

(Not in the other Pharmacopœias.)

QUININÆ SALICYLAS ($C_{20}H_{24}N_2O_2.C_7H_6O_3$, eq. 458·85).—Slightly crystalline powder, prepared by decomposing Quinine Sulphate with Sodium Salicylate. It is practically anhydrous, and contains 70 p. c. of Quinine.

Solubility.—1 in 630 of Water; 1 in 24 Alcohol (90 p.c.); 1 in 25 of Chloroform.

Foreign Pharmacopœias.—Official in Fr., Mex. (Salicilato de Quinina Basico); Russ., Span. and Swiss; not in the others.

QUININÆ SULPHAS ACIDA ($C_{20}H_{24}N_2O_2.H_2SO_4.7H_2O$, eq. 544·34).—Colourless crystals, which effloresce on exposure to air. It was originally called the **Neutral Quinine Sulphate.**

Solubility.—1 in 10 of Water; 1 in 45 of Alcohol (90 p.c.).

A **solution** of 1 or 2 grains to the fluid ounce of Distilled Water applied to the eyes and nostrils for Hay Fever.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr., Hung., Mex., Swiss and U.S.; not in the others.

QUININÆ TANNAS.—A yellowish-white amorphous body; sparingly soluble in Water, very soluble in Alcohol. At one time recommended because of its being tasteless.

Large doses recommended in whooping cough, 1½ grains for each year of age.—*L.M.R.* '81, 177.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Fr., Ger., Hung., Ital., Mex., Port., Russ., Span., and Swiss; not in the others.

QUININÆ TARTRAS $(C_{20}H_{24}N_2O_2)_2.C_4H_6O_6.H_2O$, eq. 810·48).

Solubility.—Very sparingly in Water (about 1 in 1000).

Quinine Sulphate, 80 grains; Tartaric Acid, 40 grains; Distilled Water, to measure 4 fl. drm., has been used in India for **hypodermic injection.**

QUININÆ VALERIANAS ($C_{20}H_{24}N_2O_2.C_5H_{10}O_2.H_2O$, eq. 441·03).—A white crystalline salt, smelling, but not strongly, of Valerianic Acid.

Made by decomposing Quinine Hydrochloride with Sodium Valerianate.

Solubility.—1 in 120 of cold Water; 1 in 2 of Alcohol (90 p.c.); 1 in 14 of Ether.

Dose.—1 to 3 grains.

Foreign Pharmacopœias.—Official in Belg., Fr., Ital., Mex.. Port., Russ., Span., Swed., Swiss and U.S.

SYRUPUS QUININÆ DIKINATIS.—Introduced by Dr. Donovan of Dublin.

1 fl. drm. contains 2 grains of Quinine Dikinate.

Dose.—½ to 1 fl. drm.

WARBURG'S TINCTURE FOR MALARIAL FEVER.—Dr. Carl Warburg's contains Quinine. The formula for this is given in the *M.T.* '75, ii. 540, with some interesting cases by Professor Maclean, C.B.:—Aloes Socotrinæ 4, Rad. Rhei 4, Sem. Angelicæ 4, Conf. Damocratis 4, Rad. Helenii 2, Croci Sativi 2, Sem. Fœniculi 2, Cretæ Præparatæ 2, Rad. Gentianæ 1, Rad. Zedoariæ 1, Pip. Cubebæ 1, Myrrh Elect. 1, Camphoræ 1, Bolet. Laricis 1. Digest with 500 of Proof Spirit on a water-bath for twelve hours, express and add Quininæ Sulphatis 10. Continue heating on a water-bath till all the Quinine Sulphate is dissolved; filter when cold.

Warburg's Tincture is without its equal in persistent and protracted agues.—*T.G.* '94, 842.

QUINETUM.—The mixed Alkaloids from the E. I. Red Cinchona Bark. The Sulphate resembles Quinine Sulphate, and is given in the same doses.

Solubility.—Sparingly in Water; 1 in 90 of Alcohol (90 p.c.).

QUINIDINÆ SULPHAS $(C_{20}H_{24}N_2O_2)_2.H_2SO_4 2H_2O$, eq. 776·78.— White silky crystals.

Solubility.—1 in 200 of Water; 1 in 24 of Alcohol (90 p.c.); about 1 in 100 of Glycerin.

Foreign Pharmacopœias.—Official in Fr. and U.S.; not in the others.

QUINOIDIN, *Syn.* CHINOIDIN. — A mixture of alkaloids, mostly amorphous,

obtained as a by-product in the manufacture of the crystallisable alkaloids from Cinchona. A brownish black mass with alkaline reaction. On ignition should not leave more than ·7 p. c. of ash.

Foreign Pharmacopœias.—Official in Jap., Norw., Russ. and Swed; not in the others.

QUINOLIN (Chinolin).—Is formed by the distillation of Quinine or Cinchonine with aqueous Potassium Hydroxide, or synthetically from Aniline and Nitrobenzene. It is a colourless mobile liquid having a faint aromatic odour and a peculiar penetrating taste, sparingly soluble in Water, miscible with Alcohol, Ether, and Carbon Bisulphide.

QUINOSOL (Chinosol. Potassium Oxychinolin Sulphonate).—A bright lemon-yellow powder with a faint odour, soluble in Water.

It is a powerful antiseptic, disinfectant, and deodorant. Even dilute solutions prevent the growth of various micro-organisms. The pure powder, used as a dressing for wounds, causes much irritation. It acts better in solution than in powder.—*B.M.J.* '96, i. 285; '97, i. 263; *B.M.J.E.* '98, i. 91; *L.* '96, i. 557; '98, i. 1206; *P.J.* '96, i. 82, 299, 484; '98, i. 61.

Diaphthol (Quinaseptol) and **Diaphtherin** (Oxychinaseptol) have also been used as antiseptics.

QUININÆ HYDROCHLORIDUM.

QUININE HYDROCHLORIDE.

Hydrochlorate of Quinine.—*B.P.* '85.

$C_{20}H_{24}N_2O_2HCl, 2H_2O$, eq. 393·79.

The Hydrochloride of an alkaloid obtained from the bark of various species of *Cinchona* and *Remijia*.

Solubility.—1 in 37 of Water; 1 in 1 of boiling Water; 1 in 1 of Alcohol (90 p.c.). The anhydrous salt is very soluble in Chloroform.

Medicinal Properties.—Same as Quinine Sulphate. This salt is very much more soluble than the Sulphate.

Dose.—1 to 10 grains.

Official Preparations.—Tinctura Quininæ and Vinum Quininæ.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap. and Swiss, Chininum Hydrochloricum; Dan., Norw., and Swed., Chloretum Chinicum; Dutch, Hydrochloras Chinini; Fr., Chlorohydrate de Quinine Basique; Ital., Cloridrato di Chinina; Mex., Clorhidrato de Quinina basico; Port., Chlorhydrato de Quinina; Span., Cloruro Quinico; Russ., Chininum Hydrochloratum; U.S.; not in Belg.

Description.—In crystals resembling those of Quinine Sulphate, but generally somewhat larger.

Tests.—It affords the reactions characteristic of Hydrochlorides. It should yield only the slightest characteristic reactions with the tests for Sulphates. When converted into Quinine Sulphate, by dissolving it together with an equal weight of Sodium Sulphate in ten times its weight of hot Water, and setting the mixture aside at

60° F. (15·5° C.), it should respond to the characters and tests that are mentioned under 'Quininæ Sulphas.'

Dried at a temperature of 212° F. (100° C.), it loses 9 p.c. of Water.

Preparations.

TINCTURA QUININÆ. TINCTURE OF QUININE. (ALTERED.)

Quinine Hydrochloride, 175 grains; Tincture of Orange, 20 fl. oz. Dissolve the Quinine Hydrochloride in the Tincture of Orange.

=(about 1 grain in 55 minims).

Formerly it contained 1 grain in 60 minims.

Now prepared without heat, from Tincture of Orange (fresh peel).

Dose.—½ to 1 fl. drm.

VINUM QUININÆ. QUININE WINE. (ALTERED.)

Quinine Hydrochloride, 20 grains; Orange Wine, 20 fl. oz. Dissolve; set aside; filter if necessary.

Dose.—½ to 1 fl. oz.

Now made with Quinine Hydrochloride instead of Quinine Sulphate, and the Citric Acid omitted.

QUININÆ HYDROCHLORIDUM ACIDUM.

ACID QUININE HYDROCHLORIDE.

[NEW.]

$C_{20}H_{24}N_2O_2$, 2HCl, $3H_2O$, eq. 447·86.

The Acid Hydrochloride of an alkaloid obtained from the bark of various species of *Cinchona* and *Remijia*.

Dose.—1 to 10 grains.

(Fr. Chlorhydrate neutre de Quinine; not in the others.)

Description.—A white crystalline powder soluble in less than its own weight of Water, yielding a somewhat acid liquid.

Tests.—It affords the reactions characteristic of Hydrochlorides. It should yield only the slightest characteristic reactions with the tests for Sulphates. Each gramme, when dissolved in 20 c.c. of Water, should require for its complete neutralisation not more than 2·5 c.c. of Volumetric Solution of Soda. When converted into Quinine Sulphate, by dissolving it together with an equal weight of Sodium Sulphate in ten times its weight of hot Water, exactly neutralising this liquid with Solution of Ammonia, and setting it aside at 60° F. (15·5° C.) to cool, it should respond to the characters and tests which are mentioned under 'Quininæ Sulphas.' Dried at a temperature of 212° F. (100° C.) it loses not more than 12 p.c. of water.

QUININÆ SULPHAS.

QUININE SULPHATE.

$((C_{20}H_{24}N_2O_2)_2, H_2SO_4)_2, 15H_2O$, eq. 1750·24.

The Sulphate of an alkaloid obtained from the bark of various species of *Cinchona* and *Remijia*.

Solubility.—About 1 in 800 of Water; 1 in 25 of boiling Water; 1 in 65 of Alcohol (90 p.c.); 1 in 40 of Glycerin.

60 grains require 60 minims of Diluted Sulphuric Acid or 100 minims of Diluted Phosphoric Acid for solution in 2 fl. oz. of Distilled Water.

66 grains require 60 minims of Diluted Nitric Acid for solution in 2 fl. oz. of Water.

Medicinal Properties.—In small doses it acts as a most valuable tonic and bitter stomachic. In large doses it is an antiperiodic and antipyretic in intermittent fevers and all malarial conditions; in moderate doses it is an antipyretic in influenza and continued fevers, especially enteric (in which it also acts as an antiseptic); and it is analgesic in supra-orbital and other forms of neuralgia. Used as a spray (2 grains to 1 fl. oz.) in hay-fever; contra-indicated during advanced pregnancy.

Quinine as a parturient.—*B.M.J.* '85, i. 427, 1320.

Quinine in pneumonia, *B.M.J.* '85, i. 1245; in whooping-cough, *M.A.* '95, 522; *T.G.* '94, 126; in cholera nostras, *B.M.J.E.* '93, ii. 7.

Quinine in large doses or if taken frequently produces deafness.—*L.M.R.* '81, 177.

As a prophylactic in African fevers.—*L.* '96, i. 219. As a prophylactic against influenza.—*B.M.J.E.* '95, ii. 92; *L.* '95, ii. 1381.

Quinine Sulphate and Ipecacuanha in dysentery.—*Pr.* liv. 478; *P.J.* (3) xxv. 1167.

Dose.—1 to 10 grains.

Prescribing Notes.—Given in **pills** or **cachets**, also in **aqueous solution** assisted by the addition of Diluted Sulphuric or Diluted Hydrochloric Acid, 1 minim to each grain; it also dissolves readily in Tincture of Ferric Chloride.

One of the most pleasant ways of giving Quinine is in a **mixture** with Citric Acid, to be taken during **effervescence** with a solution containing Potassium Bicarbonate and Ammonium Carbonate. It is also given in solution with Hydrobromic Acid to diminish the tendency to Cinchonism. Milk covers the taste well. Effervescent Quinine Citrate is also a very palatable form.

When a large dose (say 10 grains) is given, it is best suspended in Water; the bitterness is not then so intense as when in solution.

It is best made into **pills** with liquid Glucose.

For **hypodermic injection** *see* other salts of Quinine, under each of which the solubilities are given. Of the neutral salts, the Lactate (1 in 4) is the most soluble; of the acid salts, the Hydrochloride (1 in 1).

Quinine is precipitated from aqueous solutions of its salts by alkalis. In the Ammoniated Tincture of Quinine the alkaloid is dissolved by the Alcohol.

Incompatibles.—All Alkalis and their Carbonates: all infusions containing Tannin throw down a Quinine Tannate, which Sulphuric Acid, instead of dissolving, helps in precipitating.

Official Preparations.—Pilula Quininæ Sulphatis and Tinctura Quininæ Ammoniata. Used in the preparation of Ferri et Quininæ Citras and Syrupus Ferri Phosphatis cum Quinina et Strychnina.

Foreign Pharmacopœias.—Official in all; Austr., Ger., Hung., Jap., Russ., and Swiss, Chininum Sulfuricum; Belg., Sulphas Quininæ; Dan., Norw. and Swed., Sulphas Chinicus; Dutch, Sulphas Chinini; Fr., Sulfate de Quinine Basique; Ital., Solfato di Chinina; Mex. and Port., Sulfato de Quinina; Span., Sulfato Quinico; U.S. Quininæ Sulphas.

Description.—Filiform silky white crystals, of an intensely bitter taste.

Considerable discussion has arisen from time to time on the subject of 'light' and 'heavy' Quinine. Chemically pure Quinine Sulphate naturally crystallises in hard crystals somewhat resembling Zinc Sulphate, and at one time it was considered that the light, feathery form was inseparable from the presence of traces of Cinchonidine. In fact, as Cuprea (Remijia) bark contains no Cinchonidine, manufacturers, using this variety alone, were obliged to add a certain proportion of this Sulphate to obtain their Quinine Sulphate in the 'light' form, which was universally in demand. It has more recently been discovered that the addition of a small quantity of Ammonium Sulphate to the crystallising liquid produces the same effect.—*C.D.* '92, i. 22.

Tests.—Soluble in about 800 parts of Water, giving a solution which has a bluish fluorescence. Entirely soluble in Water acidulated with a mineral acid. Aqueous solutions of Quinine salts yield with Solution of Ammonia white precipitates soluble in Ether and in excess of the Solution of Ammonia. When such aqueous solutions are treated first with Solution of Bromine or of Chlorine and afterwards with Solution of Ammonia, they become of an emerald-green colour, changing to red when mineral acids are added. Exposed to dry air, Quinine Sulphate effloresces until the 15 molecules of Water have been reduced to 4. It affords the reactions characteristic of Sulphates. 2·5 grammes of the freshly prepared salt should lose ·38 gramme of water by drying at 212° F. (100° C.). Heated to redness with free access of air, it burns without leaving any residue (absence of mineral impurity).

Quinine Sulphate when tested by the following methods should not afford any appreciable reaction characteristic of Cinchonine, Quinidine, Cupreine, or amorphous alkaloid, and should not yield more than a total of 3 p.c. of crystals of impure Cinchonidine by the following test.

Test for Cinchonidine and Cinchonine.—Dissolve 4 grammes of the Quinine Sulphate in 120 c.c. of boiling Water. Cool the solution slowly to 122° F. (50° C.), with frequent stirring. Separate, by filtration, the purified Quinine Sulphate which has crystallised out. Concentrate the filtrate by evaporation until it is reduced to 10 c.c. or less; transfer to a small stoppered flask, and, when cold, shake with 10 c.c. of Ether and half that amount of Solution of Ammonia. Set aside in a cool place for not less than 24 hours. Collect the crystals, which consist of Cinchonidine and Cinchonine combined with Quinine, on a tared filter, wash with a little Ether, dry at 212° F. (100° C.), and weigh. These should not amount to more than ·12gramme.

Test for Quinidine.—Dissolve 1 gramme of the Quinine Sulphate in 30 c.c. of boiling Water; cool, and filter. To the solution add Solution of Potassium Iodide, and a little Alcohol (90 p.c.) to prevent the precipitation of amorphous Hydriodides. Collect any separated Quinidine Hydriodide, wash with a little Water, dry, and weigh. The weight represents about an equal weight of crystallised Quinidine Sulphate. None or only the slightest traces should be obtained.

Test for Cupreine.—Shake the recrystallised Quinine Sulphate, obtained in testing the original Quinine Sulphate for Cinchonidine and Cinchonine, with 25 c.c. of Ether and 6 c.c. of Solution of Ammonia, and to this ethereal solution, separated, add the ethereal liquid and washings also obtained in testing the original Sulphate for the two alkaloids just mentioned. Shake this ethereal liquid with 6 c.c. of a 10 p.c. Solution of Sodium Hydroxide, adding Water if any solid matter should separate. Remove the ethereal solution. Wash the aqueous solution with more Ether, and remove the ethereal washings. Add Diluted Sulphuric Acid to the aqueous liquid heated to boiling, until exactly neutral. When cold, collect any crystallised Cupreine Sulphate on a tared filter; dry, and weigh. None or only the slightest traces should be obtained.

Test for Cinchonine and Amorphous Alkaloids.—Dissolve 1 gramme of the Quinine Sulphate in 30 c.c. of boiling Water, add 1 gramme of Sodium Potassium Tartrate. Allow to cool, with frequent stirring; filter. The solution when evaporated to small bulk should give little or no precipitate with Solution of Ammonia.

It has been shown by Cownley (*P.J.* '98, i. 412), who has criticised the B.P. test adversely, that Cinchonine, Quinine and Cupreine are never present in Quinine Sulphate of any known commercial manufacture. Moreover Cupreine occurs in Cuprea bark (*Remijia pedunculata*) (*P.J.* (3) xv. 221, 401), now seldom if ever employed by Quinine manufacturers and in any case it could only exist in Quinine Sulphate to the extent of a few hundredths p.c. It has also been shown (*ibid.*) that a yield of 3 p.c. of crystals of impure Cinchonidine (by the B.P. test) really means an admixture of 5·99 p.c. crystallised Cinchonidine Sulphate in Quinine Sulphate answering the B.P. requirements, while the 1885 B.P. stipulated that a Quinine Sulphate should not contain much more than 5 p.c. of Sulphates of other Cinchona alkaloids. 'It would therefore have been better for the Pharmacopœia, failing the insertion of a satisfactory test, to describe that limit of impurity, leaving its determination when necessary in the hands of those competent to undertake it' (Cownley, *P.J.* '98, i. 412). The most convenient and satisfactory test for the determination of Cinchonidine in Quinine Sulphate, is a modification of Paul's test (*P.J.* (3), vii. 673). It consists in re-crystallising 2 to 5 grammes of Quinine Sulphate from 100—120 c.c. of boiling water until in the last mother liquor no further indication of Cinchonidine is obtained. When the filtrate is concentrated to a very small bulk and agitated with Ether and Ammonia, Cinchonidine will crystallise out if left for 24 hours. The crystals so obtained represent the total amount of impure Cinchonidine in the sample under examination, but they contain a varying amount of Quinine, according to the quantity of Quinine present in the solution. In testing Quinine the object is to eliminate from solution as much Quinine Sulphate as possible before applying the Ether test, and in this respect the B.P. is extremely unsatisfactory. In Paul's test, according to Cownley, the crystals separating from Ether usually contain 70 p.c. of Cinchonidine. The amount of Cinchonidine Sulphate in commercial Quinine Sulphate varies from 0 to 12·34 p.c. and the amount of water from 8·61 to 16 p.c. (*P.J.* (3), xix. 665). There is no doubt that very little of the Quinine Sulphate used for dispensing purposes contains the amount of water represented by the formula given above (15 molecules) owing to the efflorescent nature of the salt. On that account it has been suggested that the more stable salt $(C_{20}H_{21}N_2O_2)_2H_2SO_4$, $2H_2O$ should be made official (Cownley, *P.J.* '96, ii. 525).

Preparations.

PILULA QUININÆ SULPHATIS. PILL OF QUININE SULPHATE. (NEW.)

Quinine Sulphate, 30 grains; Tartaric Acid, in powder, 1 grain; Glycerin, 4 grains; Tragacanth, in powder, 1 grain. Triturate the Quinine Sulphate with the Tartaric Acid; add the product to the previously mixed Glycerin and Tragacanth; make a mass.

Dose.—2 to 8 grains.

TINCTURA QUININÆ AMMONIATA. AMMONIATED TINCTURE OF QUININE. (ALTERED.)

Quinine Sulphate, 175 grains; Solution of Ammonia, 2 fl. oz.; Alcohol (60 p.c.), 18 fl. oz. Mix the Solution of Ammonia with the Alcohol; add the Quinine Sulphate; shake until a clear solution is produced; set aside for three days; filter. =(about 1 grain in 55 minims).

Formerly 1 grain in 60 minims. Alcohol (60 p.c.) is now used in place of Proof Spirit and less Ammonia is added.

Dose.—½ to 1 fl. drm.

When mixed with water the Quinine is precipitated in a fine state of division, but the particles soon aggregate and adhere to the sides of the glass; therefore this preparation should not be prescribed in mixtures, unless Mucilage of Acacia be used to suspend the Quinine.

When prepared with Ammonium Carbonate instead of Liquor, the Tincture does not precipitate so badly and it may be diluted with Water saturated with Carbonic Acid without any precipitation at all.

When first made, the Tincture usually deposits a little, so it is better to allow a day or two to elapse before filtering. It has been shown (*P.J.* (3) xxi. 511) that this deposit contains Cinchonidine.

(Not in the other Pharmacopœias.)

RESINA.

RESIN.

The residue left after the distillation of the Oil of Turpentine from the crude Oleo-resin (Turpentine) of various species of *Pinus*.

Solubility.—In almost all proportions of Alcohol (90 p.c.), Ether, and Oil of Turpentine, and in hot Olive Oil.

Medicinal Properties.—Important as an ingredient of ointments and plasters, but never used internally.

Official Preparations.—Emplastrum Resinæ and Unguentum Resinæ. Used in the preparation of Emplastrum Calefaciens, Emplastrum Cantharidis, Emplastrum Menthol, Emplastrum Picis, Emplastrum Plumbi Iodidi, Emplastrum Saponis.

Resin Plaster is contained in Emplastrum Belladonnæ, Emplastrum Opii, also in Emplastrum Calefaciens.

Foreign Pharmacopœias.—Official in all; U.S., Resina; Austr., Belg., Dutch, Ger., and Swiss, Colophonium; Dan., Norw., Russ., and Swed., Resina Colophonium; Fr., Colophone and Poix-resine; Hung., Colophonium Depuratum Flavum; Ital., Colophonia; Jap., Resina Pini; Mex., Brea; Port., Pez Loaro and Colophonia; Span., Resina Comum de Pino and Colofonia.

Description.—Translucent, of a light amber colour, compact,

brittle, pulverisable; fracture shining; odour and taste faintly terebinthinate. It is soluble in Alcohol (90 p.c.), Ether, Benzol, and Carbon Bisulphide, is easily fusible, and burns with a dense yellow flame and much smoke, leaving no appreciable ash.

Preparations.

EMPLASTRUM RESINÆ. Resin Plaster. *B.P.Syn.*—Adhesive Plaster. (Altered.)

Resin, 4; Lead Plaster, 32; Hard Soap, 2. Melt each ingredient separately at as low a temperature as possible: mix. =(1 in 9½).

Now made with Hard Soap instead of Curd Soap.

Foreign Pharmacopœias.—Official in Jap. and U.S., Emplastrum Resinæ; Austr., Belg., Dan., Dutch, Ger., Hung., Norw., Russ., Swed., and Swiss, Emplastrum Adhesivum; Port., Emplastro de Chumbo Composto; Mex., Emplasto Adhesivo; Span., Emplasto de Diapalma; all differing in composition; not in Fr. or Ital.

Used chiefly for strapping wounds and ulcers.

UNGUENTUM RESINÆ. Resin Ointment. *N.O.Syn.*—Basilicon Ointment. (Altered.)

Resin, in powder, 8; Yellow Beeswax, 8; Olive Oil (by weight), 8; Lard, 6. Add the Lard and Olive Oil to the previously melted Resin and Beeswax; strain; stir until cold. =(1 in 3¾).

Olive Oil and Lard used in place of Almond Oil and Simple Ointment and the quantity of Beeswax increased.

Foreign Pharmacopœias.—Official in Dan. and Norw., Ung. Basilicum Nigrum; Fr., Onguent Basilicum; Belg., Ger. and Russ., Ung. Basilicum; Mex., Ung. Amarillo; Port., Ung. de Resina; Span., Ung. de Colofonia Palida; Swed., Ung. Terebinthinæ Resinosum; Swiss, Ung. Resinosum; U.S., Ceratum Resinæ; all differing in composition. Not in Austr., Dutch, Ital. or Jap.

A stimulating dressing for indolent ulcers.

Not Official.

RESORCINUM.

METADIOXYBENZOLUM.

$C_6H_4(HO)_2$, eq. 109·22.

White crystals obtained by the destructive distillation of Brazilin or by fusing Potassium Benzoldisulphonate with Potassium Hydroxide.

Solubility.—4 in 3 of Water; 4 in 3 of Alcohol (90 p.c.); 1 in 1 of Glycerin; 1 in 1 of Ether.

Medicinal Properties.—Antiseptic and antipyretic. Has been employed in the treatment of acute fevers; also as a **spray** (1 or 2 p.c.) in diphtheria and whooping-cough, *Pr.* liv. 381; 5 to 10 p.c. **solutions** in Glycerin; 5 to 10 p.c. **ointments** in skin diseases.—*B.M.J.* '88, i. 435; *L.* '88, i. 570; '90, ii. 1347; '91, ii. 505, 1185; *T.G.* '90, 270. In acne rosacea, *Pr.* li. 380; in pruritus, *M.A.* '95, 436; in diarrhœa and gastric affections, and as a local germicide and stimulant in ulcers and in pharyngitis and chronic rhinitis.—*Y.B.T.* '94, 463; in leucoplakia, *T.G.* '95, 181. Untoward effects when administered internally as a powder.—*L.* '98, ii. 779, 836.

Dose.—1 to 5 grains.

Prescribing Notes.—When given internally it should be in dilute solution, as it has a caustic action.

Antidotes.—White of egg; wash out the stomach with Soda or Saccharated Lime well diluted; stimulants; Atropine; Amyl Nitrite.—*Murrell.*

In large doses it produces profuse perspiration, flushing of the face, and giddiness. Dr. Murrell describes a case of poisoning by 2 drm. of it which nearly proved fatal. —*M.T.* '81, ii. 487.

Foreign Pharmacopœias.—Official in Dan., Dutch, Fr., Ger., Hung., Ital., Mex., Norw., Russ., Swiss and U.S.; not in the others.

Test.—Its aqueous solution becomes deep violet on the addition of Ferric Chloride.

Preparations.

GARGARISMA RESORCIN (*T.H.*).—20 grains to 1 fl. oz. Water.

GLYCERINUM RESORCIN (*G.H.*).—Resorcin 1, Glycerin 4.

LOTIO RESORCINI (*B.S.H.*). Andeer's Lotion.—Resorcin 40 grains, Water 1 fl. oz. Used as an antiseptic and stimulant in foul and syphilitic ulcerations, and to allay irritation in chronic eczema and psoriasis.

PIGMENTUM RESORCIN (*T.H.*).—Resorcin 96 grains, Water to 1 fl. oz.

RESORCIN PLASTER MULL (Unna).—Contains $\frac{3}{4}$ grain to the square inch.

RESORCIN CAMPHOR.—A liquid obtained by heating together equal parts of Camphor and Resorcin. Is superior to the mercurial ointment in removing pediculi. —*P.J.* '96, i. 299, 326.

RESORCINOL.—Obtained by melting together equal volumes of Resorcin and Iodoform. It is a red brown powder partially soluble in Water, soluble in Ether. Has been introduced as a substitute for Iodoform as a dressing.—*P.J.* '96, 446.

ANUSOL.—The Bismuth salt of Iodo-resorcin-sulphonic Acid, is employed in suppository form in the treatment of piles.—*P.J.* '96, ii. 378.

Not Official.

RHAMNI FRANGULÆ CORTEX.

Syn.—Cortex Frangulæ.

The dried bark of *Rhamnus Frangula.*

Collected from the young trunk and from the larger branches, and kept at least one year before being used.

Official in B.P. '85, but not in B.P. '98.

Medicinal Properties.—Similar to those of Rhamnus Purshianus. A laxative or purgative for delicate constitutions and the aged.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Ger., Norw., Russ., and Swed., Cortex Frangulæ; Port., Amieiro Negro; Swiss, Cortex Rhamni Frangulæ; U.S., Frangula; not in the others.

A solid **Extract** is official in Dutch., Russ. and Swed.; a **Fluid Extract** in Dan., Ger., Norw., Russ. and U.S.

RHEI RADIX.

RHUBARB ROOT.

The erect rhizome or so-called root of *Rheum palmatum*, and probably other species, collected in China and Thibet, deprived of more or less of its cortex, and dried.

Medicinal Properties.—Cathartic and astringent, the latter property not interfering with the former, as the purgative effect precedes the astringent, and therefore is useful in diarrhœa when an aperient is indicated. Stomachic tonic in small doses. Given in dyspepsia attended with constipation. It is non-irritant, suitable for delicate constitutions, and increases the effect of other cholagogues and cathartics. It is frequently combined with an antacid or carminative.

Is a certain though not powerful hepatic stimulant.—Dr. Rutherford.

Dose.—3 to 10 grains, for repeated administration; for a single administration, 15 to 30 grains.

Prescribing Notes.—May be given in **cachets, pills, mixtures**, or Compressed Tablets. The **compound powder** is also prescribed in **cachets, capsules,** etc.

4 grains of Powdered Rhubarb and 1 minim of 'Dispensing Syrup' make a nice **pill.** Sodium Bicarbonate in equal weight with Powdered Rhubarb counteracts the astringency, and covers the taste; the addition of Peppermint Water still further hides it; or 1 drop of Oil of Peppermint, 30 grains of Sugar, will disguise the taste of 15 grains of Powdered Rhubarb; or 1 drop Oil of Nutmeg, 30 grains Sugar, and 10 grains of powdered Rhubarb, make a good **draught** with Water to $1\frac{1}{2}$ fl. oz.

Official Preparations.—Extractum Rhei, Infusum Rhei, Liquor Rhei Concentratus, Pilula Rhei Composita, Pulvis Rhei Compositus, Syrupus Rhei, Tinctura Rhei Composita.

Not Official.—Elixir Rhei, Extractum Rhei Compositum and Vinum Rhei.

Foreign Pharmacopœias.—Official in all; Fr., Rhubarbe; Port., Rhuibarbo; Mex. and Span., Ruibarbo.

Description.—In cylindrical, barrel-shaped, conical, plano-convex, or irregularly formed pieces; the surface sometimes covered with a bright yellowish-brown powder; rounded or somewhat angular, usually smooth, and marked with reddish-brown or dark rusty-brown lines, intermixed in a yellowish-brown or greyish substance, and nearly always presenting small scattered starlike marks. Frequently the pieces are bored with a hole, which sometimes contains a fragment of cord used to suspend them while drying. The pieces are hard and compact; fracture uneven, presenting a marbled appearance, and in some cases a rhomboidal network of reddish lines. Odour characteristic, somewhat aromatic; taste bitter, feebly astringent; when chewed the Root is gritty between the teeth.

Exhaustive paper on the chemistry of Rhubarb.—*P.J.* '95, ii. 325; *A.J.P.* '95, 615.

The *Rheum rhaponticum* and *R. officinale* are grown at Banbury, in Oxfordshire. In four or five years the roots attain the size of a man's arm; in drying, the root loses 75 p. c., and yields a fine yellow powder. A good deal is exported, and some is used in this country.

Preparations.

EXTRACTUM RHEI. Extract of Rhubarb. (Altered.)

Moisten Rhubarb Root, in No. 20 powder, with Alcohol (60 p.c.), and set aside for forty-eight hours; transfer to a percolator; slowly pass as much of the Alcohol as may be sufficient to exhaust the Rhubarb Root. Remove most of the Alcohol by distillation, and evaporate the residual liquid to dryness.

Now made with Alcohol (60 p.c.) instead of Proof Spirit and Water, and evaporated to dryness instead of a soft extract.

Dose.—2 to 8 grains.

Foreign Pharmacopœias.—Official in Austr., with boiling Water; Belg., Fr., Hung., Ital., Mex., Port., Russ., Span. and Swed., with Water; Span., Alcoholic; Dan., Dutch, Ger., Jap., Norw., Swiss and U.S. with Spirit and Water mixed; Mex. and U.S. have also a **Fluid Extract**, 1 in 1.

INFUSUM RHEI. Infusion of Rhubarb. (Altered.)

Rhubarb Root, in thin slices, 1; Distilled Water, boiling, 20. Infuse in a covered vessel for fifteen minutes; strain. =(1 in 20).

Now 1 in 20 instead of 1 in 40 and the time is reduced.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in Belg., 1 and 13⅓ (at 90° C.); Fr. 1 in 200 cold; Ital., 3 in 50; Span., 1 in 30; Mex., 1 in 50; Infusum Rhei Alkalinum.—Dan. and Norw., 1 in 8, Belg. and Swed., 1 in 10; Tinctura Rhei Aquosa.—Austr., 1 in 15 cold Water, Hung., 1 in 16, Ger., Russ., and Swiss, 1 in 10; Dutch, 1 Extract in 20; Jap., has a **Compound Infusion**; not in the others.

LIQUOR RHEI CONCENTRATUS. Concentrated Solution of Rhubarb. (New.)

Rhubarb Root, in No. 5 powder, 10; Alcohol (20 p.c.), 25, or a sufficient quantity. Moisten the Rhubarb with 5 of the Alcohol; pack in a closed percolator; set aside for three days; percolate with the remaining Alcohol, added in ten equal portions at intervals of twelve hours; continue percolation with more Alcohol until the product measures 20.

Dose.—½ to 1 fl. drm.

PILULA RHEI COMPOSITA. Compound Rhubarb Pill. (Modified.)

Rhubarb Root, in powder, 3 oz.; Socotrine Aloes, in powder, 2¼ oz.; Myrrh, in powder, 1½ oz.; Hard Soap, in powder, 1½ oz.; Oil of Peppermint, 1½ fl. drm.; Syrup of Glucose (by weight), 2¾ oz., or a sufficient quantity. Mix to form a mass.

Now made with Syrup of Glucose instead of Glycerin and Treacle.

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in Jap., Swiss, and U.S.: U.S. has also **Pilula Rhei**, Rhubarb 20, Soap 6, Water q. s.; not in the others.

PULVIS RHEI COMPOSITUS. Compound Powder of Rhubarb. *B.P.Syn.*—Gregory's Powder.

Rhubarb Root, in powder, 2; Light Magnesia, 6; Ginger, in powder, 1: mix. =(1 in 4½).

If a less bulky powder be desired, Heavy Magnesia may be employed.

Dose.—20 to 60 grains.

Foreign Pharmacopœias.—Official in Ger. (Pulvis Magnesiæ cum Rheo), and Span. (Polvo de Magnesia con Ruibarbo), Carb. Magnes. 60, Sacch. 40, Rhei 15, Ol. Fœnic. 1; Dan., Norw. and Swed. (Pulvis Magnesiæ c. Rheo), Carb. Magnes. 1, Sugar 1, Rhubarb 1, Oil of Fennel (Dan. and N. $\frac{1}{30}$, S. $\frac{1}{100}$); also. Russ. Carb. Magnes. 4, Sugar 2, Rhubarb 1, Oil of Fennel $\frac{1}{25}$; Jap. (Pulvis Infantum), Carb. Magnes. 3, Rhubarb 1, Elæosacchari Fœniculi 2; Swiss (Pulvis

Magnesiæ Compositus), Rhubarb 2, Sugar 3, Oil of Fennel $\frac{1}{10}$, Carb. Magnes 5; U.S. Rhubarb 5, Magnesia 13, Ginger 2; not in the others.

SYRUPUS RHEI. Syrup of Rhubarb. (Modified.)

Rhubarb Root, in No. 20 powder, 2; Coriander Fruit, in No. 20 powder, 2; Refined Sugar, 24; Alcohol (90 p.c.), 8; Distilled Water, 24. Moisten the mixed Rhubarb Root and Coriander Fruit with a portion of the mixed Alcohol and Distilled Water, and set aside; pack in a percolator; pass the remainder of the diluted Alcohol slowly through the materials; evaporate the percolate until it is reduced to 14, and in this, after it has been filtered, dissolve the Refined Sugar by the aid of heat. The product should weigh nearly 40.

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

A very unsatisfactory formula. The Rhubarb is in too fine powder, and by evaporation as above almost the whole aroma of the Coriander is driven off, and the liquid is difficult to filter. Judging from the strong flavour of commercial samples we should say that in practice the B.P. process is largely modified, and Ol. Coriand. added at the finish.

A good formula is to make a (1 in 4) fluid Extract of Rhubarb with Alcohol (60 p.c.); evaporate 8 fl. oz. of the fluid Extract to 3 fl. oz.; mix this and 5 minims of Oil of Coriander, with 24 oz. of Sugar, and add Water to make the weight 40 oz.: dissolve in the cold and filter.

Dose.—½ to 2 fl. drm.

Foreign Pharmacopœias.—Official in Austr., 1 in 26, with Potassium Carbonate; Belg., Syr. Rhei, and Syr. Rhei Compositus, both 1 in 20; Dan. and Dutch, 1 in 20, Hung., 1 in 27, Swed., 1 in 14, all with Sodium Carbonate; Ger., Russ. and Swiss, with Cassia and Potassium Carbonate, 1 in 20; Ital., Scirropo di Cicoria con Rabarbaro; Mex., Jarabe de achicoria y ruibarbo; Port., 1 in 20; Jap. and U.S., Syr. Rhei, 1 in 10, U.S. has also Syr. Rhei Aromaticus; Fr., Sirop de Rhubarbe Composé; all differ from Brit.; not in Norw. or Span.

TINCTURA RHEI COMPOSITA. Compound Tincture of Rhubarb. (Altered.)

Rhubarb Root, in No. 20 Powder, 2; Cardamom Seeds, bruised, ¼; Coriander Fruit, bruised, ¼; Glycerin, 2; Alcohol (60 p.c.) a sufficient quantity. Moisten the solid ingredients with 2 of the Alcohol; proceed with the percolation process until a volume of 18 of liquid has been obtained; agitate; set aside for forty-eight hours; filter; mix with the Glycerin. =(1 in 10).

Now made with Alcohol (60 p.c.) in place of Proof Spirit, Glycerin is added and Saffron omitted.

Dose.—½ to 1 fl. drm., for repeated administration; for a single administration, 2 to 4 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Fr., Ital., Mex. and Port., Rhubarb only, 1 in 5; Dan., Norw. and Swed. (Tinct. Rhei Amara) 1 and 10; by weight; Jap. and U.S., 1 in 10, U.S. has also (Tinct. Rhei Aromat.) 1 in 5, and (Tinct. Rhei Dulcis) 1 in 10; not in the others.

Not Official.

ELIXIR RHEI (*B.P.C.*).—Rhubarb Root, in No. 12 Powder, 5; Fennel Fruit, bruised, 2; Glycerin, 3; Refined Sugar, 4; Rectified Spirit, 1 volume, diluted

with Distilled Water 3 volumes, a sufficient quantity: moisten the Rhubarb and Fennel with 15 of the mixed Spirit and Water; macerate for forty-eight hours, and express. Break up the marc, and add to it sufficient of the menstruum to furnish, with the previous pressing, 15 of clear product. Express again after twenty-four hours' maceration. Unite the liquors, allow to stand for two days, and then filter into the Sugar and Glycerin. Dissolve without heat; then, if necessary, add sufficient of the above menstruum to make the product measure 20.

Dose.—1 to 3 fl. drm.

EXTRACTUM RHEI COMPOSITUM.

Belg., Dutch and Swiss, Ext. Rhei 3, Ext. Aloes 1, Resina Jalapæ ½, Soap ½.
Dan., Norw. and Swed., Ext. Rhei 5, Ext. Aloes 2, Resin Jalap 1½, Soap 1½.
Ger., Ext. Rhei 3, Ext. Aloes 1, Resina Jalapæ ½, Soap 2.
Russ., Ext. Aloes 2, Ext. Rhei 6, Jalapini Resin 1, Soap 1.

VINUM RHEI.—Official in B.P. '85 (1½ oz. to the 20 fl. oz.), but not in B.P. '98.

Foreign Pharmacopœias.—Official in Belg., about 1 in 17; Fr., 3 in 50; Mex., 1½ and 50; Austr., Ger. and Russ. (Tinct. Rhei Vinosa), also Swiss (Vinum Rhei Compositum), with Orange Peel and Cardamoms.

RHŒADOS PETALA.

RED-POPPY PETALS.

The fresh petals of *Papaver Rhœas*.

Chiefly used as a colouring agent.

Official Preparation.—Syrupus Rhœados.

Foreign Pharmacopœias.—Official in Austr., Flores Rhœados; Belg., Flores Papaveris Rhœados; Dutch, Petala Rheados; Fr., Coquelicot; Mex. and Span., Amapola; Swiss, Flos Rhœados; not in the others.

Description.—The fresh petals are of a bright scarlet colour; they are transversely elliptical in outline, about two inches (five centimetres) broad, have a smooth lustrous surface and an entire margin. The odour is characteristic and somewhat unpleasant; taste slightly bitter.

Preparation.

SYRUPUS RHŒADOS. SYRUP OF RED-POPPY. (MODIFIED.)

Red-Poppy Petals, 13; Refined Sugar, 36; Alcohol (90 p.c.), 2½; Distilled Water, a sufficient quantity. Add the Red-Poppy petals gradually to 20 of Distilled Water kept hot upon a water-bath; stir frequently, and afterwards, the vessel being removed, infuse for twelve hours. Then press out the liquid; strain; add the Refined Sugar, and dissolve by the aid of heat. When nearly cold, add the Alcohol, and sufficient Distilled Water to produce 58 (by weight) of the Syrup. =(1 in 3½).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Mex., and Span.; not in the others.

RICINI OLEUM.

CASTOR OIL.

The Oil expressed from the seeds of *Ricinus communis*.

Ricinoleic Acid stated to be the active principle.—*P.J.* '97, ii. 84; *T.G.* '97, 749.

Solubility.—Entirely soluble in all proportions of Absolute Alcohol, Ether, Oil of Turpentine, and Glacial Acetic Acid; 1 in 3½ of Alcohol (90 p.c.).

Medicinal Properties.—A mild and speedy cathartic. It is the best purgative in constipation from indurated fæces, or after swallowing acrid substances. Used in diseases attended with irritation or inflammation of the bowels, as colic, and diarrhœa due to indigestible food, dysentery and the constipation of typhoid fever; the most suitable purgative after parturition, during pregnancy and after abdominal operations. The safest cathartic for infants, to whom a larger relative dose than to adults may be given; a small quantity in emulsion relieves infantile spasms. It may be administered in an enema with some mucilaginous fluid.

The decoction of the leaves of *Ricinus* applied to the breast is said to produce an abundant supply of milk.

Stimulates the intestinal glands, but not the liver.—Dr. Rutherford.

Dose.—1 to 8 fl. drm.

Prescribing Notes.—In **draught** suspended with mucilage of Gum Acacia, or in **capsules.**

One of the least disagreeable modes of taking Castor Oil is to pour it on to some milk contained in a wineglass, the interior and edges of which have been moistened with milk.

Official Preparations.—Mistura Olei Ricini. Contained in Collodium Flexile, Linimentum Sinapis, and Pilula Hydrargyri Subchloridi Composita.

Not Official.—Capsules of Castor Oil, Emulsio Olei Ricini, and Enema Olei Ricini.

Foreign Pharmacopœias.—Official in all. Fr., Huile de Ricin; Ital., Olio di Ricino; Port., Oleo de Ricino; Mex. and Span., Aceite de Ricino.

Description.—Viscid, colourless or with a faint tinge of yellow, having scarcely any odour, and a taste bland at first but subsequently acrid and unpleasant.

Tests.—Sp. gr. ·950 to ·970. Soluble in an equal volume of Absolute Alcohol, and in five times its volume of Alcohol (90 p.c.). It dries slowly to a varnish when exposed to the air in a thin layer. If 3 c.c. of the Oil be shaken with an equal volume of Carbon Bisulphide, and 1 c.c. of Sulphuric Acid be then added, the mixture on being shaken should not become brown (absence of various fixed oils, including Cotton-seed Oil). Equal volumes of Castor Oil and Petroleum Spirit do not yield a clear mixture if kept at 60° F. (15·5° C.); but they yield a perfectly clear solution if other fixed oils be present.

Results of the analyses of 78 samples of Castor Oil from the Indian section of the Imperial Institute.—*J.S.C.I.* '94, 959.

Preparation.

MISTURA OLEI RICINI. Castor Oil Mixture. (Altered.)

Castor Oil, 3; Mucilage of Gum Acacia, 1½; Orange-flower water of commerce, undiluted, 1; Cinnamon Water, 2½. Mix the undiluted Orange-flower water and the Cinnamon Water; place the Mucilage of Gum Acacia in a mortar and to it add, alternately, in portions, the Castor Oil and the mixed Waters, with constant trituration.

The Oil is now emulsified by means of Mucilage of Acacia in place of saponification with Solution of Potash, and Cinnamon Water replaces the Oils of Lemon and and Cloves.

Dose.—*As a draught*, 1 to 2 fl. oz.

Not Official.

CAPSULES OF CASTOR OIL.—Flexible capsules containing 30 minims, or 60 minims in each.

EMULSIO OLEI RICINI.—Castor Oil, ½ fl. oz.; Mucilage of Acacia, ½ fl. oz.; Syrup of Ginger, ¼ fl. oz.; Cinnamon Water, 1 fl. oz.: mix.

Castor Oil, ½ fl. oz.; Yolk of Egg, ¼ fl. oz.; Syrup, ¼ fl. oz.; Peppermint Water, 1 fl. oz.: mix.

Either of these formulas yield good emulsions.

ENEMA OLEI RICINI.—Castor Oil, 2 fl. oz.; Mucilage of Starch, 18 fl. oz.

ROSÆ GALLICÆ PETALA.

RED-ROSE PETALS.

The fresh and dried unexpanded petals of *Rosa gallica*; from cultivated plants.

Medicinal Properties.—Astringent. Often used on account of their colouring matter.

Official Preparations.—Of the **petals**, Confectio Rosæ Gallicæ, Infusum Rosæ Acidum, and Syrupus Rosæ. The **confection** is contained in Pilula Aloes Barbadensis, Pilula Aloes et Asafetidæ, Pilula Aloes Socotrinæ and Pilula Hydrargyri.

Not Official—Extractum Rosæ Fluidum, Infusum Rosæ cum Acido Nitrico, and Mel Rosæ.

Foreign Pharmacopœias.—Official in Belg., Flores Rosæ Rubræ; Dutch, Petala Rosæ; Fr., Rose Rouge; Ital., Rosa Rossa; Port., Rosas Rubras; Russ., Flores Rosæ Gallicæ; Span., Rosa Rubra; Swed., Petala Rosæ Gallicæ; Swiss, Flos Rosæ; U.S., Rosa Gallica; not in the others.

Description.—Usually in little cone-like masses, or sometimes separate and more or less crumpled. The petals are velvety, of a deep purplish-red colour, which passes into brownish-yellow towards the base, odour fragrant, especially developed in drying; taste somewhat bitter, feebly acid, and astringent.

Preparations.

CONFECTIO ROSÆ GALLICÆ. Confection of Roses.

Fresh Red-Rose Petals, 1; Refined Sugar, 3: beat together in a stone mortar. =(1 in 4).

Used as a pill basis. Also applied in aphthous conditions of the mouth.

Foreign Pharmacopœias.—Official in Belg., Port. and Span., with powdered Petals, Sugar, and Rose Water; Fr., with powdered Petals, Sugar, Glycerin, and Rose Water; Mex., with powdered Petals (Rosa centifolia), Sugar, Honey, and Rose Water; U.S., with powdered Petals, Sugar, Honey, and Rose Water; Swed., with Rosa centifolia and Sugar; not in the others.

INFUSUM ROSÆ ACIDUM. Acid Infusion of Roses.

Red-Rose Petals, dried and broken, ½ oz.; Diluted Sulphuric Acid, 2 fl. drm.; Distilled Water, boiling, 20 fl. oz. Add the Diluted Sulphuric Acid to the Distilled Water; infuse the Red-Rose Petals in the mixture in a covered vessel for fifteen minutes; strain. =(1 in 40).

Time reduced to fifteen minutes.

A similar infusion was in use in 1674.

Astringent. An excellent vehicle for more powerful medicines. Prescribed with Alum it forms a good **gargle**, but Borax or Alkalis change the colour to green.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in Fr. and Mex., 1 in 100, without acid; Port. (Infuso de Rosas Composto), Red Rose Petals 5, Dilute Sulphuric Acid 2, Boiling Water 200; Swed. (Infusum Rosæ Acidulum), Red Rose Petals 3, Dilute Sulphuric Acid 2, Sugar 8, Boiling Water 200; not in the others.

SYRUPUS ROSÆ. Syrup of Roses.

Dried Red-Rose Petals, 2; Refined Sugar, 30; Distilled Water, boiling, 20. Infuse the Red-Rose Petals in the Distilled Water for two hours; strain; press; heat the liquid to the boiling-point; filter; dissolve the Refined Sugar in the liquid by the aid of heat. The product should weigh nearly 46. =(1 in 17¼).

Mildly astringent. Added to mixtures on account of its colour.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., 1 in 10; U.S., with **Fluid Extract**, 1 in 8; Mex., Jarabe de Rosa (Rosa centifolia); not in the others.

Not Official.

EXTRACTUM ROSÆ FLUIDUM (*U.S.*).—1000 grammes of Roses in No. 30 powder, percolated with a mixture of 100 c. c. Glycerin, and 900 c. c. of Diluted Alcohol until the powder is exhausted. Reserve the first 750 c. c., and evaporate the remainder to a soft extract, dissolve this in the reserved portion, and make up with Diluted Alcohol to 1000 c. c.

INFUSUM ROSÆ CUM ACIDO NITRICO.—Rose Petals, broken small, 2; Diluted Nitric Acid, ½; cold Distilled Water, 40: infuse two hours, frequently stirring, strain, and add Powdered Sugar, 1.

MEL ROSÆ (*U.S.*).—Fluid Extract of Roses 12 c. c., Clarified Honey a sufficiency to make the product weigh 100 grammes.

Foreign Pharmacopœias.—Official in Ger., Russ. and Swiss, Leaves, 1 in 10; Ital., Infusion of Roses and Honey, evaporated to sp. gr. 1·32; not in the others.

ROSÆ OLEUM.

OIL OF ROSE.

B.P.Syn.—Otto of Rose.

[NEW.]

The oil is distilled from the fresh flowers of *Rosa damascena*.

Medicinal Properties.—The principal use in pharmacy is as a perfume in various preparations.

Official Preparation.—Contained in Unguentum Aquæ Rosæ.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Port., Russ., Swiss and U.S.; not in the others.

Description.—A pale yellow crystalline semi-solid, with the strong fragrant odour of Rose and a sweet taste.

Tests.—Sp. gr. ·856 to ·860 at 86° F. (30° C.). The congealing and melting points vary according to the proportion of crystalline matter, but should lie between 67° and 72° F. (19·4° and 22·2° C.).

The vehicle of the odour is the elæoptene (Rhodinol) alone, and the less stearoptene there is in an otto used for manufacturing purposes the better.—*C.D.* '96, ii. 349. A method of examination proposed (*C.D.* '96, ii. 795) recommends the determination of the Alcohol-contents by the acetylisation process together with a determination of the specific gravity, stearoptene content, and crystallising point, as means of detecting adulteration, but Conroy has pointed out that a mixture containing 10·7 p.c. of Geranium Oil will be within the limits of these four tests.—*C.D.* '97, i. 33, 67, 103. An examination of a number of samples of Rose Oil.—*Analyst* '98, 104.

Constituents of Rose Oil.—*P.J.* '97, ii. 417; *J.S.C. Abs.* '98, i. 35. At this date no trustworthy means existed of detecting Geranium oil in oil of Roses.—*J.C.S. Abs.* '95, ii. 187. The subject of the testing of Rose oil is far from satisfactory and opinions on the value of certain tests differ very widely. The specific gravity depends upon the amount of stearoptene present, as does also the freezing point, and forms no absolute criterion of the purity of a sample, whilst Hager's Sulphuric Acid test and Schiff's reagent are totally unreliable. Far more important than the freezing point is the determination of the optical activity.—*C.D.* '96, ii. 349; *J.C.S. Abs.* '95, ii. 187.

ROSÆ AQUA.

ROSE WATER.

The Rose Water of commerce, prepared by distillation from the flowers of *Rosa damascena*, diluted, immediately before use, with twice its volume of Distilled Water.

The Rose Water of commerce is a saturated solution of the essential oil of the Rose flowers.

Medicinal Properties.—An agreeable vehicle for medicines; employed in making lotions and eye-washes.

Official Preparation.—Unguentum Aquæ Rosæ. Contained in Mistura Ferri Composita, and the 'Rose Basis' for Lozenges.

Foreign Pharmacopœias.—Official in Swiss and U.S.; Rose Water of commerce; Fr., Mex., Port. and Span., 1 in 1; Belg. and Dutch, 1 in 2½; Ital., 1 in 2;

Swed., 1 in 3, all with petals; Austr., Ger., Hung., Norw., and Russ., 1 in 4000; Dan., 1 in 10000, all with Otto.

Preparation.

UNGUENTUM AQUÆ ROSÆ. Rose-Water Ointment. (New.)

Rose Water, undiluted, 7 fl. oz.; White Beeswax, 1½ oz.; Spermaceti, 1½ oz.; Almond Oil (by weight), 9 oz.; Oil of Rose, 8 minims. Melt together the White Beeswax, Spermaceti, and Almond Oil; pour the mixture into a warmed mortar and add the Rose Water gradually with constant trituration; add the Oil of Rose; continue the trituration until cold.

Foreign Pharmacopœias.—U.S., Ung. Aq. Rosæ; Fr., Cold Cream; Austr. and Belg., Ung. Rosatum; Hung., Ung. Emolliens; Mex., Cerato de Galeno; Port., Pomada Rosada: various formulas.

ROSMARINI OLEUM.

OIL OF ROSEMARY.

N.O.Syn.—Oleum Anthos.

The Oil distilled from the flowering tops of *Rosmarinus officinalis*.

That distilled in Britain is superior to the imported.

Solubility.—In all proportions of Absolute Alcohol; 2 in 1 of Alcohol (90 p.c.); sparingly in Alcohol (60 p.c.).

Medicinal Properties.—Aromatic stimulant and carminative. It is used in hair lotions and liniments as a stimulant; also used for its odour, which is disliked by insects.

Dose.—½ to 3 minims.

Official Preparation.—Spiritus Rosmarini. Contained in Linimentum Saponis, and Tinctura Lavandulæ Composita.

Foreign Pharmacopœias.—Official in all except Mex.; Dan., Norw. and Swed., Ætheroleum Rosmarini; Fr., Huile Volatile de Romarin; Ital., Essenza di Rosmarino; Port., Essencia de Alecrim; Span., Esencia de Romero.

Description.— Colourless or pale yellow, with the odour of Rosemary, and a warm camphoraceous taste.

Test.—Sp. gr. ·900 to ·915. It should dissolve in twice its volume of Alcohol (90 p.c.), and should not rotate the plane of a polarised ray of light more than 10° to the right in a tube 100 millimetres long (absence of Oil of Turpentine).

Schimmel says: Oil of Rosemary is dextro-rotatory (*see A.J.P.* '91, 303), but we find both Foreign and English Oils to vary between +5° and —9°. The English oils most likely to be genuine are more usually lævo-rotatory.

The following is a comparison, which we made in June, 1893, of the various imported varieties:—

1. **Eperte** .	price 3/1 per lb.,	rotation — 8°	Soluble in *S.V.R.*	2 in	1
2. **Extra** . .	,, 2/6 ,, ,,	,, —12°	,, ,, ,,	2 in	1
3. **Super** . .	,, 1/9 ,, ,,	,, —33°	,, ,, ,,	2 in	9
4. **Fine** . .	,, 1/3 ,, ,,	,, —40°	,, ,, ,,	2 in	10
French Turpentine		,, —57°	,, ,, ,,	2 in	8

Solid Magenta imparts no colour to Oil of Rosemary, but if Alcohol be present the dye dissolves.—*P.J.* (3) xx. 415.

French and Italian Oils have a Sp. gr. ·900 and are slightly dextro-rotatory.—*J.S.C.I.* '96, 925.

Preparation.

SPIRITUS ROSMARINI. SPIRIT OF ROSEMARY. (ALTERED.)

Oil of Rosemary, 1; Alcohol (90 p.c.), a sufficient quantity. To the Oil of Rosemary add enough of the Alcohol to form 10 of the Spirit of Rosemary. =(1 in 10).

Now 1 in 10 instead of 1 in 50, and Alcohol (90 p.c.) used in place of Rectified Spirit.

Dose.—Not given in B.P.; 5 to 30 minims.

This Spirit of Rosemary contains five times the proportion of Oil of Rosemary present in the Spirit of Rosemary of the British Pharmacopœia of 1885.

Foreign Pharmacopœias.—Official in Austr. and Swed., from leaves; Belg., Essentia Rosmarini, 1 in 100; Fr. (Teinture d'Essence de Romarin), and Norw., 1 in 50; Port. (Esperito d'Alecrim), and Span. (Alcohol de Romero), from flowering tops; Russ., 1 in 100; Mex., Compound Spirit from leaves; not in the others.

Not Official.

RUTÆ OLEUM.

OIL OF RUE.

The Oil distilled from the fresh herb of *Ruta graveolens*. According to Schimmel it has sp. gr. ·833—·840. Rotation +2° in 100 m.m. tube. It crystallises at 8° to 10° C. and gives a clear solution in 2 to 3 parts of Alcohol (70 p.c.).—*J.S.C.I.* '96, 925.

It was Official in B.P. '85.

Medicinal Properties.—Antispasmodic. A topical stimulant, rubefacient and vesicant. Administered in the form of enema for flatulent colic in children.

Dose.—1 to 4 minims.

Foreign Pharmacopœias.—Official in Belg., Essentia Rutæ; Fr., Huile Volatile de Rue; Port., Essencia de Arruda; Span., Esencia de Ruda; not in the others.

Not Official.

SABINÆ CACUMINA.

SAVIN TOPS.

The fresh and dried tops of *Juniperus Sabina*, collected in spring from plants cultivated in Britain.

It was Official in B.P. '85.

Medicinal Properties.—A powerful local and general irritant. The ointment is used for maintaining discharges from granulating or blistered surfaces. It is a powerful emmenagogue, but its use requires caution as it may cause inflammation of the abdominal and pelvic viscera.

Dose.—4 to 10 grains.

Antidotes.—Stomach tube, emetics; Castor oil, Linseed poultices to the abdomen, opiates and demulcents.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Hung., Ital., Mex., Port., Swed., Swiss and U.S.; not in Ger., Jap., Norw., Russ. or Span.

Preparations.

OLEUM SABINÆ.—The Oil distilled in Britain from fresh Savin. Soluble 4 in 1 of Alcohol (90 p.c.), in all proportions of Absolute Alcohol.

Dose.—1 to 4 minims; in **pill** with Soap and Liquorice powder, p. 484.

Foreign Pharmacopœias.—Official in Belg., Dutch, Port., Swed. and U.S.; not in the others.

TINCTURA SABINÆ.—Savin Tops, dried and coarsely powdered, 1; Alcohol (60 p.c.), 8. Made by percolation.

Dose.—20 to 60 minims.

Foreign Pharmacopœias.—Official in Belg., Fresh herb 1, Alcohol (92°) 1, by weight; U.S. has a **Fluid Extract** 1 in 1; not in the others.

UNGUENTUM SABINÆ.—Fresh Savin Tops, bruised, 8; Yellow Beeswax, 3; Benzoated Lard, 16; melt the Lard and the Beeswax together on a water-bath, add the Savin, digest twenty minutes, strain and press through calico.

Foreign Pharmacopœias.—Official in Belg., Ext. Sabinæ 1, Simple Ointment 9; Dan., 1 in 4; Swed., Tops 4, Yellow Wax 3, Lard 12; not in the others.

SACCHARINUM. *See* GLUSIDUM.

SACCHARUM LACTIS.

MILK SUGAR.

B.P.Syn.—LACTOSE.

$C_{12}H_{22}O_{11},H_2O$, eq. 357·48.

A crystallised Sugar obtained from the Whey of Milk.

Solubility.—1 in 6 of cold Water; 1 in 1 of boiling Water; almost insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Nutrient in various cases of extreme irritability of the stomach, as it does not ferment; it is used to mix with the food of children; dissolved in water, and mixed with cow's milk, it forms a good substitute for human milk. Has been found to act as a diuretic in cardiac dropsy. Useful for triturating with potent medicinal powders, in order to equally distribute the dose.

Dose.—Not given in B.P.; 60 to 120 grains or more in Water.

Official Preparations.—Used in the preparation of Extractum Belladonnæ Alcoholicum, Extractum Nucis Vomicæ, Extractum Physostigmatis, Extractum Strophanthi and Pulvis Elaterini Compositus.

Foreign Pharmacopœias.—Official in all. Fr. (Sucre de Lait), Ital. (Lattosio), Mex. (Azucar de leche); Port. (Assucar de Leite); Span. (Lactosa).

Description.—In crystals or in crystalline masses, greyish-white, hard, odourless, faintly sweet.

Tests.—It should not leave more than ·25 p.c. of ash when incinerated with free access of air. 1 gramme dissolved in 10 c.c. of Water gives a red colour with Solution of Phenol-phthalein after the addition of three drops of the Volumetric Solution of Sodium Hydroxide (limit of Lactic Acid).

SACCHARUM PURIFICATUM.

REFINED SUGAR.

B.P.Syn.—SUCROSE.

$C_{12}H_{22}O_{11}$, eq. 339·60.

A crystallised Sugar, obtained from the juice of the sugar-cane.

Solubility.—100 in 45 of Water, measures 113; 1 in 100 of Alcohol (90 p.c.).

Medicinal Properties.—Nutrient, demulcent, used in catarrhal affections in the form of candy, syrup, etc.; also in irritant corrosive poisoning. Employed almost entirely as a sweetening agent and as a preservative, and to assist the suspension of powders.

Official Preparation.—Syrupus. Sugar in some form is contained in all Syrups and Lozenges, several Confections, Mixtures, Pills and Powders.

Foreign Pharmacopœias.—Official in all except Norw. and Swed.; Fr., Sucre de Canne; Ital., Zucchero; Mex., Azucar de Cana; Port., Assucar; Span., Azucar.

Description.—Colourless and inodorous separate crystals. Readily and completely soluble in half its weight of Water, forming a clear bright syrup.

Tests.—When the syrup is heated to about 180° F. (82·2° C.) with Solution of Potassio-cupric Tartrate or with Solution of Copper Sulphate and excess of Solution of Potassium Hydroxide, there should not result more than a trace of a red or yellowish precipitate (absence of Glucose). Refined Sugar should yield no reaction with the tests for Calcium, Chlorides, and Sulphates.

Preparation.

SYRUPUS. SYRUP.

Refined Sugar, 10; Distilled Water, boiling, a sufficient quantity. Add the Refined Sugar to 5 of the boiling Distilled Water; heat until dissolved; make the weight of the product 15 by the addition of boiling Distilled Water. Sp. gr. 1·330. =(1 in $1\frac{1}{6}$).

It is convenient to remember that 7 measures of Syrup contain 6 of Sugar.

Foreign Pharmacopœias.—Official in all. Ital., Sciroppo Simplice; Port., Xarope Commun; Mex., Jarabe Comun; Span., Jarabe Simple.

Not Official.

SALEP.

The prepared tubers of *Orchis Morio*, and other species of *Orchis*.

Medicinal Properties.—Mucilaginous and nutrient.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Mex., Norw., Port., Russ., Span., Swed. and Swiss; not in Jap. or U.S.

Preparation.

MUCILAGO SALEP.—Powdered Salep 1: agitate well with cold Water 10; pour on to this, boiling Water 90, and stir till cold.

Foreign Pharmacopœias.—Official in Belg., Dutch, Ger., Norw., Russ., Swed. and Swiss., 1 in 100; Dan., Mixtura Salep, same strength, but containing Syrup of Poppies.

Salib Misri, the Salep of the Indian Bazaars, is derived from a species of *Eulophia*.

SALICINUM.

SALICIN.

$C_6H_{11}O_5 \cdot O \cdot C_6H_4 \cdot CH_2OH$, eq. 283·99.

A crystalline glucoside obtained from the bark of various species of *Salix*, and of *Populus*.

The bark is obtained principally from Germany and America, that grown in this country, even from the same species, yielding little or no Salicin.—*C.D.* '87, i. 171.

Solubility.—1 in 28 of Water; 1 in 60 of Alcohol (90 p.c.); insoluble in Ether.

Medicinal Properties.—Antipyretic, tonic, and bitter stomachic; specially recommended in acute rheumatism. For the latter purpose it has been largely replaced by Sodium Salicylate, the action of which is more powerful, though not so well sustained, as Salicin; the Salicylate has also a greater tendency to cause cardiac depression, and is not so well tolerated by the stomach as Salicin.

Has been recommended for the prevention and cure of Influenza.

Salicin and Salicylates in psoriasis.—*L.* '95, i. 1421; *P.J.* '95, ii. 51.

Dose.—5 to 20 grains.

Prescribing Notes.—It is given in **cachets, mixtures,** or **pills.** A good pill can be made by adding Glucose, *q.s.*

Not Official.—Saligenin and Salix Nigra.

Foreign Pharmacopœias.—Official in Ital., Mex., Port. and U.S.; not in the others.

Description.—Colourless shining trimetric tabular crystals, with a very bitter taste.

Tests.—Coloured red by Sulphuric Acid. A small quantity heated with a little Potassium Bichromate, a few drops of Sulphuric Acid, and some Water, yields Salicylic Aldehyde, recognisable by its odour of meadow-sweet. The crystals melt when heated, and evolve Salicylic Aldehyde. On heating to redness in air they leave no residue (absence of mineral impurity).

Not Official.

SALIGENIN.—Obtained by the action of Formic Aldehyde on Phenol, or by the action of diluted mineral acids on Salicin. It has been recommended in acute rheumatism and in gout.—*P.J.* (3) xxv. 755, 1115; '95, ii. 175.

Dose.—4 grains.

SALIX NIGRA.—The bark of this tree has been recommended as a sexual and general sedative.—*B.M.J.* '87, ii. 237; *L.* '88, i. 869.

Its virtues are probably due to Salicin which exists in all species of Salix (Willow).

SALOL.

SALOL.

[NEW.]

$C_6H_4 \cdot OH \cdot COO \cdot C_6H_5$, eq. 212·47.

Salol or Phenyl Salicylate is prepared by the interaction of Salicylic Acid and Phenol, or of their Sodium salts with Phosphoryl Chloride or Carbonyl Chloride.

Solubility.—1 in 20 of Alcohol (90 p.c.), 2 in 1 of Ether, 3 in 1 of Chloroform. Insoluble in cold Water.

Medicinal Properties.—Antipyretic, antiseptic, and intestinal disinfectant. It passes through the stomach unchanged, and is decomposed in the duodenum by the alkali of the pancreatic juice. It has been recommended in acute and chronic rheumatism, in cholera, and in typhoid fever. The best antiseptic for intestinal dyspepsia and fermentation. Useful in diarrhœa. When given in excessive doses, or repeated frequently, has given rise to toxic symptoms.

Externally it is used as a substitute for Iodoform; combined with a blood tonic in the treatment of anæmia, *M.A.* '95, 103; and pernicious anæmia, *L.* '94, ii. 1274; in diarrhœa of phthisis, *Pr.* liii. 275; as a pill-coating, *B.M.J.E.* '94, i. 79, ii. 63; in choleraic diarrhœa, *T.G.* '94, 40.

In catarrh of the bladder.—*B.M.J.* '87, ii. 1438; good result in gonorrhœa.—*L.* '90, i. 644; an intestinal and urinary disinfectant.—*B.M.J.* '93, i. 643.

Owing to its low melting point it is useful in filling up irregular or superficial bone cavities; also as a stopping for carious teeth.—*B.M.J.E.* '96, i. 64; *P.J.* '95, ii. 216.

Formation of Salol calculus from its internal administration.—*B.M.J.* '97, ii. 78; *P.J.* '97, ii. 446.

Dose.—5 to 15 grains.

Prescribing Notes.—It is given in **cachets, mixtures, powders**, or Compressed Tablets. In mixtures it should be suspended with Mucilage of Acacia or Compound Tragacanth Powder.

Not Official.—Salol Camphor and Salophen.

Foreign Pharmacopœias.—Official in Dan., Fr., Ger., Ital., Mex., Norw., Russ., Swiss and U.S.; not in the others.

Description.—Colourless crystals having a faint aromatic odour and very little taste. Almost insoluble in Water, soluble in 10 parts of cold Alcohol (90 p.c.), very soluble in boiling Alcohol (90 p.c.), also soluble in one third part of Ether or Chloroform, and in Fixed and Volatile Oils.

Tests.—Melting point 107·6°—109·4° F. (42°—43° C.). An alcoholic solution gives a white precipitate with Solution of Bromine. A violet coloration is produced on adding a few drops of dilute Test-solution of Ferric Chloride to the alcoholic solution. On melting together Salol and Sodium Hydroxide, and then acidulating with Hydrochloric Acid, a white precipitate is produced and Phenol is evolved. Water which has been shaken with Salol should not be

affected by Test-solution of Ferric Chloride (absence of free Salicylic Acid) and should yield no reaction with the tests for Sulphates or Chlorides. The alcoholic solution of Salol should be neutral to Litmus.

Not Official.

SALOL CAMPHOR.—Prepared by moistening 1 of Camphor with Alcohol and triturating it with 1½ Salol till a transparent liquid is obtained. Has been found useful in treatment of furuncles and carbuncles.—*B.M.J.E.* '95, ii. 84.

SALOPHEN.—The Salicylic Ester of Acetylparamidophenol. A white crystalline powder, insoluble in Water, soluble in Alcohol and Ether.

Medicinal Properties.—Analgesic and antipyretic. Has been recommended in acute and subacute rheumatism, and in neuralgia. Said to be useful in the nerve symptoms following influenza.—*L.* '94, ii. 455; *L.* '95, ii. 932; *B.M.J.E.* '94, i. 35; '95, i. 56; '95, ii. 4; '96, i. 20; '97, ii. 91; *M.P.* '94, i. 304; *Y.B.T.* '95, 454; *T.G.* '93, 28; *Pr.* lvi. 206; *P.J.* '95, ii. 343; '96, i. 179.

Dose.—10 to 30 grains, usually given in cachets.

SAMBUCI FLORES.

ELDER FLOWERS.

The flowers of *Sambucus nigra*, separated from the stalks.

Official Preparation.—Aqua Sambuci.

Foreign Pharmacopœias.—Official in all except Jap. and Norw.; Fr., Sureau; Ital., Sambuco; Port., Sabugueiro; Mex. and Span., Sauco.

Description.—Elder Flowers are small; calyx superior, five-toothed; corolla flat, rotate, deeply five-lobed, creamy-white, with five stamens inserted in the tube; anthers yellow. They have a slightly bitter taste, and a sweet, faint, not altogether agreeable odour.

Preparation.

AQUA SAMBUCI. ELDER-FLOWER WATER.

Fresh Elder Flowers, 1 (or an equivalent quantity of the Flowers preserved whilst fresh with Common Salt); Water, 5: distil 1. =(1 in 1).

Chiefly used for **lotions** and **collyria.**

Foreign Pharmacopœias.—Official in Belg., 3 in 10; Fr. (Eau de Sureau), with dried flowers, 1 in 4; Dan., 1 in 10, also Conc. 1 in 1; Port., 1 in 4; Span., 1 in 5; Swed., 1 in 3; Swiss, concentrated, 5 of fresh flowers or 1 of dried flowers in 1; not in the others.

SANTALI OLEUM.

OIL OF SANDAL WOOD.

B.P.Syn.—OIL OF SANTAL WOOD.

The oil distilled from the Wood of *Santalum album*.

Solubility.—In less than its own weight of Alcohol (90 p.c.).

Medicinal Properties.—Antiblenorrhagic; has been prescribed

extensively for subacute and chronic gonorrhœa; it is best taken about an hour and a half after meals.

Dose.—5 to 30 minims.

Prescribing Notes.—Generally given in **capsules** or in a **mixture** suspended with Mucilage. It is best taken in Capsules, as the taste is nauseous.

Not Official.—Capsules of Sandal Oil and Mistura Olei Santali.

Foreign Pharmacopœias.—Official in Austr., Dan., Norw., Span. (Esencia de Sandalo Cetrino), Swiss and U.S.; not in the others.

Description.—Somewhat viscid in consistence, pale yellow in colour, having a strongly aromatic odour and a pungent and spicy taste.

Tests.—Sp. gr. ·975—·980. It forms a clear solution with six times its volume of Alcohol (70 p.c.), (absence of Cedar Wood Oil). It rotates the plane of a ray of polarised light to the left, through an angle of not less than 16° and not more than 20° in a tube 100 millimetres long (absence of other varieties of Sandal Wood Oil).

Adulteration of Sandal Wood Oil with Oleum Cedri.—*C.D.* '94, ii. 460. With Castor Oil.—*Analyst* '95, 174; *P.J.* (3) xxv. 1167.

A suggested valuation of Sandal Wood Oil by means of its Santalol-contents, and a method for the determination of Santalol.—*P.J.* '95, ii. 118; *C.D.* '95, ii. 197; *C.D.* '98, i. 51.

A process by Schimmel is also given.—*J.S.C.I.* '97, 568.

With regard to the test for solubility in Alcohol, pure Sandal Wood Oil, which is old or has been badly preserved, may not give a clear solution.—*J.S.C.I.* '97, 168.

Not Official.

CAPSULES OF SANDAL OIL.—Containing 10 and 20 minims in each.

MISTURA OLEI SANTALI.—Oleum Santali m xxx; Mucilage of Acacia fl. ʒ i; Syrup fl. ʒ i; Tincture of Orange fl. ʒ ss.; Water to fl. ℥ i, for a dose three times a day.

SANTONINUM.

SANTONIN.

$C_{15}H_{18}O_3$, eq. 244·29

A crystalline principle, prepared from Santonica, the dried unexpanded flower-heads or capitula of *Artemisia maritima*.

Solubility.—Sparingly in Water; 1 in 350 of boiling Water; 1 in 40 of Alcohol (90 p.c.); 1 in 4 of boiling Alcohol (90 p.c.); 1 in 160 of Ether; 1 in 2 of Chloroform; about 1 in 400 of Olive Oil; slightly in Glycerin and in Solution of Potash.

Medicinal Properties.—Anthelmintic. Useful both for round worms and thread-worms. It frequently affects the vision, causing all objects to appear yellow or green; to avoid this unpleasantness, Santonin is given at night, the disturbance of vision then remains only for half an hour or so, after the patient awakes in the morning.

Santonin has been recommended as an emmenagogue, but writers differ as to its efficacy.—*L.* 85, ii. 430; 86, i. 61, 132, 286; *M.A.* '95, 192.

Dose.—2 to 5 grains.

Prescribing Notes.—2 to 3 grains for children, in Castor Oil, in which it is readily soluble. About three doses are sufficient; one every other night, followed by a brisk cathartic the morning after each dose.

Official Preparation.—Trochiscus Santonini.

Not Official.—Suppositorium Santonini.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss. and U.S.

Description.—Colourless flat rhombic prisms, feebly bitter, fusible and volatile when gently heated.

Tests.—Sunlight renders it yellow. Added to warm Alcoholic Solution of Potassium Hydroxide, it yields a violet-red colour. It is not dissolved by diluted mineral acids. Heated to redness, with free access of air, it burns without leaving any residue (absence of mineral impurity).

In consequence of several accidents due to the contamination of Santonin with Strychnine the German and U.S.P. include a test for the latter substance.—*Allen.*

Preparation.

TROCHISCUS SANTONINI. Santonin Lozenge.

Santonin, 1 grain (·0648 gramme). Mix with the Simple Basis to form a Lozenge.

Dose.—Not given in B.P.; 1 to 5 lozenges.

Foreign Pharmacopœias.—Official in Austr., Belg., Ger. and Ital., $\frac{2}{3}$ grain; Dan., Russ., Swed., Swiss and U.S., $\frac{1}{2}$ grain; Dutch, $\frac{3}{4}$ grain; Fr. and Port., $\frac{1}{4}$ grain; Jap., about $\frac{1}{5}$ grain; Mex. (Pastillas), $\frac{3}{8}$ grain; Norw., $\frac{3}{8}$ grain; Span., $\frac{1}{3}$ grain in each lozenge; not in Hung.

Not Official.

SUPPOSITORIUM SANTONINI (*G.H.*).—Santonin 3 grains, Oil of Theobroma 10 grains.

SAPO ANIMALIS.

CURD SOAP.

Soap made with Sodium Hydroxide and a purified animal fat consisting principally of stearin; containing about 30 p.c. of Water.

For the purposes of powdering it is not affected injuriously by drying at a temperature of 212° F. (100° C.).

Solubility.—Sparingly in Water; 1 in $1\frac{1}{2}$ of boiling Water; partially in Alcohol (90 p.c.); almost entirely 1 in 2 of boiling Alcohol (90 p.c.).

Official Preparations.—Used in the preparation of Extractum Colocynthidis Compositum, Linimentum Potassii Iodidi cum Sapone, and Pilula Scammonii Composita.

Foreign Pharmacopœias.—Official in Austr., Sapo Medicinalis; Belg., Sapo Animalis; Dan. and Norw., Sapo Butyraceus; Fr., Savon Animal; Hung., Sapo Albissimus Droguistarum; Ital., Sapone Animale; Port., Sabao Animal; Russ., Sapo Butyrinus, Sapo Sebacinus; Mex., and Span., Jabon Animal; Swed., Sapo Butyrinus; Swiss, Sapo Stearinicus; Ger., Jap. and Russ., Sapo Medicatus, made with Lard and Olive Oil; not in Dutch or U.S.

Description.—White or with a very light greyish tint; dry; nearly inodorous; becomes horny and pulverisable when kept in dry warm air. Easily moulded when heated. Soluble in Alcohol (90 p.c.), especially on warming. Sparingly soluble in cold Water; soluble in hot Water.

Tests.—5 grammes of the dried and powdered Soap, digested in boiling Alcohol (90 p.c.), filtered while hot, and the filter washed thoroughly with more of the boiling Alcohol, yield a filtrate which should not afford a red or pink coloration with Solution of Phenol-phthalein (limit of alkaline Hydroxide); and the filter, when washed with hot Water, will yield a solution which, on adding Solution of Phenol-phthalein, should not require more than 3 c.c. of Deci-normal Volumetric Solution of Sulphuric Acid to discharge the resulting red colour (limit of alkaline Carbonate). It does not impart a greasy stain to white unglazed paper (absence of free oil and fat). Incinerated it yields an ash which does not deliquesce (absence of Potassium Soap). It should lose about 30 p.c. of moisture when dried at 230° F. (110° C.).

Preparation.

EMPLASTRUM SAPONIS.

Formerly made with Curd Soap; now made with Hard Soap. *See* SAPO DURUS.

SAPO DURUS.

HARD SOAP.

Soap made with Sodium Hydroxide and Olive Oil; containing about 30 p.c. of Water.

Solubility.—The greater part is soluble 1 in 20 of Water; entirely 1 in 1½ of boiling Water; 1 in 2 of boiling Alcohol (90 p.c.).

We found that of 30 grains of White Castile Soap digested for four days in 1 ounce of cold Alcohol (90 p.c.), only 24 grains were dissolved; when heated it all dissolved.

Medicinal Properties.—Laxative and antacid. Combined with Rhubarb, it is administered as an antacid in dyspepsia attended with constipation. Large and frequent doses are most effective in removing gall-stones; used as a laxative suppository.

The **Liniment** is used as a counter-irritant and deobstruent and is useful in sprains and rheumatic pains, and stiffness of joints.

Dose.—Not given in B.P.; 5 to 15 grains.

Prescribing Notes.—Best given in **wafer paper** or in **cachets.**

Official Preparations.—Emplastrum Saponis, and Pilula Saponis Composita. Contained in Emplastrum Resinæ, Pilula Aloes Barbadensis, Pilula Aloes et Asafetidæ, Pilula Aloes Socotrinæ, Pilula Cambogiæ Composita, Pilula Rhei Composita, Pilula Scillæ Composita. Used in the preparation of Hydrargyri Oleas and Unguentum Zinci Oleatis. Soap Plaster is contained in Emplastrum Calefaciens, and Emplastrum Cantharidis.

Foreign Pharmacopœias.—Official in Austr. and Hung., Sapo Venetus; Belg. and Dutch, Sapo Medicatus; Dan., Sapo Medicatus and Sapo Albus Oleaceus; Norw., Sapo Albus Oleaceus; Russ., Sapo Hispanicus Albus; Span., Jabon de

Sosa; Swed., Sapo Albus Hispanicus; Swiss, Sapo Oleaceus; U.S., Sapo. With **Almond Oil**—Fr., Savon Médicinal; Hung., Sapo Medicinalis; Ital., Sapone Medicinale; Mex., Jabon Medicinal; Port., Sabao Vegetal; Span., Jabon Amigdalino. With **Lard** and **Olive Oil**—Ger., Jap., and Russ., Sapo Medicatus.

Description.—Greyish-white, dry, inodorous; becomes horny and pulverisable when kept in dry warm air. Easily moulded when heated. Soluble in Alcohol (90 p.c.), especially on warming.

Tests.—It should not contain more alkaline Hydroxide or Carbonate than is allowed under 'Sapo Animalis.' It does not impart a greasy stain to white unglazed paper (absence of free oil). Incinerated it yields an ash which does not deliquesce (absence of Potassium Soap). It should lose about 30 p.c. of moisture when dried at 230° F. (110° C.).

Aqueous Soap Solution is alkaline to most indicators, *see* Acidum Oleicum.

If a solution of 5 grammes of Soap in 50 c. c. of Water be mixed with 3 c. c. of decinormal Oxalic Acid, the subsequent addition of a few drops of Phenolphthalein *T.S.*, should produce no pink or red tint (limit of alkalinity).—*U.S.P.*

Preparations.

EMPLASTRUM SAPONIS. Soap Plaster. (Modified.)

Hard Soap, 6; Lead Plaster, 36; Resin, 1. Melt each ingredient separately at a low temperature; mix; evaporate, with constant stirring, to a proper consistence. =(1 of Soap in $7\frac{1}{6}$).

Now made with Hard Soap instead of Curd Soap.

Foreign Pharmacopœias.—Emplastrum Saponis—Belg., 1 in 15; U.S., 1 in 10; Emplastrum Saponatum—Austr., 1 in 6; Dan., 1 in 11; Ger., 1 in 17; Hung., about 1 in $15\frac{1}{2}$; Norw., about 1 in 17; Russ., 1 in $17\frac{1}{2}$; Swiss, 1 in 10; Emplastrum Saponaceum—Swed., 1 in 9; Emplâtre de Savon—Fr., 1 in 18; Emplasto de Jabon—Mex., 1 in 18; Emplastro de Sabao—Port., 1 in $12\frac{1}{2}$; Emplasto de Jabon—Span., about 1 in 16; not in Dutch, Ital. or Jap.

LINIMENTUM SAPONIS. *See* Sapo Mollis.

PILULA SAPONIS COMPOSITA. *See* Opium.

SAPO MOLLIS.

SOFT SOAP.

Soap made with Potassium Hydroxide and Olive Oil.

Solubility.—1 in 4 of Water; 1 in 1 of boiling Water; almost entirely 1 in 1 of Alcohol (90 p.c.).

Official Preparation.—Linimentum Saponis. Contained in Linimentum Terebinthinæ. **Soap Liniment** is contained in Linimentum Opii.

Not Official.—Mollin.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Jap., Russ. and Swiss, Sapo Kalinus; Ger. and Swiss, also Sapo Kalinus Venalis; Belg., Russ., Swed. and Hung., Sapo Kalinus Albus and Sapo Kalinus Venalis; Ital., Sapone di Potassa; U.S., Sapo Mollis; not in the others.

Description.—Yellowish-white, sometimes yellowish-green, almost inodorous, of an unctuous consistence.

Tests.—Readily soluble in Alcohol (90 p.c.) especially on warming; the liquid, on filtration, yielding not more than 3 p.c. of residue (limit of Potassium Carbonate, insoluble Soaps, &c.). It should not contain more alkaline Hydroxide or Carbonate than is allowed under 'Sapo Animalis.' It does not impart an oily stain to paper (absence of free oil). Incinerated it yields an ash which is very deliquescent, and which should afford no reaction with the tests for Copper.

Preparation

LINIMENTUM SAPONIS. Liniment of Soap. (Altered.)

Soft Soap, 2 oz.; Camphor, 1 oz.; Oil of Rosemary, 3 fl. drm.; Alcohol (90 p.c.), 16 fl. oz.; Distilled Water, 4 fl. oz. Dissolve the Soap in the Distilled Water; dissolve the Camphor and Oil of Rosemary in the Alcohol; mix the solutions; set aside for one week; filter.

Now made with Alcohol (90 p.c.) instead of Rectified Spirit, and Soft Soap is used in place of Hard Soap.

Linimentum Saponis.

U.S., Soap, 70 grammes; Camphor, 45 grammes; Oil of Rosemary, 10 c.c.; Alcohol (94°), 750 c.c.; Water to make 1000 c.c.

Linimentum Saponis Mollis.

U.S., Soft Soap, 650 grammes; Oil of Lavender, 20 c.c.; Alcohol, 300 c.c.; Water to make 1000 c.c.

Linimentum Saponis Camphoratum. All the following are by weight:

Swed., Sap. Alb. Hisp., 10; Camphor, 5; Alcohol (64°), 100; Ol. Rosmar., 1.

Liniment Savonneux.

Fr., Tincture of Soap (1 to 5), 10; Alcohol (80°), 9; Expressed Oil of Almonds, 1.

Liniment Savonneux Camphré.

Fr., Tincture of Soap (1 to 5), 10; Tincture of Camphor (1 to 9), 9; Expressed Oil of Almonds, 1.

Linimentum Saponato-Camphoratum.

Austr., Sap. veneti, 8; Sap. communis, 16; Alcohol (70°), 100; Ol. Lavand., 1; Ol. Rosmarini, 1; Liq. Ammoniæ, 4; Camphor, 2; Alcohol (90°), *q.s.*

Ger., Sap. Medic., 80; Camphor, 20; Alcohol (90°), 840; Ol. Thymi, 4; Ol. Rosmar., 6; Liq. Ammoniæ, 50.

Hung., Sap. Alb., 24; Alcohol (70°), 100; Camphor, 2; Ol. Lavand., 1; Ol. Rosmarini, 1; Liq. Ammoniæ, 4.

Jap., Sapo Kalinus, 10; Water, 15; Liq. Ammoniæ, 2; Spirit (90°) 70; Camphor, 2; Ol. Menthæ, 1.

Russ., Sap. Medicati, 40; Camphor, 10; Alcohol (90°), 420; Ol. Citri, 2; Ol. Rosmar., 2; Ol. Thymi, 1; Liq. Ammoniæ, 25.

Linimentum Saponato-Camphoratum Liquidum.

Russ., Spirit Saponati, 175; Spirit Camphor, 60; Liquor Ammoniæ, 12; Ol. Rosmarini, 2; Ol. Thymi, 1.

Linimento di Sapone con Canfora.

Ital., Sapo Animalis, 15; Alcohol, 125; Camphor, 12; Oil of Rosemary, 5; Solution of Ammonia, 5.

Linimentum Opodeldoc.

Norw., Sap. Butyr., 8; Camphor, 2; Alcohol (90°), 84; Sol. Ammon., 4; Ol. Rosmar., 1; Ol. Thymi, 1.

Swed., Sap. Butyr., 30; Camphor, 10; Alcohol (90°), 250; Ol. Thymi, 2; Ol. Rosmar., 3; Sol. Ammon., 15.

Balsamo Opodeldoc Liquido.

Span., Soda Soap, 50; Camphor, 25; Alcohol (85°), 500; Ol. Rosmar., 8; Ol. Thymi, 4; Liq. Ammon., 20.

Balsamo de Opedeldoc Concreto.

Mex., Sapo Animal, 30; Camphor, 24; Liq. Ammoniæ, 10; Ol. Rosmar., 6; Ol. Thymi, 2; Alcohol (90°), 250.

Balsamo Opodeldoc Solido.

Span., Animal Soap, 30; Camphor, 24; Alcohol (90°), 250; Ol. Rosmar., 6; Ol. Thymi, 2; Liq. Ammon., 10.

Balsamum Opodeldoc Liquidum.

Belg., Spirit Saponis, 725; Spirit Camphor, 225; Liquor Ammoniæ, 30; Ol. Rosmarini, 15; Ol. Thyme, 5.

Balsamum Opodeldoc Solidum

Belg., Sap. Animal., 20; Camphor, 16; Liquid Ammonia, 5; Alcohol (92°), 155; Ol. Rosmar., 3; Ol. Thymi, 1.

Baume Opodeldoc.

Fr., Sap. Animal., 15; Camphor, 12; Alcohol (90°), 125; Liq. Ammon., 5; Ol. Rosmar., 3; Ol. Thymi, 1.

Baume Opodeldoc Liquido.

Fr., Sap. Dur., 10; Camphor, 9; Alcohol (80°), 100; Ol. Rosmar., 2; Ol. Thymi, 1; Liq. Ammon., 3.

Opodeldoc.

Dan., Sapo Butyr., 100; Camphor, 15; Solution of Ammonia, 50; Oil of Rosemary, 10; Oil of Thyme, 10; Spirit (90 p.c.) to make 1000.

Port., Sap. Animal., 16; Camphor, 16; Alcohol (85°), 158; Ol. Lavand., 1; Ol. Rosmar., 1; Liq. Ammon., 8.

Swiss, Lard or Butter, 10; Alcohol (95 p.c.), 5; Sol. Caustic Soda, 5; Saponify and add, Alcohol 162; Camphor, 5; Ol. Rosmar., 2; Ol. Thymi, 1; Liq. Ammon., 10.

Opodeldoc Liquidum.

Swiss, Spirit of Soap, 136; Spirit of Camphor (1 to 9), 48; Ol. Rosmar., 2; Ol. Thymi, 1; Liq. Ammon., 13.

Sapo Aromaticus.

Dutch, Sap. Med., 14; Alcohol (70°), 80; Camphor, 2; Oil of Rosemary, 1; Liq. Ammon., 3.

Spiritus Saponis Camphoratus.

Dan., Caustic Potash, 20; Water, 40; Olive Oil, 100; Spirit, 500; Camphor, 25; Ol. Rosmar., 10; Ol. Thymi, 10; Water to make 1000.

Norw., Sap. Alb., 15; Camphor, 3; Alcohol (64°), 80; Ol. Origani, 1; Ol. Rosmar., 1.

Tintura de Jabon Alcanforada.

Mex., Soap, 6; Alcohol (80°), 200; Camphor, 6; Ol. Rosmar., 1½; Ol. Thymi, 1½; Liq. Ammon., 6.

Not Official.

MOLLIN.—A Soft Soap containing 17 p.c. of uncombined fat and 30 p.c. of Glycerin.

It has been recommended as a basis for ointments.

SARSÆ RADIX.

SARSAPARILLA.

The dried root of *Smilax ornata*. Imported from Costa Rica and commonly known as Jamaica Sarsaparilla.

Medicinal Properties.—Alterative and tonic. Opinions differ as to its efficacy in secondary syphilis, chronic rheumatism and skin diseases. It is given alone or in combination with other remedies such as Potassium Iodide.

Incompatibles.—Alkalis; they accelerate its decomposition.

Official Preparations.—Extractum Sarsæ Liquidum, Liquor Sarsæ Compositus Concentratus.

Foreign Pharmacopœias.—Official in all; Fr., Salsepareille; Ital., Salsapariglia; Port., Salsaparrilha; Mex. and Span., Zarzaparrilla.

Description.—Very long, nearly cylindrical, tough, flexible roots of a greyish-brown or dark reddish-brown colour, folded together and bound with a root of the same plant into bundles of about eighteen inches (half a metre) in length, and four or five inches (ten to twelve and a half centimetres) in diameter. The roots are usually three-sixteenths of an inch (five millimetres) in thickness, are deeply wrinkled longitudinally, and provided with numerous rootlets. The transverse section usually exhibits a reddish-brown cortex and yellowish-white wood. The cells of the endodermis are nearly square in transverse section and uniformly thickened. Sarsaparilla has no odour, and only a slightly bitter taste.

Preparations.

EXTRACTUM SARSÆ LIQUIDUM.—Liquid Extract of Sarsaparilla. (Altered.)

Sarsaparilla, in No. 40 powder, 20; Alcohol (20 p.c.) a sufficient quantity; Glycerin, 2. Divide the Sarsaparilla into three portions. Moisten one portion with 4 of the Alcohol; pack in a percolator; set aside for twenty-four hours; percolate with the Alcohol until a quantity of 4 is obtained. Moisten the second portion of the drug with this liquid; pack in a percolator; set aside for twenty-four hours; percolate with a menstruum obtained by further percolation of the first portion; continue until a quantity of 4 is obtained. Moisten the third portion of the drug with this liquid; pack in a percolator; set aside for twenty-four hours; percolate with a menstruum obtained by successive percolation through the first and second portions as directed above; collect 18 from the third percolator; add the Glycerin. The product should measure 20. =(1 root in 1).

Now made by repercolation with diluted Alcohol as suggested in *Companion*, and Glycerin is used in place of Sugar.

Dose.—2 to 4 fl. drm.

Foreign Pharmacopœias.—Official in Mex., and U.S., 1 in 1; not in the others; Belg., Fr., Mex., Port. and Span., have a **solid extract.**

LIQUOR SARSÆ COMPOSITUS CONCENTRATUS.—Concentrated Compound Solution of Sarsaparilla. (New.)

Sarsaparilla, cut transversely and bruised, 20; Sassafras Root, in

shavings, 2; Guaiacum Wood, in shavings, 2; Dried Liquorice Root, bruised, 2; Mezereon Bark, cut small, 1; Alcohol (90 p.c.), 4½; Distilled Water, a sufficient quantity. Infuse the Sarsaparilla in three successive portions of 100 of the Distilled Water, for one hour each, at 160° F. (71·1° C.). Boil the other solid ingredients with Distilled Water until exhausted. Rapidly concentrate the mixed infusion and decoction until, when cold, the liquid measures 16; add the Alcohol; set aside for at least fourteen days; filter. The product should measure 20. =(1 in 1).

Dose.—2 to 8 fl. drm.

This formula is practically the same as that which has been given in preceding editions of *Companion*, under the heading, 'Extractum Sarsæ Liquidum Compositum;' the ingredients are similar to those of Decoctum Sarsæ Compositum, B.P. '85.

Foreign Pharmacopœias.—U.S. (Extractum Sarsaparillæ Fluidum Compositum), ingredients similar but half strength, and contains Glycerin; U.S. has also a Compound Decoction, 1 in 10; Port., Compound Decoction, 1 in 20; Austr. and Ger., Decoctum Sarsaparillæ Compositum Fortius, Austr. also Mitius; Belg., Hung., and Swed., Decoctum Zittmanni Fortius and Mitius; Mex., Tisana de Zittmann; Span., Cocimiento Edulcorante de Zarzaparrilla.

SASSAFRAS RADIX.

SASSAFRAS ROOT.

The dried root of *Sassafras officinale*.

It contains a Volatile Oil which is largely distilled in America; the yield is about 2 p.c. The bulk of the Oil consists of **Safrole**, $C_{10}H_{10}O_2$, a compound also extracted from Oil of Camphor. It is much used for scenting soaps.

Medicinal Properties.—Aromatic, stimulant, diaphoretic, alterative. Used as an adjuvant to other medicines in chronic rheumatism, syphilis, and chronic cutaneous diseases.

Official Preparation.—Contained in Liquor Sarsæ Compositus Concentratus.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Fr., Ger., Ital., Jap., Mex., Port., Russ., Span., Swed. and Swiss, the **Root**; U.S., the **Root-bark** not in Dan., Hung., or Norw.

Description.—In large branched pieces more or less covered with bark. Bark rough and greyish-brown, or rusty-brown, externally; internally smooth, glistening, and rusty-brown, with an agreeable aromatic odour, and a peculiar aromatic somewhat astringent taste. Wood soft, light in weight, greyish-yellow or greyish-red, with taste and odour similar to those of the bark, but more feeble.

SCAMMONIÆ RADIX.

SCAMMONY ROOT.

The dried root of *Convolvulus Scammonia*.

From Syria and Asia Minor.

Official Preparation.—Used in the preparation of Scammoniæ Resina.

Foreign Pharmacopœias.—Official in Belg.; not in the others.

Description.—Brownish-grey or yellowish-grey, tapering, or nearly cylindrical roots, varying usually from one to three inches (two and a half to seven and a half centimetres) or more in diameter. The Root is frequently contorted and the surface longitudinally furrowed. It is enlarged at the crown, and bears the remains of slender aerial stems. The fracture is very coarsely fibrous; internally the colour is light or dark grey. The section exhibits an abnormal wood, consisting of numerous irregularly arranged wood bundles, and, when examined under the microscope, appears beset with Starch grains of characteristic shape, and, especially in the cortical region, with resin-cells. Odour characteristic; taste at first somewhat sweet, afterwards slightly acrid.

Test.—It yields to Alcohol (90 p.c.) a resin which should have the properties of Scammony Resin.

Note on a sample of Scammony.—*P.J.* '97, i. 245.

SCAMMONIÆ RESINA.

SCAMMONY RESIN.

O.M.P.—Scammony Root, in coarse powder 8; Alcohol (90 p.c.) a sufficient quantity; Distilled Water, a sufficient quantity. Exhaust the Scammony Root with the Alcohol by percolation; place the resulting Tincture in a still; recover the greater part of the Alcohol; slowly pour the liquid which remains after the distillation of the Tincture into three times its volume of the Distilled Water, constantly stirring; allow the mixture to stand for the Resin to subside; then wash the Resin on a filter with boiling Distilled Water and dry it on a water-bath.

Solubility.—It is soluble in almost all proportions of Alcohol (90 p.c.) or Ether; also soluble in Solution of Potash.

Medicinal Properties.—An energetic cathartic. May be used when brisk action is needed, as in cerebral congestion and severe dropsy, but on account of its griping properties it is rarely used alone. In combination it promotes the action of other medicines, whilst its own harshness is mitigated. A good vermifuge for thread-worms.

Is a powerful intestinal, but a feeble hepatic stimulant.—Dr. Rutherford.

Dose.—3 to 8 grains.

Official Preparations.—Pilula Scammonii Composita and Pulvis Scammonii Compositus. Contained in Extractum Colocynthidis Compositum, Pilula Colocynthidis Composita, and Pilula Colocynthidis et Hyoscyami.

Foreign Pharmacopœias.—Official in Belg., Fr., Ital., Mex., Norw., Swed. and U.S.; not in the others.

Description.—In brownish translucent pieces, brittle, resinous in fracture, and of a sweet fragrant odour. It does not, alone, form an emulsion with Water.

Tests.—Its solution in Alcohol does not give a blue colour with Test-solution of Ferric Chloride, or with Solution of Hydrogen Peroxide (absence of Guaiacum Resin). Ether dissolves it almost entirely (distinction from Jalap Resin).

Preparations.

PILULA SCAMMONII COMPOSITA. Compound Scammony Pill. (Modified.)

Scammony Resin, 1; Jalap Resin, 1; Curd Soap, in powder, 1; Tincture of Ginger, 3. Add the Tincture of Ginger to the Soap and Resins; dissolve with the aid of slight heat; evaporate on a water-bath until the mass has acquired a suitable consistence for forming pills.

Much weaker in Ginger than B.P. '85.

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in Belg. (Pilulæ Hænii), Scammony 1, Resin of Jalap 1, Soap 1, Pill of Aloes with Hellebore 2; not in the others.

PULVIS SCAMMONII COMPOSITUS. Compound Powder of Scammony.

Scammony Resin, in powder, 4; Jalap, in powder, 3; Ginger, in powder, 1. Mix. =(1 in 2).

Dose.—10 to 20 grains.

Foreign Pharmacopœias.—Official in Port. (Po de Escamonea Composto), Scammony 5, Jalap 4, Ginger, 1; not in the others.

SCAMMONIUM.

SCAMMONY.

A Gum Resin obtained by incision from the living root of *Convolvulus Scammonia*, known in commerce as Virgin Scammony.

Chiefly from Smyrna, in Asia Minor.

Solubility.—Almost entirely dissolved in boiling diluted Alcohol.

Medicinal Properties.—Similar to those of Scammony Resin, but Scammony emulsifies with Water, the Resin does not.

Dose.—5 to 10 grains.

Foreign Pharmacopœias.—Official in Fr., Ital., Mex., Port. and Span. (Escamonea), Swed., Swiss and U.S.; not in the others.

Description.—Scammony is usually imported in flattened cakes or irregular pieces of varying sizes. It is brown, dark grey, or nearly black externally, and often covered with a greyish-white powder. It is very brittle, and the freshly exposed surface is glossy, resinous, more or less porous, and of a uniform dark-brown or nearly black colour; in thin fragments the drug is brown and more or less translucent. It is easily reduced to an ash-grey powder, and forms an emulsion with Water. It has a characteristic odour and acrid taste.

Tests.—It should afford only the slightest reactions with the tests for Starch, and should yield at least 70 p.c. of Resin soluble in Ether, and not more than 3 p.c. of ash on incineration. An alcoholic solution should not afford a blue colour with Test-solution of Ferric Chloride (absence of Guaiacum Resin).

In estimating the resin soluble in Ether, it is recommended to use a light Ether

(sp. gr. ·717), and to break up the residue after evaporating the Ether, and again heat to avoid error due to Resin holding down the Ether.—*P.J.* (3) xxi. 477.

It would probably be better to dry the Scammony, extract with Ether, and weigh the residue.

Has been adulterated with Resin prepared from the root, which can be detected by odour and colour on comparison with a genuine specimen.—*P.J.* (3) xiv. 397.

SCILLA.

SQUILL.

The bulb of *Urginea Scilla*, divested of its dry membranous outer scales, cut into slices, and dried.

From the Mediterranean coasts.

Two active principles have been extracted from Squill, Scillitoxin (Scillain) and Scillipicrin, both of which strongly affect the heart, but their actions are antagonistic.

Medicinal Properties.—A stimulant expectorant, diuretic and cardiac tonic, acting similarly to Digitalis. It increases the secretion of the bronchial mucous membrane and aids the expectoration of mucus. The Tincture diluted with Water may be taken frequently to relieve the cough of chronic bronchitis (contra-indicated in acute bronchitis). As an expectorant, it is also used with Ipecacuanha and Ammonia. In dropsy, especially if cardiac in origin, it is combined with Blue Pill and Digitalis.

Toxic effects causing death in two children.—*P.J.* (3) xvi., 828, 832; (3) xvii., 227.

Dose.—1 to 3 grains.

Official Preparations.—Acetum Scillæ, Oxymel Scillæ, Pilula Scillæ Composita, and Tinctura Scillæ. Contained in Pilula Ipecacuanhæ cum Scilla. The **Vinegar** is used in the preparation of Syrupus Scillæ.

Foreign Pharmacopœias.—Official in all; Fr., Scille; Mex. and Span., Escila.

Description.—The slices of the inner scales usually present the form of curved strips, frequently tapering towards both ends; they are yellowish-white or somewhat pinkish, from about one to two inches (two and a-half to five centimetres) long, somewhat translucent, brittle and easily pulverisable when quite dry, but tough and flexible when moist. Inodorous, disagreeably bitter.

Preparations.

ACETUM SCILLÆ. VINEGAR OF SQUILL.

Squill, bruised, 2½; Diluted Acetic Acid, 20, or a sufficient quantity. Exhaust the Squill by the process of maceration as directed for Tinctures. The resulting Vinegar of Squill should measure 20.

=(1 in 8).

It is conveniently filtered through Talc.

Dose.—10 to 30 minims.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Fr., Ger.,

Hung., Ital., Norw., Port., Russ., Swed., Swiss and U.S., 1 in 10; Mex., Vinagre Escilitico, 1 and 10; Belg., about 1 in 12; Span., 1 in 12: all by weight except U.S.

OXYMEL SCILLÆ. Oxymel of Squill. (Altered.)

Squill, bruised, 2½; Acetic Acid, 2½; Distilled Water, 8; Clarified Honey, liquefied, a sufficient quantity. Digest the Squill for seven days in a mixture of the Acetic Acid and Distilled Water. Press strongly; filter. Mix the product, which should measure approximately 10, with about 27 (by measure) of the Clarified Honey, or sufficient to produce Oxymel of Squill having the sp. gr. 1·320.

Now made direct from Squill, Acetic Acid and Distilled Water instead of Vinegar of Squill; the Clarified Honey is now *measured*, instead of *weighed* as in B.P. '85.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Ger., Ital. and Russ., Vinegar of Squill 1, Honey 2; Dan. and Norw., Vinegar of Squill, 35, Honey to make 100; Span. and Swed., Vinegar of Squill 1, Honey 3; Dutch, Vinegar of Squill 2, Sugar 1, Honey 1; Fr., Mex. (Oximiel Escilitica), and Port., Vinegar of Squill 1, Honey 4; Hung., Extract of Squill 2, Honey 320, Strong Acetic Acid (96 p. c.) 3, Dilute Acetic Acid 4; Swiss, Vinegar of Squill 3, Sugar 3, Honey 4: all by weight. Not in Belg., Jap. or U.S.

PILULA SCILLÆ COMPOSITA. Compound Squill Pill. (Altered.)

Squill, in powder, 1¼; Ginger, in powder, 1; Ammoniacum, in powder, 1; Hard Soap, in powder, 1; Syrup of Glucose (by weight), 1 or a sufficient quantity. Mix to form a mass.

=(about 1 in 4).

Now 1 in 4 instead of 1 in 5, and made with Syrup of Glucose in place of Treacle.

Dose.—4 to 8 grains.

Foreign Pharmacopœias.—Official in Belg., 1 in 7; not in the others.

SYRUPUS SCILLÆ. Syrup of Squill. (Modified.)

Vinegar of Squill, 20; Refined Sugar, 38. Dissolve the Refined Sugar in the Vinegar of Squill by the aid of gentle heat. The product should weigh 58.

Quantity of Sugar reduced from 40 to 38.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Vinegar of Squill 347, Sugar 653; Russ., Squill 1, Water 12, Spirit 1, Sugar 18; Swed., Squill 2, Ginger 1, Hyssop 4, Peppermint Water 35, Sugar 63: all by weight; U.S., Vinegar of Squill 45, Sugar 80; Water to measure 100. Not in the others.

TINCTURA SCILLÆ. Tincture of Squill. (Altered.)

Squill, bruised, 4; Alcohol (60 p.c.), 20. Prepare by the maceration process.

=(1 in 5).

Now 1 in 5 instead of 1 in 8, and Alcohol (60 p.c.) used in place of Proof Spirit.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Belg., Fr., Ger., Jap., Mex., Port., Russ., Span., Swed. and Swiss, 1 in 5: all by weight. U.S., 15 in 100. Not in the others.

SCOPARII CACUMINA.

BROOM TOPS.

The fresh and the dried tops of *Cytisus scoparius*.

Medicinal Properties.—Diuretic and in large doses cathartic. Employed in dropsical complaints, especially if cardiac, and often prescribed along with Potassium salts and Digitalis; in renal dropsy it is contra-indicated if there be acute nephritis.

Official Preparations.—Infusum Scoparii and Succus Scoparii.

Not Official.—Sparteina, Sparteinæ Sulphas, Sparteine Periodide.

Foreign Pharmacopœias.—Official in Port., Giesta; U.S., Scoparius; not in the others.

Description.—The stem is dark green with long, straight, slender, alternate branches; the latter, like the upper part of the stem, are winged, tough, flexible and glabrous. The leaves, when present, are small, sessile and simple above, stalked and trifoliate below. The taste is bitter and nauseous; the odour of the fresh Tops, especially when bruised, is characteristic, but when dry the drug is almost odourless.

Preparations.

INFUSUM SCOPARII. Infusion of Broom. (New).

Broom Tops, dried and bruised, 2; Distilled Water, boiling, 20. Infuse in a covered vessel for fifteen minutes; strain.

Dose.—1 to 2 fl. oz.

This preparation has been introduced in place of the Decoction of Broom of the British Pharmacopœia of 1885.

SUCCUS SCOPARII. Juice of Broom. (Modified).

Bruise Fresh Broom Tops; press out the juice; to every 3 volumes of juice add 1 of Alcohol (90 p.c.); set aside for seven days; filter.

Now made with Alcohol (90 p.c.) instead of Rectified Spirit.

Dose.—1 to 2 fl. drm.

Not Official.

SPARTEINA ($C_{15}H_{26}N_2$, eq. 232·53).—A liquid alkaloid, heavier than Water, obtained from Broom.

Practically insoluble in Water, soluble in Alcohol, Ether, and Chloroform.

SPARTEINE PERIODIDE.—$C_{15}H_{26}N_2.2HI.I_3$, containing 43·7 p.c. of loosely-combined Iodine. A diuretic in combination with Iodine.

SPARTEINÆ SULPHAS ($C_{15}H_{26}N_2.H_2SO_4.5H_2O$, eq. 419·27).—Colourless crystals, readily soluble in Water.

Medicinal Properties.—Cardiac tonic and diuretic. Useful in mitral disease. It slows and strengthens the pulse. Its action is more rapid and less persistent than that of Digitalis.—*B.M.J.* '86, i. 1246; '88, i. 363; *L.* '87, ii. 203; *P.J.* xvi. 543; *Pr.* li. 213; as a preliminary to chloroform anæsthesia.—*B.M.J.E.* '94, 11. 48; *T.G.* '95, 40.

Dose.—$\frac{1}{4}$ to 2 grains.

Foreign Pharmacopœias.—Official in Fr., Swiss and U.S.; Mex., has Sparteín; not in the others.

Hypodermic Lamels $\frac{1}{2}$ grain of Sparteine Sulphate in each.

A small quantity of the salt, mixed in a porcelain capsule with one-third of its weight of Chromic Acid and gently warmed, gives a green coloration due to the reduction of the Acid and emits a distinct odour of Conine.—*P.J.* '95, ii. 482; '97, ii. 203.

It is rather a peculiar fact that although Sparteine is dibasic, only half the Acid is indicated by titration with Alkali and Phenol-phthalein in aqueous solution, but when the Sparteine Sulphate is dissolved in Alcohol (Absolute or 90 p.c.), the full quantity is shown.

Not Official.

SCOPOLA.

The dried rhizome of *Scopolia carniolica*, known also on the continent as *Scopolia Atropoides*.

The experiments of Dunstan and Chaston (*P.J.* (3) xx. 461) following those of Schmidt (*P.J.* (3) xix. 245), show the alkaloid to be **Hyoscyamine** of which a sample contained ·43 p. c.

The further investigations of Schmidt on this root resulted in the separation of a quantity of **Hyoscine** (Scopolamine) in a crystallisable condition hitherto unobtainable, and so clearing up all questions regarding the formula and properties of this base, *C.D.* '92 i., 771, *see* also Hyoscine, p. 363. Hesse succeeded in isolating a compound which he called 'Atroscine' from commercial Scopolamine Hydrobromide, but Schmidt points out that this substance closely resembles inactive Scopolamine, which has precisely the same physiological action as the active modification.—*J.C.S. Abs.* '96, i. 655, 712; '97, 1. 385. *See also* Hyoscine Hydrobromide, p. 363.

Medicinal Properties.—It has the same properties as Belladonna and Hyoscyamus.

This drug has not 'taken' in British practice, but it is used on an immense scale in America for the preparation of what is termed 'Belladonna' Plaster.

Action of Scopolamine Hydrochloride on the eye.—*Pr.* liv. 469; *T.G.* '93, 338, 781; '94, 423, 480, 652, 680; *B.M.J.* '94, ii. 497.

Foreign Pharmacopœias.—Official in Jap. (Herb and Root), as an Extract, Plaster, Tincture and Ointment; not in the others.

SENEGÆ RADIX.

SENEGA ROOT.

The dried root of *Polygala Senega*.

From North America.

Medicinal Properties.—A stimulating expectorant, moderately diaphoretic and diuretic. Chiefly used in chronic bronchitis, combined with Ammonium Carbonate and Spirit of Chloroform.

Official Preparations.—Infusum Senegæ, Liquor Senegæ Concentratus, and Tinctura Senegæ.

Not Official.—Syrupus Senegæ.

Foreign Pharmacopœias.—Official in all; Fr., Polygala de Virginie; Ital., Poligala Virginiana; Mex., and Span., Poligala.

Description.—Greyish or brownish-yellow slender roots usually

varying from two to four inches (five to ten centimetres) in length, enlarged at the top into a knotty crown which bears the bases of numerous slender aerial stems. The roots are frequently curved or contorted, sparingly branched, keeled, longitudinally wrinkled, and sometimes transversely wrinkled. They break with a short fracture. A section exhibits a horny translucent cortex free from starch grains, and a white, frequently irregularly developed, wood. The Root has a distinctive odour; the taste is at first somewhat sweet but afterwards acrid.

Methyl Salicylate has been detected in Senega Root, and the Swiss Pharmacopœia employs the detection of its presence in the Ether Extract, as a test of identity.—*P.J.* (3) xxv. 1195. A new adulterant of Senega Root.—*P.J.* '96, 1. 290.

Preparations.

INFUSUM SENEGÆ. Infusion of Senega.

Senega Root, in No. 10 powder, 1; Distilled Water, boiling, 20. Infuse in a covered vessel for half an hour; strain. =(1 in 20).

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in Fr., Tisane de Polygala, 1 in 100; not in the others.

LIQUOR SENEGÆ CONCENTRATUS. Concentrated Solution of Senega. (New.)

Senega Root, in No. 20 Powder, 10; a mixture of two parts of Alcohol (20 p.c.) and 1 part of Alcohol (45 p.c.) 25, or a sufficient quantity. Moisten the Senega with 4 of the menstruum; pack in a closed percolator; set aside for three days; percolate with the remaining menstruum, added in ten equal portions at intervals of twelve hours; continue percolation with more menstruum until the product measures 20.

Dose.—½ to 1 fl. drm.

TINCTURA SENEGÆ. Tincture of Senega. (Altered.)

Senega Root, in No. 40 powder, 4; Alcohol (60 p.c.) a sufficient quantity. Moisten the powder with 4 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and Alcohol (60 p.c.) used instead of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Fr., Mex., and Russ. 1 in 5, by weight; Swiss and U.S., **Fluid Extract,** 1 in 1; not in the others.

Not Official.

SYRUPUS SENEGÆ.

Austr., Ger. Jap., and Russ.—Senega 5, Alcohol (90°) 5, Water 45; digest two days, strain, express, and filter 40, to which add Sugar 60.

Dan. and Norw., 1 in 25; Hung., 1 in 27; Ital., 1 in 30; Span., 1 in 33; Swed., 1 in 28; all by weight.

Mex. (Jarabe de Poligala), Extract ½; Alcohol (60°), 9½; Syrup, 90.

Swiss.—Fluid Extract of Senega, 1; Syrup, 19.

U.S.—Fluid Extract of Senega, 160; Water of Ammonia, 4; Sugar, 600; Water to measure 1000.

SENNA.

SENNA.

The British Pharmacopœia recognises two kinds, **Alexandrian Senna** and **East Indian Senna**.

When Senna is ordered in the Pharmacopœia, either East Indian Senna or Alexandrian Senna may be used.

Distinction between Alexandrian and Indian Senna and their adulteration with powdered Chestnut leaves.—*A.J.P.* '96, 585; '97, 298; *Analyst* '97, 41.

Medicinal Properties. — An efficient purgative in cases of occasional or habitual constipation. Given in large doses, it is apt to produce griping and nausea; it is therefore best administered with aromatics, as in the valuable **Compound Liquorice Powder.**

The different kinds of Senna, freed from stalks, are of nearly equal medicinal value.

Is an hepatic stimulant of feeble power.—Dr. Rutherford.

Dose.—Not given in B.P.; 10 to 30 grains.

Official Preparations.—Confectio Sennæ, Infusum Sennæ, Liquor Sennæ Concentratus, Syrupus Sennæ, and Tinctura Sennæ Composita. Contained in Pulvis Glycyrrhizæ Compositus. The **infusion** is used in the preparation of Mistura Sennæ Composita.

Not Official.—Extractum Sennæ Fructuum Fluidum and Acidum Catharticum.

Foreign Pharmacopœias.—Official in all; Fr., Séné; Ital., Sena; Port., Senne; Mex. and Span., Sen.

SENNA ALEXANDRINA. Alexandrian Senna.

The dried leaflets of *Cassia acutifolia.*

Description.—Pale greyish-green, thin, brittle leaflets, usually varying from three-quarters to one inch and a quarter (twenty to thirty-two millimetres) in length. They are mostly lanceolate, sometimes oval-lanceolate, in outline, acute, entire, and unequal at the base, the greatest diameter being frequently below the middle of the leaflet. The surface is usually very finely pubescent, and the veins on the under surface are distinct. The epidermis bears one-celled, thick-walled hairs. The odour is faint but characteristic; the taste mucilaginous and somewhat unpleasant.

SENNA INDICA. East Indian Senna. *B.P. Syn.*—Tinnivelly Senna.

The dried leaflets of *Cassia angustifolia.* From plants cultivated in Southern India.

Description.—Usually varying from one to two inches (two and a half to five centimetres) in length, lanceolate, acute, the greatest diameter being usually near the middle of the leaflet; unequal at the base, thin, entire, yellowish-green and smooth above, somewhat duller beneath, and glabrous or slightly pubescent. In odour and taste very similar to Alexandrian Senna.

Preparations.

CONFECTIO SENNÆ. Confection of Senna. *N.O.Syn.*—Lenitive Electuary.

Senna, in fine powder, 7; Coriander Fruit, in fine powder, 3;

Figs, 12; Tamarinds, 9; Cassia Pulp, 9; Prunes, 6; Extract of Liquorice, 1; Refined Sugar, 30; Distilled Water, a sufficient quantity. Boil the Figs and Prunes gently with 24 of Distilled Water in a covered vessel for four hours; add more Distilled Water to make up the quantity to its original volume, and then incorporate the Tamarinds and Cassia Pulp; digest for two hours; rub the softened pulp of the fruits through a hair sieve, rejecting the seeds and other hard parts; to the pulp thus obtained add the Refined Sugar and Extract of Liquorice, dissolving them by the aid of gentle heat; while the mixture is still warm, add to it gradually the mixed Senna and Coriander powders; mix the whole thoroughly; make the weight of the resulting Confection 75, either by evaporation or by the addition of more Distilled Water. =(1 in 11 nearly).

Dose.—60 to 120 grains.

Foreign Pharmacopœias.—Official in all except Dan. and Mex., but differing in composition.

INFUSUM SENNÆ. Infusion of Senna.

Senna, 2 oz.; Ginger, sliced, ½ oz. (55 grains); Distilled Water, boiling, 20 fl. oz. Infuse in a covered vessel for fifteen minutes; strain. =(1 in 10).

Time reduced to fifteen minutes.

From 20 fl. oz. of Infusion only 14 fl. oz. drain out.

Dose.—½ to 1 fl. oz.; as a draught, 2 fl. oz.

Foreign Pharmacopœias.—Official in Austr. (Inf. Sennæ c. Manna), about 1 in 8; Belg., 1 in 10; Dan., Ger., Norw., Port., Russ., Swed. and Swiss (Compound), 1 in 10; Norw., has also Simple Infusion, 1 in 10; Dutch, 1 in 25; also Compound with Anise Fruit, Rochelle Salt and Liquorice; Hung. (Infusum Laxativum), 1 in 10, with Manna; Ital., 1 in 15; Jap. with Manna; U.S., *see* below; not in the others.

LIQUOR SENNÆ CONCENTRATUS. Concentrated Solution of Senna. (New.)

Senna, in No. 5 powder, 20; Tincture of Ginger, 2½; Alcohol (90 p.c.), 2; Distilled Water, a sufficient quantity. Divide the Senna into three equal portions; slightly moisten one portion with Distilled Water; pack in a percolator; set aside for twenty-four hours; pass Distilled Water through it until 5 are obtained. Slightly moisten the second portion of Senna with this liquid; pack in a percolator; set aside for twenty-four hours; percolate with the remainder of the liquid obtained from the first portion, and also with an additional 5 obtained by passing more Distilled Water through the first portion. Repeat the process with the third portion of the Senna, and continue successive percolation through the three portions, until a quantity of 16 has been collected from the third percolator. Heat the liquid to 180° F. (82·2° C.) for five minutes; cool; add the Alcohol and Tincture of Ginger, previously mixed; set aside for seven days; filter. The product should measure 20.

Dose.—½ to 1 fl. drm.

MISTURA SENNÆ COMPOSITA. Compound Mixture of Senna. *B.P.Syn.*—Black Draught. (Altered.)

Magnesium Sulphate, 5; Liquid Extract of Liquorice, 1; Compound Tincture of Cardamoms, 2; Aromatic Spirit of Ammonia, 1; Infusion of Senna, a sufficient quantity. Dissolve the Magnesium Sulphate in 10 of the Infusion of Senna; add the mixed Liquid Extract of Liquorice, Compound Tincture of Cardamoms, and Aromatic Spirit of Ammonia; and enough Infusion of Senna to produce 20 of the Compound Mixture. =(1 of Magnesium Sulphate in 4).

Now 1 in 4 instead of 1 in 5½. Tincture of Senna omitted, Compound Tincture of Cardamoms increased, and Aromatic Spirit of Ammonia added.

Dose.—*As a draught*, 1 to 2 fl. oz.

(U.S. Infusum Sennæ Comp.—Senna 6, Manna 12, Magnesium Sulphate 12, Fennel 2, Boiling Water 80, Water sufficient to measure 100 when cold.)

SYRUPUS SENNÆ. Syrup of Senna. (Altered.)

Senna, 40 oz.; Oil of Coriander, 10 minims; Alcohol (90 p.c.), 40 minims; Refined Sugar, in powder, 50 oz.; Alcohol (20 p.c.), 70 fl. oz. Moisten the Senna with 40 fl. oz. of the Alcohol; pack tightly in a vessel which can afterwards be closed; set aside for three days; press strongly; reserve the liquid obtained; break up the marc; moisten it with 15 fl. oz. of the Alcohol; set aside for 24 hours; press strongly; add the liquid obtained to the portion previously reserved; break up the marc; mix it with the remainder of the Alcohol; set aside for three hours; press again; evaporate the resulting liquid until it is reduced to such a volume that when added to the reserved liquid the whole shall measure 40 fl. oz. Mix the evaporated liquid with the reserved liquid; heat the product in a covered vessel to 180° F. (82·2° C.) for a few minutes; set aside for twenty-four hours; filter; pass Distilled Water through the filter until the filtrate measures 40 oz.; add the Refined Sugar, and dissolve in a covered vessel by the aid of gentle heat; cool; add the Oil of Coriander dissolved in the Alcohol (90 p.c.); shake well. The product should weigh 5 lbs. 12 oz. =(1 in $2\frac{3}{5}$).

Process entirely altered and more Ol. Coriandri used.

Dose.—½ to 2 fl. drm.

Foreign Pharmacopœias.—Official in Austr., with Aniseed and Manna; Belg., with and without Manna; Dan., Norw., Russ., and Swed., with Fennel and Manna; Dutch, with simple Syrup; Ger. and Russ., with Fennel; Hung., Syrupus Mannatus, with Aniseed and Manna; Ital., with Manna and Anise; Jap., Senna only; Mex., Jarabe de Sen; U.S. similar to B. P.; not in Fr., Port., Span. or Swiss.

TINCTURA SENNÆ COMPOSITA. Compound Tincture of Senna. (Altered.)

Senna, broken small, 4; Raisins of commerce, freed from seeds, 2; Caraway Fruit, bruised, ½; Coriander Fruit, bruised, ½; Alcohol (45 p.c.), 20. Prepare by the maceration process. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and Alcohol (45 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm. for repeated administration; for a single administration, 2 to 4 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., and Swiss, 1 in 5, by weight; not in the others.

Not Official.

EXTRACTUM SENNÆ FRUCTUUM FLUIDUM.—Exhaust Senna pods with cold Water and evaporate the resulting liquid *in vacuo*, so that one of Fluid Extract shall equal 1 of Senna pods.

Senna Pods have been revived as an agreeable aperient.—*L.* '89, ii. 164.

ACIDUM CATHARTICUM.—According to Stockman, Cathartic Acid is a coloured glucoside. In the free state it is easily decomposed. It acts locally as an irritant and hence as a purgative when introduced into the alimentary canal.—*P.J.* (3) xv. 751.

Bourgoin and Bouchut, in a lengthy investigation on Senna and Cathartic Acid, conclude, 'As a general result of this enquiry it appears that the best preparation is the Infusion of Senna.'—*P.J.* (3) ii. 223.

SERPENTARIÆ RHIZOMA.

SERPENTARY RHIZOME.

The dried rhizome and roots of *Aristolochia Serpentaria*, or of *Aristolochia reticulata*.

From the southern parts of North America.

Medicinal Properties.—A bitter stomachic and tonic. Used in dyspepsia associated with nervous depression and in chronic rheumatism and gout.

Dose.—Not given in B.P.; 10 to 15 grains.

Official Preparations.—Infusum Serpentariæ, Liquor Serpentariæ Concentratus, and Tinctura Serpentariæ. Used in the preparation of Tinctura Cinchonæ Composita.

Foreign Pharmacopœias.—Official in Belg., Dan., Fr., Mex., Port., Span., Swed. and U.S.; not in the others.

Description.—The rhizome of Aristolochia Serpentaria is tortuous and slender; about one inch (two and a-half centimetres) in length and one-eighth of an inch (three millimetres) in diameter, bears on its upper surface the remains of aerial stems, and on its under surface numerous wiry interlacing roots, often about three inches (seven and a-half centimetres) in length. Both rhizome and roots are dull yellowish-brown in colour, have a characteristic camphoraceous odour, and a strong aromatic bitter taste.

The rhizome and roots of Aristolochia reticulata resemble the foregoing, but are longer and thicker and the roots are straighter than those of Aristolochia Serpentaria.

Preparations.

INFUSUM SERPENTARIÆ. Infusion of Serpentary. (Altered.)

Serpentary Rhizome, in No. 10 Powder, 1; Distilled Water, boiling, 20. Infuse in a covered vessel for fifteen minutes; strain. =(1 in 20.)

Now 1 in 20 instead of 1 in 40, and time reduced to fifteen minutes.

Dose.—½ to 1 fl. oz.

(Not in the other Pharmacopœias.)

LIQUOR SERPENTARIÆ CONCENTRATUS. CONCENTRATED SOLUTION OF SERPENTARY. (NEW).

Serpentary Rhizome, in No. 40 Powder, 10; Alcohol (20 p.c.), 25; or a sufficient quantity. Moisten the Serpentary with 5 of the Alcohol; pack in a closed percolator; set aside for three days; percolate with the remaining Alcohol, added in ten equal portions at intervals of twelve hours; continue percolation with more Alcohol until the product measures 20.

Dose.—½ to 2 fl. drm.

TINCTURA SERPENTARIÆ. TINCTURE OF SERPENTARY. (ALTERED.)

Serpentary Rhizome, in No. 40 Powder, 4; Alcohol (70 p.c.) a sufficient quantity. Moisten the powder with 4 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 5).

Now 1 in 5 instead of 1 in 8 and Alcohol (70 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in U.S., 1 in 10, also **Fluid Extract**; Mex., 1 in 5; not in the others.

SEVUM PRÆPARATUM.

PREPARED SUET.

The internal fat of the abdomen of the sheep, *Ovis Aries*, purified by melting and straining.

Official Preparation.—Used in the preparation of Unguentum Hydrargyri.

Foreign Pharmacopœias.—Official in Belg., Norw. and Swiss, Sebum; Dan. and U.S., Sevum; Fr., Suif de Mouton; Ger. and Hung., Sebum ovile; Ital., Grasso di Montone; Jap., Sebum Bovinum; Mex., Port. and Span., Sebo; Russ., Sebum Bovinum Depuratum; not in Austr., Dutch or Swed.

Description.—White, smooth, almost odourless.

Tests.—Melting point between 112° and 120° F. (44·4° and 48·9° C.); commences to re-solidify at about 100° F. (37·8° C.). Freely soluble in Petroleum Spirit, slowly soluble in Benzol, insoluble in cold Alcohol (90 p.c.), slightly soluble in Ether or boiling Alcohol (90 p.c.).

Not Official.

SIMABA CEDRON.

The bruised seeds used for snake-bites and hydrophobia.—*L.M.R.* '85, 144; *P.J.* (3) xv. 638; *T.G.* '88, 785.

A bitter principle, **Cedrine,** has been isolated.

Not Official.

SIMARUBA.

BITTER SIMARUBA, OR MOUNTAIN DAMSON.

The root bark of *Simaruba officinalis*, from the West Indies.

Medicinal Properties.—A bitter tonic. In large doses causes nausea; is dia-

phoretic and diuretic. Principally used in the asthenic and chronic form of dysentery; may be combined with Opium in epidemic dysentery, and in the advanced stages of diarrhœa.

Dose.—15 to 30 grains.

Foreign Pharmacopœias.—Official in Dutch, Fr., Mex., Port., and Span.; not in the others.

SINAPIS.

MUSTARD.

The dried ripe seeds of *Brassica nigra* and *Brassica alba*, powdered and mixed.

The whole virtue of Mustard depends upon the fact that when mixed with Water Allyl Thiocarbimide (Volatile Oil of Mustard) is formed. This compound is produced by the action of Myrosin upon Myronic Acid in the same way in which the Emulsin and Amygdalin react in the formation of Volatile Oil of Bitter Almonds. Black Mustard contains Myrosin and a large excess of Myronic Acid, and so is in itself able to produce the Volatile Oil to some extent. White Mustard contains Myrosin but no Myronic Acid, and so can by itself produce none of the Volatile Oil. The best result is obtained by mixing the black and white variety in such proportions that the Myrosin and the Myronic Acid will balance each other.

Medicinal Properties.—A powerful stimulant and sialagogue. The powder is taken internally as a condiment; a tablespoonful in a tumblerful of warm water as an emetic; used externally as a rubefacient and counter-irritant in cerebral congestion and coma, in pneumonia, pleurisy, muscular rheumatism and neuralgia; as a sitz-bath in amenorrhœa.

Official Preparations.—Charta Sinapis, Linimentum Sinapis, and Oleum Sinapis Volatile.

Not Official.—Applicatio Sinapis, Infusum Sinapis, and Charta Sinapis (U.S.).

Foreign Pharmacopœias.—Official in all; Fr., Moutarde; Ital., Senape Nera; Mex. and Span., Mostaza; Norw. (Nigra only); Port., Mostarde.

Description.—A greenish-yellow powder with a bitter pungent taste, inodorous when dry, but exhaling when moist a characteristic pungent odour.

A comparison of the constituents of black and white mustard seeds.—*A.J.P.* '95, 339.

Test.—A cooled decoction is not rendered brown by a solution of Boric Acid (absence of turmeric), and should yield no characteristic reaction with the tests for Starch.

The Iodine test for the presence of Starch is rendered negative by the ready absorption of Iodine by the Volatile Oil developed on the addition of Water.—*A.J.P.* '98, 433.

SINAPIS ALBÆ SEMINA. White Mustard Seed.

The dried ripe seeds of *Brassica alba*.

Description.—The seeds are about one-twelfth of an inch (two millimetres) in diameter and one-tenth of a grain (six and a-half milligrammes) in weight, spheroidal, of a pale yellow colour, with

a very finely pitted and reticulated testa. Externally they are hard, internally yellow and oily. Inodorous when entire or powdered; almost inodorous when triturated with Water. In taste less pungent than Black Mustard Seeds.

SINAPIS NIGRÆ SEMINA. Black Mustard Seed.

The dried ripe seeds of *Brassica nigra*.

Description.—The seeds are about one twenty-fifth of an inch (one millimetre) in diameter and one-fiftieth of a grain (one and a-third milligramme) in weight; spherical or slightly ovoid in form. Colour dark reddish-brown or greyish-brown. Testa hard and minutely pitted; interior yellowish-green and oily. When entire or when powdered they are inodorous, but when triturated with Water they yield a strong pungent odour. Taste somewhat bitter at first, followed immediately by extreme pungency.

Preparations.

CHARTA SINAPIS. Mustard Paper. (Altered.)

Black and White Mustard Seeds, equal proportions by weight; Benzol, Solution of India-rubber, of each a sufficient quantity. Bruise the Mustard Seeds and extract the fixed oil by percolation with the Benzol. Dry the residue by exposure to the air in a warm closet, and reduce to No. 60 powder. Mix 75 grains of the purified Mustard with 5 fl. drm. of Solution of India-rubber, and spread by means of a suitable brush over about 30 square inches of one side of a piece of cartridge paper. Allow it to dry by exposure to the air.

The fixed oil is now first extracted from the bruised seeds by Benzol.

Foreign Pharmacopœias.—Official in Belg.; Dutch; Norw.; Fr., Sinapismes en Feuilles; Dan., Ger. and Hung., Charta Sinapisata; Ital., Carta Senepata; Span., Papel Sinapico; Russ., Charta Sinapina; U.S.; not in the others.

LINIMENTUM SINAPIS. Liniment of Mustard. (Altered.)

Volatile Oil of Mustard, 1½ fl. drm.; Camphor, 120 grains; Castor Oil, 5 fl. drm.; Alcohol (90 p.c.), 4 fl. oz. Dissolve the Camphor in the Alcohol; add the Oil of Mustard and Castor Oil; mix. =(about 1 in 27).

Now about 1 in 27 instead of 1 in 40, Ethereal Extract of Mezereon omitted and Alcohol (90 p.c.) used in place of Rectified Spirit.

As the essential oil quickly disappears on keeping, it is better to keep the other ingredients ready mixed and to add the Mustard Oil when required.

A stimulating liniment.

Foreign Pharmacopœias.—Spiritus Sinapis:—Austr. and Hung., Oil 1, Spirit 50; Belg., Ger., Russ., Swed. and Swiss, Oil 1, Spirit 49; Mex. (Linimento de Mostaza Compuesto), 1 in 38; Span. (Alcohol de Mostaza), Oil 1, Spirit 50; all by weight. U.S., similar to B.P.; not in the others.

OLEUM SINAPIS VOLATILE. Volatile Oil of Mustard.

Distilled from Black Mustard Seeds after maceration with Water.

Solubility.—1 in 50 of Water; readily in Alcohol (90 p.c.) and Ether.

Medicinal Properties.—Applied to the skin, it produces almost

instant vesication, but when diluted it forms a useful counter-irritant application.

Foreign Pharmacopœias.—Official in Austr., Hung. and Jap., Oleum Sinapis Æthereum; Belg., Essentia Sinapis; Dan., Norw., and Swed., Ætheroleum Sinapis; Dutch, Ger., Russ., and Swiss, Oleum Sinapis; Ital., Essenza di Senape; Mex., Aceite Volatil de Mostaza; Port., Essencia de Moutarda; Span., Esencia de Mostaza; U.S., Oleum Sinapis Volatile; not in Fr.

Description.—Colourless or pale yellow. Has an intensely penetrating odour and a very acrid taste. Applied to the skin it produces almost immediate vesication.

Tests.—Sp. gr. 1·018 to 1·030. It distils between 297° F. (147·2° C.) and 306° F. (152·2° C.), and the first and last portions of the distillate should have the same sp. gr. as the original Oil (absence of Ethylic Alcohol and Petroleum).

Not Official.

APPLICATIO SINAPIS.—Volatile Oil of Mustard, 4 minims; Eau de Cologne, 1 fl. oz.: mix.

A good application in acute catarrh of the middle ear; to be applied behind the ear by means of a brush or Absorbent Wool.

INFUSUM SINAPIS.—Mustard, 2 drm.; boiling Water, 4 fl. oz.: strain. It relieves obstinate hiccough.

CHARTA SINAPIS, U.S.—Percolate Black Mustard, in No. 60 powder, with Benzin until the percolate ceases to produce a permanent greasy stain upon blotting paper. Remove and dry the powder by exposure to air: then mix it with as much of the Solution (India-rubber 1, Benzin 10, Carbon Disulphide 10) as will give it a semi-liquid consistence, and let it be spread with a suitable brush on one side of a stiff piece of well-sized paper, and allow it to dry. Each square inch of paper should contain about 6 grains of Mustard.

SODIUM.

SODIUM.

Na, eq. 22·88.

The metal Sodium as met with in commerce. It should be preserved under mineral Naphtha in well-stoppered bottles.

Description.—A soft metal, rapidly oxidising in the air, but showing a bright metallic surface when freshly cut.

Sp. gr. ·97. The metal of the alkali Soda, discovered by Sir Humphrey Davy in 1807. Like Potassium, it has a strong affinity for Oxygen: when thrown on cold water, it instantly fuses to a globule, without combustion, and traverses the surface in all directions; on hot water, however, combustion of the Hydrogen ensues.

Tests.—It violently attacks Water or Alcohol (90 p.c.), with evolution of Hydrogen, little or no insoluble matter remaining. It imparts an intense yellow colour to flame. Each gramme very cautiously added to Water affords a solution which should require for neutralisation at least 42·6 c.c. of the Volumetric Solution of Sulphuric Acid.

The Official tests for the presence of Sodium will be found in the Appendix.

Preparation.

LIQUOR SODII ETHYLATIS. *See* SODII ETHYLATIS LIQUOR.

The only direct Official preparation of Sodium.

Sodium Chloride is obtained by dissolving Rock Salt in Water, and recrystallising it; some, however, absolutely pure and perfectly white, is found embedded in the common brown Rock Salt.

From Sodium Chloride the Sodium Carbonate is now prepared, and from the latter many of the other preparations are made.

The salts of Sodium, even in much larger doses, produce a less depressing effect upon the heart than salts of Potassium.

The following are the compounds of Sodium given in the British Pharmacopœia:—

		Dose.
SODA TARTARATA		2 to 4 drm.
SODÆ CHLORINATÆ LIQUOR		10 to 20 minims.
SODII ARSENAS		$\frac{1}{60}$ to $\frac{1}{10}$ grain.
SODII ARSENATIS LIQUOR		2 to 8 minims.
SODII BENZOAS		5 to 30 grains.
SODII BIBORAS. *See* BORAX.		5 to 20 grains.
SODII BICARBONAS		5 to 30 grains.
SODII BROMIDUM		5 to 30 grains.
SODII CARBONAS		5 to 30 grains.
SODII CARBONAS EXSICCATA		3 to 10 grains.
SODII CHLORIDUM.		
SODII CITRO-TARTRAS EFFERVESCENS		1 to 2 drm.
SODII ETHYLATIS LIQUOR.		
SODII HYPOPHOSPHIS		3 to 10 grains.
SODII IODIDUM		5 to 20 grains.
SODII NITRIS		1 to 2 grains.
SODII PHOSPHAS	for repeated administration	30 to 120 grains;
	for a single administration	$\frac{1}{4}$ to $\frac{1}{2}$ oz.
SODII PHOSPHAS EFFERVESCENS—		
	for repeated administration	60 to 120 grains;
	for a single administration	$\frac{1}{4}$ to $\frac{1}{2}$ oz.
SODII SALICYLAS		10 to 30 grains.
SODII SULPHAS	for repeated administration	30 to 120 grains;
	for a single administration	$\frac{1}{4}$ to $\frac{1}{2}$ oz.
SODII SULPHAS EFFERVESCENS—		
	for repeated administration	60 to 120 grains;
	for a single administration	$\frac{1}{4}$ to $\frac{1}{2}$ oz.
SODII SULPHIS		5 to 20 grains.
SODII SULPHOCARBOLAS		5 to 15 grains.

Preparations of the above and Compounds of Sodium not official are to be found in the Index.

Not Official.

SODA CAUSTICA.

Caustic Soda and Solution of Sodium Hydroxide have been transferred to the Appendix.

Foreign Pharmacopœias.—Official in Belg., Soda Caustica Fusa; Fr., Soude

Caustique; Ital., Soda Caustica; Jap., Natrum Causticum; Mex., Sosa Caustica; Port., Hydrato de Soda; Span., Sosa Caustica por la Cal; U.S., Soda; not in the others.

The **Solution** is official in Belg., Soda Caustica Soluta (30 p.c.), sp. gr. 1·330 to 1·334; Swed., Solut. Hydratis Natrici (20 p.c.), sp. gr. 1·215—1·219; Fr., Soude Caustique Liquide (29 p.c.), sp. gr. 1·332; Ger., Liquor Natri Caustici, and Russ., Natrum Causticum Solutum (15 p. c.), sp. gr. 1·168 to 1·172; Hung., Natrium Hydrooxydatum Solutum (32 p.c.), sp. gr. 1·35; Port., Hydrato de Soda Liquido (30 p.c.), sp. gr. 1·33; Span., Solucion de Sosa Caustica (30 p.c.), sp. gr. 1·334; Swiss, Natrium Hydricum Solutum (30 p.c.), sp. gr. 1·33; U.S., Liquor Sodæ (about 5 p.c.), sp. gr. 1·059; not in the others.

Antidotes.—Same as Liquor Potassæ, p. 503.

SODA TARTARATA.

SODIUM POTASSIUM TARTRATE.

B.P.Syn.—Tartarated Soda; Tartrate of Potassium and Sodium; Rochelle Salt.

$(CHOH)_2COONa{\cdot}COOK, 4H_2O$, eq. 280·15.

Prepared by neutralising Acid Potassium Tartrate with Sodium Carbonate.

Solubility.—1 in 1½ of Water; soluble in its own water of crystallisation when hot; insoluble in Alcohol (90 p.c.).

Medicinal Properties.—A mild purgative, well suited for constipation associated with gout and hepatic dyspepsia. It is not aperient in small doses, its action then being diuretic, antilithic and to render the urine alkaline.

A feeble hepatic, but a powerful intestinal stimulant.—Dr. Rutherford.

Dose.—120 to 240 grains.

Official Preparation.—Pulvis Sodæ Tartaratæ Effervescens.

Foreign Pharmacopœias.—Official in Austr. and Hung., Kalium Natrotartaricum; Belg., Tartras Sodico-Potassicus; Dan., Norw., and Swed., Tartras Natrico-Kalicus; Dutch, Tartras Kalico-Natricus; Fr., Tartrate de Potasse et de Soude; Ger. and Swiss, Tartarus Natronatus; Ital., Tartrato Sodico-Potassico; Mex., Tartrato de Potasio y Sodio; Port., Tartrato de Potassa e de Soda; Jap. and Russ., Natrio-Kalium Tartaricum (Sal Polychrestum Seignetti); Span., Tartrato Sodico-Potasico; U.S., Potassii et Sodii Tartras.

Description.—Trimetric prisms with hemihedral facets; it is entirely soluble in cold Water; and has a saline taste.

Tests.—It affords the reactions characteristic of Potassium, of Sodium, and of Tartrates. Each gramme, heated to redness till gases cease to be evolved, should leave an alkaline residue, which when treated with Water, filtered, and well washed, yields a clear solution requiring for exact neutralisation at least 7 c.c. of the Volumetric Solution of Sulphuric Acid.

Preparation.

PULVIS SODÆ TARTARATÆ EFFERVESCENS. Effervescent Tartarated Soda Powder. Commonly known as Seidlitz Powder. *N.O.Syn.*—Pulvis Aërophorus Laxans; Pulvis Effervescens Laxans.

Sodium Potassium Tartrate, in dry powder, 120 grains; Sodium Bicarbonate, in dry powder, 40 grains. Mix. Wrap in blue paper. Tartaric Acid, in dry powder, 38 grains. Wrap in white paper.

Dose.—*For a draught*, the alkaline powder (in blue paper) is dissolved in nearly half a pint of cold or warm water, and the acid powder (in white paper) then added.

Foreign Pharmacopœias.—Official in all except Dutch and Ital.

Analysis of samples of Seidlitz powders.—*P.J.* '97, ii. 481.

SODÆ CHLORINATÆ LIQUOR.

SOLUTION OF CHLORINATED SODA.

Chlorinated Lime, 16; Sodium Carbonate, 24; Distilled Water, 160. Dissolve the Sodium Carbonate in 40 of the Distilled Water; thoroughly triturate the Chlorinated Lime with the remainder of the Distilled Water; mix the two liquids; filter.

Solution of Chlorinated Soda should be preserved in a stoppered bottle in a cool and dark place.

Medicinal Properties.—Antiseptic. Used internally in typhoid fever and in dysentery. Invaluable as a **gargle** in throat affections attended with fœtor, as in scarlet fever, diphtheria, and septic tonsillitis, 1 fl. oz. in 12 fl. oz. of water. Diluted with Water or Glycerin it forms an excellent application to sore nipples. It is also a powerful disinfecting agent, and is employed as a wash for foul ulcers.

Recommended in typhoid fever.—*L.* '85, ii. 520; for fuller information on the treatment of typhoid by Chlorine *see under* 'Chlori Liquor.'

A paper by Klein on the disinfecting action of Solutions of Sodium Hypochlorite.—*L.* '96, ii. 1509.

Dose.—10 to 20 minims.

Foreign Pharmacopœias.—Official in Belg. (Hypochloris Sodii Liquidus), Calcium Hypochlorite 22, Sodium Carbonate 44, Water 1000; Fr. Chlorure de Soude liquide), Chlorinated Lime 1, Sodium Carbonate 2, Water 45; Ital. (Ipoclorito di Sodio), Chlorine passed through a solution of Caustic Soda 1, Water, 10; Mex. (Hipoclorito de Sodio liquido), Sodium Chloride 3, Manganese Dioxide 3, Sulphuric Acid 3, Sodium Carbonate 5, Distilled Water 20; Port. (Soluto de Soda Chlorada), Calcium Hypochlorite 1, Sodium Carbonate 2, Water 40; Russ. (Natrium Hypochlorosum Solutum), Calcium Hypochlorite 25, Sodium Carbonate 30, Water to 500; Span. (Solucion de Hipochlorito Sodico), Calcium Hypochlorite 1, Sodium Carbonate 2, Water 43; Swed. (Liquor Acidi Hypochlorosi), Sodium Carbonate 3, Water 10, Chlorine Gas to effervescence; Swiss (Natrium Hypochlorosum Solutum), Calcium Hypochlorite 4, Sodium Carbonate 5, Water 120; U.S., Chlorinated Lime 75, Sodium Carbonate 150, Water to measure 1000; not in the others.

Description.—A colourless alkaline liquid, with astringent taste and faint odour of Chlorine.

Has the reputation of being an unstable solution, but this is an error. It under-

goes but slight change, even when kept under ordinary conditions during several months, or even after keeping for a week in an open white glass bottle. It goes yellow on keeping; but the 'Codex' preparation (the original Labarraque), prepared by mixing together the *unfiltered* solutions of one part of Chlorinated Lime with two parts of Soda crystals, remains colourless.

Tests.—Sp. gr. 1·054. It decolorises Solution of Indigo Sulphate. It is decomposed by Hydrochloric Acid, evolving Chlorine. It should yield not more than the slightest reaction with the tests for Calcium or for Carbonates. If 3·5 grammes be added to a solution of 1 gramme of Potassium Iodide in 100 c.c. of Water acidulated with 3 c.c. of Hydrochloric Acid, a brownish-red colour should be produced, for the discharge of which at least 25 c.c. of the Volumetric Solution of Sodium Thiosulphate should be required, corresponding to about 2½ p.c. of available Chlorine.

Test explained under Calx Chlorinata, p. 172.

Not Official.

SODII ACETAS.

ACETATE OF SODIUM.

$NaC_2H_3O_2 . 3H_2O$, eq. 135·10.

Solubility.—1 in 1 of Water; 1 in 30 of Alcohol (90 p.c.).

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Russ., Span., Swed., Swiss and U.S.; not in Austr., Dan., Norw. or Port.

Used in the preparation of Acetic Ether.

SODII ARSENAS.

SODIUM ARSENATE.

ARSENIATE OF SODIUM (HYDROUS), *B.P.* '85.

The Anhydrous salt, Di-sodium Hydrogen Arsenate, Na_2HAsO_4, eq. 184·78, obtained by exposing to a temperature of 300° F. (148·9° C.), crystallised Sodium Arsenate, which may be prepared by treating with water the product of the fusion of Arsenious Anhydride with Sodium Nitrate and Sodium Carbonate.

Solubility.—1 in 4 of Water.

Medicinal Properties.—Similar to those of Potassium Arsenite, or Fowler's Solution. Used in skin affections and nervous diseases. *See also* ACID ARSENIOSUM, page 11.

Dose.—$\frac{1}{10}$ to $\frac{1}{10}$ grain.

Prescribing Notes.—Generally employed in the form of the **Liquor**; may also be given in **pills** well triturated with Milk Sugar and Glucose *q.s.*

Official Preparation.—Liquor Sodii Arsenatis.

Not Official.—Pearson's Solution.

Antidotes.—*See* ACIDUM ARSENIOSUM, page 11.

Foreign Pharmacopœias.—Official in Belg., **dried** salt; Fr., Ital., Mex., Port., Span., Swiss and U.S., **crystallised**; not in the others.

Description.—A white powder, soluble in 6 parts of Water, and yielding an alkaline solution. It is only slightly soluble in cold or boiling Alcohol (90 p.c.).

Tests.—It affords the reactions characteristic of Sodium and of Arsenates. A solution of 1 gramme of Sodium Arsenate with 1 of Glacial Acetic Acid, in 50 c.c. of Water, should require 2·03 grammes of Lead Acetate for complete precipitation. It should yield no characteristic reaction with the tests for Lead, Copper, Iron, Aluminium, Calcium, Magnesium, Potassium, Ammonium, Carbonates, Chlorides, Nitrates, or Sulphates. It should not lose weight on being heated to 300° F. (148·9° C.) (absence of Hydrous Sodium Arsenate).

Preparation.

LIQUOR SODII ARSENATIS. Solution of Sodium Arsenate. (Modified.)

Sodium Arsenate, recently rendered anhydrous, 17½ grains; Distilled Water, a sufficient quantity. Dissolve the anhydrous Sodium Arsenate in sufficient Distilled Water to produce 4 fl. oz. of the Solution of Sodium Arsenate. =(1 in 100).

After being made, this solution deposits a little Silica introduced in the preparation of the Arsenate, but, if filtered after a few days, remains clear.

It is about half the strength of Liquor Arsenicalis in metallic Arsenic, as that preparation contains 1 p.c. of Arsenious Acid, and this 1 p.c. of Sodium Arsenate; another difference is that Liquor Arsenicalis contains an Arsenite, and this an Arsenate.

Dose.—2 to 8 minims.

110 minims contain 1·77 grains of crystallised Sodium Arsenate (Na_2HAsO_4, $7H_2O$), or the equivalent of 1 grain of the anhydrous salt. 100 c.c. contain 1·77 grammes of the crystallised salt, equivalent to 1 gramme of the anhydrous salt.

Foreign Pharmacopœias.—Official in U.S., same as Brit.; Belg., 1 in 1000; Fr. and Span., crystallised Sodium Arsenate 1 in 600; Dan., Port., and Swiss, 1 in 500; Mex. has Solucion Arsenical de Pearson, 1 in 600.

Pearson's Solution, Crystallised Sodium Arsenate, 1; Water, 600.

SODII BENZOAS.

SODIUM BENZOATE.

C_6H_5COONa, eq. 143·01.

This salt may be obtained by neutralising Benzoic Acid with Sodium Carbonate.

Solubility.—1 in 2 of Water; 1 in 25 of Alcohol (90 p.c.).

Medicinal Properties.—Antiseptic and diuretic; similar in action to Benzoic Acid but less irritating; given in chronic cystitis in which there is alkaline and decomposing urine. Given in rheumatism, gout and in rheumatic arthritis.

Is a powerful hepatic stimulant; it is not an intestinal stimulant.—Dr. Rutherford.

Dose.—5 to 30 grains.

Prescribing Notes.—May be given in **cachets**, but generally employed in **solution**.

Foreign Pharmacopœias.—Official in Belg., Benzoas Sodicus; Dutch, Benzoas Natricus; Fr., Benzoate de Soude; Hung., Jap., Russ. and Swiss, Natrium Benzoicum; Ital., Benzoato di Sodio; Mex., Benzoato de Sodio; Port., Benzoato de Soda; Span., Benzoata de Sosa; U.S., Sodii Benzoas; not in the others.

Description.—A white somewhat crystalline or amorphous powder, inodorous or having a faint odour of Benzoin, and an unpleasant sweetish saline taste. Soluble in less than 2 parts of cold Water, in 24 parts of cold Alcohol (90 p.c.), and in 12 of boiling Alcohol (90 p.c.).

Tests.—An aqueous solution has a faintly alkaline reaction, and gives a yellowish or flesh-coloured precipitate when mixed with Test-solution of Ferric Chloride. A strong aqueous solution, to which a little Diluted Hydrochloric Acid is added, affords a crystalline precipitate of Benzoic Acid. Each gramme of the salt, when heated, melts, emitting an odour of Benzoin, then chars, and finally leaves a residue which affords the reactions characteristic of Sodium, and, when dissolved in Water, requires for neutralisation from 6·8 to 6·9 c.c. of the Volumetric Solution of Sulphuric Acid. It should yield no characteristic reaction with the tests for Lead, Copper, Iron, Calcium, Magnesium, Potassium, Ammonium, or Carbonates, and only the slightest reactions with the tests for Chlorides or Sulphates.

Three commercial samples contained an average of 4 p.c. of Water, which the Volumetric Test, requiring over 97 p.c. of anhydrous Sodium Benzoate, does not recognise.

SODII BICARBONAS.

SODIUM BICARBONATE.

$NaHCO_3$, eq. 83·43.

It may be obtained by exposing crystals of Sodium Carbonate to Carbonic Anhydride, or by the interaction of Sodium Chloride and Ammonium Bicarbonate.

Solubility.—1 in 12 of Water; insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Analogous to those of Potassium Bicarbonate; but it is much more frequently given, as it is only feebly depressant and is more slowly absorbed than the Potassium salt. Employed as a gastric sedative and as an antacid in dyspepsia. In the Uric Acid diathesis the corresponding salts of Potassium and Lithium are preferable, as they form more soluble salts with Uric Acid. It is very useful in diabetes. Moistened with water, it is an excellent application to the sting of wasps and gnats.

Has scarcely any appreciable effect as a stimulant of the liver, even when given in large doses.—Dr. Rutherford.

Dose.—5 to 30 grains.

Prescribing Notes.—May be prescribed in **cachets, powders,** or in **solution.** It is also given in Compressed Tablets.

Official Preparation.—Trochiscus Sodii Bicarbonatis. Used in the preparation

of Caffeinæ Citras Effervescens, Ferri Arsenas, Ferri Phosphas, Lithii Citras Effervescens, Magnesii Sulphas Effervescens, Pulvis Sodæ Tartaratæ Effervescens, Sodii Citro-Tartras Effervescens, Sodii Phosphas Effervescens, Sodii Sulphas Effervescens, Spiritus Ætheris Compositus, and 'Soluble Saccharin.'

Not Official.—Pulvis Salinus Anticholeraicus.

Foreign Pharmacopœias.—Official in Austr. and Hung., Natrium Hydrocarbonicum; Belg., Bicarbonas Sodæ; Dan., Dutch, Norw., and Swed., Bicarbonas Natricus; Fr. Bicarbonate de Soude; Ger., Jap., Russ. and Swiss, Natrium Bicarbonicum; Ital., Bicarbonato di Sodio; Mex., Carbonato de Sodio Acido; Port., Bicarbonato de Soda; Span., Carbonato (*bi*) Sodico; U.S., Sodii Bicarbonas.

Description.—In powder or small opaque monoclinic crystals, white, of a saline taste, soluble in 11 parts of cold Water.

Tests.—It affords the reactions characteristic of Sodium and of Bicarbonates. Each gramme should require for neutralisation from 11·8 to 11·9 c.c. of the Volumetric Solution of Sulphuric Acid. It should yield no characteristic reaction with the tests for Lead, Copper, Iron, Aluminium, Calcium, Magnesium, Potassium, Sulphites, or Thiosulphates, and only the slightest characteristic reactions with the tests for Chlorides, Sulphates, or Ammonium. A solution of the salt in cold Water gives a whitish precipitate, becoming brownish-red on standing, with Test-solution of Mercuric Chloride (distinction from Sodium Carbonate). The addition of Test-solution of Ferric Chloride to the aqueous solution acidulated with Hydrochloric Acid should cause no red coloration (absence of Thiocyanates).

20 parts of Sodium Bicarbonate are neutralised by 16·7 parts of Citric Acid, and by 17·8 parts of Tartaric Acid.

Howard points out (*C.D.* '98, i. 675) that a pure sample will not pass the B.P. Mercuric Chloride Test.

It has further been noticed that the test depends largely on the conditions of experiment. A very little agitation especially in warm weather suffices to throw down red Oxychloride. The amount of Mercuric Chloride solution used also affects the test. It might with advantage have been left out, as in the latest editions of the German and U.S. Pharmacopœias.—*C.D.* '98, i. 714.

Traces of Sodium Carbonate, and also of Water, are probably present in all commercial Sodium Bicarbonate, but it may still pass the B.P. titration test, owing to the counterbalancing influence of the two impurities. The actual Carbonate may be estimated by adding excess of normal solution of Soda free from Carbonate, then excess of Barium Chloride, and titrating with Volumetric Solution of Sulphuric Acid, using Phenol-phthalein as the indicator.

Preparation.

TROCHISCUS SODII BICARBONATIS. Sodium Bicarbonate Lozenge. (Altered.)

Sodium Bicarbonate, 3 grains (·1944 gramme). Mix with the Rose Basis to form a Lozenge.

Now 3 instead of 5 grains in each, and made with the Rose Basis.

Dose.—Not given in B.P.; 1 to 6 lozenges.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Fr., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S.; not in Dan., Ger. or Hung.

Not Official.

PULVIS SALINUS ANTICHOLERAICUS (Stevens).—Sodium Bicarbonate, 30 grains; Sodium Chloride, 20 grains; Potassium Chlorate, 7 grains: for one dose.

Given frequently in a small tumbler of cold Water in cases of diarrhœa and cholera, to arrest the pain and purging.

SODII BROMIDUM.

SODIUM BROMIDE.

NaBr, eq. 102·23.

It may be prepared in the same manner as Potassium Bromide, Sodium Hydroxide being used in place of Potassium Hydroxide.

Solubility.—5 in 6 of Water; 1 in 16 of Alcohol (90 p.c.).

Medicinal Properties.—Similar to Potassium Bromide, but less depressant and more easily tolerated by the stomach.

It has been recommended as a remedy for sea sickness in 60 grain doses three times a day for at least two days before embarkation on a long voyage, the dose being reduced to half when on board.—*B.M.J.* '81, ii. 730.

Dose.—5 to 30 grains.

Prescribing Notes.—Generally given in **solution**; it may be prescribed in **powders** if carefully wrapped in tin foil. It is also given in Compressed Tablets.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ. and Swiss, Natrium Bromatum; Dan., Dutch, and Norw., Brometum Natricum; Fr., Bromure de Sodium; Ital., Bromuro di Sodio; Span., Bromuro Sodico; U.S., Sodii Bromidum; not in the others.

Description.—In small white cubic crystals, somewhat deliquescent, inodorous, with a saline taste.

Tests.—It affords the reactions characteristic of Sodium and of Bromides. Each gramme of the dry salt dissolved in Water should require for complete precipitation not less than 95·8 nor more than 97·8 c.c. of the Volumetric Solution of Silver Nitrate. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Zinc, Calcium, Magnesium, Potassium, Ammonium, Carbonates, Cyanides, Bromates, or Iodates, and only the slightest reactions with the tests for Chlorides, Iodides, or Sulphates. Test-solution of Ferric Chloride should not cause a red coloration in the aqueous solution (absence of Thiocyanates).

SODII CARBONAS.

SODIUM CARBONATE.

Na_2CO_3, $10H_2O$, eq. 284·11.

It may be obtained from Sodium Chloride, either by interaction with Ammonium Bicarbonate and subsequent ignition, or by its conversion into Sodium Sulphate and the action of heat on a mixture of the Sulphate with Carbon and Calcium Carbonate.

20 parts of Sodium Carbonate are neutralised by 9·8 parts of Citric Acid, and by 10·5 parts of Tartaric Acid.

Solubility.—5 in 8 of Water at 60° F.; 12 in 1 of Water at 100° F.; insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Antacid; but it is so apt to irritate that the Bicarbonate is almost invariably preferred. Externally, as a lotion (30 grains to a pint) in eczema.

Dose.—5 to 30 grains.

Prescribing Notes.—The **Exsiccated salt** may be given in the form of **pills** massed with Glucose and 'Dispensing Syrup.'

Official Preparation.—Sodii Carbonas Exsiccatus used in the preparation of Extractum Ergotæ and many Sodium salts; also Liquor Magnesii Carbonatis and various Carbonates, etc. The **Exsiccated Carbonate** is used in the preparation of Pilula Ferri.

Not Official.—Balneum Alkalinum.

Foreign Pharmacopœias.—Official in all.

Description.—In transparent, colourless rhombic crystals; efflorescent, with a harsh taste and strong alkaline reaction.

Tests.—It should respond to the qualitative tests enumerated under 'Sodii Bicarbonas,' except that its aqueous solution gives an immediate brownish-red precipitate with Test-solution of Mercuric Chloride. When heated it liquefies and then dries up, losing 62·93 p.c. of its weight. Each gramme of the crystallised salt should require for neutralisation at least 6·9 c.c. of the Volumetric Solution of Sulphuric Acid.

Preparation.

SODII CARBONAS EXSICCATUS. Na_2CO_3, eq. 105·31. Exsiccated Sodium Carbonate. Dried Carbonate of Sodium, *B.P.* '85.

Nearly Anhydrous Sodium Carbonate, which is obtained by heating Sodium Carbonate until it loses nearly 63 p.c. of its weight.

53 grains are equal to 143 grains of crystallised salt.

Dose.—3 to 10 grains.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Ger., Hung., Russ. and U.S.; not in the others.

Test.—It affords the reactions characteristic of Sodium and of Carbonates. It should not yield more than traces of Water when strongly heated.

Not Official.

BALNEUM ALKALINUM.—Crystals of Sodium Carbonate, 8 or 10 oz. to 60 gallons of Water.

Used in skin diseases as a solvent to remove scabs and scaly incrustations.

SODII CHLORIDUM.

SODIUM CHLORIDE.

NaCl, eq. 58·07.

Sodium Chloride is common salt, purified.

Solubility.—1 in 2¾ of Water; 1 in 2¾ of boiling Water; 1 in 200 of Alcohol (90 p.c.).

Medicinal Properties.— In small doses, stimulant, alterative, antiseptic, tonic, and in form of enema, anthelmintic; in larger doses, purgative and emetic. Locally, as a fomentation to sprains and bruises. Salt water baths (1 pound to 4 gallons) are tonic and stimulant to the system, especially in children, and are useful in chronic rheumatism and gout. Nasal injection of a saturated solution is useful in ozæna. A recent cold is greatly relieved by douching the nostrils and gargling the throat with a weak solution of Salt; gargling is also serviceable in tonsillitis and chronic throat catarrh. In case of a leech being swallowed a strong solution of Salt should be drunk; this is also a valuable antidote in poisoning by Silver Nitrate.

Its value as an article of diet is well known. Soldiers are supplied with it: our army, ·5 oz. daily; the French, ·5; Prussian, ·87; Russian, 1·86; for a long time the Russian soldiers had salt-money given, and it was only when scurvy attacked them that the money was stopped and the salt given instead.

A very feeble hepatic stimulant.—Dr. Rutherford.

Dose.—Not given in B.P.; 10 to 60 grains as a tonic; as an emetic ½ to 1 oz.

Official Preparation.—Used in the preparation of Acidum Hydrochloricum, Hydrargyri Perchloridum, Hydrargyri Subchloridum, Sodii Bicarbonas, Sodii Carbonas and Sodii Sulphas.

Foreign Pharmacopœias.—Official in Belg., Dan., Dutch, Fr., Ger., Ital., Jap., Mex., Port., Russ., Span., Swiss and U.S.; not in the others.

Description.—In small white crystalline grains or transparent cubic crystals, free from moisture, with a purely saline taste, soluble in less than 3 parts of Water.

Tests.—It affords the reactions characteristic of Sodium and of Chlorides. It should yield no characteristic reaction with the tests for Potassium, Bromides, or Iodides, and only slight reactions with the tests for Calcium, Magnesium, or Sulphates.

SODII CITRO-TARTRAS EFFERVESCENS.

EFFERVESCENT SODIUM CITRO-TARTRATE.

Sodium Bicarbonate, 51; Tartaric Acid, 27; Citric Acid, 18; Refined Sugar, 15, all in powder: mix the powders thoroughly, place the mixture in a dish or pan of suitable form heated to between 200° and 220° F. (93·3° and 104·4° C.). When the mixture, by aid of careful manipulation, has assumed a granular character, separate it into granules of uniform and convenient size by means of suitable sieves. Dry the granules at a temperature not exceeding 130° F. (54·4° C.). The product should weigh about 100.

Medicinal Properties.—A mild saline purgative.

Dose.—60 to 120 grains.

(Not in the other Pharmacopœias.)

SODII ETHYLATIS LIQUOR.

SOLUTION OF SODIUM ETHYLATE.

Sodium, clean and bright, 22 grains; Absolute Alcohol, 1 fl. oz. Cautiously dissolve the Sodium in the Absolute Alcohol contained in a flask, the latter being kept cool by a stream of cold Water.

This Solution should be recently prepared. It contains 18 p.c. of the solid substance, C_2H_5ONa.

If the Sodium be not bright, it is advisable to wash it with a little Absolute Alcohol before commencing to make the Liquor.

Medicinal Properties.—Caustic; has been used in the treatment of nævus, nasal polypus, ozæna, and lupus.—*L.* '78, ii. 625; '81, i. 168, 242; *B.M.J.* '85, ii. 344; '88, ii. 762.

It may be applied by means of a glass rod, camel's hair brush, or a quill pen. Tincture of Opium may be added to relieve the pain, but not Chloroform, as it makes an explosive mixture.

(Not in the other Pharmacopœias.)

Description.—A colourless liquid of syrupy consistence, becoming brown by keeping.

The liquid becomes yellow on keeping, and when traces of aldehyde are present in the Alcohol, the change in colour is more rapid and occurs to a much greater extent, producing a deep brown.

Tests.—Sp. gr. ·867. When slightly heated, it boils and gives off alcoholic vapours, leaving a white residue which, on being strongly heated, becomes charred. If the white residue be mixed with Water and heated, it yields Ethylic Alcohol, and the solution, on evaporation, leaves a white residue consisting almost wholly of Caustic Soda.

SODII HYPOPHOSPHIS.

SODIUM HYPOPHOSPHITE.

$NaPH_2O_2$, eq. 87·44.

Obtained by the interaction of Sodium Carbonate and Calcium Hypophosphite.

Solubility.—1 in 1 of Water; 1 in 2 of Glycerin; almost entirely 1 in 20 of Alcohol (90 p.c.).

Medicinal Properties.—Similar to those of Calcii Hypophosphis.

Dose.—3 to 10 grains.

Not Official.—Syrupus Sodii Hypophosphitis.

Foreign Pharmacopœias.—Official in U.S.; Belg., Hypophosphis Sodii; Dutch, Hypophosphis Natricus; Fr., Hypophosphite de Soude; Mex., Hipofosfito de Sodio; Port., Hypophosphito de Soda; Russ., Natrium Hypophosphorosum; not in the others.

Sodium Hypophosphite, when mixed with an equal quantity of Sodium Nitrate, forms a highly explosive mixture.—*Y.B.P.* '87, 21.

Description.—A white granular salt having a bitter nauseous taste. It is deliquescent, soluble in its own weight of Water and in 30 parts of Alcohol (90 p.c.), but insoluble in Ether.

The crystals or powder deliquesce slowly in very hot weather, but as soon as it cools (say to 65° F.) the salt dries up again.

Tests.—When heated in air it yields spontaneously inflammable Hydrogen Phosphide and Hydrogen. It colours flame strongly yellow. It is rapidly attacked by oxidising agents. Its solution yields with a warm solution of Copper Sulphate a red precipitate of Cuprous Hydride, which, on boiling, evolves Hydrogen. ·5 gramme boiled for ten minutes with 25 c.c. of Water and 1·15 grammes of Potassium Permanganate, and filtered, should afford a nearly colourless solution. It should yield no characteristic reaction with the tests for Lead, Copper, Iron, Aluminium, Zinc, Calcium, Magnesium, Potassium, Ammonium, Chlorides, or Sulphates, only the slightest reactions with the tests for Carbonates, and its solution should give little or no precipitate with Solution of Lead Acetate (limit of Phosphates and Phosphites).

For remarks on the Lead Acetate test and the assay of commercial Hypophosphites, *see* Calcii Hypophosphis, p. 167.

Not Official.

SYRUPUS SODII HYPOPHOSPHITIS (*B.P.C.*).—Dissolve 160 grains of Sodium Hypophosphite in 3 fl. drm. of Distilled Water, filter, and wash the filter with Distilled Water 1 fl. drm. To the filtered solution add sufficient Syrup to produce 20 fl. oz. : mix. Each fl. drm. contains 1 grain of Sodium Hypophosphite.

Dose.—1 to 4 fl. drm.

SODII IODIDUM.

SODIUM IODIDE.

NaI, eq. 148·78.

It may be prepared from Iodine and Sodium Hydroxide by a process similar to that employed in making Potassium Bromide; the salt being crystallised at a temperature of not less than 68° F. (20° C.).

Solubility.—11 in 6 of Water; 1 in 3 of Alcohol (90 p.c.); 1 in 1 of Glycerin.

Medicinal Properties.—Given in the same doses and for similar purposes as Potassium Iodide, and is more readily tolerated by the stomach.

It is more assimilable than Potassium Iodide.—*B.M.J.* '86, i. 748, 1092.

Dose.—5 to 20 grains.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ. and Swiss, Natrium Iodatum; Dutch and Norw., Iodetum Natricum; Fr., Ioduro de Sodium; Mex., Yoduro de Sodio; U.S., Sodii Iodidum; not in the others.

Description.—A dry white crystalline deliquescent powder, having a saline and somewhat bitter taste.

All commercial samples vary much in the proportion of Water which they contain.

Tests.—It affords the reactions characteristic of Sodium and of Iodides. Each gramme should not lose more than ·05 gramme of Water when dried at 248° F. (120° C.); and each gramme of this dried salt, when dissolved in Water, should require for complete precipita-

tion not less than 66·5 c.c. of the Volumetric Solution of Silver Nitrate. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Aluminium, Calcium, Magnesium, Potassium, Ammonium, Bromates, Cyanides, Carbonates, or Iodates, and only the slightest reactions with the tests for Bromides, Chlorides, or Sulphates.

SODII NITRIS.

SODIUM NITRITE.

$NaNO_2$, eq. 68·58.

A salt obtained by fusing Sodium Nitrate with metallic Lead.

It is frequently found in commerce fused into sticks, with a crystalline fracture.

It is prepared by fusing Sodium Nitrate with reducing substances such as metallic Lead, Barium Sulphide, &c., but if the reduction is carried too far, free alkali is formed and afterwards becomes carbonated.

Solubility.—5 in 6 of Water, 1 in 50 of Alcohol (90 p.c.).

Medicinal Properties.—Vaso-dilator and antispasmodic. Used with the object of warding off the attack in angina pectoris and asthma, as well as relieving the symptoms during an attack; also in migraine and hemicrania if accompanied by facial pallor. It is of great service in lowering arterial tension in renal cirrhosis.

Preferred to Amyl and Ethyl Nitrites, because easily given in Water.—*L.* '87, ii. 51; *P.J.* (3) xvii. 1. Closely approaches the action of Nitroglycerin, but without its objectionable features.—*Pr.* xxx. 179. On its therapeutics.—*Pr.* lii. 345. It is not so rapid in its action as Amyl Nitrite, but is more persistent and more gentle.

Dose.—1 to 2 grains.

Official Preparation.—Used in the preparation of Liquor Ethyl Nitritis.

Antidotes.—Emetics, fresh air, recumbent position, Ergot, and Atropine.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Description.—A white deliquescent crystalline powder, very soluble in Water.

Tests.—The solution is neutral or slightly alkaline, and affords reactions characteristic of Sodium salts and of Nitrites. ·1 gramme dissolved in Water, introduced into a brine-charged nitrometer, and tested with Potassium Iodide and Diluted Sulphuric Acid, should liberate at the ordinary temperature (60° F. or 15·5° C.) and pressure (30 inches or 760 millimetres of Mercury) not less than 32·5 c.c. of Nitric Oxide, corresponding to not less than 95 p.c. of Sodium Nitrite, the gas being almost completely absorbed by strong solution of Ferrous Sulphate. The aqueous solution of the salt should not give more than the slightest traces of a precipitate on the addition of Diluted Sulphuric Acid (absence of Lead).

98 p.c. is a common figure obtained from good commercial samples.

In the absence of a nitrometer it may be readily estimated with a standard solution of Potassium Permanganate; ·1 gramme of Pure Sodium Nitrite being equal to 29 cc. $\frac{N}{10}$ solution of Permanganate (containing 3·156 grammes in the litre), or to 9·1 cc. of the Official Liquor Potassii Permanganatis.

Not Official.

SODII OLEATIS SOLUTIO, *see* p. 650.

SODII ET POTASSII TARTRAS.

See SODA TARTARATA, p. 577.

SODII PHOSPHAS.

SODIUM PHOSPHATE.

Na_2HPO_4, $12H_2O$, eq. 355·64.

This salt, Di-sodium Hydrogen Phosphate, may be obtained by the interaction of Sodium Carbonate and the solution of Acid Calcium Phosphate produced on mixing bone-ash and Sulphuric Acid.

There are three Sodium Phosphates, the ortho-, meta-, and pyro-phosphate. The Official is the ortho-phosphate.

Solubility.—1 in 6 of Water; dissolves in its own water of crystallisation below 212° F.; insoluble in Alcohol (90 p.c.).

Medicinal Properties.—A mild saline purgative; from its pure saline taste it is called Tasteless Aperient Salt, and is often given to children. Diuretic, antacid, and antilithic in small doses. As it renders the urine alkaline, it is sometimes useful in gout.

By hypodermic injection in various nervous diseases.—*B.M.J.E.* '93, ii. 108.

Incompatible with alkaloids.—*T.G.* '94, 334.

Dose.—30 to 120 grains, for repeated administration; for a single administration, ¼ to ½ an oz.

Official Preparation.—Sodii Phosphas Effervescens. Used in the preparation of Ferri Phosphas.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ. and Swiss, Natrium Phosphoricum; Belg., Phosphas Sodæ; Dan., Dutch and Swed., Phosphas Natricus; Fr., Phosphate de Soude; Ital., Fosfato Bisodico; Mex., Fosfato de Sodio; Port., Phosphato de Soda; Span., Fosfato Sodico; U.S.; not in Norw.

Description.—In transparent colourless rhombic prisms, terminated by four converging planes, efflorescent, having an alkaline reaction and a saline taste.

Tests.—It affords the reactions characteristic of Sodium and of Phosphates. Heated to dull redness it loses 62·84 p.c. of its weight. It should yield no characteristic reaction with the tests for Potassium, Ammonium, or Carbonates, and only the slightest reactions with the tests for Sulphates or for Chlorides.

Preparation.

SODII PHOSPHAS EFFERVESCENS. EFFERVESCENT SODIUM PHOSPHATE.

Sodium Phosphate, in crystals, 50; Sodium Bicarbonate, in powder, 50; Tartaric Acid, in powder, 27; Citric Acid, in powder, 18. Dry

the Sodium Phosphate until it has lost 60 p.c. of its weight; powder the product and mix it with the other ingredients. Place the whole in a dish or pan of suitable form heated to between 200° and 220° F. (93·3° and 104·4° C.). When the mixture, by aid of careful manipulation, has assumed a granular character, separate it into granules of uniform and convenient size by means of suitable sieves. Dry the granules at a temperature not exceeding 130° F. (54·4° C.). The product should weigh about 100.

Dose.—60 to 120 grains, for repeated administration; for a single administration, ¼ to ½ an oz.

SODII SALICYLAS.

SODIUM SALICYLATE.

$(C_6H_4{\cdot}OH{\cdot}COONa)_2, H_2O$, eq. 335·66.

May be obtained by the interaction of Salicylic Acid and Sodium Carbonate or Sodium Hydroxide.

It has been pointed out by Helbing that crystallised Sodium Salicylate is anhydrous.

The remarks on the purity of Salicylic Acid, given p. 45, are even more applicable to Sodium Salicylate, as it is in this form that Salicylic Acid is generally used for internal administration. The Acid liberated from the Sodium salt and recrystallised, should have the melting point and answer all the tests given on that page.

Solubility.—1 in 1 of Water; 1 in 5 of Alcohol (90 p.c.); 1 in 30 of Absolute Alcohol.

Medicinal Properties.—Given as a specific in acute rheumatism; and as a powerful antipyretic in pneumonia, typhoid and all pyrexial affections. A soluble form of Salicylic Acid, and less irritating. Useful in influenza, chronic rheumatism, sciatica and in acute tonsillitis which is so often rheumatic in origin. The best antiseptic for fermentative dyspepsia. It increases the acidity of the urine, and is given in chronic cystitis. Brunton says that in obstinate constipation due to gout, its administration will tend to keep the bowels regular without any purgative whatever.

In some forms of diabetes. Combined with Potassium Bromide, in headache, *Pr.* lii. 101, *T.G.* '94, 335; in pleuritis, *T.G.* '94, 101; reason for advantage of natural over artificial Salicylate, *Pr.* lii. i. 447; of great value in psoriasis and in many forms of erythema, especially e. nodosum, *L.* '80, i. 627; '95, i. 1422; *B.M.J.* '86, i. 737; *T.G.* '85, 446. In exophthalmic goître.—*B.M.J.E.* '95, i. 91.

It is a very powerful stimulant of the liver, but a very slight stimulant of the intestinal glands.—Dr. Rutherford.

Dose.—10 to 30 grains.

Prescribing Notes.—Generally given in **solution**, may also be prescribed in **cachets** or **powders**. When dissolved with Water and mixed with Ammonia, the solution soon becomes yellow or brown on exposure to the air, which happens in mixtures containing the salt and Aromatic Spirit of Ammonia when the bottle is half full. It is sometimes prescribed with Citric Acid, which precipitates the Salicylic Acid. It is better to give it with Sodium or Potassium Citrate. When

prescribed with a salt of Quinine, Quinine Salicylate is formed, which is only slightly soluble, and is therefore thrown out.

Official Preparation.—Used in the preparation of Bismuthi Salicylas.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ. and Swiss, Natrium Salicylicum; Belg., Salicylas Sodæ; Dutch, Norw. and Swed., Salicylas Natricus; Fr., Salicylate de Soude; Ital., Salicilato di Sodio; Mex., Salicilato de Sodio; Span., Salicilato Sodico; U.S.; not in the others.

Description.—In small colourless scales, or in tabular crystals with a pearly lustre. The salt has a sweetish and somewhat unpleasant saline taste, and no odour.

Tests.—The solutions are neutral or faintly acid to Litmus. When heated to redness, the salt evolves inflammable vapours, and a white residue remains which effervesces with acids, and imparts an intense yellow colour to flame. Test-solution of Ferric Chloride colours a concentrated solution reddish-brown, and a dilute solution violet. A solution containing not less than 1 p.c. affords a yellowish-brown precipitate with Solution of Uranium Nitrate (distinction from Carbolates and Sulphocarbolates). 50 to 100 grammes kept in a closed vessel for several days should not evolve the faintest smell of Phenol. If the aqueous solution be acidulated* with Nitric Acid, and the precipitate be dissolved by a little Alcohol (90 p.c.), the mixture affords not more than the slightest reactions with the tests for Sulphates or for Chlorides. It dissolves without coloration or effervescence in cold Sulphuric Acid (absence of organic impurities and of Carbonates).

SODII SULPHAS.

SODIUM SULPHATE.

$Na_2SO_4.10H_2O$, eq. 319·90.

This salt may be obtained by the interaction of Sodium Chloride and other Sodium salts with Sulphuric Acid.

Solubility.—1 in 3 of Water, and measures $3\frac{1}{2}$; 10 in 3 of Water at 92° F.; 10 in $4\frac{1}{2}$ of Water at 212° F.; insoluble in Alcohol (90 p.c.).

Medicinal Properties.—Hydragogue purgative and cholagogue; useful in cases of gall-stones and of liver disease; in small repeated doses it is especially well adapted for cases of constipation associated with gout and hepatic dyspepsia.

A moderately powerful stimulant of the liver, and a powerful stimulant of the intestine.—Dr. Rutherford.

Dose.—30 to 120 grains, for repeated administration; for a single administration, $\frac{1}{4}$ to $\frac{1}{2}$ an ounce.

Official Preparation.—Sodii Sulphas Effervescens.

Not Official.—Pulvis Sodii Sulphatis et Zingiberis.

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* The word 'acidulated' should be 'supersaturated,' as sufficient Nitric Acid must be added to prevent the precipitation of Silver Salicylate over and above what is necessary to completely decompose the Sodium Salicylate.

Foreign Pharmacopœias.—Official in Austr. and Hung., Natrium Sulfuricum Crystallisatum, also Siccum; Belg., Sulphas Sodæ; Dan., Dutch, Norw., and Swed., Sulphas Natricus; Dan., also Siccatus; Dutch, also Exsiccatus; Fr., Sulfate de Soude Purifié; Ger. and Swiss, Natrium Sulphuricum, also Siccum; Ital., Solfato di Sodio; Jap., Natrium Sulfuricum; Mex., Sulfato de Sodio; Port., Sulfato de Soda; Russ., Natrium Sulfuricum, Depuratum, Crudum, and Siccum; Span., Sulfato Sodico; U.S.

Description.—In transparent, monoclinic prisms; has a bitter saline taste; effloresces on exposure to the air; is soluble in less than half its weight of Water at temperatures from 77° to 86° F. (25° to 30° C.). Heated to boiling this solution deposits crystals of the anhydrous salt. Insoluble in Alcohol (90 p.c.).

Tests.—Exposed to heat in a porcelain crucible it loses 55·9 p.c. of water. It affords the reactions characteristic of Sodium and of Sulphates. Each gramme dissolved in Water and acidulated with Hydrochloric Acid gives, by the addition of Solution of Barium Chloride, a white precipitate, which, when it has been washed and dried, should weigh ·725 gramme. It should yield no characteristic reaction with the tests for Lead, Iron, Aluminium, Calcium, Magnesium, Potassium, Ammonium, or Carbonates, and only the slightest reactions with the tests for Chlorides.

Preparation.

SODII SULPHAS EFFERVESCENS. Effervescent Sodium Sulphate.

Sodium Sulphate in crystals, 50; Sodium Bicarbonate in powder, 50; Tartaric Acid in powder, 27; Citric Acid in powder, 18. Dry the Sodium Sulphate until it has lost 56 p.c. of its weight; powder the product and mix it with the other ingredients. Place the whole in a dish or pan of suitable form heated to between 200° and 220° F. (93·3 and 104·4° C.). When the mixture, by aid of careful manipulation of the powder, begins to aggregate, stir it assiduously until it has assumed a granular character; then separate it into granules of uniform and convenient size by means of suitable sieves. Dry the granules at a temperature not exceeding 130° F. (54·4° C.). The product should weigh about 100. =(1 in 2).

Dose.—60 to 120 grains, for repeated administration; for a single administration, ½ to ½ an ounce.

Not Official.

PULVIS SODII SULPHATIS ET ZINGIBERIS.—Sodium Sulphate, in powder, 60 grains; Ginger in powder, 5 grains: mix.

To be taken in a small tumbler of warm Water, in the morning.

SODII SULPHIS.

SODIUM SULPHITE.

Na_2SO_3, $7H_2O$, eq. 250·38.

May be obtained by interaction of Sulphurous Acid and Sodium Carbonate.

Solubility.—3 in 4 of Water; insoluble in Alcohol (90 p.c.); 1 in 25 of Glycerin.

Medicinal Properties.—Antiseptic; given with success in fermentative vomiting and dilated stomach due to sarcina ventriculi. Externally as a lotion in parasitic cutaneous affections.

Dose.—5 to 20 grains.

Not Official.—Liquor Sodii Sulphitis Benzoicus.

Foreign Pharmacopœias.—Official in Mex., Sulfito de Sodio; Port., Sulfito de Soda; U.S.; not in the others.

Description.—In colourless transparent monoclinic prisms, efflorescent in dry air, inodorous, with a saline and sulphurous taste.

Tests.—It affords the reactions characteristic of Sodium and of Sulphites. The aqueous solution has a neutral or faintly alkaline reaction, and if treated with Hydrochloric Acid evolves Sulphurous Anhydride, but does not become cloudy (absence of Thiosulphate). Each gramme dissolved in 50 c.c. of Water should decolorise not less than 77·7 nor more than 81·7 c.c. of the Volumetric Solution of Iodine.

Not Official.

LIQUOR SODII SULPHITIS BENZOICUS.—Sodium Sulphite, 30; Benzoic Acid, 14; Water, 500.

An **Antiseptic solution,** recommended by Heckel.—*B.M.J.* '87, ii. 1355.

SODII SULPHOCARBOLAS.

SODIUM SULPHOCARBOLATE.

$C_6H_4OH{\cdot}SO_2ONa,\ 2H_2O$, eq. 230·44.

Sodium Sulphocarbolate, or Sodium Phenol-para-sulphonate, may be obtained by dissolving Phenol in excess of Sulphuric Acid, and converting the Phenolsulphonic Acid so obtained into a Sodium salt.

The Sulphocarbolates used in Medicine are defined as the salts of Para-phenol-sulphonic Acid. The action of Sulphuric Acid upon Carbolic Acid results in a mixture of Para- and Ortho-phenol-sulphonic Acids, the proportion of the latter being less the higher the temperature, and the longer continued the contact. To eliminate the Ortho salt further purification is necessary.

Solubility.—1 in 6 of Water; 1 in 150 of Alcohol (90 p.c.); 1 in $5\frac{1}{2}$ of Glycerin.

Medicinal Properties.—Antiseptic and antipyretic; given in cases of flatulence, fermentative dyspepsia, and other conditions in which Carbolic Acid is used.

Dose.—3 to 15 grains.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Description.—Colourless, transparent, rhombic prisms, inodorous or nearly so, with a saline and somewhat bitter taste. Its solutions are without action on Litmus.

Tests.—On ignition it gives off Phenol, and leaves a residue of Sodium Sulphate. It imparts an intense yellow colour to flame. The dilute aqueous solution is rendered violet by Test-solution of Ferric Chloride, does not give a yellowish-brown precipitate with Solution

of Uranium Nitrate (distinction from Salicylate), and should not at once be rendered turbid by Solution of Barium Chloride (absence of Sulphates).

Not Official.

SODII TAUROCHOLAS.

Prepared from Ox-bile or Pig's-bile.

Has been given in the treatment of gouty obesity and dyspepsia, in doses of 4 grains at each meal immediately after food. The **pills** should be coated with Keratin.—*L.* '85, i. 745, 917.

Dose.—2 to 6 grains, made into a **pill** with Alcohol (60 p.c.).

SOLUBILITY.

Figures for the solubility of the various substances have been given in the *Companion* since its first issue in 1864, and these have been revised and supplemented from time to time in subsequent editions, from experiments made for that purpose. In most instances the figures have been ascertained by adding the solid substance in fine powder to a liquid, and shaking it at intervals during three days at a temperature between 58° and 62° F. They represent the weight of a solid in grammes, and the measure of a fluid in cubic centimetres. Some liquids are stated to be miscible in all proportions; this has been ascertained by adding to 5 c.c. of one fluid small quantities of the other fluid, $\frac{1}{10}$ c.c. at first, and afterwards $\frac{1}{2}$ c.c. until 20 c.c. have been added, shaking the mixture between each addition.

Not Official.

SOMATOSE.

A light white or greyish powder stated to be prepared from fresh meat, soluble in Water, and consisting to a large extent of albumoses.

Denaeyer states that it is neither albumose nor a peptone but has the characters of an alkali-albumen. This statement is partially confirmed by Allen.

Recommended in anæmia, in intestinal disorders, and in dyspepsia.

Iron Somatose.—Is a light brown almost tasteless powder, soluble in aqueous liquids. It contains 2 p.c. of Iron, and has been recommended in the treatment of chlorosis. **Milk Somatose** has also been introduced.

Not Official.

SOZOIODOL.

IODOPARAPHENOLSULPHONIC ACID.

A white, shining, crystalline, odourless powder, containing Iodine 52 p.c., Carbolic Acid 20 p.c., and Sulphur 7 p.c., preferably used in the form of its salts. When required in solution, the Sodium salt is most applicable, dissolving 1 in 14 of Water or Glycerin. The Potassium salt, soluble 1 in 100 of Water, is preferable as a **dusting powder**, or in **ointments**. Solution of the Zinc salt, 1 to 3 p. c., is suitable for **injection**. The compound with Mercury is an orange-coloured powder.

Medicinal Properties.—It is introduced as a substitute for Iodoform.

It is recommended locally in nasal and pharyngeal disorders, and as an application of great energy in parasitic skin affections.—*B.M.J.* '89, ii. 42; *T.G.* '89, 132, '91, 592. In aural and nasal affections.—*L.* '94, i. 1636; *B.M.J.E.* '94, i. 99.

Sozoiodol cotton and **gauze** containing 5 and 10 p.c.

Not Official.

SPERMIN.

DR. BROWN-SEQUARD'S ORCHITIC FLUID.

Full details regarding its preparation and uses are published *B.M.J.* '93, i. 1145, 1212, with an editorial article p. 1279: *B.M.J.E.* '94, ii. 52, 56; *T.G.* '93, 110.

Some recent experiments, at the Hospital for the Paralysed and Epileptic, are given *L.* '94, i. 263.

In ataxia, epilepsy and mental disease.—*B.M.J.E.* '93, ii. 108.

SPIRITUS.

SPIRIT.

All substances which have undergone the vinous fermentation, and in which it is not completely over, contain Alcohol ready formed, which is separated by distillation. The various kinds are distinguished by varieties of flavour and colour.

When Alcohol is distilled with aromatic substances containing volatile oil, the oil is carried over by the alcoholic vapour, and condenses along with it.

The Spirits of the British Pharmacopœia are as follows: the formulas will be found under the names of the drugs from which they are prepared:—

Dose.			Proportion of ingredient.
60 to 90 minims	SPIRITUS ÆTHERIS		1 in 3.
for repeated administration, 20 to 40 minims.			
60 to 90 minims	SPIRITUS ÆTHERIS COMPOSITUS.		
for repeated administration, 20 to 40 minims.			
60 to 90 minims	SPIRITUS ÆTHERIS NITROSI.		
for repeated administration, 20 to 40 minims.			
60 to 90 minims	SPIRITUS AMMONIÆ AROMATICUS.		
for repeated administration, 20 to 40 minims.			
60 to 90 minims	SPIRITUS AMMONIÆ FETIDUS.		
for repeated administration, 20 to 40 minims.			
5 to 20 minims	SPIRITUS ANISI	(Oil)	1 in 10.
60 to 120 minims	SPIRITUS ARMORACIÆ COMPOSITUS .		1 in 8.
5 to 20 minims	SPIRITUS CAJUPUTI	(Oil)	1 in 10.
5 to 20 minims	SPIRITUS CAMPHORÆ.		1 in 10.
30 to 40 minims	SPIRITUS CHLOROFORMI		1 in 20.
for repeated administration, 5 to 20 minims.			
5 to 20 minims	SPIRITUS CINNAMOMI	(Oil)	1 in 10.
20 to 60 minims	SPIRITUS JUNIPERI	,,	1 in 20.
5 to 20 minims	SPIRITUS LAVANDULÆ	,,	1 in 10.
5 to 20 minims	SPIRITUS MENTHÆ PIPERITÆ .	,,	1 in 10.
5 to 20 minims	SPIRITUS MYRISTICÆ	,,	1 in 10.
	SPIRITUS RECTIFICATUS (90 p.c. of Alcohol by volume).		
	SPIRITUS ROSMARINI	(Oil)	1 in 10.
	SPIRITUS VINI GALLICI (43½ p.c. of Alcohol by volume).		

All the Spirits except Brandy and Spiritus Rectificatus are prepared with Alcohol (90 p.c.).

SPIRITUS ÆTHERIS NITROSI.

SPIRIT OF NITROUS ETHER.

B.P.Syn.—Sweet Spirit of Nitre.

An Alcoholic Solution containing Ethyl Nitrite, Aldehyde, and other substances.

Medicinal Properties.—Stimulant, diaphoretic, diuretic, and antipyretic. Useful in dropsy of renal origin, but is contra-indicated in acute nephritis. Being a nitrite it is sometimes useful in asthma, angina pectoris and dysmenorrhœa. *See also* prescribing notes under Liquor Ammonii Acetatis.

Dose.—20 to 40 minims, for repeated administration; for a single administration, 60 to 90 minims.

Incompatibles.—Potassium Iodide, Ferrous Sulphate, Tincture of Guaiacum, Gallic and Tannic Acids, Antipyrine and Salicylates.

When prescribed with Potassium Iodide separation of Iodine may be prevented by neutralising the free acid in Spiritus Ætheris Nitrosi with Potassium Hydroxide or the Carbonate. The incompatibility of Antipyrine and Spiritus Ætheris Nitrosi may be overcome by prescribing them in alkaline solution.

Foreign Pharmacopœias.—Belg., Æther Nitricus Alcoholicus, sp. gr. ·850—·860; Norw., Æther Nitrosus Spirituosus, ·840—·850; Swed., Æther Nitrosus Spirituosus, sp. gr. ·840; Dutch, Nitris Æthylicus cum Spiritu, sp. gr. ·840—·850; Fr., Acide Azotique Alcoolisé; Spiritus Ætheris Nitrosi, Ger., Jap. and Russ., sp. gr. ·840—·850, Swiss, sp. gr. ·845—·855, U.S. sp. gr. ·836—·842; Ital., Etere Nitroso Officinale, sp. gr. ·850; Port., Acido Azotico Alcoolisado; Mex. and Span., Eter Nitroso Alcoholizado; not in the others.

O.M.P.—Nitric Acid, 3; Sulphuric Acid, 2; Copper, 2; Alcohol (90 p.c.) a sufficient quantity. To 20 of the Alcohol add gradually the Sulphuric Acid, stirring them together; then stir in 2½ of the Nitric Acid; the mixture being made in a retort or flask, in which the Copper has been placed, and to which a thermometer is fitted; attach to the retort or flask an efficient condenser and receiver, the latter containing 20 of the Alcohol, and, applying heat gently, distil at a temperature commencing at 170° F. (76·7° C.) and rising to 175° F. (79·4° C.), but not exceeding 180° F. (82·2° C.), until the volume of liquid in the receiver has been increased to 32, the receiver and the condenser being kept cool with ice-cold water. Then withdraw the source of heat, and having allowed the contents of the retort to cool, introduce the remaining ½ of Nitric Acid, and resume the distillation as before, until the liquid in the receiver has been increased to 34. Mix this liquid with 20 of the Alcohol, or with as much as will make the product contain 2½ p.c. of Ethyl Nitrite when tested as described in the following paragraph. Preserve the Spirit of Nitrous Ether in well-closed vessels; preferably in a cool dark place, and in small bottles.

Description.—A limpid liquid, having a very faint yellowish tinge, inflammable, of a peculiar penetrating apple-like odour, and a characteristic taste.

Tests.—Sp. gr. ·838 to ·842. When Spirit of Nitrous Ether is

carefully poured on an acidulated strong solution of Ferrous Sulphate contained in a test-tube, a deep olive-brown coloration is produced at the surface of contact of the two liquids, widening as the tube is gently shaken. 10 c.c., mixed with 5 c.c. of the Volumetric Solution of Sodium Hydroxide and 5 c.c. of Water, should assume a yellow colour, which should not become brown on standing 12 hours (limit of Aldehyde). It should not effervesce, or only very feebly, when shaken with Sodium Bicarbonate (limit of Acid). 1 volume agitated briskly at intervals during 5 minutes in a brine-charged nitrometer, with 1 volume of Solution of Potassium Iodide and 1 volume of Diluted Sulphuric Acid, should yield, at the normal temperature (60° F. or 15·5° C.) and pressure (30 inches or 760 millimetres of Mercury), and when freshly prepared, at least 6¼, but not more than 7, volumes of Nitric Oxide Gas, corresponding to at least 2½ parts by weight of Ethyl Nitrite in 100 parts by weight of the Spirit; and even after it has been kept for some time, and the vessel containing it has occasionally been opened, it should yield not much less than 5 times its volume of the Gas, corresponding to nearly 2 p.c. by weight of Ethyl Nitrite, or a minimum of 1¾ p.c.

Allen's method consists in treating the sample with an acidulated solution of Potassium Iodide, and measuring the Nitric Oxide liberated. Fill a nitrometer with strong brine, and then introduce 5 c.c. of the Spirit of Nitrous Ether; then allow 5 c.c. of a strong solution of Potassium Iodide to enter, followed by 5 c.c. of Diluted Sulphuric Acid. Agitate briskly at intervals, after five minutes adjust the liquid in the two limbs of the nitrometer to the same level, and read off the volume of gas obtained. The B.P. requires 35 c.c. or not much less than 31·25 c.c. from 5 c.c. of Spirit of Nitrous Ether.

To calculate the percentage of real Ethyl Nitrite, the following data are required:—

1. The sp. gr. of the sample examined.
2. 23·55 c.c. of Nitric Oxide, measured at *ordinary* pressure and temperature, weigh ·03 grm.
3. 30 parts by weight of Nitric Oxide are equivalent to 75 parts by weight of Ethyl Nitrite.

The measure of gas evolved on the addition of Potassium Iodide is a measure of the acidity of the Spiritus Ætheris Nitrosi under examination. It should not amount to much more than a third of the total gas volume registered.

The following process has been suggested for the assay of this preparation. Into 100 c.c. flask provided with a loosely-fitting stopper, place successively 10 c.c. of Distilled Water, 5 c.c. of a cold aqueous saturated solution of Potassium Chlorate, 5 c.c. of the sample to be tested and 5 c.c. of 10 p.c. Nitric Acid solution. Insert the stopper and shake frequently for 30 minutes, then add 10 c.c. $\frac{N}{10}$ Solution of Silver Nitrate and shake briskly for a minute, add 10 drops of Ferric Ammonium Sulphate Solution and titrate the excess of Silver Nitrate with $\frac{N}{10}$ Solution of Potassium Sulphocyanate. Each c.c. of $\frac{N}{10}$ Silver Nitrate Solution consumed in precipitating the Chloride formed, corresponds to ·0225 gramme of Ethyl Nitrite:—*A.J.P.* '98, 273.

The above process is stated to give higher and more correct results than Allen's Nitrometer process, but it has been pointed out in an editorial (*C.D.* '98, ii. 59), that the Nitrometer process was never put forward as an absolutely true one, but as one by which solutions of Ethyl and other Nitrites might be estimated with approximate accuracy and that it has fulfil its expectation admirably.

Dymond (*P.J.* (3) xix. 467) states, that Ethyl Nitrite in Rectified Spirit decomposes from there being so much Water in it, and that this is likely to account for loss of strength on keeping. Our experience scarcely agrees with this. When evaporation is prevented, we do not find the loss to exceed 6 p.c. (32 c.c. of gas from 5 c.c. reduced to 30 c.c.) in a month, and believe evaporation to be the chief cause of deterioration.

Under the name of **'Itrosyl'** a concentrated form of Nitrous Ether has been introduced, 1 fl. oz. of which mixed with 19 fl. oz. of Alcohol (90 p.c.) is stated to be equivalent to Spiritus Ætheris Nitrosi.

LIQUOR ETHYL NITRITIS.—Solution of Ethyl Nitrite. (New.)

A mixture of 95 parts by volume of Absolute Alcohol with 5 parts by volume of Glycerin, containing when freshly made 3 p.c. by weight, and even when long kept not less than 2½ p.c. by weight of Ethyl Nitrite. The Ethyl Nitrite is obtained by the interaction of Alcohol (90 p.c.), Sodium Nitrite, and diluted Sulphuric Acid, at a low temperature.

The reasons for its introduction will be found, *P.J.* (3) xviii. 861.

Medicinal Properties.—Similar to those of the other more slowly acting Nitrites.

Dose.—20 to 60 minims.

Experiments testing the physiological activity of the B.P. preparation compared with a 2·5 p.c. solution of the pure Ethyl Nitrite showed that both were practically identical.—*P.J.* (3) xix. 490.

Description.—A limpid liquid, practically colourless, of characteristic apple-like odour and taste. It is highly inflammable.

Tests.—Sp. gr. ·823 to ·826. When Solution of Ethyl Nitrite is poured on an acidulated strong solution of Ferrous Sulphate contained in a test-tube, a deep olive-brown coloration is produced at the surface of contact of the two liquids, widening as the tube is gently shaken. The Solution should not effervesce when shaken carefully with Sodium Bicarbonate (absence of Acid). 10 c.c., mixed with 5 c.c. of the Volumetric Solution of Sodium Hydroxide and 5 c.c. of Water, should not assume a yellow colour (absence of Aldehyde). 1 volume, agitated briskly at intervals during five minutes in a brine-charged nitrometer with 1 volume of Solution of Potassium Iodide and 1 volume of Diluted Sulphuric Acid, should yield, at the ordinary temperature (60° F. or 15·5° C.) and pressure (30 inches or 760 millimetres of Mercury), and when freshly prepared, at least 7·6 volumes of Nitric Oxide gas; and even after the Solution has been kept for some time, and the vessel containing it has occasionally been opened, it should possess at least five-sixths of the strength just indicated.

Solution of Ethyl Nitrite should be stored in small bottles.

Not Official.

SPIRITUS FRUMENTI.

WHISKY.

An alcoholic liquid obtained from fermented grain by distillation, and containing from 50 to 58 p.c. by volume of Alcohol.

Allen states: 'In the majority of cases a judicious admixture of raw and malted grain is employed. Other things being equal, the Spirit from malted grain is the most valuable, and contains least Fusel Oil. Whisky improves greatly on keeping, owing to the conversion of the Fusel Oil into other bodies.'

'As the Amyl Alcohol in Spirits rarely exceeds ·1 p.c., or 70 grains per proof gallon, it seems highly improbable that it can produce the local effects sometimes attributed to it. Its effect on the general system has probably been greatly exaggerated.'

'Whisky usually contains a trace of volatile acid, the proportion of which rarely or never reaches ·1 p.c. (in terms of Acetic Acid). When new it is colourless, or nearly so; but by storing in sherry casks (a favourite mode of imparting flavour to Whisky) it acquires colour, and then contains sensible traces of Tannin, Sugar, &c. The residue left on evaporating Whisky to dryness on the water-bath should not exceed 100 grains per gallon, and is usually much less. The smoky flavour of Irish Whisky is due to the fact that the malt used has been dried upon kilns in which peat is used for fuel, but is often imitated by adding one or two drops of Creosote to the gallon of Spirit. Logwood, Catechu, tea infusion, burnt sugar, &c., are sometimes added as colouring agents. Wood Naphtha has been occasionally used as an adulterant of Whisky. It is very doubtful whether Fusel Oil is ever purposely added to Whisky, but it is almost invariably present in greater or less quantity, and is the cause of the objectionable symptoms produced by new spirit.'

An examination of spirituous liquids for secondary constituents.—*Analyst* '91, 102.

The following characters and tests are given in U.S.P.

Sp. gr. not above ·930 nor below ·917. It should be not less than 2 years old. It has an amber colour, a distinctive odour and taste. If 100 c.c. be very slowly evaporated in a weighed capsule on a water-bath, the last portions volatilised should not have a harsh or disagreeable odour (absence of more than traces of Fusel Oil from grain or potato spirit). The residue fully dried at 212° F. (100° C.) should weigh not more than ·250 gramme, equivalent to ·25 p.c. (absence of undue amount of solids). This residue should have no sweet or distinctly spicy taste (absence of added Sugar, Glycerin, or Spices). It should nearly all dissolve in 10 c.c. of cold Water, forming a solution which is coloured light green by a dilute Solution of Ferric Chloride (traces of oak tannin from casks). 100 c.c. of Whisky should be rendered distinctly alkaline to Litmus by 1·2 c.c. of the volumetric Solution of Potash (absence of an undue amount of free acid).

Not Official.

SPIRITUS METHYLATUS.

METHYLATED SPIRIT.

The duty-free Spirit supplied to 'manufacturers' under a special bond, is a mixture of 9 parts of Alcohol with 1 part of a Wood Naphtha, approved by the Excise. It can also be supplied under a special bond for scientific purposes.

As supplied to 'licensed retailers' Methylated Spirit is, three pints of Petroleum Oil added to 100 gallons of the mixture described above. The Petroleum Oil is added, partly to make it more nauseous for drinking, and partly to facilitate its recognition. It becomes turbid when mixed with Water, which quality renders it unsuitable for many purposes to which duty-free Spirit has been applied.

Licensed retailers of Methylated Spirit must not sell more than 1 gallon at any one time, and may not keep stock exceeding 50 gallons. They may not sell Methylated Spirit between the hours of 10 p.m. on Saturdays and 8 a.m. on Mondays.

SPIRITUS RECTIFICATU

ALCOHOL (90 p.c.).

B.P.Syn.—Rectified Spirit.

A liquid containing 90 parts by volume of Ethyl Hydroxide, C_2H_5OH, and 10 parts by volume of water; obtained by the distillation of fermented Saccharine liquids.

Alcohol (90 p.c.) is only slightly stronger than the Rectified Spirit of the British Pharmacopœia, '85, containing by volume 1·35 p.c., or by weight 1·65 p.c., more Ethyl Hydroxide.

On mixing Alcohol (90 p.c.) and water, contraction of volume and rise of temperature occur. When such a mixture is prescribed in the British Pharmacopœia, the cooled liquid should be employed.

It is possible to rectify Alcohol up to 98 p.c. (minimum strength for B.P. Absolute Alcohol), and 95 p.c. is prepared commercially in large quantities.

It may here be noted that although it is illegal for Chemists and Druggists to sell Rectified Alcohol except upon prescription, the Board of Inland Revenue do not appear to interfere with its sale by them in small quantities not exceeding 8 ounces at a time, for the purposes of medical or scientific research.

Alcohol (90 p.c.) dissolves Camphor, Balsams, Castor Oil, Iodine, Potassium and Sodium Hydroxides, but not the Carbonates.

Medicinal Properties.—Internally a powerful diffusible stimulant, especially cardiac; mildly antipyretic, diuretic, and diaphoretic. Used in some states of acute disease characterised by excessive debility, as in typhoid, acute pneumonia and influenza; in chronic wasting diseases as phthisis; in insomnia of old people; as an aid to digestion, more especially in the aged and feeble and in those exhausted by overwork; in sudden fainting and during convalescence from acute disease. Externally to prevent bed-sores and cracked nipples by hardening and disinfecting the skin; it is antiseptic and astringent and is applied diluted to stop sweating and to produce cold by evaporation; 1 of Alcohol (90 p.c.) and 2 of Camphor Water mixed is a good evaporating **lotion.** Diluted, it forms a lotion for erysipelas, erythema, burns and scalds while the cuticle is entire, and for sprains and recent bruises. As an ingredient of liniments it is rubefacient, it relieves rheumatic and other kinds of pain, and aids the resorption of inflammatory products.

Pure diluted spirit does not affect the biliary secretion.—Dr. Rutherford.

Foreign Pharmacopœias.—Official in all; *see* table p. 601.

Description.—A colourless, transparent, very mobile and inflammable liquid, with a characteristic pleasant odour and a strong spirituous burning taste.

Tests.—Sp. gr. ·8340. It contains 85·65 p.c. by weight of Ethyl Hydroxide, C_2H_5OH, and 14·35 p.c. by weight of Water. It burns with a blue smokeless flame. It leaves no residue when evaporated (absence of fixed matter). It remains clear when mixed with Water (absence of oily or resinous substances). A little exposed on clean white filter paper leaves no unpleasant smell after the Alcohol has evaporated (absence of fusel oil and allied impurities). 100 c.c. with 2 c.c. of the Volumetric Solution of Silver Nitrate, exposed for

24 hours to bright light and then decanted from the black powder which has formed, undergo no further change when again exposed to light with more of the Volumetric Solution (absence of more than traces of Amylic Alcohol and of other organic impurities). When mixed with half its volume of Solution of Potassium Hydroxide, the liquid should not immediately darken in colour (absence of more than traces of Aldehyde). The addition of Solution of Ammonia should not cause an immediate darkening in colour (absence of Tannic Acid, excess of Aldehyde, and other organic impurities).

Alcohol (90 p.c.) is occasionally met with, which gives a yellow colour on the addition of Liquor Ammoniæ.

DILUTED ALCOHOL.

The four official liquids obtained by diluting 'Alcohol (90 p.c.)' with Distilled Water, contain respectively, 70, 60, 45, and 20 p.c. of Ethyl Hydroxide by volume. They may be prepared as described in the following paragraphs.

1. Alcohol (70 p.c.).—With 100 fl. oz. of Alcohol (90 p.c.) mix 31 (more accurately 31·05) fl. oz. of Distilled Water. Or, with 1000 c.c. of Alcohol (90 p.c.) mix 310·5 c.c. of Distilled Water. Sp. gr. ·8900.

2. Alcohol (60 p.c.).—With 100 fl. oz. of Alcohol (90 p.c.) mix 53⅔ (more accurately 53·65) fl. oz. of Distilled Water. Or, with 1000 c.c. of Alcohol (90 p.c.) mix 536·5 c.c. of Distilled Water. Sp. gr. ·9135.

3. Alcohol (45 p.c.).—With 100 fl. oz. of Alcohol (90 p.c. mix 105⅓ (more accurately 105·34) fl. oz. of Distilled Water. Or, with 1000 c.c. of Alcohol (90 p.c.) mix 1053½ (more accurately 1053·4) c.c. of Distilled Water. Sp. gr. ·9436.

4. Alcohol (20 p.c.).—With 100 fl. oz. of Alcohol (90 p.c.) mix 355¾ (more accurately 355·8) fl. oz. of Distilled Water. Or, with 1000 c.c. of Alcohol (90 p.c.) mix 3558 c.c. of Distilled Water. Sp. gr. ·9760.

A table by Bird for the dilution of Alcohol (90 p.c.), when making the lower percentages.—*P.J.* '98, i. 501.

When the sp. gr. of Alcohol is ·920 it is called **Proof Spirit**; if lighter than this, it is called 'above proof'; if heavier than this, 'under proof'; and the percentage of Water, or of Rectified Spirit, sp. gr. ·825 (the Inland Revenue standard), by measure, necessary to be added to any sample of spirit to bring it to the standard of Proof Spirit, indicates the number of degrees the given sample is above or below proof. Thus, if 100 volumes of a Spirit require 10 volumes of Water to reduce it to proof, it is said to be '10 over proof'; on the other hand, if 100 volumes of Spirit require 10 volumes of Spirit to raise it to proof, the sample is said to be '10 under proof.'

The Spirits of the Pharmacopœias are as follows:—

	Sp. gr.	Percentage of Absolute Alcohol by Volume.
British	·834	Alcohol 90 p.c. (Spiritus Rectificatus) 90
,,	·890	,, 70 p.c. 70
,,	·9135	,, 60 p.c. 60
,,	·9436	,, 45 p.c. 45
,,	·976	,, 20 p.c. 20
Austrian	·830—·834	Sp. Vini Concentratus . . . 90 to 91
,,	·894—·896	,, Dilutus . . . . . 68 to 70

	Sp. gr.	Percentage of Absolute Alcohol by Volume.
Austrian	.920—·925	,, Cognac (by weight) 45 to 50
Belgian	·794	Alcohol Anhydrus 100
,,	·8276	,, at 92° 92
Danish	·830—·834	Spiritus Concentratus 90 to 91
,,	·893—·895	,, Dilutus 68 to 69
,,	·940—·942	,, Tenuis 46 to 47
Dutch	·831—·837	,, Fortior 89 to 91
,,	·887—·892	,, Dilutus 69 to 74
French	·816	Alcohol at 95° 95
German	·830—·834	Spiritus 90 to 91
,,	·892—·896	,, Dilutus 68 to 69
,,	·920—·924	,, e Vino (by weight) 46 to 50
Hungarian	·831—·834	Spiritus 90 to 91
,,	·892	,, Dilutus 70
,,	·919—·924	Cognac (by weight) 46 to 50
Italian	·8344	Alcool 90
,,	·79367	,, Absoluto 96
,,	·9139	,, Diluito 60
Japanese	·830—·834	Spiritus 86
,,	·892—·896	,, Dilutus 60
Mexican	·79	Alcohol Vinico 100
,,		Alcohol at 50° 50
,,		,, 60° 60
,,		,, 80° 80
,,		,, 90° 90
Norwegian	·8306—·8339	Spiritus Concentratus 90 to 91
,,	·9021—·9044	,, Dilutus 64 to 65
Portuguese	·834	Alcool at 90° 90
,,	·850	,, 85° 85
,,	·905	,, 65° 65
Russian	·813—·816	Sp. Vini Alkoholisatus 95
,,	·831—·834	,, Rectificatissimus 90
,,	·888—·890	,, Rectificatus 70
,,	·952—·955	,, Dilutus 38
Spanish		Alcohol Anhidro 100
,,		,, de 90° 90
,,		,, de 60° 60
Swedish	·830—·834	Spiritus Concentratus 90 to 91
,,	·901—·905	,, Dilutus 64 to 65
,,	·935	,, Tenuis 50
Swiss	·812—·816	Spiritus 95 to 96
,,	·890—·892	,, Dilutus 69 to 70
,,		,, e Saccharo (Rum) 50 to 60
,,		,, e Vino (Cognac) 50 to 60
U.S.	·820	Alcohol 94
,,	·797	,, Absolutum (by weight) 99
,,	·816	,, Deodoratum 95
,,	·936	,, Dilutum 48·6
,,	·925—·941	Sp. Vini Gallici 46 to 55
,,	·917—·930	,, Frumenti 50 to 58

Table of the Amount of absolute Alcohol by weight, or Proof-spirit (Brandy) by volume, in the following Wines, &c., from Dr. Christison's Experiments in 1838.

	Alc. by weight in 100 parts.	Proof-sp. by vol.
Port, weakest . . .	14·97	30·56
,, mean of 7 wines	16·20	33·91
,, strongest . . .	17·10	37·27
White Port	14·97	31·31
Sherry, strongest . .	16·17	35·12
,, mean of 9 wines long in cask in E. Indies.	14·72	32·30
,, Madre da Xeres	16·90	37·06
Madeira, long in cask in the East Indies . .	14·09	30·80
,, strongest . .	16·90	37·00
Teneriffe, long in cask at Calcutta .	13·84	30·21
Rudesheimer, first quality	8·40	18·44
,, inferior	6·90	15·19
Hambacher, 1st qual.	7·35	16·15
Sercial	15·45	33·65
Dry Lisbon	16·14	34·71
Shiraz	12·95	28·30
Amontillado	12·63	27·60
Sherry, weakest . .	13·98	30·84
,, mean of 13 wines not long in cask.	15·37	33·59
Claret, 1st growth, 1811	7·72	16·95
Château-Latour, Do. 1825	7·78	17·06
Rausan, 2nd growth, 1825	7·61	16·74
Vin Ordinaire, Bordeaux	8·99	18·96
Rives Altes	9·31	22·35
Malmsey	12·86	28·37
Edinb. ale, unbottled .	5·70	12·60
,, 2 yrs. bot.	6·06	13·40
London porter, four months in bottle. .	5·36	11·91

The Alcohol of most true wines is derived solely from the fermentation of the sugar, or alteration of the acids contained in the grape-juice from which they are produced. In others the proportion is increased by adding starch-sugar before or during fermentation. In others, again, it is added directly in the form of Brandy, partly to please the palate of consumers, partly because it is thought necessary to make the wine keep well. The strong wines commonly used in Britain, such as Port, Sherry, and the like, are almost all strengthened in this manner, and frequently also the inferior sorts of Bordeaux wine.

SPIRITUS VINI GALLICI.

BRANDY.

A spirituous liquid distilled from wine and matured by age, and containing not less than 36½ p.c. by weight or 43½ p.c. by volume of Ethyl Hydroxide.

Preparation.

MISTURA SPIRITUS VINI GALLICI. Mixture of Brandy.

Brandy, 4 fl. oz.; Cinnamon Water, 4 fl. oz.; Refined Sugar, ½ oz.; Two yolks of Eggs. Rub the yolks of Eggs and Refined Sugar together; add the Cinnamon Water and Brandy; mix.

Dose.—*As a draught*, 1 to 2 fl. oz.

Not Official.

STANNI OLEAS.

A greyish coarsely granular powder, insoluble in Alcohol, very slightly soluble in Almond Oil, completely disintegrated and partially dissolved by Ether or Oleic Acid.

Preparation.

UNGUENTUM STANNI OLEATIS.—Stannous Oleate, 60 grains; Lard, 1 oz.

Of great utility in diseases of the nails; it overcomes the brittle, split, and soft conditions of the nails, and gives them a brilliant lustre.—*B.M.J.* '84, ii. 753; *T.G.* '86, 494.

STAPHISAGRIÆ SEMINA.

STAVESACRE SEEDS.

The dried ripe seeds of *Delphinium Staphisagria.*

Medicinal Properties.—The seeds have been used in ointments for many years as a parasiticide for pediculi; the activity rests in an Oil which they contain in rather large quantity. Mr. Balmanno Squire experimented with this Oil, and also with the Seeds from which the Oil had been withdrawn by Ether, and found the latter inert. He successfully used an ointment made with the Oil in prurigo senilis.

Official Preparation.—Unguentum Staphisagriæ.

Not Official.—Delphinina, Oleum Staphisagriæ, and Unguentum Olei Staphisagriæ.

Foreign Pharmacopœias.—Official in Belg., Semen Staphysagriæ; Fr., Staphisaigre; Ital., Stafisagria; Port., Paparraz; Mex., Estaphisagra; Span., Estafisagria; U.S., Staphisagria; not in the others.

Description.—Irregularly triangular or obscurely quadrangular, arched, blackish-brown when fresh, but becoming dull greyish-brown by keeping. Testa wrinkled and deeply pitted; interior soft, whitish, oily. No marked odour; taste nauseous, bitter and acrid.

Four samples of seeds yielded (by extraction with Ether) 31·4, 32·8, 33·9, and 34·8 p.c. of Oil.

Preparation.

UNGUENTUM STAPHISAGRIÆ. Stavesacre Ointment. (Altered.)

Stavesacre Seeds, 2; Yellow Beeswax, 1; Benzoated Lard, 8½. Crush the Stavesacre Seeds; digest the crushed seeds with the Benzoated Lard on a water-bath for two hours; strain and press through calico; add the Beeswax to the liquid; heat gently to dissolve; stir until cold.

Now about ½ the strength of B.P. '85, and Yellow Beeswax is added.

Foreign Pharmacopœias.—Official in Ital., 1 and 3; not in the others.

Not Official.

DELPHININA.—An amorphous yellowish alkaloid of resinous appearance, obtained from Stavesacre. Insoluble in Water, but dissolves in Acidulated Water, in Alcohol, Ether, and Chloroform.

Dose.—$\frac{1}{60}$ grain, and repeat every two hours in neuralgia.—*L.M.R.* '87, 446. *L.* '87, ii. 879.

OLEUM STAPHISAGRIÆ.—The Oil obtained by expression from the Seeds.

It is insoluble in Alcohol (90 p.c.), but dissolves readily in hot Absolute Alcohol.

UNGUENTUM OLEI STAPHISAGRIÆ (*B.S.H.*).—Expressed Oil, 60 minims; Lard, 1 oz. Used as a non-irritant remedy in scabies and in phtheiriasis.

Not Official.

STEARIN.

COCOA-NUT STEARIN.

This substance, which melts at about 84° F., is much more suitable for the manufacture of **suppositories** (especially in the cooler months of the year) than Oil of Theobroma; the melting point of the latter is so near the temperature of the body, that the suppositories made with it frequently take a very long time to melt. Mixtures of Stearin and Theobroma Oil give intermediate figures.

STRAMONII FOLIA.

STRAMONIUM LEAVES.

The dried leaves of *Datura Stramonium*.

Medicinal Properties.—It is much used for asthma, in the form of **cigarettes** and **smoking mixtures.**

Official Preparation.—Tinctura Stramonii.

Not Official.—Pulvis Stramonii Compositus.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Mex., Norw., Russ., Span., Swed., Swiss and U.S.; not in Hung., Jap. or Port.

Description.—Ovate petiolate leaves, usually varying from four to six inches (ten to fifteen centimetres) in length. They are unequal at the base, the margin is sinuate-dentate and the apex acuminate. The upper surface is dark greyish-green and minutely wrinkled; the under surface is paler. The mesophyll contains cluster-crystals of Calcium Oxalate. The leaves have a characteristic odour, and an unpleasant, bitter taste.

Preparation.

TINCTURA STRAMONII. TINCTURE OF STRAMONIUM. (ALTERED.)

Stramonium Leaves, in No. 20 powder, 4; Alcohol (45 p.c.) a sufficient quantity. Moisten the powder with 4 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 5).

The B.P. '85 tincture was made with Proof Spirit from the **seeds.**

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Belg. and Fr., **dried leaves** 1 and 5, also Alcoolature with **fresh leaves** and Spirit equal parts; Mex., **dried leaves** 1 in 5; Port., **dried leaves** 1 and 5, **fresh leaves** 1 and 1, **seeds** 1 and 5; Swed., **seeds** 1 and 10; U.S., **seeds** 15 in 100; not in the others; all by weight except U.S.

Not Official.

PULVIS STRAMONII COMPOSITUS.—Stramonium leaves, Datura Tatula, Cannabis Indica, and Lobelia inflata, all in powder, of each 6 drm.; Nitre in powder, 1 oz; Eucalyptus Oil, 30 minims.; mix thoroughly.

It burns well, gives off dense fumes, and affords great relief during asthmatic attacks.—*B.M.J.* '84, ii. 465; '87, ii. 494.

STRAMONII SEMINA.

STRAMONIUM SEEDS.

The dried ripe seeds of *Datura Stramonium*.

The mixed alkaloids of Stramonium are generally called **Daturine**, but are the same as contained in Belladonna, viz., a mixture of Hyoscyamine and Atropine.

Medicinal Properties.—Similar to those of Belladonna. Antispasmodic and sedative in spasmodic and bronchitic asthma. The Extract and the Tincture are used in convulsive cough as antispasmodics. The Extract has been given with success for hay asthma. Like Belladonna, it causes dilatation of the pupil.

Official Preparation.—Extractum Stramonii.

Not Official.—Guttæ Daturinæ.

Antidotes.—Same as for poisoning with Belladonna, page 135; also Morphine subcutaneously, and Chloroform Inhalation.

Foreign Pharmacopœias.—Official in Belg., Fr., Port. (Estramonio), Swed., Swiss and U.S.; not in the others.

Description.—Dark brown or nearly black seeds, about one-sixth of an inch (four millimetres) long, reniform in outline, flattened. The surface is marked with reticulate depressions and is also minutely pitted. The embryo is curved and embedded in a white oily albumen. The Seeds have no marked odour, but a slightly bitter taste.

Total alkaloids found in Stramonium Seeds, ·17—·5 p.c. (average of fifteen samples ·35 p.c.); in Leaves ·32—·47 p.c. (average of eleven samples ·38 p.c.). —*C.D.* '92, ii. 401.

Preparation.

EXTRACTUM STRAMONII. Extract of Stramonium. (Altered.)

Pack Stramonium Seeds, in No. 40 powder, in a percolator; exhaust the powder by slow percolation with Alcohol (70 p.c.); remove most of the Alcohol from the percolate by distillation; evaporate the residual liquid to the consistence of a firm extract.

Now made with Alcohol (70 p.c.) in place of Proof Spirit and the removal of Fixed Oil by Ether omitted.

Dose.—¼ to 1 grain.

Foreign Pharmacopœias.—Official in Belg. and Mex., from **fresh leaves**; Fr., clarified juice of **fresh leaves** evaporated, also alcoholic from **seeds**; Port., aqueous from **dried plant**, and clarified juice from **fresh leaves**; Span., expressed juice of **leaves** clarified and evaporated, also aqueous from **dried leaves** and alcoholic from **dried leaves**; Swiss, with diluted alcohol, 1 = 2 of **Seeds**, also **Fluid Extract** 1 in 1; U.S., alcoholic from **seeds**, also **Fluid Extract** from **seeds**.

Not Official.

GUTTÆ DATURINÆ (*L.O.H.*).—Daturine Sulphate, 2 grains; Water, 1 fl. oz.

Not Official

STRONTII BROMIDUM.

In colourless crystals.

Solubility.—2 in 1 of Water; 1 in 3 of Alcohol (90 p.c.).

Medicinal Properties.—Recommended in chronic gastritis and dilated stomach, in doses of 30 grains thrice daily ; also the same doses in epilepsy, and does not possess the depressing effect of Potassium Bromide.—*B.M.J.* '92, ii. 1286 ; '95, i. 1089, 1252 ; *B.M.J.E.* '95, i. 76 ; *L.* '92, i. 47 ; '93, ii. 46 ; '95, i. 567 ; '96, ii. 871 ; '98, ii. 988; *T.G.* '91, 830 ; '92, 120. In acute gastric catarrh, *Pr.* liii. 130 ; in the treatment of vomiting, *T.G.* '93, 115 ; in enteritis, *M.A.* '95, 239 : in exophthalmic goitre in children.—*B.M.J.* '98, ii. 1042.

It has an unpleasant metallic taste.

Dose.—5 to 30 grains.

3 drm. daily has been given for weeks without any unpleasant symptoms.—*L.* '98, ii. 988.

STRONTIUM LACTATE.—A white granular powder, soluble 1 in 3 of Water, has been recommended for albuminuria in parenchymatous nephritis.—*L.* '92, i. 47; '95, i. 567 ; '96, i. 255 ; *T.G.* '94, 461 ; *B.M.J.E.* '96, ii. 76 ; '97, ii. 40.

As an excellent diuretic in many cases of Bright's disease.—*L.* '94, ii. 992.

Dose.—20 to 30 grains.

STRONTIUM SALICYLATE.—A white powder slightly soluble in Water. Has been recommended as an intestinal antiseptic ; also in gouty and rheumatic conditions.—*C.D.* '95, i. 291 ; *P.J.* '96, ii. 63 ; '97, ii. 118.

Dose.—5 to 15 grains.

STROPHANTHI SEMINA.

STROPHANTHUS SEEDS.

The dried ripe seeds of *Strophanthus Kombé*, freed from the awns.

The commercial seed usually contains the seeds of other species in addition to those of *S. Kombé*.—*P.J.* (3) xix. 660. The active principle is a glucoside, **Strophanthin.**

Medicinal Properties.—A cardiac tonic. Especially valuable in mitral regurgitation with failure of compensation, and in aortic regurgitation accompanied by cardiac insufficiency. The active principle being very soluble and diffusible, Strophanthus acts with such rapidity that it is more useful than Digitalis in promptly stimulating extreme or sudden cases of cardiac failure. It is easily eliminated, it is not cumulative, it can be administered over a long period of time, and, unless there be marked gastro-intestinal catarrh, it has no tendency to produce digestive disturbance. It has acted beneficially in many cases in which Digitalis has failed or has disagreed.

Strophanthus acts more energetically on the heart than on the vessels, whereas Digitalis acts on the vessels as much as, or even more than, on the heart. Digitalis thus possesses the power of increasing arterial tension, and so of putting extra strain on the heart ; therefore, in those cases in which pulse tension is high, Strophanthus is to be preferred. Strophanthus has also been found of great value in avoiding both the cardiac embarrassment so frequently fatal in acute pneumonia and the collapse which may occur at the crisis.

References.—*B.M.J.* '85, ii. 904 ; '89, i. 603 ; *L.* '87, ii. 202 ; *P.J.* (3) xx. 328 ; *L.* '95, i. 551.

A more powerful cardiac tonic than Digitalis and superior as a diuretic.—*B.M.J.* '95, i. 368; *B.M.J.E.* '97, ii. 3; '98, i. 12; *T.G.* '98, 36.

In Graves' disease.—*L.* '93, ii. 822. In Alcoholism.—*L.* '94, ii. 212.

As to the disparity in the results obtained by different observers, Fraser remarks that 'there are several species of the genus, and that while the therapeutic effects have been determined with only one of these species, the seeds of several of the others have indiscriminately been substituted. The whole fruit, and not the seeds only, and immature seeds, poor in the active principle and rich in irritating resin, have been used to prepare the Tincture; seeds already exhausted with Alcohol have been re-sold in the market; and further, even when good seeds were used, Petroleum Ether has been substituted for Ethylic Ether, preparatory to percolation with Rectified Spirit, with the result that the Tincture (1885) contained much resin, which produced stomach and intestinal disorder.'

Official Preparations.—Extractum Strophanthi and Tinctura Strophanthi.

Not Official.—Strophanthin.

Foreign Pharmacopœias.—Official in Austr., Dan., Fr., Ger., Ital., Mex., Norw., Russ., Swiss and U.S.; not in the others.

Description.—Oval acuminate seeds, about three-fifths of an inch (fifteen millimetres) long and one-sixth of an inch (four millimetres) broad, of a greenish fawn colour, and covered with silky appressed hairs. The Seeds are flattened, narrowed towards the base, which is obtuse, and provided on one side with a longitudinal ridge running from the centre to the apex of the seed. The nucleus is white and oily; the cotyledons are straight and surrounded by a thin endosperm. Sulphuric Acid colours the latter, and sometimes the cotyledons, dark green (presence of Strophanthin). The odour is characteristic; the taste very bitter.

A new species of Strophanthus (*S. Nicholsoni*).—*P.J.* '97, ii. 209.

Adulteration of Strophanthus seeds with those of *Kicksia Africana*.—*J.S.C.I.* '97, 1036.

Preparations.

EXTRACTUM STROPHANTHI. Extract of Strophanthus. (New.)

Strophanthus Seeds, reduced to No. 30 powder, and dried at 110° F. (43·3° C.) 1; Purified Ether, Alcohol (90 p.c.), Milk Sugar, of each a sufficient quantity. Pack the dried powder in a percolator, and having moistened it with the Ether, macerate for twenty-four hours; then allow percolation to proceed, continuing the addition of the Ether until the liquid passes through colourless. Remove the marc from the percolator, and dry it, gradually heating it to 120° F. (48·9° C.). Again reduce it to powder, repack in the percolator, and moisten with the Alcohol. Macerate for forty-eight hours, then pour on successive quantities of the Alcohol, percolating slowly, until 10 of liquid is obtained. Evaporate most of the Alcohol; transfer the residual liquid to a counterpoised basin; concentrate until the liquid begins to thicken; then add sufficient finely powdered Milk Sugar to produce 2 of Extract, in powder.

Dose.—$\frac{1}{4}$ to 1 grain.

A quick method of approximately estimating Strophanthin in the B.P. Extract and Tincture by the optical rotation.—*P.J.* '98, ii. 199; *C.D.* '98 ii. 289.

Foreign Pharmacopœias.—Fr. and Mex.; not in the others.

TINCTURA STROPHANTHI. TINCTURE OF STROPHANTHUS. (ALTERED.)

Strophanthus Seeds, in No. 30 powder, ½ oz.; Alcohol (70 p.c.) a sufficient quantity. Pack the powder in a percolator; moisten it with 1 fl. drm. of the Alcohol; set aside for forty-eight hours; pour on successive quantities of the Alcohol, allowing percolation to proceed slowly, until a total volume of 10 fl. oz. of percolate has been obtained; filter; add a sufficient quantity of the Alcohol to produce 20 fl. oz. of the Tincture. =(1 in 40).

Now 1 in 40 instead of 1 in 20; Alcohol (70 p.c.) is used in place of Rectified Spirit and the removal of the Fixed Oil by Ether is omitted.

Dose.—5 to 15 minims.

This preparation is made with half the proportion of Strophanthus Seeds ordered for the corresponding preparation in the British Pharmacopœia of 1885 (Additions 1890).

Foreign Pharmacopœias.—Official in Austr., Ital. and U.S., 1 in 20; Norw., 1 and 10; Dan., Ger., Russ. and Swiss, 1 in 10; Fr., 1 and 5; Mex., 1 in 5; all by weight except U.S.; not in the others.

Not Official.

STROPHANTHIN.—Occurs as a pale yellow amorphous powder, or in white microscopic crystalline plates. Melts at 172·5° C.

Recommended as a heart tonic.—*L.* '90, ii. 415; *Pr.* xlv. 130.

Solubility.—Freely in Water and Alcohol (90 p.c.); practically insoluble in Chloroform, Ether, and Carbon Bisulphide.

Dose.—$\frac{1}{300}$ to $\frac{1}{200}$ grain.

STRYCHNINA.

STRYCHNINE.

$C_{21}H_{22}N_2O_2$, eq. 331·75.

An Alkaloid obtained from the dried ripe seeds of Strychnos Nux Vomica, and other species of Strychnos.

Solubility.—1 in 6000 to 8000 of Water; 1 in 160 of Alcohol (90 p.c.); about 1 in 400 of Alcohol (60 p.c.); 1 in 350 of Absolute Alcohol; 1 in 6 of Chloroform; nearly insoluble in Ether.

Medicinal Properties.—Similar to those of Nux Vomica; useful in the treatment of reflex or functional paralysis; and of peripheral neuritis and paralysis due to alcohol, tobacco, or diphtheria; also in cases of lead-palsy. As a bitter tonic. Small doses have been given with advantage in epilepsy, chorea and other chronic nervous diseases. Recommended in chronic alcoholism, muscular tremors, tobacco amblyopia, impotence and nervous exhaustion. For other uses and for its contra-indications see Nux Vomica. It has a cumulative action and is a very active poison.

An antidote in Chloroform poisoning.—*B.M.J.E.* '94, i. 47. In snake-bite, *T.G.* '93, 542; '94, 517.

Dose.—$\frac{1}{60}$ to $\frac{1}{15}$ grain.

Prescribing Notes.—May be given in the form of **pill** well triturated with Milk Sugar and the addition of Glucose q.s.; but it is more frequently prescribed in solution.

Antidotes.—Chloroform, Belladonna, Aconite, Morphine, Tobacco; Chloral Hydrate in 1 drm. doses.

Animal Charcoal or Tannic Acid, followed by an emetic, or the stomach-pump. Potassium Bromide, in ½ oz. dose in water, with 30 grains of Chloral. 2 drm. of the Bromide, with or without 10 grains of Chloral, may be given every 15 or 20 minutes if necessary. Amyl Nitrite inhalations, the Amyl being poured freely on a handkerchief and held close to the nose. The patient may be kept fully under Chloroform or Ether. Curare, ½ grain, by hypodermic injection. *Artificial respiration if possible.—Murrell.*

A case of recovery after taking 3 grains of Strychnine.—*L.* '67, ii. 41, 118.

8 grains of Morphine said to be an antidote for 1 grain of Strychnine.—*L.* '71, ii. 840.

Foreign Pharmacopœias.—Official in Belg., Fr., Ital. (Stricnina), Port. (Estrychnina), Mex. and Span. (Estricnina), Swed., and U.S.; not in the others. Fr., Ital., Mex., and Swed. have also the Nitrate; Austr., Dan., Dutch, Ger., Hung., Jap., Norw., Russ. and Swiss have the Nitrate only; Belg., Fr., Mex., Port., Span., Swiss and U.S. have also the Sulphate.

Description.—Trimetric prisms, colourless and inodorous.

Tests.—Very sparingly soluble in Water; but communicating to it an intensely bitter taste. Sulphuric Acid forms with it a colourless solution, which on the addition of Potassium Bichromate acquires an intensely violet hue, speedily passing through red to yellow. When Sulphuric Acid containing one two-thousandth part of Potassium Permanganate is brought into contact with a minute particle of Strychnine, a violet coloration results. Not coloured by Nitric Acid (absence of Brucine); leaves no ash when burned with free access of air (absence of mineral impurities).

STRYCHNINÆ HYDROCHLORIDUM.

STRYCHNINE HYDROCHLORIDE.

Hydrochlorate of Strychnine.—*B.P.* '85.

[NEW.]

$C_{21}H_{22}N_2O_2$, HCl,$2H_2O$. 403·70.

The Hydrochloride of an alkaloid obtained from Nux Vomica and from other species of Strychnos.

Medicinal Properties.—*See* 'Strychnina.'

Dose.—$\frac{1}{60}$ to $\frac{1}{15}$ of a grain.

Official Preparation.—Liquor Strychninæ Hydrochloridi.

Description.—Small, colourless, trimetric prisms which readily effloresce in the air; soluble in 35 parts of Water or in 60 parts of Alcohol (90 p.c.), forming a solution which is neutral to Litmus and intensely bitter to the taste.

Tests.—The salt should afford the reactions characteristic of Hydrochlorides, and should respond to the qualitative tests mentioned under 'Strychnina,' but should not yield any characteristic reaction

for Sulphates. Dried at a temperature of 212° F. (100° C.) it should lose from 7·3 to 8·8 p.c. of moisture.

Preparation.

LIQUOR STRYCHNINÆ HYDROCHLORIDI. Solution of Strychnine Hydrochloride. Solution of Hydrochlorate of Strychnine.—*B.P.* '85. (Altered.)

Strychnine Hydrochloride 17½ grains; Alcohol (90 p.c.) 1 fl. oz.; Distilled Water a sufficient quantity. Dissolve the Strychnine Hydrochloride in the Alcohol mixed with sufficient Distilled Water to produce 4 fl. oz. of the Solution of Strychnine Hydrochloride.

The metric quantities are 1 gramme of the salt; Alcohol 25 c.c.; Distilled Water a sufficient quantity to produce 100 c.c.

Now made from Strychnine Hydrochloride instead of Strychnine and Hydrochloric Acid, and is ⅛ weaker than the corresponding Solution of B.P. '85.

Dose.—2 to 8 minims.

110 minims contain 1 grain of Strychnine Hydrochloride. 100 c.c. contain 1 gramme.

2 minims subcutaneously injected for peripheral paralysis.

STYRAX PRÆPARATUS.

PREPARED STORAX.

A balsam obtained from the trunk of *Liquidambar orientalis*, and purified by solution in Ethylic Alcohol, filtration, and evaporation of the solvent.

Owing to loss of volatile constituents of the resin during the evaporation of the solvent, Ethylic Alcohol is unsuitable for purification of the resin and Ether would have been preferable, the only objection to Ether being its inflammability.—*C.D.* '98, ii. 130.

Medicinal Properties.—Similar in action to the Balsams of Peru and Tolu. The Ointment is useful as a parasiticide in scabies and phtheiriasis.

Official Preparation.—Contained in Tinctura Benzoini Composita.

Not Official.—Unguentum Styracis.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Ger., Hung., Jap., Russ. and Swiss, Styrax Liquidus; Dan., Norw. and Swed, Balsamum Styrax Liquidus; Fr., Styrax Liquide; Ital., Storace Liquido; Mex., Balsamo de Liquidambar; Port. and Span., Estoraque Liquido; U.S., Styrax.

Description.—A semi-transparent, brownish-yellow, semi-liquid balsam with a strong agreeable odour and balsamic taste.

Tests.—Heated in a test-tube placed in boiling water, it becomes more liquid, but gives off no moisture; boiled with Solution of Potassium Bichromate and Sulphuric Acid, it evolves an odour resembling that of Essential Oil of Bitter Almonds.

A limit of moisture 8 p.c. might have been introduced together with a limit for the proportion of matter insoluble in Alcohol.—*C.D.* '98, ii. 130.

Not Official.

UNGUENTUM STYRACIS (*B.S.H.*).—Prepared Storax, 2 fl. drm.; Prepared Lard, 1 oz.; mix.

SUCCI.

JUICES.

Juices expressed from fresh medicinal plants, and preserved by the addition of Alcohol, were introduced by Peter Squire in 1835 (*P.J.* vol. i.). By thus obtaining and preserving the juice of the plant, its properties are not impaired by the action of the heat employed in making an Extract.

The following are the Juices of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared:—

	Dose.
SUCCUS BELLADONNÆ	5 to 15 minims.
SUCCUS CONII	1 to 2 fl. drm.
SUCCUS HYOSCYAMI	½ to 1 fl. drm.
SUCCUS SCOPARII	1 to 2 fl. drm.
SUCCUS TARAXACI.	1 to 2 fl. drm.

These consist of 3 parts of Juice and 1 of Alcohol (90 p.c.).

SUCCUS LIMONIS is freshly expressed and contains no Alcohol.

Juices which are not official are enumerated in the Index.

The Alcoolatures of the Fr. are made by digesting equal weights of fresh plant and Rectified Spirit together for 10 days; press and filter. Aconite, Belladonna, Conium (Ciguë), Digitalis, Eucalyptus, Henbane (Jusquiame), Stramonium Leaves, Flowers and Corms of Colchicum, are so prepared.

Not Official.

SUCCINUM.

AMBER.

A fossil resinous exudation from *Pinites succinifer*, an extinct coniferous tree, on the shores of the Baltic.

Hard and brittle, yellow or yellowish-red.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr. (Succin), Mex. (Ambar Amarillo), Port. (Ambar), Span. (Sucino), and Swed.

Preparations.

OLEUM SUCCINI RECT.—A volatile Oil obtained by the destructive distillation of Amber, and purified by subsequent rectification.

Externally it is stimulant and rubefacient.

Dose.—1 to 3 minims on Sugar.

Foreign Pharmacopœias.—Official in Belg. and Hung., Ol. Succini Rect.; Dan., Norw. and Swed., Pyroleum Succini, Crude and Rect.; Mex., Aceite Volatil de Succino; Port., Oleo de Ambar; Span., Aceite Pirogenado de Sucino.

LINIMENTUM SUCCINI.—Oil of Amber, 1; Spirit of Camphor, 1; Spirit of Hartshorn, 1: mix.

A domestic **embrocation** for whooping cough.

TINCTURA SUCCINI.—Amber, in fine powder, 1; Alcohol (90 p.c.), 16. Digest 7 days.

Dose.—25 minims in Water for headache.

Foreign Pharmacopœias.—Official in Dutch, 1 Amber and 5; Fr., Succin, 1; Alcohol (80°), 10; Port., Tinctura de Ambar Composta, 2·8 Oil in 10; Swed., 1 Amber in 5; not in the others.

SULPHONAL.

SULPHONAL.

$(CH_3)_2C(SO_2C_2H_5)_2$, eq. 226·53.

Sulphonal, or Dimethyl-methane-diethylsulphone, is a product of the oxidation of Mercaptol, $(CH_3)_2C(SC_2H_5)_2$, obtained from Acetone and Mercaptan.

Solubility.—1 in 500 of Water; 1 in 15 of boiling Water; 1 in of Alcohol (90 p.c.); 1 in 3 of Chloroform; 1 in 90 of Ether.

Medicinal Properties.—Hypnotic. Useful in the insomnia of chronic heart disease, of nervous irritability and of phthisis, especially in cases where Opium is contra-indicated.—(*B.M.J.* '95, i. 153.) It produces no secondary evil effects under usual circumstances, but cases of heart disease and of lunatics have been reported where poisonous symptoms have been produced. Slow in action, especially if given undissolved.

B.M.J. '88, i. 864; '88, ii. 31, 1450, 1454; '89, i. 952; '89, ii. 689, 817; '90, i. 710; '90, ii. 237; '95, i. 153; *L.* '89, ii. 1051—1054; '90, i. 619; '91, i. 447, 787; *P.J.* (3) xviii. 901, 1005; *C.D.* '88, i. 785; *B.M.J.E.* '95, i. 16.

Cases of poisoning.—*B.M.J.* '98, ii. 1821.

The urine of patients taking Sulphonal is stated to reduce Fehling's Solution.—*B.M.J.E.* '95, ii. 43; *P.J.* (3) xxv. 1124.

Dose.—10 to 30 grains.

Prescribing Notes.—It is given in **mixtures** suspended with Compound Tragacanth Powder, 60 grains to 6 fl. oz. of Water. Also in **cachets, capsules,** Compressed Tablets, or in **powders** one to be taken in hot Water.

Not Official.—Trional.

Foreign Pharmacopœias.—Official in Fr., Acetone-diethylsulfone; Dan., Ger., Norw., Russ. and Swiss, Sulfonalum; Ital., Solfonale; Mex., Sulfonal; not in the others.

Description.—Colourless, inodorous, nearly tasteless prismatic crystals. Soluble in 450 parts of cold Water, in 50 parts of cold Alcohol (90 p.c.), very soluble in boiling Alcohol (90 p.c.), soluble in Ether.

It is now generally supplied in *powder*; its action is stated to be quicker an more certain in that form than when administered in crystals.

Tests.—Without action on Litmus; melting at 258° F. (125·5° C.) Heated to redness with free access of air, it burns, evolving Sulphurous Anhydride, and leaving no residue (absence of mineral impurity). If a mixture of Sulphonal with an equal weight of Potassium Cyanide be heated, the odour of Mercaptan is evolved, and when to the solution of the product in Water excess of Hydrochloric Acid and a few drops of Test-solution of Ferric Chloride are added, a reddish colour is developed. It evolves Hydrogen Sulphide when gradually warmed with dried Sodium Acetate. It should yield no characteristic reaction with the tests for Chlorides or Sulphates.

Not Official.

TRIONAL.—A white crystalline powder with a faintly bitter taste, slightly soluble in Water, soluble in Alcohol and in Ether. Is analogous in composition to Sulphonal, but with a Methyl group replaced by Ethyl. Has been recommended as a hypnotic and sedative. Useful in melancholia, mania, and in many nervous affections.—*B.M.J.E.* '94, ii. 24; '95, i. 16; '95, ii. 16, 39, 47, 55; '96, i. 47; *B.M.J.* '95, i. 153; *L.* '95, i. 426, 1024; '96, i. 1102; '97, i. 883; in delirium tremens.—*B.M.J.E.* '94, ii. 60; in sleeplessness of children.—*L.* '95, i. 49, 1468; '95, ii. 1060; may induce constipation.—*L.* '94, ii. 346.

A comparison of the hypnotic effects of Sulphonal, Trional and Tetronal.—*B.M.J.* '95, i. 153.

Unfavourable results in cases of patients suffering from cancer.—*P.J.* '98, i. 42.

Poisonous effects.—*B.M.J.E.* '95, ii. 76; not produced if used cautiously.—*B.M.J.E.* '96, i. 27.

Dose.—Children, 5 to 10 grains; adults, 15 to 20 grains, in **cachets.**

Tests.—It should melt at 76·5° C. Mixed with powdered wood-charcoal and heated in a test-tube it evolves the odour of Mercaptan. A saturated aqueous solution should give no precipitate with solution of Silver Nitrate, or with solution of Barium Chloride, and should not decolorise 1 drop of solution of Potassium Permanganate (1 in 1000).

TETRONAL.—*See* p. 626.

Not Official.

SULPHUR.

SULPHUR.

S, eq. 31·82.

Sulphur occurs native, and is found in masses or in the powdery form mixed with various impurities. It is abundant in volcanic countries, as in Sicily, and in some parts of Italy. It exists in this country in combination with Iron and Lead. It readily volatilises, and when the vapours are passed into a large brick chamber kept cold, it condenses in fine powder (Sublimed Sulphur), but when a small chamber is used and kept at a temperature of about 120° C., it condenses in the liquid form and is run into moulds (Roll Sulphur).

Foreign Pharmacopœias.—Official in Belg., Sulphur Venale; Fr., Soufre; Ital., Solfo; Port., Enxofre; Mex. and Span., Azufre; Swed.; not in the others.

SULPHUR PRÆCIPITATUM.

PRECIPITATED SULPHUR.

B.P. Syn.—Milk of Sulphur.

Sulphur precipitated by Hydrochloric Acid from a solution of Calcium Sulphides and Thiososulphate, which has been made by boiling together Sulphur and Lime in Water.

Medicinal Properties.—Similar to those of Sulphur Sublimatum, only more active. Mixed with Milk and rubbed till smooth, children take it readily.

Dose.—20 to 60 grains.

Official Preparation.—Trochiscus Sulphuris.

Not Official.—Lotio Sulphuris, Trochiscus Sulphuris Comp. and Unguentum Sulphuris Precipitati.

Foreign Pharmacopœias.—Official in all; Fr., Soufre Précipité; Ital., Solfo Precipitato; Port., Enxofre Precipitado; Mex. and Span., Azufre Precipitado.

Description.—A greyish-yellow soft powder, free from grittiness, and from the smell of Hydrogen Sulphide.

Test.—Under the microscope it is seen to consist of opaque globules without any admixture of crystalline matter. It responds to the chemical tests mentioned under 'Sulphur Sublimatum.'

The best test is that it should dissolve readily and completely in Carbon Bisulphide.

Lac Sulphuris of former Pharmacopœias contained a large amount of Calcium Sulphate, owing to Sulphuric Acid being used in its preparation, but as Hydrochloric Acid is now employed, no distinction should be made between Milk of Sulphur and Precipitated Sulphur.

Preparation.

TROCHISCUS SULPHURIS. Sulphur Lozenge.

Precipitated Sulphur, 2500 grains; Acid Potassium Tartrate, in powder, 500 grains; Refined Sugar, in powder, 4000 grains; Gum Acacia, in powder, 500 grains; Tincture of Orange, 500 minims; Mucilage of Gum Acacia, 500 minims. Mix the Tincture of Orange with the powders; add the Mucilage of Gum Acacia to form a suitable mass. Divide into 500 lozenges. Dry them in a hot-air chamber at a moderate temperature.

The Tincture of Orange made from fresh Peel is now used.

Each lozenge contains 5 grains (·324 gramme) of Precipitated Sulphur.

Dose.—Not given in B.P.; 1 to 6 lozenges.

Not Official.

LOTIO SULPHURIS.—Precipitated Sulphur, ½ oz.; Glycerin, 120 minims; Alcohol (90 p.c.), 1 fl. oz.; Rose Water, 3 fl. oz.; Lime Water, 3 fl. oz.

Recommended in acne of the face.—*L.* '87, i. 66.

TROCHISCUS SULPHURIS COMP.—Each lozenge contains 5 grains of Precipitated Sulphur, and 1 grain of Cream of Tartar.

These lozenges differ from the Official Sulphur lozenge in that they contain no Orange, and are therefore preferred by many persons.

A convenient form of administering Sulphur as a general laxative, in cases of sluggish liver, bleeding piles, and habitual constipation.—*L.* '89, i. 665

UNGUENTUM SULPHURIS PRÆCIPITATI.—Precipitated Sulphur, 2; Potassium Carbonate, 1; Lard, 8: mix.

Excellent for scabies.

SULPHUR SUBLIMATUM.

SUBLIMED SULPHUR.

B.P.Syn.—Flowers of Sulphur.

May be prepared, more or less directly, from native Sulphur or Sulphides.

Solubility.—Insoluble in water. Slightly soluble in hot Alcohol. Only partially soluble in Carbon Bisulphide.

Medicinal Properties.—Laxative, alterative, diaphoretic, expectorant. Employed internally in hæmorrhoidal affections and chronic rheumatism, hepatic congestion, gout and syphilis, chronic bronchitis and many skin diseases; externally also for skin diseases, especially scabies and acne. Dusted on the membrane in diphtheria.—*B.M.J.* '93, ii. 993; '94, i. 459; *L.* '95, i. 265, 327. As an antiseptic in surgery.—*L.* '94, ii. 1098.

Dose.—20 to 60 grains.

Official Preparations.—Confectio Sulphuris and Unguentum Sulphuris; contained in Pulvis Glycyrrhizæ Compositus. Used in the preparation of Acidum Sulphuricum, Acidum Sulphurosum, Emplastrum Ammoniaci cum Hydrargyro, Emplastrum Hydrargyri, Antimonium Sulphuratum, Potassa Sulphurata, Sulphur Precipitatum and Sulphuris Iodidum.

Not Official.—Unguentum Sulphuris Compositum, and 'Chelsea Pensioner.'

Foreign Pharmacopœias.—Official in all; Austr. and Belg. have also Sulphur Depuratum; Dan., Ger., Hung., Ital., Russ., Swed. and Swiss, Crude and Washed; Dutch and Jap. have also Sulfur Depuratum; Fr., Soufre Sublimé, also S.S. Lavé; Norw.; Port., Enxofre Sublimado; Mex. and Span., Azufre Sublimado.

Description.—A slightly gritty powder of a bright greenish-yellow colour, without taste and without odour.

Tests.—Under the microscope it is seen to consist of almost opaque irregular particles without any admixture of crystalline matter. It burns with a blue flame forming Sulphurous Anhydride; and is entirely volatilised by heat. It should not have any action upon Litmus. Solution of Ammonia, agitated with it, and filtered, does not on evaporation leave any residue (absence of Arsenium Sulphide).

The B.P. test of freedom from acidity can only be expected from **'washed Sulphur,'** which is Official in most foreign Pharmacopœias. Commercial Sublimed Sulphur is always more or less acid.

Preparations.

CONFECTIO SULPHURIS. Confection of Sulphur. (Altered.)

Sublimed Sulphur, 4 oz.; Acid Potassium Tartrate, in powder, 1 oz.; Tragacanth, in powder, 18 grains; Syrup, 2 fl. oz.; Tincture of Orange, ½ fl. oz.; Glycerin, 1½ fl. oz.: mix. =(1 in 2¼).

Now made with Glycerin, Syrup, and Tincture of Orange in place of Syrup of Orange Peel.

Dose.—60 to 120 grains.

(Not in the other Pharmacopœias.)

UNGUENTUM SULPHURIS. Sulphur Ointment. (Altered.)

Sublimed Sulphur, finely sifted, 1; Benzoated Lard, 9: mix. =(1 in 10).

Now 1 in 10, formerly 1 in 5.

Foreign Pharmacopœias.—Official in Belg., 1 in 5, also alkaline 1 in 5½; Fr., Pommade, 1 in 10, also precipitated, 1 in 10; Jap., 1 and 2; Mex., 1 in 4; Port., 3 in 10, also Compound, 1 in 5; Russ., 1 in 3, also Compound, 1 in 10; Span.,

1 in 5; Swiss, 3 in 10, also Compound, 1 in 10; U.S., 3 in 10; Austr., Dutch, Hung., Norw., and Swed. (Compound *see* below), 3 in 20.

Precipitated Sulphur makes a more active Ointment, and Essence of Lemon covers the odour.

An **ointment** $\frac{1}{3}$ of B.P. '85 strength exerts a destructive effect on the ringworm fungus.—*B.M.J.* '89, i. 398.

Not Official.

UNGUENTUM SULPHURIS COMPOSITUM. *Syn.*—Ung. ad Scabiem Viennense. Wilkinson's Ointment.

Sulphur, 15; Chalk, 10; Tar, 15; Lard, 30; Soap, 30.

This is the formula official in Austr., Dutch, Hung., Norw. and Swed.

'CHELSEA PENSIONER.'—Sulphur, 6; Mustard, 6; Powdered Guaiacum, 3; Rhubarb, $1\frac{1}{2}$; Nitre, $1\frac{1}{2}$: mix. Honey or Treacle sufficient to make it into an Electuary.

Dose.—A teaspoonful every alternate evening for rheumatism; it is also taken in the morning as an aperient to regulate the bowels.

Not Official.

SULPHURIS CHLORIDUM.

SULPHUR CHLORIDE.

S_2Cl_2, eq. 134·02.

Prepared by the direct union of Chlorine with Sulphur, forming a mobile reddish-yellow liquid, sp. gr. 1·69, with a penetrating disagreeable odour, and fuming strongly in air. It dissolves without decomposition in Carbon Bisulphide or Benzol, but is decomposed by Water, Alcohol and Ether.

Preparation.

UNGUENTUM SULPHURIS HYPOCHLORITIS.—The Ointment prescribed under this name is composed of Sublimed Sulphur, 1 oz.; Chloride of Sulphur, 1 fl. drm.; Spermaceti Ointment, (B.P. 1867) 8 oz.: Essential Oil of Almonds, 80 minims, is usually added to mask the disagreeable odour.

Used in the treatment of scabies and acne.

SULPHURIS IODIDUM.

SULPHUR IODIDE.

O.M.P.—Iodine, 4; Sublimed Sulphur, 1: intimately mix the Sublimed Sulphur with the Iodine; heat the mixture gently in a loosely corked flask, when the mass becomes uniformly dark, increase the temperature so as to produce liquefaction; allow the product to cool in the flask. The flask should then be broken, and the solidified mass of Sulphur Iodide reduced to fragments, which should be kept in a well-closed vessel.

The proportions of Iodine and Sulphur are used in equivalents to form SI, eq. 157·72, but the combination is a very loose one.

Solubility.—1 in 60 of Glycerin; 1 in 4 of Carbon Bisulphide. Insoluble in cold Water.

Medicinal Properties.—The Ointment is an excellent remedy for acne rosacea, and for parasitic, tubercular and other eruptions of the skin.

Official Preparation.—Unguentum Sulphuris Iodidi.

Foreign Pharmacopœias.—Official in Belg., Ioduretum Sulphuris; Dutch, Iodetum Sulphuris c. Sulphure; Mex., Yoduro de Azufre; Port., Enxofre Iodado; Span., Ioduro de Azufre; U.S., Sulphuris Iodidum; not in the others.

Description.—A greyish-black solid substance, with a radiate crystalline appearance. It resembles Iodine in smell, and in the property of staining the skin.

Test.—When boiled with Water the Iodine passes off in vapour, and the Sulphur remains as an insoluble residue having about one-fifth of the weight of the Sulphur Iodide taken.

Preparation.

UNGUENTUM SULPHURIS IODIDI. SULPHUR IODIDE OINTMENT. (ALTERED.)

Sulphur Iodide, 20 grains; Glycerin, 20 grains; Benzoated Lard, 460 grains. Triturate the Sulphur Iodide and Glycerin in a slightly warmed mortar until a smooth paste results; gradually add the Benzoated Lard; stir until cold. =(about 1 in 25).

Now 1 in 25 instead of 1 in 15½. Glycerin is added and Benzoated Lard replaces Hard and Soft Paraffin.

Foreign Pharmacopœias.—Official in Port., 1 in 10; not in the others.

SUMBUL RADIX.

SUMBUL ROOT.

The dried transverse slices of the root of *Ferula Sumbul*.

Imported from Russia. It possesses a powerful odour resembling Musk.

An inferior kind has of late years replaced the old Sumbul root. This inferior drug is probably the product of Ferula suaveolens.

Medicinal Properties.—A nervine tonic, carminative and antispasmodic, said to be useful in hysteria and nervous complaints.

Official Preparation.—Tinctura Sumbul.

Foreign Pharmacopœias.—Official in Mex.; Port., Sombula; U.S.; not in the others.

Description.—Varying much in size, but usually from about one inch to three inches (two and a-half to seven and a-half centimetres) in diameter, and from three-quarters of an inch to an inch (eighteen to twenty-five millimetres) or more in thickness. The pieces are covered on the outer surface with a dusky-brown, papery, tranversely wrinkled cork, and are sometimes beset with short bristly fibres; internally they are spongy, coarsely fibrous, dry, and dirty yellowish-brown, mottled with whitish patches and spots of exuded resin. Odour strong, musk-like; taste bitter, aromatic.

The cultivation of Sumbul in England.—*P.J.* '97, i. 347.

Preparation.

TINCTURA SUMBUL. TINCTURE OF SUMBUL. (ALTERED.)

Sumbul Root, bruised, 2; Alcohol (70 p.c.), 20. Prepare by the maceration process. =(1 in 10).

Now 1 in 10 instead of 1 in 8, and Alcohol (70 p.c.) used in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in U.S., 1 in 10; not in the others.

SUPPOSITORIA.

Suppositories are for the most part prepared by the following general formula:—

Melt the Oil of Theobroma; triturate the active ingredient intimately with a little of the Oil, and add to the remainder; stir well; as the mixture begins to thicken pour it into the moulds; or let the mixture cool and then divide it into twelve equal parts of a conical or other convenient form for a suppository.

The moulds, previously made cold, must be kept so in summer by immersion in iced water. All difficulty in removing the suppositories from the moulds may be obviated by having the moulds previously wiped with some oiled lint.

Cocoa-nut **Stearin** (p. 605) is in many instances a better basis for Suppositories than Oil of Theobroma.

	Each contains
SUPPOSITORIA ACIDI CARBOLICI	1 grain.
SUPPOSITORIA ACIDI TANNICI	3 grains.
SUPPOSITORIA BELLADONNÆ. Alcoholic Extract . .	1½ grains.
SUPPOSITORIA GLYCERINI	70 p.c.
SUPPOSITORIA IODOFORMI	3 grains.
SUPPOSITORIA MORPHINÆ. Morphine Hydrochloride .	¼ grain.
SUPPOSITORIA PLUMBI COMPOSITA. Lead Acetate . .	3 grains.
Powdered Opium.	1 grain.

Suppositories, not official, are enumerated in the Index.

Not Official.

SYMPHYTI RADIX.

COMMON COMFREY ROOT.

The root of *Symphytum officinale;* black without and white within.

Medicinal Properties.—Astringent, mucilaginous, glutinous; useful to form cases for injured limbs. The black rind is scraped off, and the mucilaginous root is then scraped carefully into a nice even pulp; this spread to the thickness of a crown-piece upon cambric or old muslin, is wrapped round the limb and bandaged over; it soon stiffens, and forms a casing superior to starch, giving great support and strength to the part. The late Author knew a bone-setter who practised more than fifty years ago, and rendered himself famous by treating fractures after this method, which he kept secret, the bandage not being removed until the limb was well.

Foreign Pharmacopœias.—Official in Belg., Radix Symphiti; Fr., Consoude; Mex., Sinfito; Port., Consolda Maior; Span., Sinfito Mayor; not in the others.

SYRUPI.

SYRUPS.

Syrups are apt to ferment or mould when made with too little Sugar, and to crystallise when too concentrated, or when mixed with Acids or Alcohol. There is no uniformity in the method given in B.P. for the twenty-two Syrups which are Official. In seven of them the final product is directed to be made to a given volume by the addition of Water or of Syrup, and in three of them to a given weight. The sp. gr. is inserted in two of them, Syrupus, and Syrupus Ferri Iodidi. In the case of Syrupus Sennæ and Syrupus Tolutanus, the fluid is made to a given volume by the addition of Distilled Water before the Sugar is dissolved in it, but in Syrupus Hemidesmi, Syrupus Rosæ and Syrupus Scillæ no such precaution is taken. Syrupus Aurantii and Syrupus Zingiberis are both mixtures of a Tincture with Syrup, but the latter is made to a definite volume, the former is not.

The following are the Syrups of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared:—

Dose.		Proportion of Ingredient.
	SYRUPUS. *See* SACCHARUM	Sugar 1 in 1½.
½ to 1 fl. drm.	SYRUPUS AROMATICUS . .	Tincture of Orange 1 in 4.
½ to 1 fl. drm.	SYRUPUS AURANTII	Tinct. 1 in 8.
½ to 1 fl. drm.	SYRUPUS AURANTII FLORIS . . .	O.F. Water 1 in 6¾.
½ to 1 fl. drm.	SYRUPUS CALCII LACTOPHOSPHATIS.	Calcium Phosphate about 1 in 40.
½ to 2 fl. drm.	SYRUPUS CASCARÆ AROMATICUS.	Liquid Extract of Cascara 1 in 2½.
½ to 2 fl. drm.	SYRUPUS CHLORAL	1 in 6.
½ to 2 fl. drm.	SYRUPUS CODEINÆ	Codeine Phosphate 1 in 220.
½ to 1 fl. drm.	SYRUPUS FERRI IODIDI, 11 mins. contain 1 gr. Ferrous Iodide.	
½ to 1 fl. drm.	SYRUPUS FERRI PHOSPHATIS . .	1 grain in each fl. drm.
½ to 1 fl. drm.	SYRUPUS FERRI PHOSPHATIS CUM QUININA ET STRYCHNINA. 1 fl. drm. = 1 grain Anhydrous Ferrous Phosphate, ⅛ grain of Quinine Sulphate, and $\frac{1}{32}$ grain of Strychnine.	
	SYRUPUS GLUCOSI	About 1 in 3.
½ to 1 fl. drm.	SYRUPUS HEMIDESMI	Root about 1 in 8.
1 fl. drm.	SYRUPUS LIMONIS	Juice 1 in 2.
½ to 1 fl. drm.	SYRUPUS PRUNI VIRGINIANÆ . . .	Bark 1 in 6⅔.
½ to 2 fl. drm.	SYRUPUS RHEI	Root 1 in 15.
½ to 1 fl. drm.	SYRUPUS RHŒADOS	Petals 1 in 3½.
½ to 1 fl. drm.	SYRUPUS ROSÆ	Petals 1 in 17¼.
½ to 1 fl. drm.	SYRUPUS SCILLÆ	Squill about 1 in 16.
½ to 2 fl. drm.	SYRUPUS SENNÆ	Senna about 1 in 1½.
½ to 1 fl. drm.	SYRUPUS TOLUTANUS	Balsam 1 in 26.
½ to 1 fl. drm.	SYRUPUS ZINGIBERIS	Root 1 in 40.

Syrups that are not official are enumerated in the Index.

Not Official.

TABACI FOLIA.

LEAF TOBACCO.

The dried leaves of the Virginian Tobacco, *Nicotiana Tabacum*.

Official in *B.P.* '85, but now omitted.

When dry they yield about 20 p.c. of ash, containing a large proportion of Potassium Carbonate.

The Virginian leaf contains about 6 p.c. of **Nicotine**, and is one of the strongest varieties of Tobacco.

Medicinal Properties.—A powerful depressant, especially affecting the heart and respiration. Smoked, it is sedative and antispasmodic in various cases of asthma. Occasionally used as snuff for its errhine action, increasing the flow of nasal mucus.

It forms the basis of a proprietary article for the relief of neuralgia of the face.

Nicotine is one of the most powerful and rapid poisons known.

Tobacco Juice (a strong infusion) is a powerful insecticide, but some preparations for this purpose contain Arsenic in addition to the Tobacco, and in a case that came under our notice, several animals were killed by the Arsenic.

Antidotes.—In case Tobacco has been swallowed, an emetic; stimulants internal and external. Recumbent position; Tannic Acid; Nux Vomica or Strychnine.

Foreign Pharmacopœias.—Official in Belg., Ger., Norw., Russ., Swed. and Swiss, Folia Nicotiana; Fr., Nicotiane ou Tabac; Mex., Tabaco; Port. and Span., Nicociana; U.S., Tabacum; not in Austr., Dan., Dutch, Hung., Ital., Jap. or Norw.

Preparation.

NICOTINE ($C_{10}H_{14}N_2$, eq. 160·98).—A nearly colourless volatile liquid alkaloid, Sp. gr. 1·011, with an acrid burning taste, inflammable, miscible with Water, Ether, Alcohol, and the fixed Oils. Boiling point about 250° C. To this alkaloid Tobacco owes its activity. The most easily crystallised salt is the Acid Tartrate. Nicotine is never used therapeutically.

Foreign Pharmacopœias.—Official in Swed.; not in the others.

TAMARINDUS.

TAMARINDS.

The fruits of *Tamarindus Indica*, freed from the brittle outer part of the pericarp and preserved with Sugar.

Imported from the West Indies.

Medicinal Properties.—Refrigerant and slightly laxative. Infused with Water, forms a cooling drink in febrile affections.

Dose.—Not given in B.P.; ½ oz. and upwards.

Official Preparation.—Contained in Confectio Sennæ.

Foreign Pharmacopœias.—Official in all except Dan.

Description.—A reddish-brown moist sugary mass, containing strong branched fibres, and brown shining seeds, each of which is enclosed in a tough membranous coat or endocarp. Taste agreeable, refreshing, subacid.

Test.—The pulp should not yield any characteristic reaction for Copper with the tests for that metal.

The Tamarind Acid equal to about 10 p.c. (calculated as Tartaric) would take up Copper if such vessels were used.

TARAXACI RADIX.

TARAXACUM ROOT.

The fresh and the dried roots of *Taraxacum officinale*, collected in the autumn.

Medicinal Properties.—A mild laxative and bitter tonic, given in atonic dyspepsia with habitual constipation. Not now believed to be cholagogue. In dropsy, arising from obstruction of the liver, it is given in combination with purgatives.

A very feeble stimulant of the liver.—Dr. Rutherford.

Official Preparations.—Extractum Taraxaci, Extractum Taraxaci Liquidum, and Succus Taraxaci.

Not Official.—Liquor Taraxaci.

Foreign Pharmacopœias.—Official in all except Norw.; Fr., Pissenlit; Ital., Tarassaco; Mex., Diente de Leon, **root** and **leaves.**

Description.—Root, when fresh, frequently a foot (three decimetres) or more in length, and half-an-inch (twelve millimetres) or more in diameter, smooth, and yellowish-brown externally, whitish within. It breaks readily with a short fracture; from the fractured surface, which exhibits faint concentric rings, a milky juice exudes. When dried, it is more or less shrivelled, deeply wrinkled longitudinally, dark brown or nearly black, breaks with a short fracture, and the exposed surface shows a small yellow porous wood, surrounded by a thick nearly white cortex which exhibits a variable number, according to its size, of irregular well-marked concentric rings. Inodorous; taste bitter.

An investigation of Taraxacum Root and Taraxacin.—*A.J.P.* '95, 465; '96, 518; '97, 543.

Preparations.

EXTRACTUM TARAXACI. EXTRACT OF TARAXACUM.

Crush fresh Taraxacum Root; press out the juice; allow the feculence to subside; heat the liquid to 212° F. (100° C.), and maintain the temperature for ten minutes; strain; evaporate to the consistence of a soft extract.

Dose.—5 to 15 grains.

Foreign Pharmacopœias.—Official in Ital. and U.S., from **fresh root**; Swiss, from **dried root**; Fr., from **dried leaves**; Austr., Belg., Dan., Dutch, Ger., Hung., Port., Russ. and Swed., from **whole plant**; Jap., from **whole plant dried**; Mex., from **root** and **leaves**; Span., clarified juice of **fresh leaves** evaporated, also aqueous from **dried leaves.**

EXTRACTUM TARAXACI LIQUIDUM. LIQUID EXTRACT OF TARAXACUM. (MODIFIED.)

Taraxacum Root, dried, in No. 20 powder, 20; Alcohol (60 p.c.) 40; Distilled Water, a sufficient quantity. Mix the powdered Taraxacum Root with the Alcohol; set aside in a closed vessel for forty-eight hours; press out 10 of liquid; set the latter aside; mix the pressed residue with 40 of the Distilled Water; set aside for forty-eight hours; press out and strain the liquid; evaporate to about 10; mix the two

liquids; if necessary make up the volume to 20 by the addition of Distilled Water; filter.

Now made with Alcohol (60 p.c.) instead of Proof Spirit.

When made in this way it deposits greatly. A much better Fluid Extract is made by percolation with Alcohol (30 p.c.).

Dose.—½ to 2 fl. drm.

Foreign Pharmacopœias.—Official in Russ. and U.S.; not in the others.

SUCCUS TARAXACI. Juice of Taraxacum. (Modified.)

Bruise fresh Taraxacum Root; press out the juice; to every 3 volumes of juice add 1 of Alcohol (90 p.c.); set aside for seven days; filter.

Now made with Alcohol (90 p.c.) instead of Rectified Spirit.

Dose.—1 to 2 fl. drm.

(Not in the other Pharmacopœias.)

Not Official.

LIQUOR TARAXACI.—A preparation resembling the Succus, but in which the Alcohol (90 p.c.) is added directly to the bruised root before pressing. Introduced many years before the Succus and superior to it. The opinion (*C.D.* '92, i. 612) is wrong that Liquor in this case is synonymous with Fluid Extract, since the root depreciates considerably in the drying, before powdering.

TEREBENUM.

TEREBENE.

[NEW.]

A mixture of Dipentene and other Hydrocarbons; obtained by agitating Oil of Turpentine with successive quantities of Sulphuric Acid until it no longer rotates the plane of a ray of polarised light, and then distilling in a current of steam.

Solubility.—1 in 6½ of Alcohol (90 p.c.); in all proportions of Absolute Alcohol or Chloroform; 1 in 3¾ of Ether; 5 in 8 of Glacial Acetic Acid; very sparingly in Water.

Medicinal Properties.—Used for the relief of winter cough (chronic bronchitis).—*B.M.J.* '86, i. 259, 392; '87, i. 796; *P.J.* (3) xvi. 611. In phthisis, *Pr.* liii. 275.

Dose.—5 to 15 minims.

Prescribing Notes.—Small doses may be taken on **sugar**. It may be given in **mixture** suspended with Mucilage, in **flexible capsules**, **lozenges** or **pastilles**.

Not Official.—Terpene Hydrate, and Terpinol.

Foreign Pharmacopœias.—Russ. and U.S.; not in the others.

Description.—A colourless liquid, having an agreeable odour and an aromatic Terebinthinate taste.

Tests.—Sp. gr. ·862 to ·866. Does not rotate the plane of a ray of polarised light. Should distil between 312·8° and 356° F. (156° and 180° C.), leaving only a slight viscid residue (absence of excess of Resin). Not more than 15 p.c. should distil below 329° F. (165° C.).

Not Official.

Terpene Hydrate.—A colourless crystalline solid, slightly soluble in Water, freely in Alcohol. Dose, 3 to 10 grains.

Used as an expectorant to reduce secretion in bronchitis and other respiratory disorders.—*Pr.* liv. 383.

Foreign Pharmacopœias.—Official in Fr., Terpine; Ger., Mex., Terpina; Norw., Hydras Terpinicus; Russ., Swiss and U.S.; not in the others.

Terpinol.—A colourless liquid. Dose, 2 minims.

TEREBINTHINA CANADENSIS.

CANADA TURPENTINE.

B.P.Syn.—Canada Balsam.

The oleo-resin obtained from *Abies balsamea*.

Solubility.—Soluble in all proportions of Benzol, Chloroform, and Ether; 1 in 3 (*or less*) of Absolute Alcohol; 1 in 1 (*or less*) of Alcohol (90 p.c.).

Seldom used internally, its medicinal properties are similar to those of Oleum Terebinthinæ.

Foreign Pharmacopœias.—Official in U.S.; not in the others.

Official Preparation.—Used in the preparation of Collodium Flexile.

Description.—A pale yellow and faintly greenish transparent oleo-resin, of the consistence of thin honey; with a peculiar and agreeable Terebinthinate odour, and a slightly bitter feebly acrid taste; drying very slowly on exposure to the air into a transparent varnish, and solidifying when mixed with about a sixth of its weight of Magnesia moistened with a little Water.

By long exposure to air at the ordinary temperature, or quickly when heated, it loses about 25 p. c. of its weight of volatile Turpentine, and forms a hard brittle solid, which, dissolved in Benzol, Toluol, or Xylol is much used as a medium for mounting microscopical objects, and as a cement for glass; it is also used in its natural state for the same purposes.

Not Official.

TEREBINTHINA CHIA.

CHIAN TURPENTINE.

An oleo-resin obtained from the incised trunk of *Pistacia Terebinthus*, collected in Scio.

A soft solid with a characteristic odour. When treated with its own weight of Absolute Alcohol or Pure Ether, the greater portion is dissolved.

Medicinal Properties.—Has been recommended in the treatment of cancer.—*L.* '80, i. 477; '87, ii. 1005, 1144, 1190, 1244.

Dose.—5 to 10 grains.

Foreign Pharmacopœias.—Official in Fr., Térébinthine de Chio: Port., Terebinthina de Chio; Span., Trementina de Chio; not in the others.

Preparation.

PILULA TEREBINTHINÆ CHIÆ.—Chian Turpentine, 6 grains; Sublimed Sulphur, 4 grains. To be made into 2 pills, and taken every four hours.

A case is reported of these pills forming a compact mass in the bowel, removed by enemas.—*C.D.* '90, ii. 75.

TEREBINTHINÆ OLEUM.

OIL OF TURPENTINE.

The oil distilled, usually by the aid of steam, from the oleo-resin (Turpentine) obtained from *Pinus sylvestris* and other species of *Pinus;* rectified if necessary.

The Oil of Turpentine sold in Britain is almost wholly imported from America, and is the product (mainly) of *Pinus australis* and *P. Tæda*. German and Russian Oil is principally distilled from *P. sylvestris*; French Oil from *P. maritima*. Hungarian Turpentine is distilled from the cones of *P. Pumilio*, and Carpathian Turpentine from *P. Cembra* or *P. Pumilio*.

The sp. gr. varies between ·860 and ·880; the boiling point approximates to 160° C. The French Oil is strongly lævo-rotatory, but both English and Russian Oils are dextro-rotatory.

French Turpentine is stated to be dextro-rotatory (Armstrong).—*J.S.C.I.* '96, 363; *P.J.* '96, i. 370.

The above statement is at variance with that mentioned in a test for the presence of resin oil in French Turpentine oil, described (*P.J.* '97, ii. 260), which depends on the difference in their rotation, resin oil being stated to be dextro- and French oil lævo-rotatory.

Oil of Turpentine, especially Russian, when exposed to the continuous action of atmospheric air in presence of water, develops a large quantity of Hydrogen Peroxide, Camphoric Acid, and other oxygenated products, which form the basis of the 'Sanitas' series of disinfectants.

Oil of Turpentine dissolves Beeswax, Iodine, Sulphur, Phosphorus, fixed Oils; and Resins forming varnish.

Solubility.—1 in 6½ of Alcohol (90 p.c.); in all proportions of Absolute Alcohol, Carbon Bisulphide, Chloroform, Ether sp. gr. ·720, and Glacial Acetic Acid.

Medicinal Properties.—Antiseptic, hæmostatic, diuretic, anthelmintic. Useful in passive hæmorrhage from the various organs; 4 fl. drm. along with an equal quantity of Castor Oil is often successful in removing tapeworm. Antispasmodic in hysterical affections and in hiccough; it is said to dissolve gall-stones. In small doses (2 to 10 minims), and in large doses (3 to 4 fl. drm.), it does not usually tend to irritate the kidneys, but in doses of about 1 fl. drm. it is apt to do so. Used as an **inhalation** in chronic bronchitis and other lung diseases; as an **enema** for obstinate constipation, for flatulency and tympanitic distension of the bowels, and in threadworm. Externally rubefacient and counter irritant; employed as a **liniment** in chronic inflammation and rheumatism.

Flies and gnats are kept away by the odour of Turpentine.

Dose.—2 to 10 minims; as an anthelmintic, 3 to 4 fl. drm.

Prescribing Notes.—Usually given in the form of **mixture** suspended with

Mucilage or Powder of Acacia. It may be given in Mistura Amygdalæ. It is also given in **capsules**. 1 fl. drm. of Mucilage, with diligent trituration, renders ½ fl. drm. of Oil of Turpentine emulsive with 1 fl. oz. of Distilled Water.

30 grains Powder of Acacia rubbed first with 1 fl. drm. of Oil of Turpentine, then with 1 fl. drm. of Water, and lastly triturated whilst adding gradually 1 fl. oz. Distilled Water, makes a good emulsion.

Official Preparations.—Linimentum Terebinthinæ and Linimentum Terebinthinæ Aceticum. Used in the preparation of Terebenum.

Antidotes.—Emetics, Epsom Salts, demulcent drinks, Morphine or Laudanum to relieve pain.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Hung., Jap., Russ., Swiss and U.S., Oleum Terebinthinæ; Belg., Essentia Terebinthinæ; Dan., Norw. and Swed., Ætheroleum Terebinthinæ; Fr., Essence de Térébenthine; Ital., Essenza di Trementina; Port., Essencia de Terebinthina; Span., Esencia de Trementina.

Description.—Limpid, colourless, with a strong peculiar odour, which varies in the different kinds of Oil, and a pungent and somewhat bitter taste.

Tests.—It is soluble in its own volume of Glacial Acetic Acid. It commences to boil at about 320° F. (160° C.), and almost entirely distils below 356° F. (180° C.), little or no residue remaining.

Preparations.

LINIMENTUM TEREBINTHINÆ. Liniment of Turpentine. (Altered.)

Soft Soap, 1½; Distilled Water, 5, or a sufficient quantity; Camphor, 1; Oil of Turpentine, 13. Mix the Soft Soap with 2 of the Distilled Water; dissolve the Camphor in the Oil of Turpentine; gradually add the latter solution to the former, triturating until the mixture becomes a thick creamy emulsion; lastly mix with sufficient Distilled Water to produce 20. =(about 1 in 1½).

Formula entirely altered.

Foreign Pharmacopœias.—Official in U.S., Resin Cerate 65, Ol. Turpentine 35; not in the others.

LINIMENTUM TEREBINTHINÆ ACETICUM. Liniment of Turpentine and Acetic Acid.

Oil of Turpentine, 4; Glacial Acetic Acid (by weight), 1; Liniment of Camphor, 4: mix. =(about 1 in 2).

An imitation of St. John Long's celebrated Liniment.

Foreign Pharmacopœias.—Official in Swed. (Linimentum Terebinthinæ Acetatum), 9 Oil in 20; Swiss (Linimentum Terebinthinæ Compositum), about 3 Oil in 10; not in the others.

Not Official.

TETRONAL.

DIETHYLSULPHON-DIETHYLMETHANE.

It is analogous in composition to Sulphonal, but with the two Methyl groups replaced by Ethyl. A white crystalline odourless powder.

Medicinal Properties.—Hypnotic.—*L.* '93, ii. 758; comparisons with Sulphonal and Trional.—*B.M.J.* '95, i. 153.

Dose.—10 to 20 grains.

Not Official.

THALLINÆ SULPHAS.

$(C_{10}H_{13}NO)_2$. H_2SO_4. $2H_2O$, eq. 456·94.

The Sulphate of a synthetically-prepared base derived from Chinoline, the full name of which is Tetrahydroparaquinanisol or Tetrahydroparamethyloxychinolin.

A yellowish-white crystalline powder, with an odour resembling that of Coumarin, and an aromatic bitter taste. Its dilute aqueous solution gives a green colour with Test Solution of Ferric Chloride.

The free base is precipitated from solutions by Caustic Alkali, and from it are obtained the **Iodide** and other Iodinated compounds (*e.g.*, **Periodotetrahydroparamethyloxychinolinum**) which have been used in the treatment of cancer.

Solubility.—1 in 7 of Water.

Medicinal Properties.—Antipyretic and antiseptic. Has been recommended internally in typhoid and other fevers.—*L.* '84, ii. 1018; *L.M.R.* '85, 456; *B.M.J.* '87, ii. 1438.

For gonorrhœa, an **injection** 2½ grains in 150 minims of Water; a **bougie** 2 grains in 40 grains of Cacao Butter.—*B.M.J.* '87, ii. 1438; *L.M.R.* '87, 162.

Adverse results in gonorrhœa.—*B.M.J.* '89, i. 1458.

Dose.—3 to 8 grains.

Foreign Pharmacopœias.—Official in Ger. and Russ., Thallinum Sulfuricum; not in the others.

THEOBROMATIS OLEUM.

OIL OF THEOBROMA.

B.P.Syn.—Cacao Butter.

A concrete oil obtained by pressing the warm crushed seeds of *Theobroma Cacao*.

Official Preparations.—Contained in all the Suppositories except Glycerin.

Not Official.—Theobromine, Theobromine Salicylate, and Diuretin.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Ger., Hung., Jap., Norw., Russ., Swed. and Swiss, Oleum Cacao; Fr., Beurre de Cacao; Ital., Burro di Cacao; Mex., Manteca de Cacao; Port., Oleo de Cacao; Span., Aceite de Cacao; U.S., Oleum Theobromæ.

Description.—A yellowish-white solid, breaking with a smooth fracture; odour resembling that of cocoa; taste bland and agreeable; free from rancidity.

Tests.—It softens at 80° F. (26·6° C.) and melts at temperatures between 88° and 93° F. (31·1° and 33·9° C.). If 1 gramme be dissolved in 3 c.c. of Ether, in a test-tube, at 62° or 63° F. (or 17° C.), and the tube be placed in water at 32° F. (0° C.), the liquid should neither become turbid nor deposit a granular mass in less than three minutes; and if the mixture after congealing be exposed to a temperature of 60° F. (15·5° C.) it should gradually afford a clear solution (absence of other fats).

Some interesting notes on the **melting point** of Cacao Butter will be found *P.J.* (3) xxiii. 247. The principal points are: (1) m. p. of trade samples by Redwood's Mercury process 73°—91° F.; (2) m. p. raised and finally lowered by continued heat above its melting point; (3) m. p. in capillary tubes depends upon diameter of bore, the smaller the bore the lower the m. p.; (4) after melting, Cacao Butter takes about twenty-four hours in capillary tubes, to regain its original m. p.

It has also been found that when a sample of Theobroma Oil had been once melted, it requires to be allowed to stand several days before an accurate determination of the sp. gr. can be made.—*P.J.* '98, i. 69.

It has been shown (*C.D.* '89, i. 800) that a large number of chemicals used in the form of suppositories caused the melting point of the mixture to be several degrees higher than the base employed.

Cocoanut Stearin is a better substance than Cacao Butter for making suppositories. *See* p. 605.

Not Official.

THEOBROMINE ($C_7H_8N_4O_2$).—The alkaloid contained in the Cacao seeds, which latter when deprived of part of their fixed oil, constitute the bulk of the commercial 'Cocoa' so largely used as a beverage. It is closely allied to Caffeine, and has a similar physiological action but stronger. It is much less soluble in water than Caffeine, and acts the part of a weak acid, forming compounds with alkalis. The seeds contain 1 to 2 p.c. of the alkaloid.

Diuretic, acting most efficiently in cases of cardiac diseases.—*T.G.* '93, 767; *B.M.J.E.* '93, ii. 104. Considered in many respects superior to Diuretin.—*Pr.* li. 299. Diuresis may be prolonged by the subsequent administration of Digitalin ($\frac{1}{12}$ and $\frac{1}{6}$ grain).—*T.G.* '96, 330; *L.* '96, i. 205; '96, ii. 1820; *P.J.* '95, ii. 391.

Dose.—5 to 10 grains.

Theobromine Salicylate, is stated to be far more stable than the double salt (Diuretin), the latter being decomposed even by Carbonic Acid.—*P.J.* '96, i. 161.

DIURETIN (Sodium Theobromine Salicylate).—A white odourless powder soluble 1 in 1 of cold Water, soluble in Alcohol, insoluble in Chloroform and Ether. Cardiac tonic and diuretic. Useful in both chronic and acute Bright's disease.—*B.M.J.E.* '93, ii. 80; '94, ii. 71; *L.* '96, i. 1132; '98, i. 1621; *Pr.* lvi. 319.

Dose.—10 to 20 grains thrice daily.

THUS AMERICANUM.

FRANKINCENSE.

The concrete oleo-resin which is scraped off the trunks of *Pinus palustris* and *Pinus Tæda*.

From the Southern States of North America.

Solubility.—Almost wholly soluble 1 in 1 of Alcohol (90 p.c.); entirely 4 in 3 of Ether.

Medicinal Properties.—Used externally for the same purposes as Resin.

Official Preparation.—Used in the preparation of Emplastrum Picis.

Description.—When fresh it is a rather soft pale yellow, opaque, tough solid, with a Terebinthinate odour; but on keeping, it becomes dry, brittle, translucent, darker in colour, and fainter in odour.

THYMOL.

THYMOL.

$C_6H_3 \cdot OH \cdot CH_3 \cdot C_3H_7$, eq. 148·98.

A crystalline substance obtained from the volatile oils of *Thymus vulgaris*, *Monarda punctata*, and *Carum Copticum*. Purified by recrystallisation from Alcohol.

Solubility.—1 in 1500 of Water; 1 in 190 of Glycerin; 8 in 3 of Alcohol (90 p.c.) or Ether; 8 in 5 of Chloroform; 1 in 6 of Petroleum Spirit; 1 in 3 of Oil of Turpentine; 1 in 2 of Olive Oil; 4 in 3 of Glacial Acetic Acid; 1 in 6 of Solution of Potash.

Medicinal Properties.—A saturated **solution** in Water is a very powerful antiseptic; it is said to be a more powerful antiseptic than Carbolic Acid; it arrests fermentation in a solution of Sugar and Yeast better than either Carbolic Acid or Salicylic Acid, and it also arrests putrefaction of animal matters.—*B.M.J.* '75, i. 680; used as an intestinal antiseptic in diarrhœa and typhoid. As an **ointment** or **soap** in parasitic skin diseases. As an **inhalation** in laryngitis and bronchial affections; and for many other conditions in which Carbolic Acid is useful. As an anthelmintic.—*L.* '94, ii. 1273. It is a very powerful deodorant, and is a local anæsthetic.

Usually employed as a deodorant, which property it possesses to a marked degree; its **aqueous solution** is very useful in a night commode, and an extremely small quantity of it will keep urine, when it is required to make a twenty-four hours' collection.

Dose.—½ to 2 grains.

Not Official.—Liquor Thymolis, Thymol Antiseptic Dressings, Vapor Thymolis, Oleum Thymi, and Carvacrol Iodide.

Foreign Pharmacopœias.—Official in Austr., Dan., Ger., Hung., Jap., Norw., Russ. and Swiss, Thymolum; Dutch, Fr. and U.S., Thymol; Ital., Timolo; Mex., Acido Timico; Span., Timol; not in the others.

Description.—Large oblique prismatic crystals, having the odour of Thyme and a pungent aromatic taste.

Tests.—They sink in cold Water, but on heating the mixture to a temperature of 110° to 125° F. (43·3° to 51·7° C.) they melt and rise to the surface. The crystals volatilise completely at the temperature of a water-bath. A solution of Thymol in half its bulk of Glacial Acetic Acid, warmed with an equal volume of Sulphuric Acid, assumes a reddish-violet colour.

A characteristic reaction for Thymol and also for Carvacrol, in solution, is a red colour produced on heating a small quantity of either with ·1 gramme of Potassium Hydroxide and 20 drops Chloroform. Thymol requires the addition of a few drops of Alcohol to effect solution, before the colour is produced.—*P...* '96, i. 165.

Not Official.

LIQUOR THYMOLIS.—Thymol, 1; Alcohol (90 p.c.), 100. This solution is very useful, as it may be diluted to any extent with Water without precipitation. Half a pint diluted to a gallon is about the same strength as a saturated aqueous solution.

THYMOL ANTISEPTIC DRESSINGS.—**Gauze**, 5 p. c., and **Wool**, 5 p. c.

VAPOR THYMOLIS (*T.H.*).—Thymol, 6 grains; Alcohol (90 p.c.), 60 minims; Light Magnesium Carbonate, 3 grains. Water to 1 fl. oz.; mix.

A teaspoonful in a pint of Water at 140° F. for each **inhalation.**

A strong stimulant and disinfectant.

OLEUM THYMI.—The Oil distilled from *Thymus vulgaris*. Sp. gr. ·900—·990. Slightly lævo-rotatory. Should contain from 25 to 35 p.c. of Phenols (Thymol and Carvacrol), which should distil about 220° C.

Determination of Thymol and Carvacrol in Thyme Oil.—*J.S.C.I.* '97, 568.

CARVACROL IODIDE.—Produced by the action of Iodine and Potassium Iodide on Carvacrol in solution. A reddish-brown powder, insoluble in water and Alcohol, but soluble in Ether and Chloroform.

As a germicide it is stated to be 5 times more powerful than Iodoform, and being more bulky is better adapted as a dusting powder. The substance which we have prepared many years at the suggestion of Dr. Mortimer Granville is of a reddish-brown colour, but more recently a substance of a light yellow colour has been used in Germany as a substitute for Iodoform.—*P.J.* '96, i. 241.

Iodocrol, a fancy name applied to the latter product.—*P.J.* '98, i. 61.

THYROIDEUM SICCUM.

DRY THYROID.

[NEW.]

A powder prepared from the fresh and healthy Thyroid Gland of the sheep.

Medicinal Properties.—Various preparations of the Thyroid Gland have been used with success in the treatment of myxœdema and certain forms of insanity; psoriasis and chronic scaly skin diseases.—*B.M.J.* '91, ii. 796, 798; '92, ii. 449, 613, 894, 940, 1386; '93, i. 737; '93, ii. 217; '96, ii. 1641; '98, ii. 142; *L.* '92, ii. 941; '93, i. 580; '94, ii. 846; '95, i. 625; '97, ii. 267; *B.M.J.E.* '94, i. 101; *Pr.* liii. 100; preparations, *B.M.J.* '92, ii. 1384, 1459; *L.* '93, i. 273, 396; *C.D.* 93, i. 296; *P.J.* (3) xxiii. 321, 360, 379; *C.D.* '93, i. 296; in goitre, *L.* '95, ii. 169; *B.M.J.* '95, ii. 75; '96, i. 48; in cancer, *L.* '96, ii. 106, 162; in cretinism, *L.* '96, i. 853, 1446; '97, ii. 853; in lupus, *B.M.J.* '94, i. 786; '96, ii. 1200; *L.* '96, ii. 41, 470; in psoriasis, *B.M.J.* '94, i. 186, 617; '95, i. 697; *L.* '95, i. 813; *B.M.J.E.* '95, ii. 35; *P.J.* '95, ii. 391; in ichthyosis, *B.M.J.* '95, i. 696; in pityriasis rubra, *B.M.J.* '95, i. 695; Chemistry and Pharmacology, *P.J.* '96, i. 231; active principle of, *P.J.* '96, i. 351.

Dose.—3 to 10 grains.

Official Preparation.—Liquor Thyroidei.

Not Official.—Iodothyrin, Thyroglandin.

O.M.P.—Remove the external fat and connective tissue from Thyroid Glands taken from sheep immediately after killing. Cut the glands across, and reject any which contain cysts, are hypertrophied, or otherwise abnormal. Mince finely the healthy glands, and dry at a temperature of 90° to 100° F. (32·2° to 37·8° C.); powder the dried product; remove all fat from it by treatment with Petroleum Spirit; and again dry the residue.

Description.—A light dull-brown powder, with a very faint meat-like odour and taste, and free from any flavour of putrescence. It is liable to become damp on exposure to the air, and then deteriorates.

Preparation.

LIQUOR THYROIDEI.—Thyroid Solution. (New.)

A liquid prepared from the fresh and healthy Thyroid Gland of the sheep.

O.M.P.—Remove the external fat and connective tissue from Thyroid Glands taken from sheep immediately after killing; cut the glands across, and reject any that contain cysts, are hypertrophied, or are otherwise abnormal. Count the healthy glands that remain; slice them and bruise them thoroughly in a mortar; for each entire gland (consisting of two lobes) add 34 minims (or 2 c.c.) of Glycerin, and 34 minims (or 2 c.c.) of a ·5 p.c. solution of Phenol in Distilled Water; transfer the mixture, well stirred, to a flask, and close the neck with a plug of Cotton Wool; allow it to stand for twenty-four hours; then strain through linen, with strong pressure; add to the strained liquid sufficient of the ·5 p.c. solution of Phenol to make 100 minims (or 6 c.c.) of the Solution for each gland used.

Description.—A pinkish turbid liquid, entirely free from any odour of putrescence. It must be freshly prepared, and kept in well-stoppered, sterilised, bottles.

100 minims (or 6 c.c.) represent one entire Thyroid Gland.

Dose.—5 to 15 minims.

This preparation does not appear to be a success pharmaceutically, as it readily undergoes decomposition. The menstruum is equal parts of Glycerin and Distilled Water, containing about 1 of Phenol in 400 of the total volume. As there is no attempt at sterilisation by heat, the object of plugging the flask for 24 hours with Cotton Wool is not very evident.

Glycerin is stated not to dissolve out Thyroiodin.—*P.J.* '98, ii. 167; *C.D.* '98, ii. 288.

This statement has been contradicted.—*P.J.* '98, ii. 482. But reaffirmed on strong evidence, and a method, stated to be more accurate, given for the determination of very minute quantities of Iodine in organic compounds.—*P.J.* '98, ii. 546.

Not Official.

IODOTHYRIN (Thyroiodin).—An organic compound of Iodine constituting the active principle of the Thyroid Gland. It is an amorphous light brown powder, insoluble in Water, soluble in Alcohol. Dissolved by alkalis and again precipitated on the addition of an acid. Usually standardised by dilution with Milk Sugar, to contain a definite percentage of Iodine.—*L.* '96, i. 592, 666, 941; '97, ii. 855; *B.M.J.* '96, i. 722; *B.M.J.E.* '96, ii. 59; '97, ii. 8; *P.J.* '96, i. 161; '96, ii. 215, 388; '97, i. 287.

THYROGLANDIN.—A preparation stated to consist of the entire active constituents of the raw gland. It contains the Iodo-globulin obtained from the fresh glands by simple treatment with Water, together with the total amount of Iodothyrin obtained by subsequent treatment of the residual glands with 1 p.c. Soda Solution and exact neutralisation with Hydrochloric Acid.—*P.J.* '98, ii. 167, 654; *C.D.* '98, ii. 288, 970; *B.M.J.* '98, ii. 79.

TINCTURÆ.

TINCTURES.

Most of the Tinctures of the British Pharmacopœia are directed to be made either by 'maceration' or by 'percolation,' the number in each class is nearly equal but there are rather more of the latter; about a dozen are made by simple solution, or mixing the ingredients.

General Processes for 'percolation' and for 'maceration' are given in the Appendix.

The following Tinctures are standardised:—Cinchona, Jalap, and Opium; the Tinctures of Belladonna and Nux Vomica are made from standardised Fluid Extracts; Ammoniated Tincture of Opium and Compound Tincture of Camphor are made from standardised Tincture of Opium; Compound Tincture of Cinchona from standardised Tincture of Cinchona.

The strengths of the various Tinctures have been adjusted so as to have a dosage of 5 to 15 minims for the potent Tinctures, and 30 to 60 for the less potent.

Regarding the Foreign Pharmacopœias, it may be noted that Austr., Dan., Dutch, Ger., Russ., Swiss and U.S., standardise Tincture of Opium; Dutch and U.S. prepare their Tincture of Nux Vomica from a standard Extract. Jap. standardises the Tinctures of Cinchona, Nux Vomica and Opium to a weight of alkaloid, and Tincture of Ipecacuanha with Mayer's reagent. Although in Swiss the Tinctures are made to a given weight, yet there is a rough attempt at standardisation of the Tinctures of Aconite, Belladonna, Colchicum, Ergot, Gelsemium, Ipecacuanha, Nux Vomica, and Sabadilla, by directing that a certain quantity of the Tincture shall yield a flocculent precipitate with Mayer's reagent; Tincture of Digitalis should be rendered opaque by Tannic Acid; the details of the operation are given under the several Tinctures. Tincture of Opium is standardised in the usual manner.

Recovery of Residual Tincture from marcs.—*P.J.* (3) xxv. 141, 155; '95, ii. 157.

Detection of Methylated Spirit in Tinctures.—*Analyst* '94, 265.

The following are the Tinctures of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared; unless otherwise stated they are made with Alcohol (60 p.c.)

Dose.		Proportion of Ingredient.	Alcohol.
5 to 15 minims	TINCTURA ACONITI	1 in 20	70 p.c.
if very frequently repeated, 2 to 5 minims.			
1½ to 2 fl. drm.	TINCTURA ALOES	1 in 40	45 p.c.
for repeated administration, 30 to 60 minims.			
	TINCTURA ARNICÆ	1 in 20	70 p.c.
30 to 60 minims	TINCTURA ASAFETIDÆ	1 in 5	70 p.c.
30 to 60 minims	TINCTURA AURANTII	1 in 4	90 p.c.
5 to 15 minims	TINCTURA BELLADONNÆ. (Liq. Ext.)	1 in 15	
30 to 60 minims	TINCTURA BENZOINI COMPOSITA .	1 in 10	90 p.c.
30 to 60 minims	TINCTURA BUCHU	1 in 5	
30 to 60 minims	TINCTURA CALUMBÆ	1 in 10	
30 to 60 minims	TINCTURA CAMPHORÆ COMPOSITA Tincture of Opium, 29·25 minims; Benzoic Acid, 2 grains; Camphor, 1½ grains; Oil of Anise, 1½ minims	in 1 fl. oz.	
5 to 15 minims	TINCTURA CANNABIS INDICÆ (Ext.)	1 in 20	90 p.c.
5 to 15 minims	TINCTURA CANTHARIDIS	1 in 80	90 p.c.
if frequently repeated, 2 to 5 minims.			

Dose.		Proportion of Ingredient.	Alcohol.
5 to 15 minims	TINCTURA CAPSICI	1 in 20	70 p.c.
30 to 60 minims	TINCTURA CARDAMOMI COMPOSITA .	1 in 80	
30 to 60 minims	TINCTURA CASCARILLÆ	1 in 5	70 p.c.
30 to 60 minims	TINCTURA CATECHU	1 in 5	
30 to 60 minims	TINCTURA CHIRATÆ	1 in 10	
5 to 15 minims	TINCTURA CHLOROFORMI ET MORPHINÆ COMPOSITA		90 p.c.
30 to 60 minims	TINCTURA CIMICIFUGÆ	1 in 10	
30 to 60 minims	TINCTURA CINCHONÆ	standardised	70 p.c.
30 to 60 minims	TINCTURA CINCHONÆ COMP. (Tinct.)	1 in 2	70 p.c.
30 to 60 minims	TINCTURA CINNAMOMI	1 in 5	70 p.c.
5 to 15 minims	TINCTURA COCCI	1 in 10	45 p.c.
5 to 15 minims	TINCTURA COLCHICI SEMINUM . .	1 in 5	45 p.c.
30 to 60 minims	TINCTURA CONII . . . . . (Fruit)	1 in 5	70 p.c.
5 to 15 minims	TINCTURA CROCI	1 in 20	
30 to 60 minims	TINCTURA CUBEBÆ	1 in 5	90 p.c.
5 to 15 minims	TINCTURA DIGITALIS	1 in 8	
30 to 60 minims	TINCTURA ERGOTÆ AMMONIATA .	1 in 4	60 p.c. & Ammon.
5 to 15 minims	TINCT. FERRI PERCHLORIDI (Strong Solution)	1 in 4	90 p.c. & Water
5 to 15 minims	TINCTURA GELSEMII	1 in 10	
30 to 60 minims	TINCTURA GENTIANÆ COMPOSITA .	1 in 10	45 p.c.
30 to 60 minims	TINCTURA GUAIACI AMMONIATA . .	1 in 5	90 p.c. & Ammon.
30 to 60 minims	TINCTURA HAMAMELIDIS	1 in 10	45 p.c.
30 to 60 minims	TINCTURA HYDRASTIS	1 in 10	
30 to 60 minims	TINCTURA HYOSCYAMI	1 in 10	45 p.c.
2 to 5 minims	TINCTURA IODI. (Iodine 1, Iodide Potass. 1)	in 40	90 p.c.
30 to 60 minims	TINCTURA JABORANDI	1 in 5	45 p.c.
30 to 60 minims	TINCTURA JALAPÆ	standardised	70 p.c.
30 to 60 minims	TINCTURA KINO	1 in 10	90 p.c. with Water & Glyc.
30 to 60 minims	TINCTURA KRAMERIÆ	1 in 5	
30 to 60 minims	TINCTURA LAVANDULÆ COMP. (Oil).	1 in 213	90 p.c.
30 to 60 minims	TINCTURA LIMONIS	1 in 4	90 p.c.
5 to 15 minims	TINCTURA LOBELIÆ ÆTHEREA . .	1 in 5	Sp. Ether
30 to 60 minims	TINCTURA LUPULI	1 in 5	
30 to 60 minims	TINCTURA MYRRHÆ	1 in 5	90 p.c.
5 to 15 minims	TINCTURA NUCIS VOMICÆ. 1 grain of Strychnine in 1 fl. oz.		90 p.c. & Water
20 to 30 minims	TINCTURA OPII	standardised	90 p.c. & Water.
for repeated administration, 5 to 15 minims.			
30 to 60 minims	TINCTURA OPII AMMONIATA (Tr. Opii).	3 in 20	90 p.c. & Ammon.
5 to 15 minims	TINCTURA PODOPHYLLI	1 in 27	90 p.c.

Dose.		Proportion of Ingredient.	Alcohol.
30 to 60 minims	TINCTURA PRUNI VIRGINIANÆ . .	1 in 5	90 p.c. & Water
	TINCTURA PYRETHRI	1 in 5	70 p.c.
30 to 60 minims	TINCTURA QUASSIÆ	1 in 10	45 p.c.
30 to 60 minims	TINCTURA QUILLAIÆ	1 in 20	
30 to 60 minims	TINCTURA QUININÆ	about 1 grain in 60 minims.	Tr. Orange.
30 to 60 minims	TINCTURA QUININÆ AMMONIATA .	about 1 grain in 60 minims.	60 p.c. & Ammon.
2 to 4 fl. drm.	TINCTURA RHEI COMPOSITA. . . .	1 in 10	
	for repeated administration, 30 to 60 minims.		
5 to 15 minims	TINCTURA SCILLÆ	1 in 5	
30 to 60 minims	TINCTURA SENEGÆ	1 in 5	
2 to 4 fl. drm.	TINCTURA SENNÆ COMPOSITA . .	1 in 5	45 p.c.
	for repeated administration, 30 to 60 minims.		
30 to 60 minims	TINCTURA SERPENTARIÆ	1 in 5	70 p.c.
5 to 15 minims	TINCTURA STRAMONII	1 in 5	45 p.c.
5 to 15 minims	TINCTURA STROPHANTHI	1 in 40	70 p.c.
30 to 60 minims	TINCTURA SUMBUL	1 in 10	70 p.c.
30 to 60 minims	TINCTURA TOLUTANA—(*See* BALSAM) .	1 in 10	90 p.c.
30 to 60 minims	TINCTURA VALERIANÆ AMMONIATA	1 in 5	60 p.c. & Ammon.
30 to 60 minims	TINCTURA ZINGIBERIS	1 in 10	90 p.c.

Tinctures that are not official are enumerated in the Index.

TRAGACANTHA.

TRAGACANTH.

A gummy exudation obtained by incision from *Astragalus gummifer*, and some other species of Astragalus. Known in commerce as Syrian Tragacanth.

Medicinal Properties.—Demulcent. Used for the suspension of heavy insoluble powders in liquids; 10 grains of the Compound Powder of Tragacanth being used for each fluid ounce of water.

Official Preparations.—Glycerinum Tragacanthæ, Mucilago Tragacanthæ and Pulvis Tragacanthæ Compositus; contained in Confectio Sulphuris, Mistura Cretæ, Mistura Guaiaci, Pilula Quininæ Sulphatis, and Pulvis Opii Compositus. The **Mucilage** is contained in Lotio Hydrargyri Nigra.

Foreign Pharmacopœias.—Official in Belg., Dan., Dutch, Fr., Ger., Hung., Jap., Norw., Russ., Swed., Swiss and U.S.; Ital., Gomma Adragante; Mex., Goma Tragacanto; Port., Gomma Adragantha; Span., Tragacanto; not in Austr.

Description.—White or pale yellowish-white flattened flakes, of varying length and breadth; frequently about one inch (two and a-half centimetres) long and half-an-inch (twelve millimetres) wide; thin, irregularly oblong or more or less curved, and marked on the surface by concentric ridges. They are somewhat translucent, horny, break with a short fracture, and are inodorous and almost tasteless.

Tests.—It is sparingly soluble in Water, but swells into a gelatinous mass, which may be tinged violet or blue by Solution of Iodine.

Pure Tragacanth gives a blue colouration with Iodine, varying in depth in different samples, but in any case it is much too faint to be confounded with added Starch.

Preparations.

GLYCERINUM TRAGACANTHÆ. GLYCERIN OF TRAGACANTH. (ALTERED.)

Tragacanth, in powder, ½; Glycerin, 1½; Distilled Water, ½. Mix the Glycerin with the Tragacanth; add the Distilled Water; triturate until a homogeneous paste is produced.

Tragacanth slightly increased, less Glycerin and more Water used.

Used as a **pill excipient,** but we find the following better for that purpose:—

Tragacanth in powder, 1; Glycerin, 6; rub together and keep for two or three days before use to allow it to stiffen.

(Not in the other Pharmacopœias.)

MUCILAGO TRAGACANTHÆ. MUCILAGE OF TRAGACANTH. (MODIFIED.)

Tragacanth, in powder, 60 grains; Alcohol (90 p.c.) 2 fl. drm.; Distilled Water, a sufficient quantity. Mix the Tragacanth with the Alcohol in a bottle; add a sufficient quantity of Distilled Water to form 10 fl. oz. and shake immediately. =(1 in 74).

Alcohol (90 p.c.) now used instead of Rectified Spirit, and less Water added.

One part of Tragacanth gives more viscosity to water than 25 parts of Gum Acacia.

Foreign Pharmacopœias.—Official in Belg. 1 in 83; Dutch, 1 in 50; Fr., Mucilage de Gomme Adragante, 1 in 10; Ital. and Port., 1 in 10 and 1 in 100; Mex., 1 in 20; Russ., Tragacanth 4, Acacia 1, Water 500; U.S., 6 in 100 with Glycerin; not in the others.

PULVIS TRAGACANTHÆ COMPOSITUS. COMPOUND POWDER OF TRAGACANTH.

Tragacanth, in powder, 1; Gum Acacia, in powder, 1; Starch, in powder, 1; Refined Sugar, in powder, 3. Mix. =(1 in 6).

Dose.—20 to 60 grains.

Foreign Pharmacopœias.—Official in Jap. and Swiss (Pulvis Gummosus), Tragacanth 2, Gum Arabic 2, Sugar 6; not in the others.

Not Official.

TRIFOLIUM.

CLOVER.

A **fluid extract** is made from the dried plant, and from this a **syrup,** a teaspoonful of which 3 or 4 times a day is serviceable in Whooping Cough.

Not Official.

TRITICUM.

COUCH GRASS.

The rhizome of *Agropyrum repens*, gathered in the spring, and deprived of the rootlets.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch and Swiss, Rhizoma Graminis; Fr. Chien-dent; Mex., Grama; Port., Grama Franceza: U.S., Triticum not in the others.

Preparations.

DECOCTUM TRITICI.—Triticum cut small, 1 oz.; Water, 20 fl. oz.: boil ten minutes, and strain when cold.

Dose.—4 to 8 fl. oz. three times a day for cystitis with mucous discharge from the bladder.

(Fr. Tisane 1 in 50.)

EXTRACTUM TRITICI LIQUIDUM (*B.P.C.*).—Triticum in No. 20 powder, 10; percolate with Water until exhausted; evaporate the percolate to 15, and add 5 of Rectified Spirit; set aside for 48 hours, filter, and make up to 20 with a mixture of Water 3 and Rectified Spirit 1.

Dose.—1 to 6 fl. drm.

More easily prepared, and without heat (which is very detrimental to the Extract) by percolation with the above diluted Alcohol, so as to obtain 20 of finished product from 10 of the drug.

Foreign Pharmacopœias.—Official in U.S., 1 in 1; not in the others.

TROCHISCI.

LOZENGES.

The following are the Lozenges of the British Pharmacopœia:—

	Quantity of the active ingredient contained in each lozenge.
TROCHISCUS ACIDI BENZOICI	$\frac{1}{2}$ grain.
TROCHISCUS ACIDI CARBOLICI	1 grain.
TROCHISCUS ACIDI TANNICI	$\frac{1}{2}$ grain.
TROCHISCUS BISMUTHI COMP.(Oxycarbonate)	2 grains.
TROCHISCUS CATECHU	1 grain.
TROCHISCUS EUCALYPTI GUMMI . . .	1 grain.
TROCHISCUS FERRI REDACTI	1 grain.
TROCHISCUS GUAIACI RESINÆ	3 grains.
TROCHISCUS IPECACUANHÆ	$\frac{1}{4}$ grain.
TROCHISCUS KRAMERIÆ	1 grain.
TROCHISCUS KRAMERIÆ ET COCAINÆ	
Extract of Krameria	1 grain.
and Cocaine Hydrochloride	$\frac{1}{60}$ grain.
TROCHISCUS MORPHINÆ . (Hydrochloride)	$\frac{1}{60}$ grain.
TROCHISCUS MORPHINÆ ET IPECAC. „	$\frac{1}{60}$ and $\frac{1}{12}$ grain Ipecac.
TROCHISCUS POTASSII CHLORATIS . . .	3 grains.
TROCHISCUS SANTONINI	1 grain.
TROCHISCUS SODII BICARBONATIS . . .	3 grains.
TROCHISCUS SULPHURIS	5 grains.

Lozenges that are not official are enumerated in the Index.

Black Currant paste is a most convenient substance for making Lozenges of any special drug.

Not Official.

ULEXINE.

An alkaloid prepared from *Ulex Europæus*, the common gorse or furze.

Solubility.—Freely soluble in Water and Chloroform; insoluble in Pure Ether.

The **Nitrate, Hydrochloride,** and **Hydrobromide** are crystalline salts.

Medicinal Properties.—Diuretic; useful in cases of dropsy due to heart disease.

Dose.—$\frac{1}{20}$ to $\frac{1}{15}$ grain dissolved in 60 minims of Water.

P.J. (3) xvii. 101, 229; (3) xix. 1029; (3) xx. 1017; *L.* '86, ii. 645; '87, ii. 691; '88, i. 241.

Ulexine temporarily masks the action of Strychnine.—*T.G.* '87, 280, 690.

Not Official.

ULMUS.

The dried inner bark of *Ulmus campestris*.

Medicinal Properties.—Bitter, demulcent, tonic, astringent. Given internally for chronic scaly skin diseases, externally as an emollient.

Foreign Pharmacopœias.—Official in Fr., Orme Champêtre and O. Fauve; Port., Olmo; U.S., Ulmus Fulva, Slippery Elm.

Preparation.

DECOCTUM ULMI.—Elm Bark cut small, 1; Distilled Water, 8; boil 10 minutes, strain and make up to 8.

Dose.—2 to 4 fluid ounces, three or four times daily.

Foreign Pharmacopœias.—Official in U.S. (Mucilago Ulmi), 6 of Slippery Elm in 100; not in the others.

UNGUENTA.

OINTMENTS.

The following are the Ointments of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared:—

	Proportion of active ingredients in the mass.
UNGUENTUM ACIDI BORICI	1 in 10.
UNGUENTUM ACIDI CARBOLICI	1 in 25.
UNGUENTUM ACIDI SALICYLICI	1 in 50.
UNGUENTUM ACONITINÆ	1 in 50.
UNGUENTUM AQUÆ ROSÆ (Rose Water)	about 1 in $2\frac{3}{4}$.
UNGUENTUM ATROPINÆ	1 in 50.
UNGUENTUM BELLADONNÆ (Liquid Extract)	about 1 in 2.
UNGUENTUM CANTHARIDIS	about 1 in 10.
UNGUENTUM CAPSICI	about 1 in 5.
UNGUENTUM CETACEI	about 1 in 5.
UNGUENTUM CHRYSAROBINI	1 in 25.
UNGUENTUM COCAINÆ	1 in 25.

		Proportion of active ingredients in the mass.
UNGUENTUM CONII	(Juice)	2 in 1.
UNGUENTUM CREOSOTI		1 in 10.
UNGUENTUM EUCALYPTI		1 in 10.
UNGUENTUM GALLÆ		1 in 5.
UNGUENTUM GALLÆ CUM OPIO	(Opium)	about 1 in 13½.
UNGUENTUM GLYCERINI PLUMBI SUBACETATIS		1 in 6.
UNGUENTUM HAMAMELIDIS	(Liquid Extract)	1 in 10.
UNGUENTUM HYDRARGYRI	(Mercury)	about 1 in 2.
UNGUENTUM HYDRARGYRI AMMONIATI		1 in 10.
UNGUENTUM HYDRARGYRI COMPOSITUM	(Mercury)	1 in 5.
UNGUENTUM HYDRARGYRI IODIDI RUBRI		1 in 25.
UNGUENTUM HYDRARGYRI NITRATIS	(Mercury)	1 in 15
UNGUENTUM HYDRARGYRI NITRATIS DILUTUM		1 in 5.
UNGUENTUM HYDRARGYRI OLEATIS		1 in 4.
UNGUENTUM HYDRARGYRI OXIDI FLAVI		1 in 50.
UNGUENTUM HYDRARGYRI OXIDI RUBRI		1 in 10.
UNGUENTUM HYDRARGYRI SUBCHLORIDI		1 in 10.
UNGUENTUM IODI	(Iodine)	1 in 25.
UNGUENTUM IODOFORMI		1 in 10.
UNGUENTUM PARAFFINI	Hard 3, Soft 7,	in 10.
UNGUENTUM PICIS LIQUIDÆ		5 in 7.
UNGUENTUM PLUMBI ACETATIS		1 in 25.
UNGUENTUM PLUMBI CARBONATIS		1 in 10.
UNGUENTUM PLUMBI IODIDI		1 in 10.
UNGUENTUM POTASSII IODIDI		1 in 10.
UNGUENTUM RESINÆ		1 in 3¾.
UNGUENTUM STAPHISAGRIÆ	about	1 in 5¾.
UNGUENTUM SULPHURIS		1 in 10.
UNGUENTUM SULPHURIS IODIDI		1 in 25.
UNGUENTUM VERATRINÆ		1 in 50.
UNGUENTUM ZINCI	about	1 in 6⅔.
UNGUENTUM ZINCI OLEATI		1 in 2.

Ointments which are not official are enumerated in the Index.

Not Official.

URANIUM NITRATE.

A yellow crystalline salt soluble in Water. Has been recommended in the treatment of diabetes.—*B.M.J.* '95, ii. 467; '97, ii. 1044; *Pr.* lxi. 257.

Dose.—5 to 10 grains.

Not Official.

URETHANE.

$C_3H_7NO_2$, eq. 88·43.

The Ethylic Ester of Carbaminic Acid.

In colourless, prismatic crystals, with a peculiar cooling taste; free from odour. Melts at 48° to 50° C. Evolves Ammonia when boiled with Solution of Potash.

Solubility.—1 in 2 of Water; 1 in 1 of Alcohol (90 p.c.); 2 in 3 of Ether.

Medicinal Properties.—A pure hypnotic; has no anodyne properties.

References.—*B.M.J.* '85, ii. 611; '86, i. 343, 354; '86, ii. 108, 468; *T.G.* '88, 340. A weak hypnotic and very uncertain.—*M.A.* '91, 4. In uræmic convulsions.—*M.A.* '95, 498. An antidote to Strychnine.—*B.M.J.* '86, ii. 176.

Dose.—15 to 30 grains.

Foreign Pharmacopœias.—Official in Russ. and Swiss; Mex., Uretano; not in the others.

SOMNAL.—Ethylated Chloral-urethan, $C_{17}H_{12}Cl_3O_3N$.

Hypnotic.—*L.* '89, ii. 1024; very uncertain.—*Y.B.T.* '95, 88; contra-indicated if any gastro-intestinal disturbance be present.—*L.* '95, i. 1024.

Dose.—30 grains.

UROTROPINE. *See* Formic Aldehyde.

UVÆ URSI FOLIA.

BEARBERRY LEAVES.

The dried leaves of *Arctostaphylos Uva-ursi*.

Contains a crystallisable glucoside, **Arbutin**, soluble in Water and Alcohol (90 p.c.).

Medicinal Properties.—Astringent and tonic; it has a disinfectant influence on the urinary tract and is valuable in inflammation of the bladder and urethra.

Official Preparation.—Infusum Uvæ Ursi.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr. (Busserole), Ger., Ital., Jap., Mex. (Gayaba del pais), Norw., Port. (Uva Ursina), Russ., Span. (Gayuba), Swed., Swiss and U.S.; not in Hung.

Description.—Yellowish-green, obovate or spathulate, coriaceous leaves, usually about three-quarters of an inch (eighteen millimetres) in length. They are entire and very shortly petiolate. The upper surface is glabrous, shining and reticulate, and the veinlets are depressed. The leaves have no definite odour but a very astringent taste.

Preparation.

INFUSUM UVÆ URSI. Infusion of Bearberry.

Bearberry Leaves, bruised, 1; Distilled Water, boiling, 20. Infuse in a covered vessel for fifteen minutes; strain. =(1 in 20).

Time reduced.

Dose.—½ to 1 fl. oz.

In the 1864 Pharmacopœia the leaves were not ordered to be bruised; *when bruised*, the infusion is stronger, but a large deposit forms from the strained fluid.

Incompatibles.—Iron salts, Lead salts, Silver Nitrate, vegetable alkaloids, Gelatin.

Foreign Pharmacopœias.—Official in Fr. (Tisane), 1 in 100; not in the others; Mex., has a **Solid Extract**; U.S. has a **solid** and a **Fluid Extract.**

VALERIANÆ RHIZOMA.

VALERIAN RHIZOME.

B.P.Syn.—VALERIAN ROOT.

The dried erect rhizome and roots of *Valeriana officinalis*, collected in the autumn.

That from wild plants growing on dry soil is preferred. It owes its properties to a volatile Oil and a volatile Acid, the salts of which (Valerianates) are not prepared from the root, but synthetically from Amylic Alcohol.

The bulk of the Valerian root used in this country is of foreign growth, and should either be allowed or expressly prohibited in B.P.

Medicinal Properties.—It is a nervine stimulant and antispasmodic. Useful in hysteria, in functional nervous diseases associated with hysteria, and as an adjunct to tonics.

Official Preparation.—Tinctura Valerianæ Ammoniata.

Not Official.—Tinctura Valerianæ, Tinctura Valerianæ Ætherea, Oleum Valerianæ.

Foreign Pharmacopœias.—Official in all.

Description. — A short erect rhizome, entire or sliced, dark yellowish-brown externally, and giving off numerous slender brittle roots three or four inches (seven and a-half to ten centimetres) long, of the same colour as the rhizome; rhizome and roots whitish or yellowish internally.

Test.—The odour that is developed in the process of drying is strong, characteristic, and disagreeable; taste unpleasant, camphoraceous, and slightly bitter.

Preparation.

TINCTURA VALERIANÆ AMMONIATA. AMMONIATED TINCTURE OF VALERIAN. (ALTERED.)

Valerian Rhizome, in No. 40 powder, 4 oz.; Oil of Nutmeg, 30 minims; Oil of Lemon, 20 minims; Solution of Ammonia, 2 fl. oz.; Alcohol (60 p.c.), 18 fl. oz. Mix the liquid ingredients, and prepare by the maceration process. =(1 in 5).

Now 1 in 5 instead of 1 in 8; Alcohol (90 p.c.), Oils of Lemon and Nutmeg, and Solution of Ammonia used in place of Sal Volatile.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Port, 1 in 5 by weight; U.S., 1 in 5; not in the others.

Not Official.

TINCTURA VALERIANÆ.—Percolate 1 of Valerian Rhizome, in No. 40 powder, with sufficient Alcohol (60 p.c.) to produce 5 of Tincture.

Dose.—1 to 2 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Hung., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss, and U.S., 1 in 5; Mex. and U.S. have also **Fluid Extract**; all by weight, except U.S.

TINCTURA VALERIANÆ ÆTHEREA.

Foreign Pharmacopœias.—Official in Belg., Dan., Ger., Hung., Norw., Span., Swed., and Swiss, Valerian 1, Spirit of Ether 5; Fr., Powdered Valerian 1,

Ether (sp. gr. ·758) 5, by percolation; Mex. 1 and 5, Sp. Æther. (sp. gr. ·76); Russ., Valerian 1, Alcohol (90°) 4, Ether (·728) 2; all by weight.

OLEUM VALERIANÆ.—A yellow volatile Oil; sp. gr. ·930—·960.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch, Hung., Port. and Swed.

Not Official.

VANILLA.

The fruit of *Vanilla planifolia*. The finest quality comes from Mexico, and large quantities also come from Bourbon. It owes its fragrance to **Vanillin**, $C_8H_8O_3$, the aldehyde of Methylprotocatechuic Acid, which on oxidation yields **Vanillic Acid** $C_8H_8O_4$. In some text-books they are stated to be the same substance, but this is not the case. Vanillic Acid is without odour and does not form a crystallisable compound with Sodium Bisulphite.

VAPORES.

These have been deleted from B.P. For those 'Not Official' *see* Index.

Not Official.

VERATRI VIRIDIS RHIZOMA.

GREEN HELLEBORE RHIZOME.

The rhizome and rootlets of *Veratrum viride*.

Collected in autumn in U.S. and Canada.

The principal alkaloidal constituent (about half) is **Cevadine,** the same base as is found in Cevadilla; **Jervine** and **Pseudojervine**, in about equal proportions, constituting the remainder.—*P.J.* (3) ix. 986.

Medicinal Properties.—Sedative. Has been given in sthenic forms of fever, and to quiet spinal spasms; should be cautiously prescribed.

In puerperal eclampsia.—*L.* '98, i. 146.

Foreign Pharmacopœias.—Official in Mex., Eleboro Verde; U.S.; not in the others.

Preparation.

TINCTURA VERATRI VIRIDIS.—*B.P.* '85. Green Hellebore Rhizome, in No. 40 powder, 4; Rectified Spirit 20: macerate the Hellebore with 15 of the Spirit forty-eight hours, agitating occasionally, pack it in a percolator, let it drain, pour on the remainder of the Spirit; when it ceases to drop, press, filter, and add sufficient Rectified Spirit to make 20. =(1 in 5).

Dose.—5 to 20 minims.

The best menstruum is Alcohol (70 p. c.), and the best process continuous percolation; the total alkaloid in *root* varies between ·16 and 1·2 p. c., and consequently in the *tincture* between ·032 and ·24 p. c.; **Jervine** constitutes on the average 30 p. c. of total alkaloid.—*C.D.* '92, ii. 651.

Foreign Pharmacopœias.—Official in U.S., American Hellebore, 4 in 10; also a **Fluid Extract** 1 in 1; not in the others.

VERATRINA.

VERATRINE.

An alkaloid, or mixture of alkaloids, prepared from Cevadilla, the dried ripe seeds of *Schœnocaulon officinale.*

The nomenclature of the alkaloids contained in this mixture has undergone modification. Wright and Luff assign to the crystallisable portion (called by Merck 'Veratrine') the name of **Cevadine,** as it yields on saponification Cevadic Acid, the name **Veratrine** being reserved for the base described by Couerbe, which yields Veratric Acid. Another base has been called **Cevadilline,** but the bulk of the alkaloid refuses to yield any crystallisable or otherwise definable compounds.

Solubility.—Scarcely soluble in cold Water; 1 in 1000 of boiling Water; 1 in 3 of Alcohol (90 p.c.); 1 in 6 of Ether; 1 in 3 of Chloroform; sparingly in Glycerin; about 1 in 80 of Olive Oil; and readily in diluted Acids.

Medicinal Properties.—A powerful emetic and drastic purgative. Rarely given internally. As an analgesic and antiphlogistic it is used externally in neuralgia, in chronic swellings, stiffening or induration of the joints. It should not be used where the skin is broken.

Official Preparation.—Unguentum Veratrinæ.

Not Official.—Oleatum Veratrinæ.

Antidotes.—Emetic, stimulants, Coffee, warmth to the extremities. Recumbent position to be strictly maintained.—*Murrell.*

Foreign Pharmacopœias.—Official in all.

O.M.P.—It may be obtained by the following process:—Cevadilla of Commerce, 2 lbs.; Distilled Water, Alcohol (90 p.c.), Solution of Ammonia, Hydrochloric Acid; of each a sufficient quantity. Macerate the Cevadilla with half its weight of boiling Distilled Water, in a covered vessel, for twenty-four hours; remove the Cevadilla; squeeze it; dry it thoroughly in a warm place; then beat it in a mortar, and separate the seeds from the capsules. Reduce the seeds to powder; moisten the powder with the Alcohol; pack firmly in a percolator; pass the Alcohol through the marc until the percolate ceases to be coloured; concentrate the Alcoholic solution by distillation, so long as no deposit forms, and pour the residue, while hot, into twelve times its volume of cold Distilled Water; filter through calico; wash what remains on the filter with Distilled Water, until the filtrate ceases to precipitate with Solution of Ammonia. To the filtrate add Solution of Ammonia in slight excess; let the precipitate completely subside; pour off the supernatant liquid; collect the precipitate on a filter; wash it with Distilled Water until the filtrate passes colourless; distribute the moist precipitate through twelve fluid ounces of Distilled Water; add gradually, with diligent stirring, sufficient Hydrochloric Acid to make the liquid feebly but persistently acid; add sixty grains of the Purified Animal Charcoal of commerce; digest with moderate heat for twenty minutes; filter; allow the liquid to cool; add Solution of Ammonia in slight excess, and, when the precipitate has completely subsided, pour off the supernatant liquid; collect the precipitate on a filter and wash it with cold Distilled Water

until free from Chloride; dry the precipitate, first by imbibition with filtering paper, and then by the application of warmth.

Description.—Pale grey, amorphous, without odour, but, even in the most minute quantity powerfully irritating the nostrils, strongly and persistently bitter, and intensely acrid; insoluble in Water, soluble in diluted acids, leaving slight traces of an insoluble brown resinous matter.

Tests.—It dissolves in Nitric Acid, yielding a yellow solution. Warmed with Hydrochloric Acid, it dissolves with production of a blood-red colour lasting several days. Treated with fifty or sixty times its weight of Sulphuric Acid, the mixture turns yellow, subsequently acquires a yellowish-green fluorescence which becomes more distinct on the addition of more acid, and slowly changes to bright-red, or, if warmed, violet-red. Heated with access of air, Veratrine melts to a yellow liquid, and at length burns away, leaving no appreciable residue (absence of mineral impurity).

Veratrine with Sulphuric Acid first goes yellow and then bright red, the addition of a drop of Syrup darkens the red and gives it a purple colour; by exposure to air the purple becomes blue. Sulphuric Acid with ¼ of its volume of Water is a better reagent.

Preparation.

UNGUENTUM VERATRINÆ. VERATRINE OINTMENT. (ALTERED.)

Veratrine, 10 grains; Oleic Acid, 40 grains; Lard, 450 grains. Rub the Veratrine with the Oleic Acid, and gently warm the mixture until dissolved; add the Lard; mix. =(1 in 50).

Now 1 in 50 instead of 1 in 63, Hard and Soft Paraffins and Olive Oil replaced by Oleic Acid and Lard.

Foreign Pharmacopœias.—Official in U.S., 1 in 25; Russ., 1 in 50; Port. (Pomada), 1 in 50; not in the others.

Not Official.

OLEATUM VERATRINÆ (*U.S.*).—Veratrine, 2; Oleic Acid, 98; rub together, and heat on a water-bath until dissolved.

Squibb suggests that this should be made 10 p.c. as more likely to give relief in neuralgia.—*Ephemeris*, p. 164.

Not Official.

VIBURNUM.

BLACK HAW.

The bark of *Viburnum prunifolium*.

Distinction between Viburnum barks.—*A.J.P.* '95, 387; '96, 225.

Medicinal Properties.—Strongly recommended as a preventive in cases of threatened abortion; to control menorrhagia and metrorrhagia and in all kinds of pelvic inflammation; brilliant results in dysmenorrhœa.—*M.A.* '95, 192; *B.M.J.* '95, ii. 1562; *L.* '95, ii. 1625.

REFERENCES —*B.M.J.* '85, i. 987; '86, i. 489, 542, 641, 740, 973; '87, i. 1153; *T.G.* '95, 114.

Foreign Pharmacopœias.—Official in Mex.; U.S.; not in the others.

Preparation.

EXTRACTUM VIBURNI PRUNIFOLII FLUIDUM (*U.S.*).—Exhaust by percolation Viburnum (in No. 60 powder), 100 parts, with a mixture of Alcohol 3 and Water 1; reserve the first 85, and evaporate the remainder to a soft extract; dissolve this in the reserved portion, and add enough menstruum to measure 100.

VINA.

WINES.

Medicated wines are of very ancient date, and were admitted into our earliest Pharmacopœias. Two only remain as representatives of the old Pharmacopœias—Vinum Antimoniale and Vinum Ferri; the former was prepared by digesting 4 ounces of the Regulus of Antimony in powder with 3 pounds of 'White' Wine (Pharmacopœia Londinensis, 1655). The latter (Vinum Chalybeatum) was made with Rhenish Wine and Iron filings.

The following are the Wines of the British Pharmacopœia, the formulas for which will be found under the names of the drugs from which they are prepared:—

Dose.		Proportion of active ingredient in the whole.
10 to 30 minims.	VINUM ANTIMONIALE	2 grains in 1 fl. oz.
As an emetic, 2 to 4 fl. drm.		
	VINUM AURANTII	10 to 12 p.c. of Ethyl Hydroxide by volume.
10 to 30 minims.	VINUM COLCHICI	(dried Corm) 1 in 5.
1 to 4 fl. drm.	VINUM FERRI	made with Iron Wire.
1 to 4 fl. drm.	VINUM FERRI CITRATIS	8 grains in 1 fl. oz.
10 to 30 minims.	VINUM IPECACUANHÆ. (Liquid Extract)	1 in 20.
as an expectorant; as an emetic, 4 to 6 fl. drm.		
½ to 1 fl. oz.	VINUM QUININÆ. (Hydrochloride.)	1 grain in 1 fl. oz.
	VINUM XERICUM.	16 p.c. Ethyl Hydroxide by volume.

VINUM XERICUM.

SHERRY.

A Spanish Wine.

Unless good sound Sherry is used, the preparations are apt to spoil by keeping.

For the amount of Alcohol in the several wines most commonly drunk in England, *see* p. 603.

Official Preparations.—Used in the preparation of Vinum Antimoniale, Vinum Colchici, Vinum Ferri, and Vinum Ipecacuanhæ.

Not Official.—Vinum Xericum Detannatum.

Description.—Pale yellowish-brown, containing not less than 16 p.c. of Ethyl Hydroxide by volume.

Tests.—When a mixture of 50 c.c. of this wine and 50 c.c. of Water, acidulated with 5 c.c. of the Volumetric Solution of Sulphuric Acid is distilled, the distillate, after rejection of the first 10 c.c. shaken with Ether, the ethereal liquid separated and its

Ether removed by evaporation, the residue should not yield a violet coloration when mixed with Test-solution of Ferric Chloride (absence of Salicylic Acid).

For remarks on the above test *see* Vinum Aurantii.

Not Official.

VINUM XERICUM DETANNATUM (*B.P.C.*).—Sherry, 160; Gelatin, cut small, 2; macerate together for fourteen days, and decant.

Not Official.

VINCA MAJOR.

GREATER PERIWINKLE.

An **infusion** made of dried herb 2, boiling Water 20, and strained when cold, is powerfully astringent.

Dose.—A wineglassful drunk as frequently as required will arrest menorrhagia when other remedies have failed.

Foreign Pharmacopœias.—Official in Fr., Pervenche Grande; not in the others.

Preparation.

EXTRACTUM VINCÆ MAJORIS LIQUIDUM.—Made from the expressed juice of the plant of such strength that 1½ fl. drm. are equal to 2 fl. oz. of the infusion.

Dose.—1 to 2 fl. drm. in water.

The Fluid Extract keeps well, and is the best to prescribe.

Not Official.

YERBA SANTA.

The leaves of *Eriodictyon Californicum*.

They contain 30 to 40 p.c. of a gum-resin.

Recommended in acute bronchitis.—*L.M.R.* '82, 47.

Fluid Extract, 1 in 1, made with strong Alcohol; dose, 10 to 60 minims.

Not Official.

ZINCUM.

ZINC.

Zn, eq. 64·91.

Zinc has been transferred to the Appendix of B.P. '98. A bluish-white metal, of peculiar taste and of a perceptible smell when rubbed; laminated, and with a crystalline fracture. Sp. gr. 7·1; fuses at 773° F.

It occurs native, as a Sulphide or as a Carbonate, and is separated from impurities by sublimation.

The Official tests for the presence of Zinc will be found in the Appendix.

Foreign Pharmacopœias.—Official in Ital., Mex., Russ. and U.S.

Incompatibles of Zinc salts are—Alkalis and their Carbonates, Lime Water, astringent vegetable Infusions or Decoctions, and Milk.

Antidotes.—In case of poisoning with the salts of Zinc, Sodium Carbonate or Potassium Carbonate in large quantities dissolved in warm Water, Milk and Eggs freely, Tannic Acid or strong Tea, Laudanum, Linseed Meal Poultices to abdomen.

If there is much pain in the abdomen, an enema of gruel, or starch and water may be given.—*Murrell.*

Official Preparations.—Used to prepare Liquor Zinci Chloridi, Zinci Chloridum, Zinci Oxidum, Zinci Sulphas.

The British Pharmacopœia contains the following salts of Zinc:—

ZINCI ACETAS.
ZINCI CARBONAS.
ZINCI CHLORIDUM.
ZINCI OXIDUM.
ZINCI SULPHAS.
ZINCI SULPHOCARBOLAS.
ZINCI VALERIANAS.

ZINCI ACETAS.

ZINC ACETATE.

$Zn(C_2H_3O_2)_2, 3H_2O$, eq. 235·71.

It is prepared by neutralising Acetic Acid with Zinc Carbonate.

The commercial salt as a rule is slightly basic, and does not give a clear solution in Water without the assistance of a little added Acetic Acid.

Solubility.—10 in 25 of Water; 4 in 1 of boiling Water, 1 in 40 of Alcohol (90 p.c.); 1 in 3 of boiling Alcohol (90 p.c.).

Medicinal Properties.—Astringent. Similar to the Sulphate, chiefly used as a local astringent.

Dose.—1 to 2 grains.

Not Official.—Lotio Zinci Acetatis.

Foreign Pharmacopœias.—Official in Belg., Fr., Ger., Hung., Mex., Port., Russ., Span. and U.S.; not in the others.

Description.—In thin, translucent, and colourless crystalline plates, of a pearly lustre; with a sharp unpleasant taste; soluble in 2·5 parts of Water.

Tests.—It affords the reactions characteristic of Zinc and of Acetates. It should yield no characteristic reaction with the tests for Lead, Copper, Cadmium, Arsenium, Iron, Aluminium, Calcium, Magnesium, Sodium, Potassium, Ammonium, Chlorides or Sulphates.

Not Official.

LOTIO ZINCI ACETATIS.—Zinc Acetate, 2 grains; Water, 1 fl. oz.: mix.

An astringent **collyrium** in ophthalmia, or as an **injection** in gonorrhœa after the acute stage has passed.

Tincture of Opium causes no precipitate with this Lotion.

A lotion very commonly prescribed at one time was that containing Zinc Sulphate and Lead Acetate, which mutually react with formation of soluble Zinc Acetate and insoluble Zinc Sulphate; it has been superseded by the above.

Not Official.

ZINCI BROMIDUM.

A whitish granular powder, very deliquescent.

Solubility.—4 in 1 of Water; 2 in 1 of Alcohol (90 p.c.).

Dose.—2 grains three times a day for epilepsy.

Foreign Pharmacopœias.—Official in Mex., Span. and U.S.; not in the others.

ZINCI CARBONAS.

ZINC CARBONATE.

$ZnCO_3(ZnH_2O_2)_2$, H_2O, eq. 339·68.

Zinc Carbonate or Zinc Hydroxycarbonate, is produced by the interaction of Zinc Sulphate and Sodium Carbonate.

The anhydrous normal Carbonate, $ZnCO_3$, occurs native as **Calamine.** The composition of the precipitated hydrated Carbonate varies much according to the conditions under which it is formed.

Official Preparations.—Used in the preparation of Zinci Acetas, Zinci Oxidum, and Zinci Valerianas.

Foreign Pharmacopœias.—Official in U.S., Zinci Carbonas Præcipitatus; not in the others.

Description.—A white, tasteless, inodorous powder, insoluble in Water; entirely soluble in Diluted Nitric Acid.

Tests.—It affords the reactions characteristic of Zinc and of Carbonates. It should yield no characteristic reaction with the tests for Lead, Copper, Cadmium, Arsenium, Iron, Aluminium, Calcium, Magnesium, Sodium, Potassium, or Ammonium, and only the slightest reactions with the tests for Chlorides or Sulphates.

ZINCI CHLORIDUM.

ZINC CHLORIDE.

$ZnCl_2$, eq. 135·29.

It is produced by the interaction of Hydrochloric Acid and Zinc.

Solubility.—10 in 4 of Water; 1 in 1 of Alcohol (90 p.c.); freely in Ether; 1 in 4 (nearly) of Glycerin.

Medicinal Properties.—Astringent, antiseptic and disinfectant. Seldom given internally. Externally, applied as a caustic, in form of **point** or **paste,** to indolent and malignant ulcers and growths, to condylomata, and to nævi. As a **lotion,** 20 grains to 1 fl. oz. of Water, it is an efficient substitute for Carbolic Acid, in syringing out offensive pus cavities, sinuses, foul ulcers, &c.

As a paste for packing the cavity of uterus in malignant disease.—*B.M.J.* '95, i. 756.

As an injection (1 grain to 1 fl. oz.) in gonorrhœa.

Official Preparation.—Liquor Zinci Chloridi.

Not Official.—Zinc Chloride Points, Compound Zinc Chloride Points, Lotio Zinci Chloridi, Pasta Zinci Chloridi, Pasta Zinci Chloridi cum Opio, Pulvis Zinci Chloridi Comp.

Antidotes.—In case of poisoning with Zinc Chloride, *see* Zincum, page 645.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ. and Swiss, Zincum Chloratum; Belg., Chloruretum Zinci; Dan., Norw. and Swed., Chloretum Zincicum; Fr., Chlorure de Zinc; Ital., Cloruro di Zinco; Mex., Cloruro de Zinc; Port., Chloreto de Zinco; Span., Cloruro Zincico; U.S., Zinci Chloridum; not in Dutch.

Description. — In colourless opaque rods or tablets, very deliquescent and caustic.

Tests.—Almost entirely soluble in Water, Alcohol (90 p.c.), and Ether. It affords the reactions characteristic of Zinc and of Chlorides. It should yield no characteristic reaction with the tests for Lead, Copper, Cadmium, Arsenium, Iron, Aluminium, Calcium, Magnesium, Sodium, Potassium, Ammonium, or Sulphates.

Preparation.

LIQUOR ZINCI CHLORIDI. Solution of Zinc Chloride.

Granulated Zinc, 16; Hydrochloric Acid, 44; Distilled Water, a sufficient quantity. Mix the Hydrochloric Acid with 20 of Distilled Water in a porcelain dish; add the Zinc; apply gentle heat until gas is no longer evolved; boil for half an hour, supplying the water lost by evaporation; allow the product to cool. Test a few drops of the resulting liquid for Iron and Lead.

If either be present, filter the remainder of the product into a bottle, and add Solution of Chlorine by degrees, with frequent agitation, until the liquid acquires a permanent odour of Chlorine; add Zinc Carbonate in small quantities at a time, with renewed agitation, until a brown sediment appears and the whole of the Iron or Lead is thus precipitated; filter the liquid into a basin, and evaporate to the bulk of 40.

If no Iron or Lead be present, filter the cooled product and evaporate it to 40.

Foreign Pharmacopœias.—Official in U.S., sp. gr. 1·535; not in the others.

Description.—A colourless liquid of astringent and sweetish taste.

Tests.—Sp. gr. 1·530. It should respond to the tests for Zinc and for Chlorides. It should not yield any characteristic reaction with the tests for Lead, Copper, Cadmium, Arsenium, Iron, Aluminium, Calcium, Magnesium, or Sulphates.

When made as above the solution will be basic and precipitate Oxychloride on dilution with Water. It should be evaporated rather lower, then neutralised with Hydrochloric Acid (so that it will cease to precipitate on being diluted with ten volumes of Water, or when this diluted solution just reddens Methyl Orange), and finally made up to 40.

When finished without loss the above quantities will yield a solution sp. gr. about 1·53. For details and an improved formula of **Chlor-Zinc Iodine (Schulze's Solution)** *see P.J.* (3) xxiii. 648.

Not Official.

ZINC CHLORIDE POINTS.—Zinc Chloride fused and run into conical moulds; preserved in glass tubes.

Darts of Zinc Chloride have been used in the treatment of Anthrax.—*B.M.J.* '87, ii. 644.

COMPOUND ZINC CHLORIDE POINTS.—Zinc Chloride, 1; Zinc Oxide, 1; Wheaten Flour, 2; Water to make a stiff paste, which is formed into points.

LOTIO ZINCI CHLORIDI (*L.O.H.*).—Zinc Chloride, 1 grain; Distilled Water, 1 fl. oz.

PASTA ZINCI CHLORIDI (*L.H.*).—Zinc Chloride and Flour, equal parts; Glycerin, *q.s.*; rub the Zinc Chloride into a thin paste with Water, then add the Flour; mix well and make into a thick paste with Glycerin.

PASTA ZINCI CHLORIDI CUM OPIO (*L.H.*).—Zinc Chloride Paste, 1 oz.; Extract of Opium, 20 grains; rub the Extract smooth with a few drops of Water and then mix thoroughly with the Paste.

PULVIS ZINCI CHLORIDI COMP.—Zinc Oxide, mixed with an equal weight of Zinc Chloride, will preserve the latter dry enough to blow through a tube into any cavity required, and may be so kept in a bottle for a long time.

Not Official.

ZINCI NITRAS.

Medicinal Properties.—Used as a caustic in the place of Zinc Chloride, it penetrates deeper and produces less pain.

It can be made into a **paste** in the same way as Zinc Chloride.

ZINCI OXIDUM.

ZINC OXIDE.

ZnO, eq. 80·79.

It may be prepared by exposing Zinc Carbonate to a dull red heat, or from metallic Zinc by combustion.

Medicinal Properties.—Internally as a tonic, especially in chronic nervous spasmodic affections and to check the perspirations of phthisis. Externally, an astringent application in eczema and slight excoriations and ulcerations, in the form of **ointment** or **paste**; absorbent as a **dusting powder** when mixed with Starch.

Dose.—3 to 10 grains.

Prescribing Note.—Generally prescribed in the form of **pills**. A good pill may be made by adding Glucose q.s.

Official Preparation.—Unguentum Zinci. Used in the preparation of Zinci Sulphocarbolas.

Not Official.—Dusting Powder, Lassar's Paste, Zinci Oleas (Shoemaker's), Zinc Oxide Plaster Mulls, Zinc and Salicylic Plaster Mulls, and Zinc Gelatin.

Foreign Pharmacopœias.—Official in all; Fr. by the dry as well as the humid process.

Description.—Prepared from the Carbonate it is a soft, nearly

white, tasteless, and inodorous powder, becoming pale yellow when heated; prepared by combustion it is white.

Tests.—It affords the reactions characteristic of Zinc. It should be entirely soluble when rubbed, and, if necessary, warmed, with Solution of Ammonia mixed with Strong Solution of Ammonia (absence of metallic zinc). It should yield no characteristic reaction with the tests for Lead, Copper, Cadmium, Arsenium, Iron, Aluminum, Calcium, Magnesium, Sodium, Potassium, Ammonium, Carbonates, Chlorides, or Sulphates.

It is questionable whether any commercial Zinc Oxide is entirely soluble in Ammonia.

Preparation.

UNGUENTUM ZINCI. Zinc Ointment.

Zinc Oxide, finely sifted, 3; Benzoated Lard, 17. Add the Zinc Oxide gradually to the Benzoated Lard, previously melted at a low temperature; stir the mixture constantly until cold. =(1 in $6\frac{2}{3}$).

Foreign Pharmacopœias.—Official in Austr., 1 in $7\frac{1}{2}$; Belg., Dan., Dutch, Fr. (Pommade), Ger., Hung., Jap., Mex., Norw., Russ. and Swiss, 1 in 10; Span., 1 in 16; U.S., 1 in 5; not in Ital., Port. or Swed.

Applied to the feet once in twenty-four hours, prevents the unpleasant odour of perspiration.

Not Official.

DUSTING POWDER.—Zinc Oxide, 3; Salicylic Acid (in fine powder), 1; Starch, 12.

LASSAR'S PASTE.—Zinc Oxide, 24; Starch, 24; Salicylic Acid, 2; Soft Paraffin, 50. Used in eczema.

ZINCI OLEAS (Shoemaker's).—Zinc Acetate, 180 grains; dissolve in cold Water 40 fl. oz. Add slowly 20 fl. oz. of a **Solution of Sodium Oleate,** made by dissolving powdered Castile Soap 1 oz. in 20 fl. oz. of Water; wash the precipitate with cold Water, collect, and dry.

It forms a solid cake, easily powdered, and melting at about 175° F.

Solution of Sodium Oleate of the above strength is also used to precipitate Bismuth, Copper, and Lead Oleates.

ZINC OXIDE PLASTER MULLS (Unna).—Containing $\frac{1}{2}$ grain and 1 grain to the square inch.

ZINC AND SALICYLIC PLASTER MULL (Unna).—Containing Zinc Oxide $\frac{1}{2}$ grain and Salicylic Acid $\frac{1}{4}$ grain to the square inch.

ZINC GELATIN (Unna).—Zinc Oxide, 10; Gelatin, 10; Glycerin, 20; Water, 20.

Not Official.

ZINCI PERMANGANAS.

In reddish-purple crystalline masses.

Solubility.—About 1 in 3 of Water, generally with a slight residue.

An **injection** in chronic urethritis, 1 grain in 8 fl. oz. of Water.—*B.M.J.* '89, i. 1458.

Not Official.

ZINCI PHOSPHIDUM.

Minutely crystalline friable fragments, or a greyish-black powder, containing about 24 p.c. of Phosphorus, corresponding to the formula Zn_3P_2.

Solubility.—Insoluble in Water or Alcohol (90 p.c.). Soluble in Acids with evolution of Phosphuretted Hydrogen, which is not spontaneously inflammable.

Medicinal Properties.—Strongly recommended as a substitute for Phosphorus. In hay fever.—*Pr.* lv. 205; *P.J.* '95, ii. 205.

Dose.—$\frac{1}{50}$ to $\frac{1}{4}$ grain, given in a **pill** with Milk Sugar and Glucose.

Foreign Pharmacopœias.—Official in Fr., Phosphure de Zinc; Mex., Fosfuro de Zinc; U.S.; not in the others.

ZINCI SULPHAS.

ZINC SULPHATE.

$ZnSO_4.7H_2O$, eq. 285·41.

It is formed by the interaction of diluted Sulphuric Acid and Zinc.

Solubility.—10 in 7 of Water. Insoluble in Alcohol (90 p.c.).

Medicinal Properties.—In small doses tonic and astringent; chiefly employed in spasmodic diseases, as epilepsy, chorea, whooping-cough; also in infantile diarrhœa; in large doses a prompt emetic. As an astringent **injection** in leucorrhœa and in the less acute stages of gonorrhœa; as a **collyrium** in ophthalmia.

Dose.—1 to 3 grains, as a tonic; as an emetic, 10 to 30 grains.

Prescribing Note.—Tincture or Wine of Opium causes no precipitate with Solutions of Zinc.

Official Preparations.—Used in the preparation of Unguentum Zinci Oleatis, Zinci Carbonas, and Zinci Valerianas.

Not Official.—Injectio Sulphatum, Injectio Zinci Sulphatis, Lotio Rubra, Lotio Zinci Sulphatis, and Cadmii Sulphas.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap., Russ. and Swiss, Zincum Sulfuricum; Belg., Sulphas Zinci; Dan., Dutch, Norw., and Swed., Sulphas Zincicus; Fr., Sulfate de Zinc; Ital., Solfato di Zinco; Mex., Sulfato de Zinc; Port., Sulfato de Zinco; Span., Sulfato Zincico; U.S., Zinci Sulphas.

Description.—Colourless, transparent, prismatic crystals, with a strong metallic styptic taste. Soluble in less than an equal weight of cold Water.

Tests.—It affords the reactions characteristic of Zinc and of Sulphates. It should yield no characteristic reaction with the tests for Lead, Copper, Cadmium, Arsenium, Aluminium, Calcium, Magnesium, Sodium, Potassium, Ammonium, or Acetates, and only the slightest reactions with the tests for Iron or Chlorides.

Preparations.

UNGUENTUM ZINCI OLEATIS. Zinc Oleate Ointment.

Zinc Sulphate, 2; Hard Soap, in shavings, 4; Distilled Water, boiling, Soft Paraffin, white, of each a sufficient quantity. Dissolve the Zinc Sulphate in 4 of the Distilled Water. Dissolve the Hard Soap in 40 of the Distilled Water. Mix the solutions; collect the precipitated Zinc Oleate; wash with hot Distilled Water until the washings afford little or no reaction for Sulphate; dry on a water-bath

and mix with an equal weight of the Soft Paraffin, melted; stir until cold.

The Zinc Oleate is now made by precipitation as above.

Not Official.

INJECTIO SULPHATUM—Zinc Sulphate, Copper Sulphate, Ferrous Sulphate and Alum, of each 1 grain, Water to 1 fl. oz.—*Lock Hospital.*

INJECTIO ZINCI SULPHATIS.—Zinc Sulphate, 3 grains; Water 1 fl. oz.

For gonorrhœa and leucorrhœa.

LOTIO RUBRA.—Zinc Sulphate, 2 grains; Compound Tincture of Lavender, 10 minims; Water to 1 fl. oz. A stimulant to indolent ulcers.

LOTIO ZINCI SULPHATIS (*L.O.H.*).—Zinc Sulphate, 1 grain; Distilled Water, 1 fl. oz. Used in ophthalmia.

CADMII SULPHAS.—Colourless crystals, readily soluble in Water, insoluble in Alcohol. Has been used as an astringent in the place of Zinc Sulphate.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., and Port.; not in the others.

ZINCI SULPHOCARBOLAS.

ZINC SULPHOCARBOLATE.

$Zn(OH{\cdot}C_6H_4{\cdot}SO_3)_2$, H_2O, eq. 426·39.

Zinc Sulphocarbolate, or Zinc phenol-para-sulphonate, may be obtained by heating a mixture of Phenol and Sulphuric Acid, and saturating the product with Zinc Oxide.

Prepared in this way it will contain a quantity of Sulphate.

Solubility.—1 in 2 of Water; 3 in 1 of boiling Water; 1 in $2\frac{1}{2}$ of Alcohol (90 p.c.).

Medicinal Properties.—Astringent and antiseptic.

For a **spray** to the throat, 5 grains to the ounce of Water; for a **nasal douche**, 2 grains to the ounce of Water; for **vaginal injection**, 60 grains in a pint of Water, for leucorrhœa or gonorrhœa.

Foreign Pharmacopœias.—Dutch, Sulphophenylas Zincicus; Russ., Zincum Sulfocarbolicum; Swiss, Zincum Sulfophenolicum; not in the others.

Description.—Colourless, transparent, tabular, efflorescent crystals; soluble in 2·5 parts of Alcohol (90 p.c.), and in 2 parts of Water.

Tests.—The aqueous solution is coloured violet by Test-solution of Ferric Chloride, and affords a white precipitate with Solution of Ammonium Hydrosulphide. It should yield no characteristic reaction with the tests for Lead, Copper, Cadmium, Arsenium, Iron, Aluminium, Calcium, Magnesium, Sodium, Potassium, Ammonium, Acetates or Chlorides, and only the slightest reactions with the tests for Sulphates.

ZINCI VALERIANAS.

ZINC VALERIANATE.

$Zn(C_5H_9O_2)_2$, eq. 265·53.

Zinc Valerianate, or Zinc Iso-valerianate, may be prepared by saturating Iso-valerianic Acid with Zinc Carbonate, or by the interaction of Zinc Sulphate and Sodium Iso-valerianate.

Solubility.—1 in 120 of Water; 1 in 60 of Alcohol (90 p.c.); 1 in 500 of Ether.

Medicinal Properties.—Antispasmodic and nervine tonic, used in various neuralgic and hysterical affections, and sometimes in chorea.

In hay fever.—*B.M.J.* '96, i. 967.

Dose.—1 to 3 grains.

Incompatibles.—All Acids, soluble Carbonates, most metallic salts, vegetable astringents.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Hung., Ital., Mex., Port., Russ., Span., Swed., Swiss and U.S.; not in Austr., Dan., Ger., Jap. or Norw.

Description.—In white pearly tabular crystals, with a disagreeable odour and a metallic taste; very slightly soluble in cold Water or in Ether, soluble in hot Water and Alcohol (90 p.c.).

Tests.—On heating to redness, after moistening with a small quantity of Nitric Acid it should yield not less than 26 nor more than 30 p.c. of Zinc Oxide. It should yield no characteristic reaction with the tests for Lead, Copper, Cadmium, Arsenium, Iron, Aluminium, Calcium, Magnesium, Sodium, Potassium, Ammonium, Acetates, or Carbonates, and only the slightest reactions with the tests for Chlorides or Sulphates. When heated with Diluted Sulphuric Acid, it gives a distillate which, when mixed with Solution of Copper Acetate, does not immediately affect the transparency of the liquid but forms after a little time oily drops, which gradually pass into a bluish-white crystalline deposit (absence of Butyrates).

Butyric Acid if present will form an immediate crystalline precipitate.

The theoretical percentage of ZnO is 30·3 (with H_2O 28·4). The examination of a number of commercial samples is given (*P.J.* (3) xxiii., 190), the yield being from 21 to 64 p. c. of Oxide, and suggesting a minimum standard of 26 p. c. All the samples examined showed Butyric Acid by the copper test. The commercial 'praecip.' generally contains a quantity of Oxide, but pure samples can occasionally be obtained.

ZINGIBER.

GINGER.

The scraped and dried rhizome of *Zingiber officinale*.

From plants cultivated in the West Indies, India, and other countries.

Medicinal Properties.—Aromatic stimulant and carminative. It is given in atonic dyspepsia, flatulency, and as a corrective adjunct to purgative medicines.

Official Preparations.—Syrupus Zingiberis, and Tinctura Zingiberis; used in the preparation of Infusum Sennæ, Pilula Scillæ Composita, Pulvis Cinnamomi

Compositus, Pulvis Jalapæ Compositus, Pulvis Opii Compositus, Pulvis Rhei Compositus, Pulvis Scammonii Compositus. Contained in Mistura Sennæ Composita, Pilula Aloes et Ferri, and Pilula Cambogiæ Composita. The **Tincture** is used in the preparation of Acidum Sulphuricum Aromaticum, Liquor Sennæ Concentratus, Pilula Scammonii Composita, and contained in Infusum Cinchonæ Acidum.

Not Official.—Tinctura Zingiberis Fortior, and Oleoresina Zingiberis.

Foreign Pharmacopœias.—Official in all; Fr., Gingembre; Ital., Zenzero; Port., Gengibre; Mex. and Span., Jengibre.

Description.—In flattish irregularly branched pieces; varying in length, but commonly from about three to four inches (seven and a-half to ten centimetres), each branch marked at its summit by a depressed scar; externally pale buff and somewhat striated and fibrous; breaking readily with a mealy, short, but rather fibrous or sometimes resinous fracture. Odour agreeable, aromatic; taste hot and pungent.

Preparations.

SYRUPUS ZINGIBERIS. Syrup of Ginger.

Ginger, in fine powder, ½; Alcohol (90 p.c.), Syrup, of each a sufficient quantity. Prepare 1 of a strong tincture of the Ginger by the process of percolation with the Alcohol. To this add sufficient of the Syrup to produce 20 of the Syrup of Ginger. =(about 1 in 27).

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Jap., 1 of Tincture in 10; Swed., 1 (rhizome) in 28, by weight; U.S., 3 (Fluid Extract) in 100; not in the others.

TINCTURA ZINGIBERIS. Tincture of Ginger. (Altered.)

Ginger, in No. 40 powder, 2; Alcohol (90 p.c.) a sufficient quantity. Moisten the powder with 2 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 10).

Now 1 in 10 instead of 1 in 8 and Alcohol (90 p.c.) used in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Fr., Ger., Hung., Jap., Mex., Port., Russ., Swiss and U.S., 1 in 5; all by weight except U.S.; not in the others.

Not Official.

TINCTURA ZINGIBERIS FORTIOR. *Syn.*—Essence of Ginger. (*B.P.* '85).—Ginger percolated with Alcohol (90 p.c.) to form 1 in 2.

Our **Essence of Ginger** has always been twice the above strength.

By repercolation a fluid Extract 1 in 1, or even 2 in 1, can be readily prepared.

OLEORESINA ZINGIBERIS (*U.S.*) *Syn.*—Gingerine.

Ginger, in No. 60 powder, 10; Ether, a sufficient quantity. Put the Ginger into a cylindrical glass percolator, provided with a stop-cock, and arranged with cover and receptacle suitable for volatile liquids. Press the drug firmly, and percolate slowly with Ether, added in successive portions, until the drug is exhausted. Recover the greater part of the Ether from the percolate by distillation on a water-bath, and, having transferred the residue to a capsule, allow the remaining Ether to evaporate spontaneously.

Keep the Oleoresin in a well-stoppered bottle.

(Not in the other Pharmacopœias.)

Note on Extract of Ginger (Gingerine).—*P.J.* '98, ii. 178; *C.D.* '98. ii. 296.