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-