2. **Chloride of Gold and Sodium** (Commercial 'Chloride of Gold'), the crystallised double salt $AuCl_3.NaCl.2H_2O$, containing 50 p.c. of metallic Gold. Official in Belg. (Chloruretum Auri et Sodii), Fr. (Chlorure d'Or et Sodium), Ital. (Cloruro di Oro e di Sodio), and Port. (Chloreto de Ouro e de Sodio).
3. **Commercial Chloride of Gold and Sodium**. Commercial Chloride of Gold and Sodium is the above crystallised salt mixed with an equal weight of Chloride of Sodium, and contains 25 p.c. of metallic Gold.
4. **Auri et Sodii Chloridum U.S.** A mixture composed of equal parts of dry Chloride of Gold and Chloride of Sodium, and which contains about 32 p.c. of pure Gold. This is Official in Dutch (Chloretum Aurico-Natricum et Chloretum Natricum), Ger., Russ. and Swiss (Auro-natrium Chloratum).

Some foreign samples of commercial Chloride of Gold are the double Chloride of Gold and Potassium $AuCl_3.KCl.2\frac{1}{2}H_2O$, corresponding to about 47 p.c. of metal.—*P.J.* (3) xxii. 902.

Medicinal Properties.—It has been given on the Continent for amenorrhœa and secondary syphilis. Chloride of Gold and Sodium has been used successfully in tertiary syphilis, spinal sclerosis, hystero-epilepsy, asthma, chorea, and in uterine affections.

Ph. Ger. maximum single dose, ·05 gramme ($\frac{3}{4}$ grain); maximum daily dose, ·2 gramme (3 grains).

Prescribing Notes.—It may be given in the form of **pills** made with Massa Kaolini; or in watery solution. Its solutions should be protected from white light.

It is also used in photography.

BALSAMUM CANADENSE.

See TEREBINTHINA CANADENSIS.

Not Official.

BALSAMUM DIPTEROCARPI.

GURJUN BALSAM, OR WOOD OIL.

(Pharmacopœia of India.)

A balsamic exudation, obtained from the trunk of *Dipterocarpus lævis* and other species by incision and the application of heat. Imported from the East Indies.

Medicinal Properties.—Similar to those of Copaiba. Useful for leprosy. Dr. Dougall used 1 part Gurjun Balsam with three parts of Lime Water to anoint the body night and morning, cleaning the body before the morning application, first with dry earth and then with water. He also gave 2 drachms of the Balsam internally night and morning, mixed with Lime Water.—*L.* '74, i. 694. Mr. J. D. Hillis, of the Leper Asylum in British Guiana, is greatly in favour of it.—*L.* '80, i. 659; *M.P.* '89, i. 664; *see* also *L.* '90, i. 136. Von Reisnen gives Wood-oil internally, commencing with daily doses of 5 drops, increasing gradually to 70 or more, suspending the treatment when intolerance is shown. Externally the leprous parts are treated with an ointment of Gurjun Balsam, 3 parts; Lanolin, 1 part.—*P.J.* '95, ii. 27.

It is used in India as a substitute for Balsam of Copaiba in gonorrhœa; also as a natural varnish.

Description.—It is an oleo-resin, constituting a transparent liquid of the con-

sistence of Olive Oil, lighter than Water, of a dark brown sherry colour, slightly fluorescent. Heated in a vial to 270° F. (132·2° C.) it becomes turbid and gelatinous. It affords a turbid solution when shaken with an equal volume of Benzol.

Test.—When dissolved in about 20 parts of Carbon Bisulphide and a drop of a cooled mixture of equal parts of Sulphuric and Nitric Acids is added, it takes a splendid violet colour, which lasts several hours. This reaction is not prevented by the presence of Resin or by Copaiba Balsam.—*Fluckiger.*

BALSAMUM PERUVIANUM.

BALSAM OF PERU.

A Balsam exuded from the trunk of *Myroxylon Pereiræ*, after the bark has been beaten and scorched.

From San Salvador, in Central America.

Solubility.—1 in 1 of Alcohol (90 p.c.); when more than 3 of Alcohol is added to 1 of Balsam it becomes turbid; in all proportions of Chloroform; insoluble in Olive Oil.

Medicinal Properties.—Stimulant and disinfectant expectorant. Useful in chronic catarrh, asthma, and other chronic pulmonary complaints, contra-indicated in acute catarrh because of its stimulant action; also to restrain excessive discharges, as gleet, &c.

Externally for chronic indolent ulcers and for sore nipples; for scabies and pediculi and parasitic skin diseases, to relieve itching in urticaria, and prevent or heal bedsores.

Balsam of Peru contains Cinnamic and Benzoic Acids, both of which possess antiseptic properties.

The Balsam contains an Essential Oil, the vapour of which is extremely toxic to the acarus of Itch. The patient is rubbed in the evening for fifteen or twenty minutes with the Balsam; it is not necessary to rub hard as the vapour is sufficient to kill the parasite.—*L.* '96, i. 1101.

Dose.—5 to 15 minims.

Prescribing Notes.—Given as an **emulsion** with mucilage, or sugar and yolk of egg with water.

Not Official.—Unguentum Peruvianum, and Unguentum Peruvianum Resinosum.

Foreign Pharmacopœias.—Official in Austr., sp. gr. 1·14—1·16; Dutch and Belg., sp. gr. 1·14—1·15; Dan.; Fr.; Ger., Hung. and Russ., sp. gr. 1·135—1·145; Norw.; Port., sp. gr. 1·15; Span., sp. gr. 1·15—1·16; Swed. and Swiss; Ital., Jap., Norw., and U.S., sp. gr. 1·135—1·150; Mex. 1·14—1·145.

Description.—A viscid liquid, in bulk nearly black, but in thin layers deep orange-brown or reddish-brown and transparent. It has an agreeable balsamic odour and an acrid taste; when swallowed it leaves a burning sensation in the throat.

Tests.—Sp. gr. between 1·137 and 1·150. 10 drops triturated with ·4 gramme of Lime produce a permanently soft mixture (absence of Copaiba and Resins); and this, on being warmed until all volatile matter is given off and until charring commences gives no fatty odour (absence of Castor Oil and other fatty Oils). It should not diminish in

volume when shaken with an equal bulk of Water (absence of Ethylic Alcohol). About 40 p.c. of resin should separate when one part of the Balsam is treated with three parts of Carbon Bisulphide; and the clear supernatant liquid should be of a pale brown colour with only a slight fluorescence (absence of Gurjun Balsam). If 5 grammes of the Balsam be shaken with 5 c.c. of a solution of Sodium Hydroxide of sp. gr. 1·16, and then washed with three successive quantities, each of 15 c.c. of Purified Ether, and the Ether removed, the residue (after cautious drying until the loss, in two weighings at 5 minutes' interval, does not exceed 1 centigramme), should weigh between 2·85 and 3 grammes. To this weighed residue 20 c.c. of Normal Volumetric Alcoholic Solution of Potassium Hydroxide and 40 c.c. of Alcohol (90 p.c.) are to be added and the whole saponified under a reflux condenser for one hour. Thus treated, the residue above specified should combine with from 11·9 to 12·8 c.c. of the Normal Volumetric Alcoholic Solution of Potassium Hydroxide (presence of a sufficient proportion of Cinnamein). The amount of uncombined alkali may be determined in the usual way by means of titration with the Volumetric Solution of Sulphuric Acid.

The acid, ester and saponification numbers and the amount of resin-ester as well as Cinnamein might have been included in the tests.—*C.D.* '98, ii. 130.

For papers on Tests for the purity of Balsam of Peru, *see P.J.* (3) xii. 45; (3) xiii. 321, 581; (3) xiv. 424; (3) xv. 237; (3) xviii. 1072.

Regarding the methods for testing Peruvian Balsam satisfactorily, Messrs. Gehe & Co. have found the determination of the percentage of Cinnamein and the saponification number a valuable method in testing the article. A series of experiments on some fifty samples show that in genuine Balsams the proportion of Cinnamein lies between 57—60 p.c., the saponification equivalent by their process being from 235—238.—*P.J.* (3) xxv. 1124.

Cinnamein is present to the extent of 62—64 p.c. in the Balsam. In the examination of Peru Balsam the yield should be about 64 p.c. of Cinnamein and 30 p.c. of Resin; should the figures differ considerably from these, a separate examination by saponification of these two important constituents should be made to establish the adulteration.—*A.J.P.* '94, 406.

A comparison of pure Balsam obtained direct from the producer with some commercial samples gave a wide range for the saponification value, and from 65 to 80 p.c. of Cinnamein.—*J.S.C.I.* '98, 268.

A process for determining the acid and saponification number.—*J.S.C.I.* '98, 806.

Not Official.

UNGUENTUM PERUVIANUM.—Balsam, 1; Lard, 7.

An excellent application for sore nipples or cracked lips.

UNGUENTUM PERUVIANUM RESINOSUM.—Balsam, 1; Resin Ointment, 1: mix. Applied upon lint for bed-sores.

BALSAMUM TOLUTANUM.

BALSAM OF TOLU.

A Balsam obtained by making incisions in the trunk of *Myroxylon Toluifera*.

Imported from the northern ports of Columbia, South America.

Solubility.—1 in 1 of Alcohol (90 p.c.); 1 in 3 of Benzol; 2 in 1 of Chloroform; 1 in 1 of Glacial Acetic Acid; insoluble in Petroleum Spirit; nearly insoluble in Carbon Bisulphide.

Medicinal Properties.—Similar to those of the Balsam of Peru, but not used externally.

Dose.—5 to 15 grains.

Prescribing Notes.—Usually given as the **Syrup**, which is useful as a flavouring agent, and as a remedy in cough mixtures. The **Tincture** when mixed with Water requires the use of Mucilage of Acacia.

Official Preparations.—Of the **Balsam**, Syrupus Tolutanus and Tinctura Tolutana; used in the preparation of Tinctura Benzoini Composita. The **Syrup** is contained in Mistura Ammoniaci. The **Tincture** is used in the preparation of Tolu Basis which is contained in Trochiscus Acidi Carbolici, Trochiscus Morphinæ, and Trochiscus Morphinæ et Ipecacuanhæ.

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

Description.—When first imported it is a soft and tenacious solid, which on keeping becomes harder and then, in cold weather, is brittle. In thin films it is transparent and of a yellowish-brown colour. Pressed between pieces of glass with the aid of heat it exhibits, when examined with a lens, an abundance of crystals. Odour highly fragrant, especially when warmed; taste somewhat aromatic and slightly acid. It is soluble in Alcohol (90 p.c.) and the solution has an acid reaction.

We found sp. gr. of two samples to be 1·230 and 1·258.

The resinous portion consists of Tolu-resinotannol in combination with Cinnamic and Benzoic Acids, the latter in small proportion only. In addition the Balsam contains 7·5 p.c. of an acid, aromatic, oily liquid, principally Benzyl Benzoate, with a little Benzyl Cinnamate and ·05 p.c. of Vanillin. Neither Styracin, free Benzyl Alcohol, or Phenyl-propyl Cinnamate could be detected.—*P.J.* (3) xxv. 643.

Tests.—If 5 grammes are gently warmed with two successive portions of 25 and 10 c.c. of Carbon Bisulphide, the solution should yield, when evaporated to dryness, a distinctly crystalline residue which should require not less than one-third of its weight of Potassium Hydroxide for its saponification (presence of a sufficient proportion of Benzoates and Cinnamates).

The above test together with a description of a spurious article, resembling genuine Balsam of Tolu in some respects, is described.—*P.J.* '95, ii. 146; *C.D.* '95, ii. 212; *P.J.* '97, i. 308.

Some of the spurious article was supplied to us in the ordinary course of business; with Carbon Bisulphide it yielded 24 p.c. of residue which absorbed 25·5 p.c. of Potassium Hydroxide, and a portion of the sample mounted on a slide and examined under a lens showed scarcely any crystals.

In addition to the saponification number the acid number might have been given.—*C.D.* '98, ii. 130.

When a few drops of the Carbon Bisulphide solution are evaporated, and the residue covered with Sulphuric Acid, pure Balsam gives an intensely blood-red colour reaction, while mixed colours are indicative of adulteration with Resin.—*P.J.* '97, ii. 446.

Preparations.

SYRUPUS TOLUTANUS. Syrup of Balsam of Tolu.

Balsam of Tolu, 1¼; Refined Sugar, 32; Distilled Water, a sufficient quantity; boil the Balsam of Tolu in 20 of the Distilled Water for half an hour in a lightly covered vessel, stirring frequently. Then remove from the source of heat and add Distilled Water, if necessary, so that the liquid when cold shall measure 16. Filter the solution, add the Refined Sugar, and dissolve by the aid of a water bath. The product should weigh 48. =(about 1 in 29).

A better flavoured Syrup may be made as follows: Balsam of Tolu, 1¼; Sugar, 8; powder the Tolu with the Sugar, macerate in Water 16, for 24 hours, with frequent agitation, filter bright and dissolve in it (cold) Sugar 24.

By the use of a little Spirit a still more strongly-flavoured Syrup may be made: Balsam of Tolu, 1¼; Alcohol (90 p.c.), 1¼; dissolve and add the Solution to Simple Syrup, 34; shake thoroughly and filter.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Fr., Ital., Jap., Norw., Port., Russ., Span., Swiss and U.S.; Dan. and Mex., made with Tincture; not in the others.

TINCTURA TOLUTANA. Tincture of Balsam of Tolu. (Altered.)

Balsam of Tolu, 2; Alcohol (90 p.c.) a sufficient quantity. Place the Balsam of Tolu in 16 of the Alcohol; set aside in a closed vessel; agitate occasionally; when the Balsam is dissolved, filter; pass sufficient of the Alcohol through the filter to produce 20 of the Tincture. =(1 in 10).

Now 1 in 10 instead of 1 in 8, and Alcohol (90 p.c.) in place of Rectified Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Dan., Fr., Mex., Span. and Swed., 1 in 5; Port., 3 in 20; U.S., 1 in 10: all by weight except U.S.; not in the others.

Not Official.

BAPTISIN.

A powdered extract obtained from *Baptisia tinctoria*.

Medicinal Properties.—In small doses, laxative; in large doses, purgative and emetic.

Dose.—1 to 5 grains. Usually given in **pill**.

Is an hepatic, and also an intestinal stimulant of considerable power.—Dr. Rutherford.

Not Official.

BARII HYPOPHOSPHIS.

This is used in the preparation of Hypophosphorous Acid, *B.P.C.*, and is directed to contain not less than 95 per cent. $Ba.2(PH_2O_2).H_2O$, and from the tests of the Acid when made, it is expected to be free from Lime.

It would appear (*P.J.* (3) xxiii. 235) that commercial Hypophosphite of Barium is anhydrous and generally contains Lime.

Not Official.

BARII SULPHIDUM.

BaS, eq. 168·22.

It is somewhat difficult to obtain in a pure condition, and commercial samples as a rule do not contain more than 50 p.c. BaS.

Medicinal Properties.—The chief use for this is as a **depilatory,** for which purpose it is unequalled, removing hair with less injury to the skin than any other application.

Method of Preparation.—Some commercial samples are obviously prepared by evaporating to dryness a solution obtained by boiling Barium Hydrate and Sulphur together with Water; these evolve Sulphurous Acid on treatment with Hydrochloric Acid, while the pure Sulphide gives nothing but Sulphuretted Hydrogen.

In small quantity it may be prepared by saturating strong Baryta Water with Sulphuretted Hydrogen and evaporating rapidly to complete dryness.

Commercially it is made by exposing to a bright red heat for some time in a closed crucible a mixture of powdered Sulphate of Barium and powdered Charcoal. From the excess of Carbon and undecomposed Sulphate, the Sulphide is extracted by boiling Water.

In presence of air and moisture, Barium Sulphide rapidly deteriorates by oxidation to Sulphate.

Test.—For the estimation of BaS: 1. Make a standard Zinc Solution by dissolving 7·7 grm. Zinc in about 75 c. c. of Diluted Hydrochloric Acid, adding excess of Ammonia and diluting to 1000 c. c.; 2. Make an alkaline Lead Solution by dissolving 1 grm. Lead Acetate in about 20 c. c. of hot Solution of Potash and diluting to 100 c. c.; 3. Heat to boiling 1 grm. of the Barium Sulphide in about 50 c. c. of Water and titrate with the standard Zinc Solution till no black or brown colour is obtained by adding a drop of the Barium Solution to a drop of the Lead indicator, spotted on a porcelain slab. Each c. c. of the Zinc Solution used is equivalent to 2 per cent. of Barium Sulphide in the sample operated upon.

Preparation.

DEPILATORY.—Barium Sulphide (containing 70 p.c. BaS, or an equivalent quantity of any other strength) in fine powder, 2; Starch, 5; Orris Root in powder, 1; mix.

For use make it into a thin paste with Water, apply to the part from which the hair is to be removed: after five minutes scrape off with a blunt knife.

Not Official.

BEBEERINÆ SULPHAS.

SULPHATE OF BEBEERINE.

A preparation made from *Nectandra* or *Bebeeru* Bark (*Nectandra Rodiæi*), containing about 60 p.c. of alkaloids, one half being **Bebeerine,** $C_{19}H_{21}NO_3$, the remainder being other amorphous alkaloids which have not yet been separated in the pure form. It has been official since 1864, but is now omitted.

In dark-brown thin translucent scales, yellow when in powder, with a strong bitter taste.

The so-called **Buxine** from Boxwood (*Buxus sempervirens*) and **Pelosine** from *Cissampelos Pareira* are identical with Bebeerine.—*P.J.* (3) x. 612, and (3) xvi. 300.

Solubility.—Sparingly in Alcohol (90 p.c.); dissolves about 1 in 1 of Water, and the solution can be diluted up to 1 and 8 of Water, but on further dilution it precipitates until about 80 or 100 parts of Water have been added, but samples vary in this respect.

Medicinal Properties.—Aromatic bitter, stomachic tonic, an imperfect substitute for Quinine.

Dose.—1 to 5 grains.

Prescribing Notes.—Given in **solution,** or in **pills** made with 'Dispensing Syrup.'

Not Official.

BELÆ FRUCTUS.

BAEL FRUIT.

The fruit of *Ægle Marmelos*.

The dried half-ripe fruit was formerly Official, but is now omitted.

Medicinal Properties.—The fresh fruit has been much extolled in India for diarrhœa and dysentery, and the Confection prepared in this country appears to have similar properties. The dried fruit is not considered a trustworthy remedy.

Preparation.

CONFECTIO BELÆ RECENTIS.—Prepared from fresh fruits imported from India in the spring months. It retains the odour and flavour of the fresh fruit.

Dose.—A teaspoonful.

BELLADONNA.

BELLADONNA.

The fresh leaves and branches of *Atropa Belladonna*, as well as the dried root, are Official, and are described under Belladonnæ Folia and Belladonna Radix respectively.

Medicinal Properties.—Anodyne, antispasmodic, mydriatic, antigalactagogue, anhydrotic, and diuretic. There is no drug which can compare with it in checking the secretions of milk, sweat, and saliva. It is given for the relief of some nervous and spasmodic disorders, as epilepsy and whooping-cough; in renal colic, dysmenorrhœa and typhlitis; in full and frequent doses for asthma, both as a prophylactic and curative. It relieves cardiac pain, palpitation and aortic regurgitation, and is of service in adynamic fevers. Useful in typhoid with contracted pupil, and in acute bronchitis it stops profuse secretion. In large or continued doses it causes dilatation of the pupil and dryness of the mouth and throat. Dr. Nunnely successfully treated habitual constipation by giving ⅛ to ¼ grain of Extract on rising in the morning, which rarely failed to produce a healthy stool after breakfast; and, by continuing its use for a week or fortnight, it restored the natural action of the bowels. For nocturnal incontinence of urine, dose 5 to 10 minims of the Tincture, with the same dose of Tinct. of Perchloride of Iron three times a day (*L.* '70, Oct. 22; *B.M.J.* '86, i. 291; *L.* '89, ii. 1056; *Pr.* lii. 331). Ringer recommends larger doses of Bella-

donna for this troublesome complaint in children, 10 to 30 minims of the Tincture three times a day; small doses often fail when large doses at once succeed. Useful in loss of tone and irritable state of the generative organs which gives rise to nocturnal emissions, although it has slightly aphrodisiacal properties. The **Extract** in pills, also the **Tincture** and **Succus** are for internal use. The **Suppository** is used in prostatitis, cystitis and chordee. Externally the **Liniment** and **Compound Liniment** sprinkled on piline are very useful in pleurodynia, lumbago and muscular rheumatism, as is also the **Chloroform** preparation alone or mixed with Oil. The **Glycerinum** as a paint, and the **Emplastrum,** are used for sprains, acute synovitis, and to check mammary secretion and prevent inflammation of the breast; the plaster is also an excellent remedyin cardiac pain and palpitation.

Dose.—Will be found under the respective preparations.

Incompatibles.—Caustic Alkalies, Opium, Strychnine.

Official Preparations.—Extractum Belladonnæ Viride, and Succus Belladonnæ from the **fresh leaves** and **branches**. Extractum Belladonnæ Liquidum from the **dried root**. Emplastrum Belladonnæ, Extractum Belladonnæ Alcoholicum, Linimentum Belladonnæ, Tinctura Belladonnæ, and Unguentum Belladonnæ from the **Liquid Extract**. Suppositoria Belladonnæ from the **Alcoholic Extract**. Atropine from **leaves** or **root**.

Not Official.—Chloroform Belladonnæ, Glycerinum Belladonnæ, Linimentum Belladonnæ Composita, and Etherial Tincture of Belladonna.

Antidotes.—In cases of poisoning by Belladonna, use stomach-tube or give one of the following emetics, 10 grains of Copper Sulphate, 20 grains of Zinc Sulphate, 1 oz. of Ipecacuanha Wine, or hypodermic injection of $\frac{1}{10}$th grain Apomorphine; inject Morphine or Pilocarpine. Chloral Hydrat. *L.* '81, i. 74, and ii. 589. Pilocarpine, *B.M.J.* '81, i. 594. Physostigmine, *B.M.J.* '81, i. 918.

BELLADONNÆ FOLIA. Belladonna Leaves.

The fresh leaves and branches of *Atropa Belladonna*, collected when the plant is in flower.

Description.—The leaves have short stalks, are alternate below but in unequal pairs above. They are from three to eight inches (eight to twenty centimetres) long, broadly ovate, acute, entire, and glabrous or nearly so. The corolla is gamopetalous, campanulate, and of a dingy purple colour. The transverse section of the leaf exhibits bi-collateral vascular bundles; the mesophyll contains numerous cells filled with very minute crystals of Calcium Oxalate.

It is now generally recognised that the greater portion of the alkaloid existing in Belladonna (both leaves and root) is Hyoscyamine, rather than Atropine. A good resumé of the literature on the subject is given in *P.J.* (3) xxii. 469, from which it would appear that although Belladonna leaves may be found in the market containing as little as ·1 p.c. of alkaloid, a good well-dried leaf should approximate to ·5 p.c., and specimens may be met with yielding as much as ·9 p.c., showing there existed a necessity for standardising the Tincture; which has now been done.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Ital., Mex., Norw., Russ., Span., Swed., Swiss and U.S., leaves; Dutch, leaves and fresh herb; Fr., leaves and fruit; Ger., leaves and branches; Port., herb; not in Hung. or Jap.

Preparations.

EXTRACTUM BELLADONNÆ VIRIDE. Green Extract of Belladonna.

Bruise the fresh leaves and young branches of *Atropa Belladonna* in a mortar, press out the juice, and heat it to 130° F. (54·4° C.), separate the green colouring matter by a calico filter; heat the strained liquor to 200° F. (93·3° C.); filter. Evaporate the filtrate on a water-bath to the consistence of a thin syrup; add to it the green colouring matter previously separated and passed through a hair sieve, stir the whole together and evaporate at a temperature not exceeding 140° F. (60° C.) to the consistence of a soft extract.

100 lbs. of herb yielde1 56 lbs. of juice, or nearly 4 lbs. Extract.

100 lbs. leaves, when dried, weighed 16 lbs.

An estimation of the alkaloids contained in four samples of Extract of Belladonna, prepared in 1885 by different makers, gave ·94 p. c., 1·17 p.c., 1·11 p. c., ·73 p. c. The following samples in good condition were examined at the same time: 1880—1·26 p. c., 1·22 p. c.; 1881—1·16 p. c., 1·21 p. c.; 1884—1·21 p. c.

A sample of 1892 Extract yielded 1·7 per cent. of Alkaloids.

Naylor and Bryant suggest a process for the assay. They state there is no difficulty in making green extract of Belladonna to contain 1 to 1·25 p.c. of alkaloid and would fix the strength of the extract at 1 p.c. of alkaloid, using when necessary, milk sugar as a diluent.—*P.J.* '98, ii. 165; *C.D.* '98, ii. 289.

Dose.—¼ to 1 grain.

Foreign Pharmacopœias.—Official in Austr. and Mex., alcoholic from the **leaves**; Belg., clarified juice from **leaves** evaporated; Dan., made from **leaves** with weak spirit; Dutch, alcoholic from **fresh herb**; Fr., clarified juice from **leaves** evaporated, also alcoholic from the **seeds**; Ger., made with water and spirit from **leaves** and flowering branches; Hung., alcoholic from **root**; Ital., Norw. and Swed., alcoholic from **leaves**; Port., aqueous from **dried leaves**, alcoholic from **fresh herb** and alcoholic extract purified by alcohol; Russ., made from **leaves** with water and spirit; Span., clarified juice from **leaves** evaporated, and aqueous from **dried leaves**; also alcoholic from **dried leaves**; Swiss, alcoholic, 1=2 of root, also **Fluid Extract** 1 in 1; U.S., an alcoholic extract from the powder of the **leaf**, also **Fluid Extract** of the **root**.

SUCCUS BELLADONNÆ. Juice of Belladonna.

Bruise the fresh leaves and young branches of *Atropa Belladonna*; press out the juice; to every three volumes of juice add one of Alcohol (90 p.c.); set aside for seven days; filter.

Dose.—5 to 15 minims.

Belladonna Juice which would yield an Extract of 1 p.c. Alkaloid would form a Succus of about ·05 p.c.

Not Official.

GLYCERINUM BELLADONNÆ (*B.P.C.*).—Green Extract of Belladonna, 8; Hot Water, 1; Glycerin to 16.

Foreign Pharmacopœias.—Official in Belg., Fr. and Port., 1 Extract in 10; Mex., Extract 1, Glycerin of Starch 10.

Used as a pigment for relieving pain and tension in acutely inflamed parts; also painted on the breasts to suppress secretion of milk.

BELLADONNÆ RADIX. Belladonna Root.

The dried root of *Atropa Belladonna*, collected in the autumn, and dried.

Description.—In nearly cylindrical pieces, entire or longitudinally split, varying in diameter from about three-eighths to three-quarters of an inch (ten to twenty millimetres), and usually from six inches to a foot (fifteen to thirty centimetres) or more in length. Externally it is of a pale greyish-brown colour, and is finely wrinkled longitudinally. The transverse fracture is short, and internally the root is whitish and starchy. Within and mostly near to the cambium ring are numerous scattered groups of vessels and fibres which should not exhibit a prominently radiate arrangement. Most of the parenchymatous cells contain small compound starch grains, and some are filled with numerous very minute crystals of Calcium Oxalate.

As in the case of Belladonna leaves, the alkaloid of the root is almost wholly Hyoscyamine. A good parcel of roots should average ·5 per cent., but occasional bales are found averaging ·7 to ·8 p.c. The best alkaloidal solvent is undoubtedly Ammoniated Spirit. 20 oz. of a particularly rich sample of powder yielded a first percolate of 20 fluid ounces containing ·75 p.c. of alkaloid, followed by a second 20 oz. of percolate of ·018 p.c. By the Dunstan process the same root yielded a total of ·69 p.c.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Hung., Ital., Mex., Port., Russ., Span., Swed., Swiss, and U.S.; not in Dutch, Ger., Jap., or Norw.

Preparations.

EMPLASTRUM BELLADONNÆ. Belladonna Plaster. (Altered.)

Liquid Extract of Belladonna, 4 fl. oz.; Resin Plaster, 5 oz. Evaporate the Liquid Extract of Belladonna on a water-bath until it is reduced in weight to 1 oz.; add the Resin Plaster previously melted; mix.

This Plaster contains ·5 p.c. of the alkaloids of Belladonna Root. = (1 in 6).

Liquid Extract of Belladonna now used instead of the Alcoholic Extract, and Soap Plaster is omitted.

Applied to the breasts to check secretion of milk.

Foreign Pharmacopœias.—Official in Belg., Extract 1 in 8; Fr., Alcoholic Extract 3 in 4; Port., Alcoholic Extract 1, Lead Plaster 9; Span., Extract about 1 in 5; Swiss, Fluid Extract 3 in 10; U.S., Alcoholic Extract of Leaves 1, Resin Plaster 2, Soap Plaster 2; Mex., from the leaves with Alcohol; not in the others.

EXTRACTUM BELLADONNÆ ALCOHOLICUM. Alcoholic Extract of Belladonna. (Altered.)

An Extract containing 1 p.c. of the alkaloids of Belladonna Root.

Evaporate 1 fl. oz. of Liquid Extract of Belladonna, in a counterpoised basin, on a water-bath, to the consistence of a moderately firm extract; weigh. The difference between the weight of the residue and three-quarters of an ounce gives the weight of Milk Sugar to be used as a diluent for each fl. oz. of the Liquid Extract. Evaporate 20 fl. oz. of Liquid Extract of Belladonna to the consistence of a thin

syrup; add to it the required quantity of Milk Sugar determined from the data obtained from the foregoing experiment; continue the evaporation until the extract weighs 15 oz.

Liquid Extract now employed and Milk Sugar added.

Dose.—$\frac{1}{4}$ to 1 grain.

This Alcoholic Extract of Belladonna contains one-third the proportion of alkaloids present in average samples of the Alcoholic Extract of Belladonna of the British Pharmacopœia of 1885.

(Foreign Pharmacopœias compared under Extractum.)

EXTRACTUM BELLADONNÆ LIQUIDUM. Liquid Extract of Belladonna. (New.)

A Liquid Extract containing $\frac{3}{4}$ grain of the alkaloids of Belladonna Root in 110 minims (·75 gramme in 100 c.c.). Moisten 8 of Belladonna Root, in No. 20 powder, with 6 of a mixture of seven volumes of Alcohol (90 p.c.) and one volume of Distilled Water; set aside for six hours; pack firmly in a percolator; pour over the powder 6 of the same Alcoholic menstruum; when the liquid begins to drop, close the lower orifice of the percolator; set aside for twenty-four hours; percolate slowly, adding more of the menstruum as required; collect the percolate in small portions. Moisten a second quantity of 8 of Belladonna Root, in No. 20 powder, with the first 6 of percolate; proceed to extract this portion of the Belladonna Root in the manner directed for the first portion, but use as the menstruum the liquid collected from the first percolator. This method of repercolation is to be carried out through two more quantities each of 8 of Belladonna Root, the third portion being extracted with the liquid from the second percolator, and the fourth portion with the liquid from the third percolator. Collect $12\frac{1}{2}$ of the strong percolate from the fourth percolator.

Determine the portion of alkaloids in the resulting strong percolate by the following analytical process.

Introduce 10 c.c. into a separator, add 10 c.c. of Chloroform, 50 c.c. of Water, and a decided excess of Solution of Ammonia; agitate; set aside; separate the Chloroformic Solution. Twice repeat the agitation with Chloroform and the separation. Shake the mixed Chloroformic Solutions with 5 c.c. of Diluted Sulphuric Acid, mixed with twice its volume of warm Water; separate the Chloroformic liquid and repeat the agitation with acidulated Water. Wash the mixed acid liquids with 3 c.c. of Chloroform; then agitate with 10 c.c. of Chloroform and an excess of Solution of Ammonia. Separate the Chloroformic Solution; twice repeat the agitation with Chloroform and the separation; wash the mixed Chloroformic Solutions with 5 c.c. of Water containing one drop of Solution of Ammonia; draw off the Chloroformic layer into a counterpoised dish, evaporate on a water-bath; dry the residue below 212° F. (100° C.); weigh. Dissolve the residue in 10 c.c. of a decinormal solution of Hydrochloric Acid (3·619 grammes of the acid, HCl, per litre) and add centinormal solution of Soda (·3976 gramme of Sodium Hydroxide, NaOH, per litre) until the liquid is neutral, using Tincture of Cochineal as an indicator. Deduct the measure of the Soda Solution

thus required, from 100 c.c., and multiply the remainder by ·00287; the product will be the weight in grammes of alkaloids present in the quantity of the percolate operated upon.

From this weight calculate the amount of alkaloids in the bulk of strong percolate, and add to the latter sufficient of the Alcoholic menstruum to produce Liquid Extract of Belladonna containing ·75 gramme of alkaloids in 100 c.c., or $\frac{3}{4}$ grain in 110 minims.

The official repercolation process extracts 78 p.c. of the total alkaloid present in the root; a simple process of maceration and percolation, reserving the first portion and evaporating the remainder, extracted 98 p.c.—*C.D.* '98, i. 768.

The following modifications of the method of assay are suggested: (a) mix the strong percolate with an equal portion of Water, acidify with Sulphuric Acid, and evaporate; (b) use equal volumes of Ether and Chloroform in place of Chloroform; (c) omit the washing of Chloroformic solutions with Water containing a trace of Ammonia; (d) that a maximum difference should be fixed for the gravimetric and volumetric results.—*P.J.* '98, i. 450.

An examination of ground Belladonna Root separated by means of sieves, 60, 40 and 20 meshes to the inch, showed that the finer powder gives a darker coloured Alcoholic Tincture, but contains less alkaloid.—*P.J.* '96, ii. 97; *C.D.* '96, ii. 197.

LINIMENTUM BELLADONNÆ. Liniment of Belladonna. (Altered.)

Liquid Extract of Belladonna, 10; Camphor, 1; Distilled Water, 2; Alcohol (90 p.c.), a sufficient quantity. Dissolve the Camphor in 6 of the Alcohol; add the Liquid Extract of Belladonna, the Distilled Water, and sufficient of the Alcohol to produce 20 of the Liniment. Set aside for 24 hours; filter.

Liquid Extract of Belladonna now used instead of dried Root, and Alcohol (90 p.c.) in place of Rectified Spirit.

Prescribing Notes.—Prescribed with equal parts of Soap Liniment or Compound Camphor Liniment. Does not mix readily with fixed oils. When an oily liniment is required, it is better to order the Chloroform of Belladonna mixed with Olive or Almond Oil.

Foreign Pharmacopœias.—Official in U.S., about 1 in 1; Mex. (Aceite de Belladonna), Dried Leaves 1, Sesame Oil, 10; Span. (Aceite de Belladonna), Fresh Leaves 1, Olive Oil 2; not in the others.

SUPPOSITORIA BELLADONNÆ. Belladonna Suppositories. (New.)

Alcoholic Extract of Belladonna, 18 grains; Oil of Theobroma, a sufficient quantity for 12 suppositories. Proceed as directed for Tannic Acid Suppositories.

Each of these suppositories contains, approximately, $\frac{1}{60}$ grain (·001 gramme) of the alkaloids of Belladonna Root.

TINCTURA BELLADONNÆ. Tincture of Belladonna. (Altered.)

Liquid Extract of Belladonna, 2; Alcohol (60 p.c.), a sufficient quantity. To the Liquid Extract of Belladonna, add enough of the Alcohol to form 30 of the Tincture; set aside for 24 hours; filter.

About twice the strength of B.P. '85.

Now made from the Liquid Extract of the Root, instead of Belladonna Leaves, and Alcohol (60 p.c.) is used in place of Proof Spirit. It is standardised.

Dose.—5 to 15 minims.

Foreign Pharmacopœias.—Official in Austr. and Swiss, 1 in 10; Belg., Fr., Mex., Port. and Span., 1 in 5; U.S. 3 in 20; Russ. 1 in 12, **dried leaves.** Belg., Fr. and Port, 1 in 1, **fresh leaves**; all by weight except U.S.; not in the others.

Test.—On evaporation to a low bulk, and subsequent treatment by the analytical process employed for 'Extractum Belladonnæ Liquidum,' 100 c.c. of the Tincture should yield not less than ·048, nor more than ·052 gramme of alkaloid.

UNGUENTUM BELLADONNÆ. Belladonna Ointment. (Altered).

Liquid Extract of Belladonna, 2; Benzoated Lard, 2¼. Evaporate the Liquid Extract of Belladonna on a water-bath until it is reduced to ¼ (by weight); add the Benzoated Lard; mix.

100 parts of this Ointment should contain ·6 part of the alkaloids of Belladonna Root.

Now made from Liquid Extract instead of Alcoholic Extract, and is slightly stronger.

Foreign Pharmacopœias.—Official in Belg., Extract 1 in 10; Fr. (Pommade) Extract 4 in 30; Mex. (Pomada) Extract 1, Lard 7½; Port. (Pomada) aqueous Extract 1, Lard 9; (Forte) Alcoholic Extract 1, Lard 9; Russ., Extract, 1 in 10; Span. (Pomada) Extract 1, Lard 5; U.S., Alcoholic Extract 1 in 10; not in the others.

Not Official.

ETHEREAL TINCTURE OF BELLADONNA (*Sawyer*).—Substitute Pure Ether for Rectified Spirit in the Liniment of B.P. '85.—*L.* '90, ii. 67.

CHLOROFORMUM BELLADONNÆ.—Belladonna Root in powder, 20: percolate with sufficient Chloroform to produce 20.

Applied with equal parts of Camphor Liniment or Olive Oil, for painful rheumatism.

The lengthy process of B.P.C. might be expected to be a great improvement on the simple method of percolating the powdered root with Chloroform, as introduced in the very first (1864) edition of the '*Companion*,' but as a matter of fact, no more alkaloid is extracted.

It is well known that this preparation only extracts about half of the total alkaloid. By mixing the Root (in No. 40 powder) with Slaked Lime and powdered Ammonium Carbonate four-fifths of the alkaloid will appear in the first 1 in 1 percolate.

LINIMENTUM BELLADONNÆ COMP.—Liniment of Belladonna, 7; Chloroform of Belladonna, 1: mix. For application to the loins in lumbago, it should be sprinkled on impermeable piline (not *spongio piline*), and firmly pressed with the hands on the part for five minutes to insure perfect contact; it should then be kept on for at least 10 or 12 hours.

Peter Squire, who suffered much from lumbago, found this more effectual and much more convenient than Belladonna plasters.

BENZOINUM.

BENZOIN.

A balsamic resin obtained from *Styrax Benzoin* and probably from other species of *Styrax*; known in commerce as Siam and Sumatra Benzoin.

Solubility.—The tears are as a rule wholly soluble 1 in 5 of Alcohol (90 p.c.); 1 in 1 of Ether; and in Solution of Potash. The mass contains impurities, which are left after treating it with Alcohol. The Solution in Alcohol or Ether is acid.

B.P. requires Benzoin to be almost entirely soluble in Alcohol 90 p.c.

Medicinal Properties.—Expectorant, styptic, antiseptic, used in making aromatic fumigating pastilles. The **compound tincture** is given internally for chronic bronchitis; the **vapor** or **spray** is used in chronic laryngeal and bronchial catarrh to check abundant secretion and cough; lint soaked in the compound tincture forms a styptic and antiseptic dressing for wounds.

Dose.—Not given in B.P.; 10 to 30 grains.

Prescribing Note.—If given in the form of **mixture** the Tincture should be emulsified with Mucilage or yolk of Egg.

Official Preparation.—Tinctura Benzoini Composita. Used in the preparation of Acidum Benzoicum, Adeps Benzoatus, and Unguentum Cetacei.

Not Official.—Tinctura Benzoini, Insufflatio Benzoini, Lotio Benzoini, Unguentum Benzoini, Vapor Benzoini.

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

Description.—In flat or curved tears varying in size, but seldom exceeding two inches (five centimetres) in length and half an inch (twelve millimetres) in thickness, yellowish or reddish-brown externally, milky white internally; or in masses composed of tears more or less closely agglutinated by a reddish-brown translucent, or greyish-brown opaque, resinous intervening substance. It is brittle but softens readily when warmed, and when further heated yields fumes of Benzoic Acid. It has an agreeable odour, recalling that of Vanilla in the case of Siam Benzoin, and of Storax in the case of Sumatra Benzoin. It is almost entirely soluble in Alcohol (90 p.c.) and in Solution of Potassium Hydroxide.

It would appear from the Official description that Sumatra Benzoin is not intended to be used, although distinctly specified, since it is almost impossible to obtain it in commerce with less than 7 to 10 p.c. of residue, which we presume is not covered by the words 'almost entirely soluble in Alcohol (90 p.c.).'

The following are the commercial varieties:—

1. '**Siam**,' the finest and most aromatic; not produced from *Styrax Benzoin*.—*P.J.* (3) xxi. 519.
2. '**Sumatra**,' exported solely from the *west* coast of Sumatra (Padang).
3. '**Penang**' and 4. '**Palembang**,' varieties also produced in Sumatra.

The botanical sources and causes of difference in the three Sumatra Benzoins are still undecided. Holmes is of opinion that 'Penang' (the smell of which so strongly resembles Storax) must be the product of a different species. It is said (*C.D.* '91, ii. 487) that the 'Palembang' is invariably and systematically adulterated before exportation with other gum-resins, which may to some extent mask its individual character.

An examination of the quality of commercial samples of Sumatra Benzoin; the residue left after treatment with Alcohol (90 p.c.) varied from 8 to 30 p.c. of the drug employed.—*P.J.* '97, ii. 140; *C.D.* '97, ii. 278.

The solubility of commercial samples of Benzoin. Siam yielded 1 to 2½ p.c. of residue, good commercial Sumatra from 7 to 10 p.c. The following conclusions were drawn:—

1. That commercial samples of Benzoin contain a large percentage of matter insoluble in spirit.
2. That a standard should be fixed in the B.P. for the amount of matter insoluble in spirit.
3. That the standard for such impurity should not in any case exceed 10 p.c.
4. That Siam Benzoin, which contains the least amount of impurities insoluble in Alcohol, should be used in all the official preparations.—*P.J.* '98 i. 507.

Dieterich (*C.D.* '98, ii. 791) recommends the determination of the amount of ash, of the proportion of matter insoluble in 96 p.c. Alcohol, of the amount of water, and finally the acid, ester, and saponification number, according to his method which is mentioned under Copaiba.—*J.S.C.I.* '98, 806.

Preparation.

TINCTURA BENZOINI COMPOSITA. Compound Tincture of Benzoin. *B.P.Syn.*—Friar's Balsam. *N.O.Syn.*—Traumatic Balsam. (Modified.)

Benzoin, in coarse powder, 8; Prepared Storax, 6; Balsam of Tolu, 2; Socotrine Aloes, 1½ (less $\frac{1}{40}$th);* Alcohol (90 p.c.) a sufficient quantity. Place the Benzoin, Storax, Balsam of Tolu, and Aloes with 64 of the Alcohol in a closed vessel, set aside for two days, frequently agitating; filter; pass sufficient of the Alcohol through the filter to produce 80 of the Tincture. =(1 in 10).

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

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Dan., Mex. (Tintura de benjui compuesta), Norw., Port., Swed. and U.S.; Fr., Teinture Balsamique; the tinctures vary considerably in composition and strength; not in the others.

Not Official.

TINCTURA BENZOINI (*B.P.C.*).—Benzoin in powder, 2; Rectified Spirit, 20: macerate for twenty-four hours with frequent agitation, then filter, and add sufficient Rectified Spirit, if required, to produce 20.

This is the same formula which has appeared in the 'Companion' since '64, with the exception of making up to a volume, which is stated (*P.J.* (3) xviii. 635) to be 21½ without any addition of Spirit. The writer there recommends that the Spirit used for maceration should be reduced to 17 or 18, as has been done in the Official Tinct. Benzoini Comp., and when filtered made up to 20.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Fr., Ger., Ital., Jap., Mex., Norw., Port., Russ., Span., Swed., Swiss and U.S., 1 in 5; all by weight except U.S.

INSUFFLATIO BENZOINI (Vigier).—Tincture of Benzoin, 1; Boracic Acid, 1; Starch Powder, 1. Mix and let the Alcohol evaporate. Used as a snuff in coryza.—*T.G.* '88, 141.

LOTIO BENZOINI.—A nice lotion to protect the face from the heat of the sun is made with Tincture of Benzoin, 1; Rose Water, 40.

* To be exact, 16 grains are to be taken from every 1½ oz. of Aloes.

UNGUENTUM BENZOINI.—Benzoin in fine powder, 1; Adeps 4: mix intimately. Useful application for ulcers of the leg.—*L.* '87, ii. 351.

VAPOR BENZOINI (*T.H.*).—Compound Tincture of Benzoin, 60 minims in a pint of Water at 140° for each inhalation.

A sedative for acute inflammation of the pharynx and larynx.

BENZOL.

BENZOL.

[NEW.]

A mixture of homologous Hydrocarbons obtained from light coal-tar oil. It contains about 70 p.c. of Benzene, C_6H_6, and 20 to 30 p.c. of Toluene, $C_6H_5.CH_3$.

Official Preparations.—Used in the preparation of Charta Sinapis and Liquor Caoutchouc.

Description.—A colourless volatile liquid free from opalescence, with a strong characteristic odour. Sp. gr. from ·880—·888. It should begin to distil at 176° F. (80° C.), and about 90 p.c. of the whole should pass over at a temperature below 212° F. (100° C.). It should wholly distil below 248° F. (120° C.).

Not Official.

BERBERIS.

The Bark of the root of *Berberis vulgaris*.

It contains the alkaloids, **Berberine** $C_{20}H_{17}NO_4$, and **Oxyacanthine** $C_{19}H_{21}NO_3$. Berberine also occurs in Hydrastis Canadensis and Calumba. Its solutions are yellow, very bitter and coloured intensely red by Chlorine Water.

Medicinal Properties.—The **Fluid Extract** and the salts of Berberine have been used with success in intermittent fevers.—*T.G.* '86, 489.

A paper on the pharmacological action of Berberine. It cannot be said to have any very marked action upon the kidneys themselves as a special diuretic, though it undoubtedly does cause, under ordinary conditions, an increase of the urinary eliminative processes.—*B.M.J.* '95, ii. 1551.

Preparations.

EXTRACTUM BERBERIDIS FLUIDUM.—Made with Alcohol (60 p.c.) One fluid ounce of Extract is equal to one ounce of Bark.

Dose.—20 to 60 minims.

BERBERINÆ PHOSPHAS.—This is the most soluble salt of Berberine. Soluble 1 in 15 of Water; 1 in 9 of hot Water, but part separates out on standing; it is also thrown down as a yellow precipitate by excess of Alcohol.

Dose.—1 to 5 grains.

Not Official.

BETULÆ ALBÆ OLEUM.

BIRCH TAR OIL.

Syn.—OLEUM RUSCI.

A bituminous liquid obtained by destructive distillation of the wood of *Betula alba*. Russia leather derives its odour from this Oil.

The Russian variety is so distinct from either German or Dutch that it alone should be used in Pharmacy; it may be distinguished by shaking a few drops of the Oil with an ounce of Water, and filtering through a wet filter; the clear filtrate will give a pink colour with Potassium Cyanide Solution, which is intensified by addition of Ammonia. The German and Dutch Oils do not give this reaction.—*P.J.* (3) xv. 769.

The active constituents of the Rectified Oil are probably Guaiacol and Cresol.—*P.J.* (3) xxi. 661.

Preparation.

UNGUENTUM OLEI BETULÆ, (*B.S.H.*)—Birch Tar, 5 fluid drachms: Yellow Beeswax, 120 grains: melt the Beeswax, add the Oil, and stir till cold.

Used in psoriasis and dry eczema.

Caution.—The use of this Ointment in eczema demands care.

Not Official.

BISMUTHUM.

BISMUTH.

Bi, eq. 207·30.

In its crude state is generally impure.

The official tests for the presence of Bismuth will be found in the Appendix.

BISMUTHUM PURIFICATUM.—A process for the purification of Bismuth was given in *B.P.*, '85, but is now omitted.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., Ital., Mex. (Bismuto), Port., Span. and Swed.; not in the others.

BISMUTHI BENZOAS.—Is described in the supplement of the French Codex as a white powder without taste, almost insoluble in Water; on ignition it yields 64 to 65 p.c. of Bismuth Oxide.

An examination of commercial samples obtained in France showed a variation of from 24 to 50 p.c. in the quantity of metallic Bismuth, and contained from traces up to 5 p.c. of Nitric Acid.—*P.J.* '97, i. 82.

BISMUTHI CITRAS. Bismuth Citrate.

A white powder, usually containing 2½ p.c. of absorbed moisture.

Solubility.—Insoluble in water; readily in Solution of Ammonia.

Medicinal Properties.—Similar to the Subnitrate.

Dose.—2 to 5 grains.

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

BISMUTHI ET AMMONII CITRAS.—Small shining translucent scales, which yield Ammonia when warmed with solution of a fixed alkali.

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

Dose.—2 to 5 grains.

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

BISMUTHI NITRAS ($Bi(NO_3)_3$, eq. 392·04).—In colourless transparent crystals. Decomposed by Water, giving a white precipitate of Subnitrate. Soluble in Glycerin, but is slowly deposited from the solution when Water is added.

A **glycerole** can be made containing 60 grains to the ounce, but as an outward application in skin diseases the strength should in most cases not exceed 10 grains to the ounce.—*M.T.* '76, ii. 646.

The salt should be dissolved without the application of heat.

BISMUTHI OLEAS.—Crystallised Bismuth Nitrate, 280 grains; dissolve cold in

Glycerin 4 oz. by weight; add slowly Solution of Sodium Oleate, 20 fl. oz.: warm gently, wash by decantation, collect, and dry.

It forms a pearly grey soft bland substance.

Medicinal Properties.—It is a reliable application in pustular eruptions and hyperæmia of the skin.—*B.M.J.* '84 ii. 751.

BISMUTH-PHENOL (Bismuth Phenate).—Prepared by adding a solution of Phenol in an alkali, to a solution of Bismuth Oxynitrate. A greyish-brown amorphous powder, insoluble in Water and Alcohol (90 p.c.). Recommended as an intestinal antiseptic.—*P.J.* (3) xxiv. 182; *C.D.* '93, ii. 576.

Dose.—5 to 15 grains.

BISMUTHI SUBGALLAS.—A light yellow insoluble powder, introduced as an odourless substitute for Iodoform, under the name **Dermatol.**

Sometimes causes symptoms of Bismuth poisoning.

Given for gastric ulcer and diarrhœa in doses of 8 to 30 grains twice a day.—*L.* '97, ii. 404.

BISMAL (Methylendigallate of Bismuth).—Introduced as an astringent for internal administration in cases of diarrhœa.

Dose.—1 to 4 grains.

BISMUTH BETA-NAPHTHOLATE (ORPHOL).—A reddish-brown powder, insoluble in Water. Recommended as an intestinal antiseptic and astringent, both for adults and children.

Dose.—5 to 20 grains.

Experiments with Bismuth Subnitrate and Beta-naphthol as intestinal antiseptics.—*B.M.J.* '95, ii. 1483.

BISMUTHI SUBIODIDUM.—A brick-red amorphous powder, insoluble in Water.

Has been recommended as a substitute for Iodoform in the treatment of chancres and foul ulcers.—*T.G.* '87, 612; *Y.B.P.* '87, 286.

BISMUTH OXYIODOGALLATE (AIROL).—A combination of Dermatol with Iodine, introduced as a substitute for Iodoform, has attracted a good deal of attention as an antiseptic dressing. A bulky greyish powder, colourless and tasteless, insoluble in Water and Alcohol. Used as a dusting powder to ulcers, also mixed with Vaseline or Anhydrous Lanolin.

As an application to corneal ulcers.—*B.M.J.* '98, i. 144. Two methods of preparation.—*P.J.* '97, i. 167; *J.S.C.I.* '95, 184.

Sometimes badly tolerated.—*B.M.J.E.* '97, ii. 43.

Comparative experiments with Airol, Dermatol, and Iodoform.—*B.M.J.E.* '97, i. 67.

BISMUTH TRIBROMOPHENOL (XEROFORM).—A yellow powder, recommended as a non-irritating antiseptic.

EUDOXINE.—Is the Bismuth salt of Tetra-iodo-phenolphthalein. A reddish-brown, odourless and tasteless powder, insoluble in Water. Adult dose, 5 grains as an intestinal antiseptic.

BISMUTHI CARBONAS.

BISMUTH OXYCARBONATE.

$(Bi_2O_2CO_3)_2$, H_2O, eq. 1029·7.

May be prepared by the interaction of Bismuth Nitrate and Ammonium Carbonate.

Bismuth Nitrate is not officially described.

Solubility.—Soluble with effervescence in Nitric Acid; insoluble in Water.

Medicinal Properties.—Similar to the Oxynitrate, and often preferred to it.

Dose.—5 to 20 grains.

Prescribing Notes.—The following prescription is a good one for pyrosis: Bismuthi Carbonatis, 2 drms.; Magnes. Carb. Levis, 1 drm.; Pulv. Tragac. Comp. 1 drm.; Aq. Flor. Aurant., Glycerini, āā 2 fl. drms.; Aquæ Chloroformi, 1½ fl. oz.; Aquam ad 6 fl. oz. 3 to 4 teaspoonfuls 3 times a day after meals.

Mucilage of Acacia is not a good vehicle for Bismuth salts. On standing a compact mass forms at the bottom of the bottle, which is difficult to diffuse.

When Sodium Bicarbonate is to be given with a Bismuth salt, the Carbonate of Bismuth should be selected.

Official Preparation.—Trochiscus Bismuthi Compositus.

Description.—A whitish powder, the general chemical characters and reactions of which are similar to those of Bismuth Oxide and Bismuth Oxynitrate. All three compounds are heavy powders insoluble in Water but soluble in Nitric Acid, diluted with half its bulk of Water.

It varies much in density; the lighter variety is most suited for dispensing, being more easily suspended.

Tests.—Each yields the reactions characteristic of Bismuth. When either is dissolved in a little Hydrochloric Acid, the solution diluted with Water slightly acidulated with the same acid, and then excess of Hydrogen Sulphide passed through the liquid, a brownish-black precipitate of Bismuth Sulphide falls. This precipitate, when rapidly washed on a counterpoised filter with Water, and quickly dried at 212° F. (100 C.), serves for the estimation of the amount of Bismuth present in the compound. These Bismuth salts, when suitably treated, should yield no characteristic reaction with the tests for Silver, Lead, Copper, Arsenium, Iron, Zinc, Calcium, Magnesium, Chlorides, or Sulphates, nor with the tests for Selenium or Tellurium.

Are we to understand that Iron, Arsenic, Lead, Tellurium, Selenium, and Magnesium are all equally objectionable?—*C.D.* '98, i. 674.

Bismuth Oxycarbonate affords the reactions characteristic of Carbonates, but not more than the slightest reactions with the tests for Nitrates. Each gramme of it should yield ·99 gramme of Bismuth Sulphide when treated as described above.

The commercial Carbonate invariably contains more than a trace of Nitrate (*P.J.* xiii. (3) 936; (3) xviii. 721, 780), but it can be obtained in commerce free from Nitrate (*C.D.* '98, i. 837).

A delicate test for Tellurium.—Dissolve, without heat, 10 grains of Bismuth Subnitrate, or Bismuth Carbonate, in 60 minims of strong Hydrochloric Acid mixed with 60 minims of Water; add 10 grains of Sodium Hypophosphite. An evolution of Nitrous fumes will take place in the case of Subnitrate, and of Carbonic Acid only if it be Carbonate; but no development of colour or precipitation if the Bismuth salt be pure. If Tellurium be present in very small proportion a black precipitate will fall, and if Arsenium be the impurity the precipitate will be brown.—*C.D.* '97, i. 631.

Foreign Pharmacopœias.—Official in Mex. (Carbonato de Bismuto), Port. and U.S.; not in the others.

Preparation.

TROCHISCUS BISMUTHI COMPOSITUS. COMPOUND BISMUTH LOZENGE. (ALTERED.)

Bismuth Oxycarbonate, 2 grains; Heavy Magnesium Carbonate, 2 grains; Precipitated Calcium Carbonate, 4 grains. Mix with the Rose Basis to form a Lozenge.

This lozenge is now made with the Oxycarbonate instead of the Oxynitrate.

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

A modification, known as the **Gastric Antacid Lozenge**, has been recommended by Sir W. Roberts ; the Bismuth is omitted and Sodium Chloride added.—*B.M.J.* '89, ii. 374.

Foreign Pharmacopœias.—Official in Fr. and Port. 1½ grain in each; not in the others.

BISMUTHI OXIDUM.

BISMUTH OXIDE.

Bi_2O_3, eq. 462·24.

May be prepared by boiling Bismuth Oxynitrate with Solution of Sodium Hydroxide.

Solubility.—Insoluble in Water; soluble in Nitric Acid mixed with half its volume of Water.

Medicinal Properties.—Similar to the Subnitrate.

Dose.—5 to 20 grains.

Not Official.—Bismuthi Oxidum Hydratum and Cremor Bismuthi.

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

Description.—A slightly brownish-yellow powder.

Tests.—It should answer to the general characters and tests enumerated under 'Bismuth Oxycarbonate.'

Each gramme should yield 1·1 grammes of Bismuth Sulphide. Heated to incipient redness it is scarcely diminished in weight (absence of Bismuth Oxycarbonate, Bismuth Oxynitrate, and moisture).

Not Official.

BISMUTHI OXIDUM HYDRATUM.—A white amorphous powder, soluble in an excess of Hydrochloric Acid and precipitated again on the addition of Water as Oxychloride. It mixes readily with Water to form a cream.

CREMOR BISMUTHI.—Hydrated Bismuth Oxide, 1; Water, 4: rub together till smooth.

BISMUTHI SALICYLAS.

BISMUTH SALICYLATE.

[NEW.]

$C_6H_4 \cdot OH \cdot COO \cdot BiO$ (eq. 359·19).

Bismuth Salicylate, or Oxysalicylate may be prepared by the interaction of Bismuth Nitrate and Sodium Salicylate.

It is recommended to be prepared from crystallised Bismuth Nitrate by precipita-

tion with Ammonia, washing the precipitate till free from Nitrate, and mixing it with a molecular portion of Salicylic Acid.—*J.C.S.Abs.* '94, i. 416.

Solubility.—Insoluble in Water and Alcohol (90 p.c.).

Medicinal Properties.—Intestinal antiseptic and sedative; has been given with success in gastro-intestinal affections, particularly the summer diarrhœa of children.—*L.* '86, ii. 31, 1229; '88, i. 191, 1100; *T.G.* '86, 775; *B.M.J.E.* '92 i. 99.

Dose.—5 to 20 grains.

Prescribing Note.—Given in **cachets**, or in a **mixture** suspended with Mucilage. The salt is dissociated by contact with water, and then effervesces with an alkaline Carbonate; in such cases it is better to prescribe Bismuth Carbonate and Sodium Salicylate.

Foreign Pharmacopœias.—Fr. and Mex., 61 p.c. of Bismuth Oxide; Dan., Ger., Norw. and Russ., 63 p.c.; Dan., 60 p.c.; Norw.; not in the others.

Description.—A white or nearly white amorphous powder.

Tests.—It affords the reactions characteristic of Bismuth. Diluted Test-solution of Ferric Chloride is coloured violet when Bismuth Salicylate is introduced. It should yield only the faintest characteristic reaction with the Copper test for Nitrates. Alcohol (90 p.c.), with which Bismuth Salicylate has been shaken, should not give a violet colour with test-solution of Ferric Chloride (absence of free Salicylic Acid). Decomposed by heating with Solution of Sodium Carbonate, the liquid portion of the resulting mixture, if containing not less than 1 p.c. of Salicylate, affords a yellowish-brown precipitate on the addition of Solution of Uranium Nitrate (distinction from Carbolates and Sulphocarbolates). Each gramme of Bismuth Salicylate should yield ·7 gramme of Bismuth Sulphide. When heated Salicylic Acid volatilises and 62 to 64 p.c. of Bismuth Oxide remains. It should be free from the impurities indicated under 'Bismuth Oxycarbonate.'

There is a slight discrepancy between the figures given for Bismuth Sulphide and Bismuth Oxide. We have not yet seen a sample which would pass the Ferric Chloride test. If made as suggested in B.P. it will probably contain a considerable percentage of Nitrate.

Not Official.

THIOFORM (basic Dithio-salicylate of Bismuth).—Used as a desiccative and topical antiseptic.—*T.G.* '94, 561; *L.* '94, ii. 211; *B.M.J.E.* '96, i. 32.

BISMUTHI SUBNITRAS.

BISMUTH OXYNITRATE.

$BiONO_3$, H_2O, eq. 302·64.

Prepared by the interaction of Bismuth Nitrate and Water.

The formula calculates into 77 p.c. of Oxide, but it always contains 79 to 82 p.c. If the compound $BiONO_3$, H_2O exists, it is so unstable that it could certainly not be kept without decomposition.—*C.D.* '85, 561.

Although Mr. David Howard called attention to the inaccuracy of the formula given in B.P. '85, the error is repeated in B.P. '98. It is also at variance with the official test which requires that it should yield 84 p.c. of Bismuth Sulphide.

An examination of commercial samples of Bismuth Subnitrate in America yielded from 81 to 83·26 p.c. of Bismuth Oxide, and from 14 to 19·68 p.c. of NO_3.—*A.J.P.* '96, 423.

Solubility.—Insoluble in Water.

Medicinal Properties.—Sedative and astringent both internally and externally. It is highly useful in pyrosis, all forms of vomiting and irritative dyspepsia; in gastric ulcer, also in diarrhœa from any cause; usually combined with Soda, Magnesia, Opium, etc.; it renders the fæces leaden-grey in colour. It is recommended to be injected in gonorrhœa and leucorrhœa, 60 grains to the ounce of Water; the Bismuth is mixed with an equal quantity of Glycerin or suspended with Tragacanth. The addition of Bismuth to mixtures for diarrhœa of phthisis controls it better than other ingredients alone.

Externally it is used as a cosmetic, but is more or less blackened by an impure atmosphere; and as lotion, powder, or ointment in burns, eczema and other skin diseases when exudation and itching are present; also as an ingredient of Ferrier's snuff in acute coryza and chronic rhinitis.

Has been recommended as a dressing for wounds.—*L.* '85, ii. 634, and *T.G.* '85, 266.

Dose.—5 to 20 grains.

Prescribing Notes.—When prescribed in a **mixture**, it should be suspended with Compound Powder of Tragacanth, 1 drm. in a 6-oz. mixture. *See* Bismuthi Carbonas.

As Bismuth Oxynitrate in Water slowly parts with its Nitric Acid, the mixture is always acid, and this somewhat interferes with its suspension, and when prescribed with Sodium Bicarbonate it causes a slight but steady evolution of Carbonic Acid, which may cause the bottle to burst; these objections do not apply to the Bismuth Carbonate, which is therefore preferable in mixtures.

Incompatibles.—Effervescence ensues if prescribed in Water with Alkaline Bicarbonates. With Potassium Iodide double decomposition slowly ensues.

Official Preparations.—Used in the preparation of Liquor Bismuthi et Ammonii Citratis, and Bismuthi Oxidum.

Not Official.—Lotio Bismuthi, Unguentum Bismuthi, and Ferrier's Snuff.

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

Description.—A heavy white inodorous powder consisting of minute crystalline scales, with not more than a slight action on Litmus.

Tests.—It should answer to the general characters and tests enumerated under 'Bismuth Oxycarbonate.' Each gramme should yield ·84 gramme of Bismuth Sulphide. It should afford only the slightest reactions with the tests for Carbonates. If 1 gramme be dissolved in Nitric Acid and the liquid mixed with a solution of about 2 grammes of Citric Acid and sufficient Solution of Ammonia to give decided alkalinity, no precipitate or opalescence should be produced by boiling the mixture while still faintly alkaline (absence of Calcium Phosphate).

E. Merck in a criticism of the B.P. recommends Bismuth to be determined as Oxide and not as Sulphide, the results being more reliable. The determination as Sulphide is apt to be too high owing to co-precipitation of Sulphur which is not

washed out. Bismuth Nitrate has a more basic character than would appear from the formula.—*C.D.* '98, ii. 348.

The best Arsenic test is to dissolve the sample in pure Hydrochloric Acid, add Arsenic-free Zinc, and cover the test-tube with filter-paper moistened with solution of Bichloride of Mercury.—*P.J.* (3) xiv. 424.

A delicate test for Tellurium *see* Bismuthi Carbonas.

It is distinguished from the Carbonate by being soluble without effervescence in diluted Nitric Acid and from the Oxychloride by dissolving in Acetic Acid.

Preparation.

LIQUOR BISMUTHI ET AMMONII CITRATIS. Solution of Bismuth and Ammonium Citrate. *B.P. Syn.*—Liquor Bismuthi. (Altered.)

Bismuth Oxynitrate, 7; Potassium Citrate, 7; Potassium Carbonate, 2; Nitric Acid, 5; Solution of Ammonia, Distilled Water, of each a sufficient quantity. Dissolve the Bismuth Oxynitrate in the Nitric Acid diluted with an equal volume of Distilled Water; add Distilled Water with constant stirring until the liquid is very faintly opalescent; add the Potassium Citrate and Carbonate dissolved in a little Distilled Water; heat the liquid to the boiling-point; cool; separate the precipitate; wash it with Distilled Water until free from Nitrates. Gradually add Solution of Ammonia to the moist precipitate until it is just dissolved; dilute with Distilled Water to 100; filter.

Now made from Bismuth Oxynitrate instead of Bismuth Citrate.

Description.—A colourless solution, with a slightly metallic taste.

Tests.—Sp. gr. 1·070. Slightly alkaline to test-paper; is freely miscible with Water; heated with alkalis evolves Ammonia, and yields a white precipitate. Evaporated to dryness and the product ignited, a residue with a yellow edge results, which when suitably treated, should not yield any reaction characteristic of Silver, Lead, Copper, Arsenium, Iron, Selenium, or Tellurium. A mixture of 10 c.c. of the Solution with 40 c.c. of Water, treated with Hydrogen Sulphide in excess, yields a black precipitate, which, when washed and dried, should weigh at least ·55 gramme.

Dose.—½ to 1 fl. drm.

1 fl. drm. contains an amount of Bismuth equivalent to about 3 grains; or 1 c.c. the equivalent of ·05 gramme, of Bismuth Oxide.

Examinations of commercial samples of Liquor Bismuthi *B.P.* '85.—*C.D.* '97, ii. 118: *P.J.* '97, ii. 157.

Not Official.

LOTIO BISMUTHI (*B.S.H.*).—Bismuth Subnitrate, 10 grains; Water, 1 fl. oz.: mix. Used as a sedative lotion in cases of eczema.

UNGUENTUM BISMUTHI.—Bismuth Subnitrate, 60 grains; Lard, 1 oz.

FERRIER'S SNUFF.—Bismuth Subnitrate, 6 drm.; Hydrochloride of Morphine, 2 grains; Gum Acacia in powder, 2 drm.—*L.* '76, i. 525.

It is described as a speedy and efficacious remedy for a recent cold in the head; each time the nostrils are cleared another pinch should be taken, using it frequently at first. One quarter to one half of this formula may be used in the twenty-four hours.

Glass insufflators are made to blow it up the nostrils.

Not Official.

BOLDO.

The leaves and young twigs of the *Peumus fragrans*, a native of Chili.

The activity is due to a glucoside, Boldine, and a volatile oil (sp. gr. ·918).

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

Medicinal Properties.—Has been used in liver complaints, and as a stimulant to digestion, also as a hypnotic.

Boldine has been given as a hypnotic in **capsules** containing 3 grains.

Preparation.

TINCTURA BOLDO.—Boldo Leaves, 1; Alcohol (60 p.c.), 10.

Digest seven days and filter.

Dose.—10 to 40 minims.

Foreign Pharmacopœias.—Fr. and Mex., 1 and 5, by weight; not in the others.

Not Official.

BONE MARROW.

See MEDULLA RUBRA.

BORAX.

BORAX.

B. P. Syn.—Biborate of Sodium.

$Na_2B_4O_7, 10H_2O$, eq. 379·12.

This salt, Sodium Pyroborate, occurs native. It is also made artificially by neutralising native Boric Acid with Sodium Carbonate, or by boiling native Calcium Borate with Solution of Sodium Carbonate.

A salt imported in a crude state from India; large quantities are also manufactured from the native Boric Acid of Tuscany, and the native Calcium Borate of Peru.

Solubility.—1 in 25 of Water; 2 in 1 of boiling Water; 2 ounces of Borax are dissolved by 2 fluid ounces of Glycerin, and the solution measures only 3¼ fluid ounces. By the aid of 1 of Glycerin, 1 part of Borax will dissolve in 12 of Water. Insoluble in Alcohol (90 p.c.).

Borax is decomposed by Glycerin, forming a solution which reddens Litmus and effervesces with Sodium Bicarbonate.

Medicinal Properties.—Antiseptic and parasiticide; mildly astringent. A local sedative to inflamed mucous membrane. As a **lotion** 10 grains to the ounce; as a **gargle** (saturated solution) about 20 grains to the ounce and as an **injection** in leucorrhœa and gonorrhœa. The Glycerin of Borax is used as a **paint** for the throat, for cracked nipples, and for erythematous skin eruptions. The Glycerin or Mel is used in aphthous ulceration of the tongue or buccal mucous membrane, and for mercurial salivation.

Internally in epilepsy (*L.* '93, ii. 1586, '95, ii. 755), but is inferior to Bromide and has many inconveniences (*B.M.J.E.* '95, i. 4).

Dose.—5 to 20 grains.

Prescribing Notes.—For internal use it is generally given in solution. Should not be prescribed with salts of Cocaine or other alkaloids.

Incompatibles.—Mineral Acids and most of their metallic salts. Mucilage of Acacia.

Official Preparations.—Glycerinum Boracis and Mel Boracis.

Not Official.—Liquor Boracis, Lotio Boracis, Tinctura Myrrhæ et Boracis, Trochisci Boracis, and Unguentum Boracis.

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

Description.—Transparent colourless crystals, sometimes slightly effloresced, with a weak alkaline reaction.

Tests.—It turns turmeric-paper brown. It colours flame intensely yellow. A hot saturated solution, when acidulated with any of the mineral Acids, lets fall, as it cools, a scaly crystalline deposit of Boric Acid, the solution of which in Alcohol (90 p.c.) burns with a green flame. Each gramme dissolved in 200 c.c. of Water should require for neutralisation 5·2 c.c. of the Volumetric Solution of Sulphuric Acid, using Methyl Orange as the indicator. It should yield no characteristic reaction with the tests for Lead, Copper, Arsenium, Iron, Calcium, Magnesium, Carbonates, Nitrates, or Phosphates, and not more than the slightest characteristic reactions with the tests for Chlorides or Sulphates.

Although Borax is really an acid salt, Boric Acid has so little action upon the usual indicators, that the Soda can be estimated by standard Acid just as if no Boric Acid was present.

Phenol-phthalein is of no use for this titration, and even Litmus gives a rather indefinite end-reaction. The best results are obtained with Methyl-orange and standard Sulphuric Acid.

Preparations.

GLYCERINUM BORACIS. Glycerin of Borax. (Altered.)

Borax, 1; Glycerin, 6. Triturate the Borax with the Glycerin until solution is effected. =(By weight 1 in 8½, measure 1 in 6½).

The water is now omitted as in *B.P.* '67, and being more viscid is better adapted for many purposes.

This is not merely a solution of Borax in Glycerin; the Glycerin splits up the Biborate into free Boric Acid and a more basic Borate with secondary reactions. It reddens Litmus paper, and effervesces on the addition of Bicarbonate of Sodium.

Dose.—Not given in B.P.; ½ to 1½ drm.

20 mins. given in diarrhœa of infants.—*L.* '89, ii. 739.

Foreign Pharmacopœias.—Official in Dutch, 1 and 5; Mex. (Glicerina Boratada), 1 and 19; Norw. (Linctus boracinus), 1 and 9; (all by weight); not in the others.

MEL BORACIS. Borax Honey.

Borax in fine powder, 2; Glycerin (by weight), 1; Clarified Honey (by weight), 16: mix. =(about 1 in 7 by volume).

Foreign Pharmacopœias.—Official in Mex. (Colutorio boratado) Borax 1, Honey 1; Swed. (Linctus), 1 in 10; Swiss, 1 in 10; the ingredients vary slightly; not in the others.

Not Official.

LIQUOR BORACIS (Thompson's Fluid) (*G.H.*).—Borax 1, Glycerin 2, Water 2; dissolve. Half an ounce to be mixed with 4 fl. oz. of warm water before use.

LOTIO BORACIS.—Borax, 1; Rose Water, 24; or Borax 1, Glycerin 1, Rose Water 16.

TINCTURA MYRRHÆ ET BORACIS.—Myrrh, 1; Eau de Cologne, 16; Borax, 1; Water, 3; Syrup, 3.

TROCHISCI BORACIS (*T.H.*).—Each Lozenge contains 3 grains of Borax. Use:—mildly detergent, useful in thrush and muscular weakness of the throat.

UNGUENTUM BORACIS.—Borax, 1; Spermaceti Ointment, 8.
For chilblains or cracked nipples.

Not Official.

BROMUM.

BROMINE.

Br, eq. 79·35.

A liquid non-metallic element, obtained from sea-water and from some saline springs.

Solubility.—In Water, 1 in 30 by weight. Readily soluble in Glycerin, Alcohol (90 p.c.), Ether, Chloroform, and Carbon Bisulphide with gradual decomposition of the solvents.

Medicinal Properties.—Deodoriser and disinfectant. Used medicinally as a sedative in the form of the Bromides and Diluted Hydrobromic Acid.

Official Preparations. — Used to prepare Potassii Bromidum, and Sodii Bromidum.

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

Description.—A dark brownish-red, very volatile liquid, which gives off red suffocating vapours at the ordinary temperature of the air. Sp. gr. 2·97 to 3·14; boils at 135° to 145° F. (57·2° to 62·8° C.).

Chlorine is the impurity most likely to be present in Bromine; both U.S.P. and Ph. Ger. allow 3 p.c. of Chloride in their alkaline Bromides.

Preparations.

HYPOBROMITE SOLUTION FOR UREA-ESTIMATION.—Prepare a stock Solution of Soda (sp. gr. 1·310) by dissolving 3½ oz. of pure Sodium Hydroxide in 9 fl. oz. of Water. To one fluid ounce of this add 42 minims of Bromine when the Solution is wanted for use.

Glass tubes (hermetically sealed) containing the proper quantity of Bromine are made.

LIQUOR BROMI.—Bromine, 160 minims; Potassium Bromide, 240 grains; Water, 4 fl. oz.: dissolve the Potassium Bromide in the Water in a bottle, add the Bromine and shake till dissolved.

BROMIPIN.—Is a Bromine addition—compound of the fatty acid of Sesame Oil. Introduced for the treatment of epilepsy in doses of one teaspoonful.

BROMOFORM ($CHBr_3$).—A colourless liquid, about twice as heavy as Chloroform, practically insoluble in Water, readily soluble in Alcohol (90 p.c.) and Ether; about 1 in 80 of Glycerin.

It becomes yellow on exposure to sunlight, and should not then be dispensed.

Given for the relief of whooping cough in doses of 2 to 5 drops three or four times a day; in some cases it caused languor and drowsiness, and an over-dose produced toxic symptoms.—*L.* '90, ii. 139; '93, i. 1062; *Pr.* xlv. 47; *T.G.* '90, 694; '91, 214.

BROMETHYLFORMINE (BROMALINE).—Colourless crystals, very soluble in Water. Has been recommended as a nervous sedative in the treatment of epilepsy, and is given in similar doses to those of the metallic Bromides.

Not Official.

BRYONIA.

The root of *Bryonia alba* and of *Bryonia dioica*.

Medicinal Properties.—In large doses it is an active hydragogue cathartic, in small doses it is given in pleurisy. It has also been used as a hæmostatic in menorrhagia.—*L.* '88, ii. 438.

It has been used for many years by the homœopaths in the form of **tincture.**

The active principle is a glucoside.

Foreign Pharmacopœias.—Official in Belg., Fr., Mex., Port., Span. and U.S.; not in the others.

Preparation.

TINCTURA BRYONIÆ (*B.P.C.*)—Ascertain the percentage of moisture in the fresh Bryony Root by drying 100 grains over a water-bath. Bruise the remainder, after having calculated the Water it contains, and reckon this as a part of the Water to form, with Rectified Spirit, a mixture equal in strength to Proof Spirit. Produce a tincture, by macerating for seven days, of such a strength that 10 fl. oz. shall represent 1 oz. of the dried root.

Fresh Bryony Root yields on an average 32 to 40 p.c. of dried root.

Dose.—1 to 10 minims.

Foreign Pharmacopœias.—Mex., 1 and 5, **dried root**; U.S., 1 **dried root** in 10; Fr. (Alcoolature), 1 **fresh root** in 1.

Antidotes.—An emetic; stimulants, Brandy or Spirit of Sal Volatile.

BUCHU FOLIA.

BUCHU LEAVES.

N.O.Syn.—Bucco; Diosma.

The dried leaves of *Barosma betulina*.

Medicinal Properties.—Tonic, stomachic, diuretic, and diaphoretic. Given chiefly in complaints of the urinary organs, as an antiseptic in chronic cystitis, and in irritation of the bladder and urethra. Also in dyspepsia, chronic rheumatism, and dropsy.

Dose.—Not given in B.P.; 20 to 40 grains in powder.

Official Preparations.—Infusum Buchu and Tinctura Buchu.

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

Description.—Usually varying in length from half an inch to three-quarters of an inch (twelve to twenty millimetres), dull yellowish-

green in colour, rhomboid-obovate in outline, rigid, and, when slightly moist, cartilaginous. The surface is glabrous and somewhat warty, the margin usually sharply denticulate, the apex blunt and recurved. Oil-glands are distinctly visible in the leaf, especially near the margin. The transverse section exhibits an epidermis whose cells contain yellow sphero-crystals; the inner walls of these cells are thick and rich in mucilage. Odour and taste strong and characteristic.

Preparations.

INFUSUM BUCHU. Infusion of Buchu.

Buchu leaves freshly broken, 1; Distilled Water, boiling, 20: infuse in a covered vessel for fifteen minutes: strain. =(1 in 20).

Time reduced from thirty minutes to fifteen minutes.

Dose.—1 to 2 fl. oz.

(Not in the other Pharmacopœias.)

TINCTURA BUCHU. Tincture of Buchu. (Altered.)

Buchu leaves, in No. 20 powder, 4; Alcohol (60 p.c.) a sufficient quantity. Moisten the powder with 4 of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20. =(1 in 5).

Now 1 in 5 instead of 1 in 8, and made with Alcohol (60 p.c.) in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Fr. and Mex., 1 and 5; both by weight; not in the others.

BUTYL-CHLORAL HYDRAS.

BUTYL-CHLORAL HYDRATE.

$CH_3.CHCl.CCl_2.CH(OH)_2$, eq. 191·97.

Butyl-Chloral Hydrate, or Trichlorbutylidene Glycol is a crystalline hydrate obtained by the addition of Water to the liquid Butyl-Chloral produced by the action of Chlorine Gas on Aldehyde.

Butyl-Chloral Hydrate was formerly known as Croton-Chloral Hydrate.

Solubility.—1 in 44 of Water; 1 in 1 of Glycerin (very slowly); 5 in 3 of Alcohol (90 p.c.); 1 in 20 of Olive Oil; 1 in 2 of Ether; 1 in 20 of Chloroform.

Medicinal Properties.—Analgesic; is an efficient remedy in neuralgia of the face and head, and in tic-douloureux, concentrating its action on the fifth nerve.

Dose.—5 to 20 grains.

Prescribing Notes.—Generally given in the form of pills made with a little Compound Powder of Tragacanth and Syrup.

Not Official.—Mistura Butyl-Chloral, Pilula Butyl-Chloral, Syrupus Butyl-Chloral.

Antidote.—Picrotoxin $\frac{1}{20}$ grain.

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

Description.—In pearly-white, trimetric laminæ, having a pungent but not acrid odour, and an acrid nauseous taste.

Some samples are acid, very pungent and acrid. Of these we found that 1 gramme heated in a porcelain capsule over a water-bath for 10 minutes wholly volatilised; but the sample lost its pungency and acridity after having been washed with about twice its weight of water, pressed, and dried by exposure to air, and when heated as above lost less than half its weight.

The slow volatility of a sample may therefore be taken as a test of its purity.

Tests.—It fuses at about 172° F. (77·8° C.) to a transparent liquid, which, in cooling, commences to solidify at about 160° F. (71·1° C.). The aqueous solution is neutral or but slightly acid to Litmus. It does not yield Chloroform when heated with Solution of Potassium Hydroxide or with Milk of Lime (absence of Chloral Hydrate).

As the Hydrate loses Water even at temperatures lower than its melting point, and fuses in consequence more easily, the **melting point** should be taken quickly on a sample which has not been previously heated.—*P.J.* (3) xvii. 797.

An acrid sample by washing and drying had its melting point raised from 165° to 174° F.

Not Official.

MISTURA BUTYL-CHLORAL (*L.H.*).—Butyl-Chloral Hydrate, 4 grains; Glycerin, 15 minims; Chloroform Water, ½ fl. oz.; Water to 1 fl. oz.

PILULA BUTYL-CHLORAL (*L.H.*).—Butyl-Chloral Hydrate, 4 grains; Compound Powder of Tragacanth, 1 grain; Water q. s.; in one pill.

SYRUPUS BUTYL-CHLORAL (*B.P.C.*)—Butyl-Chloral Hydrate, 320 grains; Syrup sufficient to make 20 fl. oz.; dissolve in the Syrup by the aid of heat.

Dose.—1 to 4 drm.

Not Official.

BYNE. MALT.

Good Malted Barley is tolerably uniform in diastase, and the widely differing results published from time to time by different analysts as to the strength of commercial Extracts must arise partly from a destruction of diastase in the manufacture of the Extracts, and partly from an ambiguity attaching to the phrase 'conversion of Starch.' Hence we find it stated on the one hand that one part of Starch requires for conversion 19 of Malt Extract, and on the other hand that one of Malt Extract will convert 30 parts of Starch.

When Starch is boiled with water it forms a semi-gelatinous fluid, which under the influence of Diastase quickly loses this condition and becomes thin and transparent, yet continues to give a blue colour with Iodine. As the action proceeds this 'soluble starch' is converted into Erythro-dextrin, giving a red colour with Iodine, and finally into Achroo-dextrin and Maltose, neither of which is coloured by Iodine. These changes are gradual and merge one into the other, but from an analytical point of view they may be said to be complete when no shade of *red* appears on the addition of a few drops of dilute Iodine Solution, as this is the best defined point in the series of changes.

We have had occasion to examine a number of high-class barley-Malts, both from British and foreign grain. At a temperature of 99°—100° F. the finest sample, when treated with its own weight of Starch ceased to give any *red* colour at the end of three minutes, and the poorest sample in fifteen minutes. A well-

prepared Extract should be but little if at all inferior in diastasic power to the Malt from which it is made.

It has been suggested by Helbing (Dec. '92), as a pharmacopœial standard, that the Starch Solution should not give any *blue* colouration after digestion for fifteen minutes at 104°—107° F. From the results given in the preceding paragraph it will be seen that as a standard this is very low.

Analysis of Malt.—*P.J.* (3) xxv. 193, 233; *J.C.S.A.* '94, ii. 371, 491; *J.S.C.I.* '94, 986; '95, 290, 690.

Preparation.

EXTRACTUM BYNES. *Syn.*—EXTRACTUM MALTI. MALT EXTRACT.

Is made by infusing or mashing ground Malt in Water at a temperature under 160° F., preferably 140° F., filtering and evaporating the solution in vacuo to the consistence of a thick syrup. It is a more convenient preparation for use when it is evaporated only to a thin syrup, but the Extract is more liable to undergo fermentation under these circumstances.

Medicinal Properties.—Malt Extract is prescribed in wasting diseases, and where the digestion is weak. It is also given with Cod Liver Oil.

Dose.—A teaspoonful to a tablespoonful.

In addition to the nutrient value which Malt Extract possesses, as representing a cooked and 'digested' farinaceous food, it has also been valued for its diastasic activity, or power of converting further quantities of starchy material into Dextrin and Maltose. So far as artificial digestion, or conversion previous to the act of feeding, is concerned, it *has* this value; but as the action of Malt-diastase is greatly retarded by a very slight acidity, it is very open to question whether its action can continue in the presence of normal gastric juice, and more especially in the presence of Pepsin.

It is, however, very useful when mixed with baked wheaten flour to form foods for infants and invalids when a certain amount of pre-digestion is required.

Foreign Pharmacopœias.—The U.S.P. 1882, ordered the Malt to be macerated in cold Water for six hours, then digested for an hour at 131° F., strained and evaporated at a temperature not exceeding 131° F. to the consistence of Honey. This contained active Diastase. It was omitted in U.S. 1893.

German Pharmacopœia gave a process for Extractum Malti in 1872, in which the infusion was *boiled* before evaporation. Of course, in this case, the whole of the Diastase was destroyed, and the process was omitted in P.G. 1882.

Test.—For Malt or Malt Extract, three solutions, *A*, *B*, and *C*, are required. (*A*) Infuse 5 grammes of ground Malt in 100 c.c. of Water at 140° F. for one hour; cool to 60° F. and make up to 100 c.c with Water; filter. For testing Malt Extract, dissolve 5 grammes of the Extract in sufficient Water to make 100 c.c. of solution. (*B*) Mix 1 gramme of Potato Starch with 10 c.c. of Water, add to it 90 c.c. of boiling Water; boil the mixture for ten minutes; cool to 60° F. and make up to 100 c.c.; strain through fine muslin. (*C*) Dilute 1 c.c. of B.P. Volumetric Solution of Iodine to 75 c.c. with Water.

METHOD.—Run 2 c.c. of the Iodine Solution into each of one dozen test-tubes. Bring solution *A* and solution *B* to 100° F.; place 50 c.c. of *B* in a beaker immersed in Water at 100° F., and add to it 10 c.c. of *A*; at the end of a minute draw off 2 c.c. of the mixture and add it to the Iodine Solution in one of the test tubes, and at the end of each subsequent minute repeat the operation. If the test-tubes are arranged in the order in which the solution is added, the colour in each test-tube will represent the amount of action in a given time represented by minutes. As it occupies from ten to fifteen seconds to run the Malt Solution from a pipette into

the Starch, we usually start the stop-watch or chronograph when half of the solution has run out of the pipette. When a first-class sample of Malt Extract is used, the contents of the first test-tube will be of a blue colour, the second will be red and the third or fourth yellow, but the changes will be somewhat slower in a sample which is not so good.

Six of the best known brands of Malt Extract examined by this test ceased to produce a red colour at the end of three, four, six, eight, fourteen, and fifteen minutes respectively, showing a variation of from three to fifteen minutes, in the digestion of *their own weight* of Starch. A fluid Malt Extract, containing Alcohol, ceased to give a red colour at the end of thirty-five minutes.

The best sample, when treated with *five times* its weight of Starch, ceased to produce a red colour at the end of fourteen minutes.

It is important that the conditions should be the same in each experiment, for any variation in the quantity of Iodine to the volume of liquid employed will affect the results, but under the conditions given, when the colours are viewed in series, two independent workers should not vary more than 1 minute in the reading.

MALT EXTRACT WITH COD LIVER OIL.—This is supplied under several well-known brands, but can be prepared extemporaneously by thinning ordinary Malt Extract with 10 to 15 p.c. of water, heating the mixture to 120° F., adding the oil and shaking thoroughly until mixed. The commercial product contains from 20 to 30 p.c. of Cod Liver Oil.

Malt Extract with Cod Liver Oil. Examination of commercial samples gave from 20 to 30 p.c. of Oil by volume.—*P.J.* (3), xxv. 162.

Prescribing Note.—Usually given in Milk.

EXTRACTUM MALTI FERRATUM (*G.H.*).—Pyrophosphate of Iron 2 parts, Water 3 parts. Dissolve and add Extract of Malt 95 parts. Mix. Dose.—1 to 4 drm. Each fl. drm. contains about 1 grain Pyrophosphate of iron.

CADINUM OLEUM.

OIL OF CADE.

B.P.Syn.—Juniper Tar Oil.

An empyreumatic oily liquid obtained by the destructive distillation of the woody portions of *Juniperus Oxycedrus*, and some other species.

Solubility.—Mixes in all proportions with Chloroform and Ether; partially soluble in Alcohol (90 p.c.); slightly soluble in Water.

Medicinal Properties.—Used as a stimulant in cases of psoriasis and of chronic eczema.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Fr., Hung., Norw., Port., Span. (Aceite de Enebro), Swed., Swiss, and U.S.; not in the others.

Description.—A dark reddish-brown or nearly black, more or less viscid, oily liquid, with a not unpleasant empyreumatic odour and an aromatic bitter and acrid taste.

Tests.—Sp. gr. about ·990. The filtered aqueous solution is almost colourless and possesses an acid reaction.

In a sample examined by us (sp. gr. ·996), the acidity amounted to ·7 p.c. pure Acetic Acid.

The composition of Juniper Tar compared with that of pine, beech, birch, and aspen.—*B.M.J.E.* '97, ii. 83.