

This preparation contains about twice the proportion of Strychnine present in the Tincture of Nux Vomica of the British Pharmacopœia of 1885.

Foreign Pharmacopœias.—Official in Austr., Dan., Ger., Ital., Jap., Norw., Russ., Swed. and Swiss, 1 in 10; Belg., Fr., Hung., Mex., Port. and Span., 1 in 5; prepared from the **seeds**. Dutch, 1 Extract in 100; U.S., 1 Extract in 50; all by weight except U.S.

Tests.—Treated by the assay process given under 'Extractum Nucis Vomice Liquidum,' 100 c.c. should yield not less than .24 nor more than .26 gramme of Strychnine, corresponding to about $\frac{1}{8}$ grain in 1 fl. drm. or $\frac{1}{4}$ grain in 110 minims.

STRYCHNINE.—See STRYCHNINA.

Not Official.

BRUCINE ($C_{23}H_{26}N_2O_4 \cdot 4H_2O$).—Colourless crystals, containing about 15 p. c. of Water, which quickly effloresce in dry air.

The presence of 5 p. c. of Strychnine in Brucine can be detected by the reaction with Sulphuric Acid and Potassium Bichromate.—*P.J.* (3) xxiv. 2.

Solubility.—But slightly soluble in Water; 1 in 20 of Alcohol (90 p.c.), 1 in 2 of Chloroform, with separation of the combined Water. Its salts are bitter, and most of them crystallisable. They are distinguished by giving a deep red with strong Nitric Acid, changing to violet on the addition of Stannous Chloride.

It possesses powerful analgesic properties, in 5 p.c. solutions of the Sulphate or Nitrate applied locally.—*T.G.* '85, 376; '86, 18.

A very sensitive reaction for Brucine is the Nitrite test.—*P.J.* '96, ii. 378.

OLEA.

OILS.

The following are the Oils of the British Pharmacopœia; they will be found under the names of the substances from which they are derived; an average percentage yield is also given:—

	Per cent.
OLEUM AMYGDALÆ. Expressed from the seed	42
OLEUM ANETHI. Distilled from the fruit	2.8 to 3
OLEUM ANISI. Distilled from the fruit	2
OLEUM ANTHEMIDIS. Distilled from the flowers75
OLEUM CADINUM. Destructive distillation of the Wood.	
OLEUM CAJUPUTI. Distilled from the leaves.	
OLEUM CARUI. Distilled from the fruit	5
OLEUM CARYOPHYLLI. Distilled from the flower-bud	16
OLEUM CINNAMOMI. Distilled from the bark.	
OLEUM COPAIBÆ. Distilled from Copaiba	35 to 45
OLEUM CORIANDRI. Distilled from the fruit6
OLEUM CROTONIS. Expressed from the seeds	25
OLEUM CUBEBÆ. Distilled from the unripe fruit	11
OLEUM EUCALYPTI. Distilled from the fresh leaves.	
OLEUM JUNIPERI. Distilled from the unripe fruit8
OLEUM LAVANDULÆ. Distilled from the flowers	1.5
OLEUM LIMONIS. From the fresh peel.	
OLEUM LINI. Expressed from the seeds without heat.	

	Per cent.
OLEUM MENTHÆ PIPERITÆ. Distilled from the fresh herb.	
OLEUM MENTHÆ VIRIDIS. Distilled from the fresh herb.	
OLEUM MORRHUÆ. Extracted from the fresh liver by heat	42
OLEUM MYRISTICÆ. Distilled from the seed kernel	5.5
OLEUM OLIVÆ. Expressed from the ripe fruit and imported.	
OLEUM PHOSPHORATUM.	
OLEUM PIMENTÆ. Distilled from the dried unripe fruit	4
OLEUM PINI. Distilled from the fresh leaves.	
OLEUM RICINI. Expressed from the seeds.	
OLEUM ROSÆ. Distilled from the fresh flowers	
OLEUM ROSMARINI. Distilled from the flowering tops5
OLEUM SANTALI. Distilled from the wood	2 to 4, sometimes 4½
OLEUM SINAPIS VOLATILE. Distilled from the seeds of Black Mustard after maceration with Water.	
OLEUM TEREBINTHINÆ. Distilled from Turpentine.	
OLEUM THEOBROMATIS. Expressed with heat from the seeds	25

Foreign Pharmacopœias.—The term **Oleum** is applied to an Oil (whether expressed or distilled) in Austr., Dutch, Ger., Hung., Jap., Russ. and U.S.; the other names for fixed and volatile Oils respectively are:—Belg., **Oleum** and **Essentia**; Dan., Norw. and Swed., **Oleum** and **Aetheroleum**; Fr., **Huile** and **Huile Volatile**; Ital., **Ulio** and **Essenza**; Mex., **Acceite** and **Acceite Volátil**; Port., **Oleo** and **Essencia**; Span., **Acceite** and **Esencia**.

Not Official.

OLEATES.

Some of these preparations have come into general use. They were originally made by dissolving the oxide of the metal, or an alkaloid, in an excess of Oleic Acid; but later Dr. Shoemaker proposed the method of precipitation by double decomposition between a salt of the base and Solution of Castile Soap (Sodium Oleate with a little Palmitate); Solution of Potassium Oleate may be used with advantage in place of the Solution of Castile Soap, when the pure Oleate is required. The Oleate can also be purified from Palmitate by solution in Petroleum Spirit.

The various Oleates will be found under the headings of their respective bases.

OLIVÆ OLEUM.

OLIVE OIL.

The Oil expressed from the ripe fruit of *Olea Europæa*.

Chiefly obtained from the south of Europe.

Solubility.—1 in 2 of Ether; partially in Alcohol (90 p.c.).

Medicinal Properties.—Nutritious and mildly laxative, demulcent in the form of emulsion; externally as an emollient and protective for burns and certain cutaneous diseases. Has also been successfully given for ascarides, followed by a purge. Valuable in corrosive poisoning; used in laxative enemata, especially for intestinal obstruction. It is most extensively employed in pharmacy, in the preparation of liniments, ointments, and plasters.

Recommended in the treatment of gall stones and hepatic colic. 30 fl. oz. taken in five doses.—*B.M.J.* '88, i. 933; '95, i. 111; *T.G.* '88, 785; *L.* '95, i. 1453. Internally in muco-enteritis.—*M.A.* '95, 23 Treatment of Lead colic by large doses.—*T.G.* '93, 538.

On the contrary it is stated to favour the production of gall stones.—*L.* '89, ii. 710; 'olive oil has proved useless in my hands' (*Ostler*).

In typhoid fever $\frac{1}{2}$ to $\frac{1}{4}$ pint as an injection at intervals of twelve to twenty-four hours.—*L.* '97, ii. 1383.

Dose.—Not given in B.P.; to 1 oz.

Official Preparations.—Used in the preparation of Emplastrum Ammoniacum Hydrargyro, Emplastrum Hydrargyri, Emplastrum Picis, Emplastrum Plumbi, Linimentum Ammoniacæ, Linimentum Calcis, Linimentum Camphoræ, Sapo Durus, Sapo Mollis, Unguentum Capsici, Unguentum Hydrargyri Compositum, Unguentum Hydrargyri Nitratis, and Unguentum Resinæ.

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

Description.—Pale yellow or greenish-yellow, with a faint odour, and a bland taste.

Tests.—Sp. gr. .914 to .919. At 50° F. (10° C.) it is liable to become of a pasty consistence, and at 32° F. (0° C.) to form a nearly solid granular mass. If 10 c.c. of the Oil be shaken with 2 c.c. of a reagent prepared by dissolving 1 gramme of Silver Nitrate in 100 c.c. of Absolute Alcohol, with the addition of 20 c.c. of Ether and one drop of Nitric Acid, no blackening should occur when the mixture is heated on a water-bath for ten minutes (absence of Cotton-seed Oil).

The congealing point depends greatly upon the length of time to which the Oil is exposed to cold. For instance, an Oil cooled by Ether to 9° F. remained unchanged, but when kept at 32° F. for four hours it partially solidified. Some samples of Oil pressed by ourselves, from Olives grown in the South of France, showed no sign of congelation during six hours at 32° F., or three hours at 15° F.; on the other hand, in the following year an Oil from the same district (guaranteed pure) set at once when cooled quickly to 13° F., and within two hours at 32° F. We have since discovered that the non-freezing oil is only produced when the fruits have been allowed to over-ripen.

Adulteration of Olive Oil is very general, large quantities of Cotton Seed and other oils being used for admixture.

Bechi's Silver Nitrate test is now carried out on the fatty acids of the oil and not on the glycerides. A sensitive reaction for Cotton Seed Oil is described under Adeps.—Detection of Castor Oil.—*J.S.C.I.* '94, 981.

OPIUM.

OPIUM.

The juice obtained by incision from the unripe capsules of *Papaver somniferum*, inspissated by spontaneous evaporation.

Any suitable variety of Opium may be employed as a source of

Tincture of Opium and Extract of Opium of the respective official alkaloidal strengths, provided that when dry it contains not less than $7\frac{1}{2}$ p.c. of Anhydrous Morphine; but, when otherwise used for officially recognised purposes, Opium must be of such a strength that when dried, and powdered, the powder heated to 212° F. (100° C.) until it ceases to lose moisture, and the product tested by the appended method, such dry powder shall yield not less than $9\frac{1}{2}$ p.c., and not more than $10\frac{1}{2}$ p.c., of Anhydrous Morphine. Opium yielding when dried more than 10 p.c. of Anhydrous Morphine may be diluted to that percentage with any Opium containing when dry between $7\frac{1}{2}$ and 10 p.c. of Anhydrous Morphine, or with Milk Sugar.

Medicinal Properties.—As a hypnotic and sedative it is used in insomnia, excitement and delirium of whatever origin, including that of typhoid; as an analgesic to relieve all forms of neuralgic and abdominal pain, the pain of pleurisy, and of gastric ulcer and of cancer, the pain during the passage of biliary and renal calculi, and the after pains of labour; as a hæmostatic in intestinal and pulmonary hæmorrhage; in diabetes; in full doses for acute peritonitis, typhlitis and perityphlitis; in small doses along with other astringents in diarrhœa, dysentery, and the early stages of cholera.

In aortic regurgitation it increases the peripheral blood supply, especially to the brain, it reduces the tendency to syncope, it relieves the neuralgia and angina, and the cardiac dyspnoea, but if the kidneys are affected it should not be given.

As an **expectorant** it is used, guarded by Ammonia, only where the mucous secretion is abundant and not thick or scanty.

As a diaphoretic in form of Dover's powder it is valuable in influenza and coryza.

As an antispasmodic in puerperal convulsions, epilepsy, colic, severe forms of chorea and spasmodic asthma; in spasmodic urethral stricture.

Locally in the form of **liniment, plaster**, or fomentation, it is used in neuralgias, rheumatism, lumbago and sciatica.

To avoid impairment of digestion and to obtain rapid action, it is given subcutaneously (as hypodermic injection of Morphine) in neuralgia and sciatica, near the seat of pain; also in angina pectoris, cardiac paroxysmal pain, and for the dyspnoea caused by intra-thoracic tumours.

In form of Morphine or Lead and Opium **suppository**, it relieves rectal and genito-urinary and other pelvic pains, and is useful after operations on these regions. Opium is preferable to Morphine in peritonitis, enteritis, and other abdominal inflammations, on account of its direct anodyne and astringent effect on the bowel, and, because of its more continued action, it is preferable in delirium and other 'head symptoms.'

Its continued use impairs the appetite, digestion, and intellect; that it is a cardiac depressant should always be borne in mind. Great caution should be exercised in giving Opium to infants and young children, as they are very susceptible to its action, and it is contra-indicated in the pain of chronic dyspepsia, in cases of coma with contracted pupil, in kidney diseases, in nursing females and plethoric

persons, in cerebral hyperæmia, in alcoholic intoxication, and in the last stages of bronchitis and pneumonia or whenever the respiration is seriously embarrassed it is a most dangerous remedy.

A valuable paper on the use of Morphine in Cardiac disease.—*L.* '98, ii. 1393.

Dose.— $\frac{1}{4}$ to 2 grains.

Prescribing Notes.—Powdered Opium can be made into pills with Alcohol (60 p.c.).

Incompatibles.—The Alkaline Carbonates, Lime Water, Salts of Lead, Iron, Copper, Mercury, and Zinc, Liquor Arsenicalis, and vegetable astringents.

Official Preparations.—Extractum Opii and Tinctura Opii; used in the preparation of Codeine and of Morphine; of the **Powdered Opium**, Emplastrum Opii, Pilula Plumbi cum Opio, Pulvis Cretæ Aromaticus c. Opio, Pulvis Opii Compositus, and Unguentum Gallæ c. Opio. Contained in Pilula Saponis Composita, Pulvis Kino Compositus, Pulvis Ipecacuanhæ Compositus, and Suppositoria Plumbi Composita. Of the **Compound Powder**, Pilula Ipecacuanhæ cum Scilla; of the **Extract**, Extractum Opii Liquidum. Of the **Tincture**, Linimentum Opii and Tinctura Opii Ammoniata; contained in Tinctura Camphoræ Composita.

Not Official.—Aqua Opii, Solution of Bimeconate of Morphia (Squire), *Syn.* Liquor Meconicus, Meconii Periodida, Liquor Opii Sedativus, Sydenham's Laudanum, Black Drop, Linimentum Opii Ammoniatum, Narceina, Narcotina, Papaverina, and Stypticin.

Antidotes.—In case of poisoning by Opium, the antidotes are an emetic of 10 grains of Copper Sulphate, the stomach pump, external stimulants, cold affusion, Ammonia to the nostrils, compelled exertion, and artificial respiration. Belladonna or hypodermic injection of Atropine should be used; Strychnine; Amyl Nitrite; Gelsemium; Potassium Permanganate. *See also* Morphine Hydrochloridum.

Foreign Pharmacopœias.—Official in Austr., Belg., Dan., Dutch, Ger., Hung., Ital., Norw., Port., Russ. and Span., not less than 10 p.c.; Mex., 10 p.c.; Swed., 9 to 11 p.c.; Fr., Jap., and Swiss, 10 to 12 p.c.; U.S., 13 to 15 p.c.; all calculated on dried Opium.

Description.—Usually in rounded, irregularly formed, or flattened masses, varying in weight, but commonly from about 8 oz. to 2 lbs. (two hundred and fifty to one thousand grammes). When fresh, plastic, and internally somewhat moist, coarsely granular, or nearly smooth, and reddish- or chestnut-brown; but becoming harder on keeping, and darkening to blackish-brown. Odour strong, and characteristic; taste bitter.

Test.—Opium, dried at 212° F. (100° C.) and in No. 50 powder, 14 grammes; Calcium Hydroxide, freshly prepared, 6 grammes; Ammonium Chloride, 4 grammes; Alcohol (90 p.c.); Ether, and Distilled Water, of each a sufficient quantity. Triturate together the Opium, Calcium Hydroxide, and 40 c.c. of Water in a mortar until a uniform mixture results; add 100 c.c. of Water and stir occasionally during half an hour. Filter the mixture through a plaited filter, about 10 centimetres in diameter, into a wide-mouthed bottle having a capacity of about 300 c.c. and marked at exactly 104 c.c., until the filtrate reaches this mark. To the filtered liquid (representing 10 grammes of Opium) add 10 c.c. of Alcohol (90 p.c.) and 50 c.c. of Ether; shake the mixture; add the Ammonium Chloride, shake

well and frequently during half an hour; set aside for twelve hours for the Morphine to separate. Counterbalance two small filters; place one within the other in a small funnel in such a way that the triple fold of the inner filter shall be superposed upon the single fold of the outer filter; wet them with Ether; remove the ethereal layer of the liquid in the bottle as completely as possible by means of a small pipette, transferring the liquid to the filter; rinse the bottle with 20 c.c. of Ether; again transferring the ethereal layer, by means of the pipette, to the filter; wash the filter with a total of 10 c.c. of Ether, added slowly and in portions. Let the filter dry in the air, and pour upon it the contents of the bottle in portions, in such a way as to transfer the granular crystalline Morphine as completely as possible to the filter. When all the liquid has passed through, wash the remainder of the Morphine from the bottle with Morphinated Water, until the whole has been removed. Wash the crystals with Morphinated Water until the washings are free from colour; allow the filter to drain, and dry it, first by pressing between sheets of bibulous paper, afterwards at a temperature between 131° and 140° F. (55° and 60° C.), finally at 230° F. (110° C.) for two hours. Weigh the crystals in the inner filter, counterbalancing by the outer filter. Take .5 gramme of the crystals and titrate with Decinormal Volumetric Solution of Sulphuric Acid until the liquid, after boiling, slightly reddens Blue Litmus Paper. 1 c.c. of this Volumetric Solution represents .0283 gramme of pure Anhydrous Morphine. The weight of pure Anhydrous Morphine indicated by the titration, plus .104 gramme (representing the average loss of Morphine during the process), should amount in total to 1 gramme, that is to say, to a total of not less than .95 gramme and not more than 1.05 grammes, corresponding to about 10 p.c. of Anhydrous Morphine in the dry powdered Opium.

The part of the test relating to the titration is not very clearly worded. One does not add 'to the weight of Anhydrous Morphine indicated by the titration,' but 'to the total weight of the crystals in the filter, corrected by the titration figure.'

The amount of Morphine stated to be equal to 1 c.c. of Volumetric Solution of Sulphuric Acid was calculated on the old atomic weights and not on those given in B.P. 1898, but has since been altered in the corrigenda.

The following method of assay is recommended by Dott:

10 grammes of powdered Opium is digested with 25 c.c. Water; 1.8 gramme Barium Chloride dissolved in about 12 c.c. water is then added, the solution made up to 50 c.c., well mixed, and after a short time filtered. 22 c.c. (representing 5 grammes Opium) is mixed with dilute Sulphuric Acid in quantity just sufficient to precipitate the Barium. About 1 c.c. is required, and the solution should be warmed to cause the precipitate to subside and the solution to filter clear. To this filtered solution a little dilute Ammonia, about .5 c.c., should be added to neutralise the free acid, and the solution concentrated to 6 or 7 c.c., and allowed to cool. 1 c.c. Spirit and 1 c.c. Ether are then added, and next Ammonia in slight excess. The Ammonia should be added gradually until there is no further precipitation, and a perceptible odour of Ammonia remains after well stirring and breaking down any lumps with the stirring rod. After three hours the precipitate is collected on counterpoised filters and washed. Before filtering, it should be noted that the

solution has a faint odour of Ammonia; if not, one or two drops of Ammonia solution should be added. The dried precipitate is washed with Benzene or Chloroform, dried and weighed. It is then titrated with $\frac{N}{10}$ Acid, until the Morphine is neutralised, as indicated by the solution reddening Litmus paper. 1 c.c. $\frac{N}{10}$ Acid = .0303 gramme Morphine Hydrate. That is on the usual acceptance that the Hydrate is $C_{17}H_{19}NO_3 \cdot H_2O$, although (as shown *P.J.* (3) xviii. 701; and '97, i. 21) there is good reason to believe that it has the composition $8C_{17}H_{19}NO_3 \cdot 9H_2O$.—*P.J.* (3) xxiv. 847.

Preparations.

EMPLASTRUM OPII. OPIUM PLASTER.

Opium in very fine powder, 1; Resin Plaster, 9: melt the Resin Plaster on a water-bath; stir in the Opium gradually. =(1 in 10).

Anodyne, to relieve local pain.

Foreign Pharmacopœias.—Official in Belg. and Mex., 1 Opium in 20; Fr., 3 Extract in 4; Port. and Span., 1 Extract in 10; Swiss, 1 Extract in 20; U.S., 1 Extract in 16; not in the others.

EXTRACTUM OPII. EXTRACT OF OPIUM.

An Extract containing 20 p.c. of Morphine.

Opium, sliced, 16; Distilled Water, 120. Set aside the sliced Opium with one-third of the Distilled Water for twenty-four hours; express the liquid; thoroughly mix the residue of the Opium with another third of the Distilled Water; set aside for twenty-four hours; express; repeat the operation with the remaining third of the Distilled Water; mix the liquids; strain through flannel; evaporate to about 8.

Dose.— $\frac{1}{4}$ to 1 grain.

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

Test.—Analysed as described under 'Opium,' using 7 grammes of the Extract in place of the 14 grammes of Opium, this Extract should yield 20 p.c. of Morphine.

To obtain Extract of Opium of proper strength and consistence, stronger and weaker extracts may be mixed, and stronger extracts may be diluted with Distilled Water or with Milk Sugar as may be necessary.

In the first issue of B.P. 1885, the extract was directed to be made from 'Opium in powder' and restricted to the Official variety; but the criticism evoked was so strong, that in the later reprints it was permitted to use any variety of Opium as long as the product conformed to the Official standard of Morphine.

This is less stimulating than powdered Opium, and is preferred as a direct sedative.

EXTRACTUM OPII LIQUIDUM. LIQUID EXTRACT OF OPIUM. (ALTERED.)

A Liquid Extract containing $\frac{3}{4}$ grain of Morphine in 110 minims.

Extract of Opium, $\frac{3}{4}$; Distilled Water, 16; Alcohol (90 p.c.), 4. Mix the Extract of Opium with the Distilled Water; set aside for an hour, stirring frequently; add the Alcohol; set aside in a cool place for twenty-four hours; filter. The product should measure 20.

Now contains $\frac{3}{4}$ Extract in 20 instead of 1 in 20; Alcohol (90 p.c.) used in place of Rectified Spirit.

Contains 1 grain of Extract in about 29 minims.

Dose.—5 to 30 minims.

Each fl. oz. of Liquid Extract of Opium represents $16\frac{1}{2}$ grains of Extract of Opium; 20 c.c. represents .75 gramme.

Test.—Sp. gr. from .985 to .995. Analysed as described under 'Tinctura Opii,' this Liquid Extract should yield an amount of Morphine, reckoned as anhydrous, corresponding to not less than .7 gramme nor more than .8 gramme in 100 c.c.

LINIMENTUM OPII. LINIMENT OF OPIUM.

Tincture of Opium, 1; Liniment of Soap, 1: mix; set aside for a few days; filter. = (1 in 2).

The addition of the Opium to the Soap Liniment renders it more useful in many cases of rheumatism and local pains.

(Not in the other Pharmacopœias.)

PILULA SAPONIS COMPOSITA. COMPOUND PILL OF SOAP. (ALTERED.)

Opium, in powder, $\frac{1}{2}$; Hard Soap, in powder, $1\frac{1}{2}$; Syrup of Glucose (by weight), $\frac{1}{2}$. Mix to form a mass. = (1 of Powder of Opium in 5).

Now slightly stronger in Opium. Syrup of Glucose used in place of Glycerin, and less Hard Soap employed.

Dose.—2 to 4 grains.

This Pill contains 20 p.c. of Opium.

Foreign Pharmacopœias.—Official in Belg. (Pil. de Cynoglosse), and Fr., 1 Extract in 10, Dan., about 1 in 7; Norw., 1 Opium in $7\frac{1}{2}$; Span., 1 Extract in 11; Port. (Pilulas de Opio Comp.), 1 Extract in 10; U.S. (Pilula Opii), Powdered Opium $6\frac{1}{2}$, Soap 2; Mex. has Pildoras pacificas each containing .02 grammes of Opium with other ingredients; not in the others.

PULVIS OPII COMPOSITUS. COMPOUND POWDER OF OPIUM.

Opium, 3; Black Pepper, 4; Ginger, 10; Caraway Fruit, 12; Tragacanth, 1; all in powder. Mix. = (1 of Powder of Opium in 10).

Dose.—2 to 10 grains.

This Powder contains 10 p.c. of Opium.

TINCTURA OPII. TINCTURE OF OPIUM. *B.P.Syn.*—LAUDANUM. *N.O.Syn.*—TINCTURA THEBAICA. (ALTERED.)

Opium, 3; Alcohol (90 p.c.), Distilled Water, of each a sufficient quantity. Rub the Opium to a paste with 10 of Distilled Water, previously heated to at least 200° F. (93.3° C.); set aside for six hours; add 10 of the Alcohol; mix thoroughly; set aside in a covered vessel for twenty-four hours; strain; press; mix the liquids; set aside for twenty-four hours; filter.

Process altered and Tincture standardised to contain .75 gramme of anhydrous Morphine in 100 c.c.

Dose.—5 to 15 minims, for repeated administration; for a single administration, 20 to 30 minims.

Determine the proportion of Morphine in the resulting Strong Tincture by the following process: Pour 80 c.c. of the liquid into a porcelain dish; evaporate on a water-bath until the volume is reduced to 30 c.c.; mix the residual liquid in a mortar with 3 grammes of freshly slaked Lime; dilute the mixture with Water to 85 c.c.; set aside for

half an hour, stirring occasionally. Filter off 50 c.c. of the liquid (representing 50 c.c. of the Strong Tincture) through a plaited filter, having a diameter of about 1 decimetre, into a wide-mouthed stoppered bottle, having a capacity of 200 c.c.; add 5 c.c. of Alcohol (90 p.c.) and 30 c.c. of Ether; shake the mixture; add 2 grammes of Ammonium Chloride; shake well and frequently during half an hour; set aside for twelve hours for the Morphine to separate. Counterbalance two small filters; place one within the other in a small funnel in such a way that the triple fold of the inner filter shall be superposed upon the single fold of the outer filter; wet them with Ether; remove the ethereal layer of the liquid in the bottle as completely as possible by means of a small pipette, and transfer it to the filter; pour into the bottle 15 c.c. of Ether; rotate the contents and set the bottle aside; transfer the separated ethereal layer carefully, by means of the pipette, to the filter; wash the filter with a total amount of 10 c.c. of Ether added slowly, and in portions; let the filter dry in the air; pour upon it the liquid in the bottle, in portions, in such a way as to transfer the granular crystalline Morphine as completely as possible to the filter. When all the liquid has passed through, wash the remainder of the Morphine from the bottle with Morphinated Water, until the whole has been removed. Wash the crystals with Morphinated Water until the washings are free from colour; allow the filter to drain; dry it, first by gentle pressure between sheets of bibulous paper, afterwards at a temperature between 131° and 140° F. (55° and 60° C.), finally at 230° F. (110° C.) for two hours. Weigh the crystals in the inner filter, counterbalancing by the outer filter. Take .3 gramme of the crystals, and titrate with Decinormal Volumetric Solution of Sulphuric Acid, as directed under Opium.

Add to the weight of anhydrous Morphine, indicated by the titration, .05 gramme (or .1 gramme for every 100 c.c. of the original filtrate, should more than 50 c.c. have been used for the estimation), a proportion representing the average loss of Morphine during the process.

Having ascertained the proportion of Morphine, calculated as anhydrous, present in the 50 c.c. of Strong Tincture, the remainder is to be diluted with sufficient of a mixture of Alcohol (90 p.c.) and Distilled Water, in equal volumes, to produce a Tincture of Opium containing .75 gramme of Morphine, calculated as anhydrous, in 100 c.c.

The remarks on the test given under 'Opium' apply equally here.

Foreign Pharmacopœias.—Official in Austr., Dan., Dutch, Ger., Hung., Ital., Norw., Russ., Swed., Swiss and U.S., 1 (powder) in 10; Belg., 1 in 11.9; Jap., 1 and 10; Span., 1 in 12; Fr., 1 Extract in 12; Mex., 1 in 8; Port., 1 Extract in 20; all by weight except U.S.

Tests.—Treated by the foregoing process, Tincture of Opium should yield an amount of Morphine, reckoned as anhydrous, corresponding to not less than .70 gramme, nor more than .80 gramme, in 100 c.c.

This preparation contains, on an average, the soluble matter of 32.8 grains of Opium (containing 10 p.c. of Morphine, calculated as anhydrous) in 1 fl. oz., or of about 1 grain of such Opium in 15 minims.

Tincture of Opium may be prepared with any variety of Opium containing a known percentage of Morphine, calculated as anhydrous, provided that the per-

centage be not less than $7\frac{1}{2}$, and provided that the resulting Tincture of Opium respond to the foregoing quantitative test.

B.P. '85 ordered a definite quantity of Opium containing about 10 p.c. of Morphine; only about three-fourths of the Morphine was extracted by the Tincture, but the figure for Morphine was fixed on a different assumption. This difficulty is now removed by fixing a standard for the Morphine content of the Tincture, irrespective of the quantity of Opium employed.

Moist Opiums contain on the average 20 p.c. of Water and 45 to 55 p.c. of dry extractive; consequently it is possible to make Laudanum varying as 3 to 1 in extractive matter, and therefore in appearance, for the best Opiums in the market are, when dried, more than twice richer in Morphine than the B.P. minimum, but about the same in extractive-content.—C.D. '98, ii. 707.

TINCTURA OPII AMMONIATA. AMMONIATED TINCTURE OF OPIUM.
(ALTERED.)

Tincture of Opium, 3 fl. oz.; Benzoic Acid, 180 grains; Oil of Anise, 1 fl. drm.; Solution of Ammonia, 4 fl. oz.; Alcohol (90 p.c.) a sufficient quantity. Dissolve the Oil of Anise and the Benzoic Acid in 12 fl. oz. of the Alcohol; add the Tincture of Opium and the Solution of Ammonia; mix well; filter; add enough of the Alcohol to form 20 fl. oz. of the Tincture.
=(1 grain Powdered Opium in 96 minims).

Now made with Alcohol (90 p.c.) in place of Rectified Spirit; Tinct. Opii used instead of Powdered Opium, Saffron omitted, and Liquor Ammonie Fortis replaced by Liquor Ammonie.

Dose.— $\frac{1}{2}$ to 1 fl. drm.

This preparation contains the soluble matter of nearly .62 grain of Opium (containing 10 p.c. of Morphine, reckoned as Anhydrous) in 1 fl. drm., or of nearly 5 grains of such Opium in 1 fl. oz.

Foreign Pharmacopœias.—Official in Russ. similar to Brit., but uses Oil of Fennel in place of Oil of Anise; not in the others.

Other preparations containing Opium.	Proportion of Opium.
PILULA IPECACUANHÆ CUM SCILLA	about 1 in 20.
PILULA PLUMBI CUM OPIO	1 in 8.
PULVIS CRETÆ AROMATICUS CUM OPIO	1 in 40.
PULVIS IPECACUANHÆ COMPOSITUS	1 in 10.
PULVIS KINO COMPOSITUS	1 in 20.
SUPPOSITORIA PLUMBI COMPOSITA	1 grain in each.
TINCTURA CAMPHORÆ COMPOSITA	$\frac{1}{4}$ grain in 1 fl. drm.
UNGUENTUM GALLÆ CUM OPIO	1 in $13\frac{1}{2}$.
	Proportion of Morphine salt.
INJECTIO MORPHINÆ HYPODERMICA	1 in 20.
LIQUOR MORPHINÆ ACETATIS	1 in 100.
LIQUOR MORPHINÆ HYDROCHLORIDI	1 in 100.
LIQUOR MORPHINÆ TARTRATIS	1 in 100.
SUPPOSITORIA MORPHINÆ	$\frac{1}{4}$ grain in each.
TINCTURA CHLOROFORMI ET MORPHINÆ COMPOSITA	1 in 100.
TROCHISCUS MORPHINÆ	$\frac{1}{32}$ grain in each.
TROCHISCUS MORPHINÆ ET IPECACUANHÆ	$\frac{1}{32}$ grain in each.

Not Official.

AQUA OPII.—Opium in powder, 1; Water, 12: distil 6.

Occasionally employed in eye lotions. Aq. Opii, 1: Aq. Sambuci, 7.

TROCHISCUS OPII.—Each lozenge contains $\frac{1}{15}$ grain of Extract of Opium.

Dose.—1 to 6 lozenges.

(U.S., Powdered Opium $\frac{1}{15}$ grain in each; not in the other Pharmacopœias.)

UNGUENTUM OPII.—Extract of Opium, 1; Spermaceti Ointment, 9: rub the Extract with a small quantity of Water to a syrupy consistence, and mix with the Ointment. = (1 in 10).

VINUM OPII.—Opium, in powder, $1\frac{1}{2}$; Sherry, 20: macerate seven days, and filter. Used as a *collyrium*, 1 to 16 of Water. = (1 of powder in $13\frac{1}{2}$).

Dose.—10 to 40 minims.

Foreign Pharmacopœias.—Official in Dan., Ital., Norw., Swed., Swiss and U.S., 1 (powder) in 10; Dutch, 1 and 5; Fr., 1 in 8; Belg., with aromatics, 1 *Extract* in 15, and without 1 strained Opium in 12; Jap. and Norw., 1 and 10; Port., 1 *Extract* in 20; all by weight except U.S.; for formulæ see Sydenham's Laudanum, given below.

SOLUTION OF BIMECONATE OF MORPHIA (*Squire*.) *Syn.*—**Liquor Meconicus.**

This preparation was introduced by Peter Squire in 1839, as a purified Solution of Opium containing the whole of the alkaloids in their natural state of combination. It is now standardised to contain 1 p.c. of Morphine.

It differs from Tincture of Opium in that the volatile and extractive matters, to which the unpleasant secondary effects of Opium have been attributed, are removed in the process of its manufacture.

The Solution of the same name inserted in the B.P. of 1885, though obviously intended to take its place, differed so widely from the original in its properties and method of preparation, that it was no substitute for it, and is now deleted.

Dose.—5 to 30 minims.

MECONII PERIODIDA.—Under this name we have made (by request) a preparation representing the alkaloids of the above preparation in combination with excess of Iodine, on the lines of the other Di-iodo-hydriodides previously introduced by us.

Dose.— $\frac{1}{8}$ to $\frac{1}{2}$ grain.

LIQUOR OPII SEDATIVUS (*Battley*) has enjoyed a reputation for a long time as an anodyne and sedative superior to Tincture of Opium, but it is somewhat stronger.

Dose.—5 to 20 minims.

SYDENHAM'S LAUDANUM.—Contains Saffron, and occurs in the majority of the foreign Pharmacopœias under the following titles; all the preparations are by weight.

Tinctura Opii Crocata. Sydenham's Laudanum.

Austr.—Opium 15, Saffron 2, Alcohol 15, Cinnamon Water to make 150.

Hung.—Opium 15, Saffron 15, Cinnamon Water, 150.

Ger.—Opium 15, Saffron 5, Cloves 1, Cassia 1, Alcohol (68 p. c.) 75, Water 75

Russ.—Opium 15, Saffron 5, Cloves 1, Cassia 1, Alcohol (70 p. c.) 90, Water 90.

Swiss.—Opium 10, Saffron 3, Cloves 1, Cassia 1, Alcohol (95 p. c.) 45, Water 50.

Laudanum Sydenhami.

Belg.—Extract of Opium 67, Saffron 34, Oil of Cloves $1\frac{1}{4}$, Water 380, Cinnamon Water 90, Alcohol (60 p. c.) to make 1000.

Laudano de Sydenham.

Mex.—Opium 10, Saffron 5, Oil of Cinnamon 8 drops, Oil of Cloves 8 drops, Acetic Acid .8, Alcohol (30°) 80.

Laudanum de Sydenham.

Fr.—Opium 40, Saffron 20, Cloves 3, Cinnamon 3, Grenache Wine 320.

Vinum Opii.

U.S.—Opium 10, Cassia 1, Cloves 1, Alcohol 15, White Wine to measure 100.

Vinum Opii Aromaticum.

Dutch.—Saffron 4, Cloves 1, Cinnamon 1, Alcohol (70 p. c.) 10, Malaga Wine 90, to 95 of this Liquor add Opium 10.

Jap.—Saffron 1, Cloves 1, Cinnamon 1, Dilute Spirit 7, Sherry 85, Opium 1.

Vinum Opii Crocatum.

Norw.—Opium 15, Saffron 5, Cloves 1, Cinnamon 1, Malaga Wine 150.

Vinho de Opio Composto.

Port.—Extract of Opium 5, Saffron 3, Cloves 1, Cinnamon 1, Madeira Wine 100.

Vino de Opio Compuesto.

Span.—Opium 15, Saffron 7½, Cloves 1, Cinnamon 1, White Wine 135.

Vino Opiato Composto.

Ital.—Opium 16, Saffron 8, Cinnamon 1, Cloves 1, Marsala Wine 144.

Vinum Thebaicum Crocatum.

Dan.—Opium 100, Saffron 25, Cloves 6, Cinnamon 6, Malaga Wine 1000.

Swed.—Opium 15, Saffron 5, Cloves 1, Cinnamon 1, Malaga Wine 159.

BLACK DROP.—Acetum Opii Crocatum.

1 drop is equal to 4 drops of Tincture of Opium.

Dose.—1 to 8 minims.

LINIMENTUM OPII AMMONIATUM (B.P.C.)—Liniment of Soap, 6; Compound Camphor Liniment, 6; Tincture of Opium, 6; Liniment of Belladonna, 1; Stronger Solution of Ammonia, 1: mix and, after standing a week, filter quickly.

NARCEINA.—Discovered by Pelletier, in 1832. In white, silky, acicular crystals: neutral, with a slightly bitter taste. Soluble in 375 parts of cold and in 220 of hot Water, also in Alcohol; insoluble in Ether, and practically insoluble in Chloroform. It is considered by some observers to possess hypnotic properties, to be less constipating, less diaphoretic and to have less tendency to cause headache than Morphine.

Dose.—½ to 1 grain.

Dilute Sulphuric Acid added to Narceine, then concentrated over a water-bath, gives rise to a beautiful violet colour, which changes to cherry red on further heating. If to this red liquid when cooled a trace of Nitric Acid is added, blue violet streaks appear.—*P.R.* '87, 215.

Narceine should not melt under 165° C. Chemically pure Narceine should be free from Acid, and complete fusion should not take place under 170° C.—*P.J.* (3) xix. 1034

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

NARCOTINA.—First noticed by Derosne, in 1803. Crystallises in prisms, reaction neutral. Insoluble in Water; soluble in Ether, in boiling Alcohol, in diluted acids; insoluble in Solution of Potash. Forms a yellow solution with Nitric Acid. It has no narcotic properties, and has therefore been called **Anarcotina**; it has been given as a substitute for Quinine as an antiperiodic in ague.

Dose.—1 to 3 grains.

STYPTICIN.—Is the hydrochloride of Cotarnine, an oxidation product of Narcotine, occurs in yellow crystals, readily soluble in Water.

Valuable in menorrhagia. Contra-indicated in threatened abortion or in any of the hæmorrhages of pregnancy.—*P.J.* '95, ii. 471; *B.M.J.* '96, ii. 17; *B.M.J.E.* '96, i. 7; '98, i. 71, 103.

PAPAVERINA.—Discovered by Merck. In white crystalline needles. Insoluble in Water; sparingly soluble in Alcohol and Ether. According to Merck, when moistened with strong Sulphuric Acid, it becomes dark blue, but Hesse states that pure Papaverine dissolves colourless in that acid cold, but when heated becomes dark violet. Strongly narcotic.

Dose.— $\frac{1}{2}$ to $\frac{1}{3}$ grain.

OXYMEL. See MEL.

OXYMEL SCILLÆ. See SCILLA.

Not Official.

PANCREATIC ENZYMES.

Pancreatic juice has been found to possess four distinct properties: conversion of starch, conversion of proteids, emulsification of fats, and curdling of milk.

Each of these properties is attributed to a peculiar soluble ferment or enzyme.

The enzymes of the pancreatic juice act only in neutral or alkaline solutions. Their action is suspended in feebly acid solutions, and when digested at 40° C. (104° F.) for an hour in a solution of Pepsine of the normal acidity of the stomach (equal to .2 p.c. Hydrochloric Acid), or when digested with some gastric juice, they are destroyed. They are also destroyed in solution by heating to 71° C. (160° F.).

Official Preparation.

LIQUOR PANCREATIS. PANCREATIC SOLUTION. (New.)

A liquid preparation containing the digestive principles of the fresh pancreas of the pig. The preparation is most active when the animal from which it is obtained has been fed shortly before being killed.

5 oz. of the Pancreas, freed from fat and external membrane and finely divided by trituration with washed sand or powdered pumice-stone, should be digested, in a closed vessel, in 20 fl. oz. of Alcohol (20 p.c.) for seven days, and then filtered.

Test.—If 2 c.c. of the Solution, together with .2 gramme of Sodium Bicarbonate and 20 c.c. of Water, be added to 80 c.c. of milk, and the mixture be kept at a temperature of 113° F. (45° C.) for one hour, coagulation should no longer occur on the addition of Nitric Acid.

Not Official.

TRYPSIN acts slowly on solid albuminoid masses (boiled egg-albumen), but with great rapidity on soluble albumens, such as the casein of milk. It converts albumens into peptones and subsequently into bodies which are not proteids, Leucin, Tyrosin, &c.

PANCREATIC DIASTASE converts starch into dextrin and maltose.

It is usually stated to be identical with the diastase of Malt, but it cannot be so.