It sometimes decomposes on keeping, with disengagement of Nitrous fumes and becomes insoluble.

The safest and best plan for its preservation is to moisten the dry material with an equal weight of Methylated Spirit and preserve in a well-stoppered jar; when required for use it is quickly and easily dried.—*P.J.* '96, ii. 110; *C.D.* '96, ii. 207.

Not Official.

CELLOIDIN.—Sold in cakes or shavings. When dissolved in a mixture of Absolute Alcohol and Ether it is used for embedding histological specimens previous to cutting sections.

PHOTOXYLIN.—A nitrated wood pulp prepared in St. Petersburg. When made into Collodion it is stated to give a tougher film than Pyroxylin on evaporation.—*L.* '87, i. 1253; *B.M.J.* '88, i. 555.

QUASSIÆ LIGNUM.

QUASSIA WOOD.

The wood of the trunk and branches of *Picræna excelsa*.

From Jamaica.

Medicinal Properties.—Possesses in a high degree the properties of the simple bitters, without astringency. Particularly adapted as a tonic in dyspepsia and in the debility which succeeds acute disease; containing no Tannin, it is a compatible vehicle for Iron preparations. The infusion is also used as an anthelmintic enema in threadworm.

A few chips of Quassia or a weak infusion used in the morning bath is a protection against the annoying insects found in our cornfields.—*L.* '84, ii. 306. A strong infusion to destroy fleas.—*L.* '95, i. 1018.

Official Preparations.—Infusum Quassiæ, Liquor Quassiæ Concentratus, Tinctura Quassiæ.

Foreign Pharmacopœias.—Official in U.S., same as Brit.; Austr., Belg., Dan., Norw., Span., and Swed., use *Quassia amara;* Dutch, Fr., Ger., Ital., Jap., Mex. (Cuasia), Port., Russ. and Swiss, use both; not in Hung.

Description.—Quassia wood is imported in logs of varying length, frequently exceeding six inches (fifteen centimetres) in diameter. The Wood is yellowish-white, tough and dense, but easily split. The longitudinal section exhibits elongated cells containing single crystals of Calcium Oxalate. The transverse section exhibits medullary rays mostly two or three cells in width. The Wood is inodorous, but has an intense, purely bitter taste.

Preparations.

INFUSUM QUASSIÆ. Infusion of Quassia. (Altered.)

Quassia Wood, finely rasped, 88 grains; Distilled Water, cold, 20 fl. oz. Infuse in a covered vessel for fifteen minutes; strain.

=(about 1 in 100).

Now 1 in 100 instead of 1 in 80, and the time is reduced.

Dose.—½ to 1 fl. oz.

Foreign Pharmacopœias.—Official in Fr. (Quassia Amara), 1 in 200; Span. (Tinct. Acuosa de Quassia Amarga), 1 in 100; not in the others.

A **solid extract** is official in the following: Fr. (Quassia Amara), Belg, Ital., Mex., Port. and Span., use cold Water; Austr., Dan., Dutch, and Swiss, use boiling Water; U.S., with cold Water; Dan., Mex. and U.S. have also a **fluid extract**; not in the others.

LIQUOR QUASSIÆ CONCENTRATUS. CONCENTRATED SOLUTION OF QUASSIA. (NEW.)

Quassia Wood, in No. 40 powder, 2; Alcohol (20 p.c.) 22, or a sufficient quantity. Mix the Quassia with 2 of the Alcohol; pack in a closed percolator; set aside for three days; percolate with the remaining Alcohol, added in ten equal portions at intervals of twelve hours; continue percolation with more Alcohol until the product measures 20. =(1 in 10).

Dose.—½ to 1 fl. drm.

TINCTURA QUASSIÆ. TINCTURE OF QUASSIA. (ALTERED.)

Quassia Wood, rasped, 2; Alcohol (45 p.c.), 20. Prepare by the maceration process. =(1 in 10).

Now 1 in 10 instead of 1 in 27, and Alcohol (45 p.c.) used in place of Proof Spirit.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Belg., Dutch, Fr., and Jap., 1 and 5 (by weight); Mex., 1 in 5; U.S., 1 in 10; not in the others.

Not Official.

QUEBRACHO.

The bark of *Aspidosperma Quebracho*, obtained from the Argentine Republic and Brazil (*Quebracho blanco*).

Medicinal Properties.—It is said to possess tonic, febrifuge, and anti-asthmatic properties. Was used rather extensively at one time as a remedy for asthma, cardiac dyspnœa, and spasmodic croup, but is now seldom prescribed.

A **Tincture** is made 1 in 5 of Alcohol (60 p.c.); also Official in Mex. and Swiss.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Austr., Ital., Mex. and Swiss; not in the others.

The following alkaloids and salts can be obtained:—Aspidospermine Cryst. and Sulphate (Fraude); Aspidosamine and Hydrochloride (Hesse); Quebrachine Cryst. and Hydrochloride (Hesse), Dose, ¾ to 1½ grains; Quebrachamine and Sulphate (Hesse); Hypoquebrachine and Hydrochloride (Hesse).

Of the alkaloids Quebrachine is more active and more poisonous than Aspidospermine: it has greater antithermic properties.—*L.* '86, i. 804.

Not Official.

QUERCUS CORTEX.

OAK BARK.

The dried bark of the small branches and young stems of *Quercus Robur*, collected in spring from trees growing in Britain.

Medicinal Properties.—An astringent, whether administered internally or applied externally. May be used either generally or topically, in all cases requiring astringents, such as relaxed throat or tenderness of the gums; in leucorrhœa, gonorrhœa, prolapsus ani, &c.

Dose.—Of the **powder**, 30 to 120 grains. Of a **Decoction** (1 to 16), 1 to 2 fl. oz.

Foreign Pharmacopœias.—Official in all except Dutch and Jap.; Fr. (Chêne), Ital. (Quercia), Port. (Corvalho), Mex. and Span. (Encina), U.S. (Quercus alba).

QUILLAIÆ CORTEX.

QUILLAIA BARK.

B.P.Syn.—Panama Bark.

[NEW.]

The inner part of the bark of *Quillaja saponaria*.

Imported from Chili.

Medicinal Properties.—Has been strongly recommended as an expectorant, but it is contra-indicated in ulceration of the throat or alimentary canal, since it is too powerful an irritant.—*Pr.* xxxvi. 29. An infusion has been used by Shoemaker for chronic ulcers, pityriasis and hyperidrosis.

The powder is excessively irritating to the air passages.

It has been found to possess properties allied to Senega, but it contains the two glucosides 'Quillaic Acid' and 'Sapotoxin' in much greater quantity than they exist in Senega.

Official Preparation.—Tinctura Quillaiæ. Used in the preparation of Liquor Picis Carbonis.

Foreign Pharmacopœias.—Official in Fr. (Bois de Panama), Ger. (Quillaia), Mex. (Quillaya), Russ. and U.S. (Quillaja); not in the others.

Description.—Quillaia Bark is usually imported in large flat pieces, about one-sixth of an inch (four millimetres) thick, and two feet (six decimetres) or more long, and four inches (ten centimetres) wide. The outer surface is brownish-white, or, where the outer bark has been imperfectly removed, reddish-brown or blackish-brown; the inner surface is smooth and white or yellowish-white. The fracture is splintery; the fractured surface is laminated, and exhibits under a lens glistening prismatic crystals; the transverse section is marked with fine radial and tangential lines. The taste is astringent and acrid; the odour is not marked but the powder is extremely irritating to the nostrils.

Preparation.

TINCTURA QUILLAIÆ. Tincture of Quillaia. (New.)

Quillaia Bark, in No. 20 powder, 1 oz.; Alcohol (60 p.c.), a sufficient quantity. Moisten the powder with ½ fl. oz. of the Alcohol, and complete the percolation process. The resulting Tincture should measure 20 fl. oz.

Dose.—½ to 1 fl. drm.

Foreign Pharmacopœias.—Official in Fr. (Teinture de Panama), 1 in 5 (Alcohol 80 p.c.); Mex., 1 in 5; U.S., 1 in 5 (Diluted Alcohol).

Not Official.

QUININA.

$C_{20}H_{24}N_2O_2$, $3H_2O$, eq. 375·48.

This alkaloid is precipitated from solutions of its salts as a Trihydrate, containing 14 p. c. of Water. It is met with as a white, soft, granular powder, slightly damp from adherent moisture, easily soluble in Ether or dilute mineral acids, and melting to a gummy-looking mass at about 140° F.

When separated from its solutions by shaking out with Ether or Chloroform and evaporating to dryness, it still retains a little Water, dried off with difficulty in a water-bath. For determination purposes it should be heated to 250° F. (120° C.) before weighing.

Quinine in the free state may be titrated with $\frac{N}{10}$ Sulphuric Acid and Methyl-Orange, and as the alkaloid has no action on Phenol-phthalein, the acid in its salts may be estimated by $\frac{N}{10}$ Soda with that indicator.

The Official salts of Quinine, (Hydrochloride and Sulphate), are given under separate headings.

Solubility.—Very sparingly in Water; 1 in 1 of Alcohol (90 p.c.); 1 in 3 of Chloroform; 1 in 4 of Ether.

Foreign Pharmacopœias.—Official in Austr., Dutch, Fr., Hung., Ital., Mex., Port., Russ., Span., Swed., Swiss and U.S.; not in the others.

Preparations.

Injectio Quininæ Hypodermica.—Quinine Hydrate, 76 grains; Lactic Acid, 27 minims, or a sufficiency; Distilled Water, a sufficiency; rub the Quinine with 6 fl. drm. of the Water, and add the Lactic Acid so as to dissolve the Quinine, and form a solution neutral or only faintly acid to Litmus paper, and make the measure up to 1 fl. oz. with Distilled Water.

QUININÆ ARSENAS.—The composition of this salt being so variable, according to the method of preparation, the compound ($C_{20}H_{24}N_2O_2.AsH_3O_4H_2O$), containing 66 p.c. of Quinine and 29 p.c. of Arsenic Acid, has been recommended as the most stable and otherwise suitable.—*P.J.* (3) xx. 162.

Dose.—One-tenth of a grain.

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

QUININÆ CARBOLAS.—The crystalline salt contains 77 p.c. of Anhydrous Quinine. For extemporaneous preparations, the alkaloid may be used, and the best proportions are:—Quinine, 4; Carbolic Acid, 1; melt and cool.

Dose.—2 grains for Diarrhœa.

(Not in the other Pharmacopœias.)

QUININÆ CITRAS.—Crystallises in delicate needles.

Various formulas are given for this salt, $Q\overline{Ci}$; $Q_2\overline{Ci}$; $Q_2\overline{Ci}.7H_2O$; but the commercial salt corresponds more closely with $(C_{20}H_{24}N_2O_2)_2H_3C_6H_5O_7.3H_2O$, eq. 887·94, containing 72·5 p.c. of Quinine.

Solubility.—1 in 1600 of Water; not soluble in Lemon Juice; slightly in Chloroform.

Foreign Pharmacopœias.—Official in Dutch, Mex. and Port.; not in the others.

QUININÆ ETHYLCARBONAS (Euquinine, Euchinine).—Is produced by the action of Ethyl Chlor-carbonate on Quinine. It is a crystalline body sparingly soluble in Water, soluble in Alcohol, Ether, and Chloroform. Melts at 95° C. Has

been recommended as a substitute for Quinine. Dose, 5 to 10 grains.—*P.J.* '97, ii. 82; *B.M.J.E.* '96, ii. 104; *B.M.J.* '97, ii. 1734; *L.* '97, ii. 728.

QUININÆ GLYCEROPHOSPHAS.—There are two Quinine Glycerophosphates, one basic and one neutral. The basic salt is the one in general use. In slender white needles melting at 154° C, soluble in Water, more readily in Alcohol. It should yield no free Glycerin when shaken with Absolute Alcohol, and subsequent evaporation of the solvent; should give no reaction for free Phosphoric Acid.—*P.J.* '98, ii. 410; *J.S.C.I.* '98, 485.

QUININÆ HYDRIODIDUM.—The neutral salt has about the same solubility in Water as the Sulphate, and dissolves freely in Alcohol and Ether. It is generally found as an amorphous powder. $C_{20}H_{24}N_2O_2.HI$, eq. 448·74.

QUININÆ HYDRIODIDUM ACIDUM ($C_{20}H_{24}N_2O_2.2HI.5H_2O$, eq. 665·04). Crystallises in large laminæ of a fine yellow colour, and is soluble 1 in 20 of Water.

QUININÆ HYDROBROMIDUM.—Colourless silky crystals, neutral or slightly alkaline.

It is given (*P.J.* (3) v. 303) with H_2O, and soluble 1 in 5. Codex with H_2O, soluble 1 in 60. Our stock (May 1893) corresponded with $C_{20}H_{24}N_2O_2.HBr.H_2O$, containing 76·5 p.c. of Quinine, and soluble about 1 in 55 of Water; after drying at 125° C., its original moisture was again absorbed rapidly from the atmosphere. U.S. (1882) gave the formula with $2H_2O$, and solubility 1 in 16 of Water; U.S. (1893) gives it with H_2O, and soluble 1 in 54 of Water.

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

QUININÆ HYDROBROMIDUM ACIDUM ($C_{20}H_{24}N_2O_2.2HBr.3H_2O$, eq. 536·18), containing 60 p.c. of Quinine.—Colourless crystals.

Solubility.—1 in 6 of Water.

Foreign Pharmacopœias.—Official in Fr., Bromhydrate de Quinine Neutre; Mex.; not in the others.

QUININÆ HYPOPHOSPHIS ($C_{20}H_{24}N_2O_2.H_3PO_2$, eq. 386·40).—Generally supplied as an amorphous powder, but it can be crystallised.

Solubility.—1 in 250 of Water; 1 in 40 of Alcohol (90 p.c.).

(Not in the other Pharmacopœias.)

QUININÆ LACTAS ($C_{20}H_{24}N_2O_2.C_3H_6O_3$. eq. 411·21).—A white crystalline powder, soluble about 1 in 6 of Water, but there is much disagreement about its solubility. A **solution**, 1 in 4, can be made by neutralising Quinine with Lactic Acid, p. 527.

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

QUININÆ PHOSPHAS.—It is stated (*P.J.* (3) xxiii. 234) that the English-made salt has the formula $3C_{20}H_{24}N_2O_2.2H_3PO_4.6H_2O$, and the German salt $2C_{20}H_{24}N_2O_2H_3PO_4.4H_2O$; the former containing 76 p.c. and the latter 79 p.c. of Quinine. Sample containing Barium as an impurity.—*P.J.* '96, i. 337; *C.D.* '96, i. 578.

Solubility.—1 in 420 of Water; 1 in 110 of Alcohol (90 p.c.).

(Not in the other Pharmacopœias.)

QUININÆ SALICYLAS ($C_{20}H_{24}N_2O_2.C_7H_6O_3$, eq. 458·85).—Slightly crystalline powder, prepared by decomposing Quinine Sulphate with Sodium Salicylate. It is practically anhydrous, and contains 70 p. c. of Quinine.

Solubility.—1 in 630 of Water; 1 in 24 Alcohol (90 p.c.); 1 in 25 of Chloroform.

Foreign Pharmacopœias.—Official in Fr., Mex. (Salicilato de Quinina Basico); Russ., Span. and Swiss; not in the others.

QUININÆ SULPHAS ACIDA ($C_{20}H_{24}N_2O_2.H_2SO_4.7H_2O$, eq. 544·34).—Colourless crystals, which effloresce on exposure to air. It was originally called the **Neutral Quinine Sulphate.**

Solubility.—1 in 10 of Water; 1 in 45 of Alcohol (90 p.c.).

A **solution** of 1 or 2 grains to the fluid ounce of Distilled Water applied to the eyes and nostrils for Hay Fever.

Foreign Pharmacopœias.—Official in Austr., Belg., Fr., Hung., Mex., Swiss and U.S.; not in the others.

QUININÆ TANNAS.—A yellowish-white amorphous body; sparingly soluble in Water, very soluble in Alcohol. At one time recommended because of its being tasteless.

Large doses recommended in whooping cough, 1½ grains for each year of age.—*L.M.R.* '81, 177.

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

QUININÆ TARTRAS $(C_{20}H_{24}N_2O_2)_2.C_4H_6O_6.H_2O$, eq. 810·48).

Solubility.—Very sparingly in Water (about 1 in 1000).

Quinine Sulphate, 80 grains; Tartaric Acid, 40 grains; Distilled Water, to measure 4 fl. drm., has been used in India for **hypodermic injection.**

QUININÆ VALERIANAS ($C_{20}H_{24}N_2O_2.C_5H_{10}O_2.H_2O$, eq. 441·03).—A white crystalline salt, smelling, but not strongly, of Valerianic Acid.

Made by decomposing Quinine Hydrochloride with Sodium Valerianate.

Solubility.—1 in 120 of cold Water; 1 in 2 of Alcohol (90 p.c.); 1 in 14 of Ether.

Dose.—1 to 3 grains.

Foreign Pharmacopœias.—Official in Belg., Fr., Ital., Mex.. Port., Russ., Span., Swed., Swiss and U.S.

SYRUPUS QUININÆ DIKINATIS.—Introduced by Dr. Donovan of Dublin.

1 fl. drm. contains 2 grains of Quinine Dikinate.

Dose.—½ to 1 fl. drm.

WARBURG'S TINCTURE FOR MALARIAL FEVER.—Dr. Carl Warburg's contains Quinine. The formula for this is given in the *M.T.* '75, ii. 540, with some interesting cases by Professor Maclean, C.B.:—Aloes Socotrinæ 4, Rad. Rhei 4, Sem. Angelicæ 4, Conf. Damocratis 4, Rad. Helenii 2, Croci Sativi 2, Sem. Fœniculi 2, Cretæ Præparatæ 2, Rad. Gentianæ 1, Rad. Zedoariæ 1, Pip. Cubebæ 1, Myrrh Elect. 1, Camphoræ 1, Bolet. Laricis 1. Digest with 500 of Proof Spirit on a water-bath for twelve hours, express and add Quininæ Sulphatis 10. Continue heating on a water-bath till all the Quinine Sulphate is dissolved; filter when cold.

Warburg's Tincture is without its equal in persistent and protracted agues.—*T.G.* '94, 842.

QUINETUM.—The mixed Alkaloids from the E. I. Red Cinchona Bark. The Sulphate resembles Quinine Sulphate, and is given in the same doses.

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

QUINIDINÆ SULPHAS $(C_{20}H_{24}N_2O_2)_2.H_2SO_4 2H_2O$, eq. 776·78.— White silky crystals.

Solubility.—1 in 200 of Water; 1 in 24 of Alcohol (90 p.c.); about 1 in 100 of Glycerin.

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

QUINOIDIN, *Syn.* CHINOIDIN. — A mixture of alkaloids, mostly amorphous,

obtained as a by-product in the manufacture of the crystallisable alkaloids from Cinchona. A brownish black mass with alkaline reaction. On ignition should not leave more than ·7 p. c. of ash.

Foreign Pharmacopœias.—Official in Jap., Norw., Russ. and Swed; not in the others.

QUINOLIN (Chinolin).—Is formed by the distillation of Quinine or Cinchonine with aqueous Potassium Hydroxide, or synthetically from Aniline and Nitrobenzene. It is a colourless mobile liquid having a faint aromatic odour and a peculiar penetrating taste, sparingly soluble in Water, miscible with Alcohol, Ether, and Carbon Bisulphide.

QUINOSOL (Chinosol. Potassium Oxychinolin Sulphonate).—A bright lemon-yellow powder with a faint odour, soluble in Water.

It is a powerful antiseptic, disinfectant, and deodorant. Even dilute solutions prevent the growth of various micro-organisms. The pure powder, used as a dressing for wounds, causes much irritation. It acts better in solution than in powder.—*B.M.J.* '96, i. 285; '97, i. 263; *B.M.J.E.* '98, i. 91; *L.* '96, i. 557; '98, i. 1206; *P.J.* '96, i. 82, 299, 484; '98, i. 61.

Diaphthol (Quinaseptol) and **Diaphtherin** (Oxychinaseptol) have also been used as antiseptics.

QUININÆ HYDROCHLORIDUM.

QUININE HYDROCHLORIDE.

Hydrochlorate of Quinine.—*B.P.* '85.

$C_{20}H_{24}N_2O_2HCl, 2H_2O$, eq. 393·79.

The Hydrochloride of an alkaloid obtained from the bark of various species of *Cinchona* and *Remijia*.

Solubility.—1 in 37 of Water; 1 in 1 of boiling Water; 1 in 1 of Alcohol (90 p.c.). The anhydrous salt is very soluble in Chloroform.

Medicinal Properties.—Same as Quinine Sulphate. This salt is very much more soluble than the Sulphate.

Dose.—1 to 10 grains.

Official Preparations.—Tinctura Quininæ and Vinum Quininæ.

Foreign Pharmacopœias.—Official in Austr., Ger., Hung., Jap. and Swiss, Chininum Hydrochloricum; Dan., Norw., and Swed., Chloretum Chinicum; Dutch, Hydrochloras Chinini; Fr., Chlorohydrate de Quinine Basique; Ital., Cloridrato di Chinina; Mex., Clorhidrato de Quinina basico; Port., Chlorhydrato de Quinina; Span., Cloruro Quinico; Russ., Chininum Hydrochloratum; U.S.; not in Belg.

Description.—In crystals resembling those of Quinine Sulphate, but generally somewhat larger.

Tests.—It affords the reactions characteristic of Hydrochlorides. It should yield only the slightest characteristic reactions with the tests for Sulphates. When converted into Quinine Sulphate, by dissolving it together with an equal weight of Sodium Sulphate in ten times its weight of hot Water, and setting the mixture aside at

60° F. (15·5° C.), it should respond to the characters and tests that are mentioned under 'Quininæ Sulphas.'

Dried at a temperature of 212° F. (100° C.), it loses 9 p.c. of Water.

Preparations.

TINCTURA QUININÆ. TINCTURE OF QUININE. (ALTERED.)

Quinine Hydrochloride, 175 grains; Tincture of Orange, 20 fl. oz. Dissolve the Quinine Hydrochloride in the Tincture of Orange.

=(about 1 grain in 55 minims).

Formerly it contained 1 grain in 60 minims.

Now prepared without heat, from Tincture of Orange (fresh peel).

Dose.—½ to 1 fl. drm.

VINUM QUININÆ. QUININE WINE. (ALTERED.)

Quinine Hydrochloride, 20 grains; Orange Wine, 20 fl. oz. Dissolve; set aside; filter if necessary.

Dose.—½ to 1 fl. oz.

Now made with Quinine Hydrochloride instead of Quinine Sulphate, and the Citric Acid omitted.

QUININÆ HYDROCHLORIDUM ACIDUM.

ACID QUININE HYDROCHLORIDE.

[NEW.]

$C_{20}H_{24}N_2O_2$, 2HCl, $3H_2O$, eq. 447·86.

The Acid Hydrochloride of an alkaloid obtained from the bark of various species of *Cinchona* and *Remijia*.

Dose.—1 to 10 grains.

(Fr. Chlorhydrate neutre de Quinine; not in the others.)

Description.—A white crystalline powder soluble in less than its own weight of Water, yielding a somewhat acid liquid.

Tests.—It affords the reactions characteristic of Hydrochlorides. It should yield only the slightest characteristic reactions with the tests for Sulphates. Each gramme, when dissolved in 20 c.c. of Water, should require for its complete neutralisation not more than 2·5 c.c. of Volumetric Solution of Soda. When converted into Quinine Sulphate, by dissolving it together with an equal weight of Sodium Sulphate in ten times its weight of hot Water, exactly neutralising this liquid with Solution of Ammonia, and setting it aside at 60° F. (15·5° C.) to cool, it should respond to the characters and tests which are mentioned under 'Quininæ Sulphas.' Dried at a temperature of 212° F. (100° C.) it loses not more than 12 p.c. of water.

QUININÆ SULPHAS.

QUININE SULPHATE.

$((C_{20}H_{24}N_2O_2)_2, H_2SO_4)_2, 15H_2O$, eq. 1750·24.

The Sulphate of an alkaloid obtained from the bark of various species of *Cinchona* and *Remijia*.

Solubility.—About 1 in 800 of Water; 1 in 25 of boiling Water; 1 in 65 of Alcohol (90 p.c.); 1 in 40 of Glycerin.

60 grains require 60 minims of Diluted Sulphuric Acid or 100 minims of Diluted Phosphoric Acid for solution in 2 fl. oz. of Distilled Water.

66 grains require 60 minims of Diluted Nitric Acid for solution in 2 fl. oz. of Water.

Medicinal Properties.—In small doses it acts as a most valuable tonic and bitter stomachic. In large doses it is an antiperiodic and antipyretic in intermittent fevers and all malarial conditions; in moderate doses it is an antipyretic in influenza and continued fevers, especially enteric (in which it also acts as an antiseptic); and it is analgesic in supra-orbital and other forms of neuralgia. Used as a spray (2 grains to 1 fl. oz.) in hay-fever; contra-indicated during advanced pregnancy.

Quinine as a parturient.—*B.M.J.* '85, i. 427, 1320.

Quinine in pneumonia, *B.M.J.* '85, i. 1245; in whooping-cough, *M.A.* '95, 522; *T.G.* '94, 126; in cholera nostras, *B.M.J.E.* '93, ii. 7.

Quinine in large doses or if taken frequently produces deafness.—*L.M.R.* '81, 177.

As a prophylactic in African fevers.—*L.* '96, i. 219. As a prophylactic against influenza.—*B.M.J.E.* '95, ii. 92; *L.* '95, ii. 1381.

Quinine Sulphate and Ipecacuanha in dysentery.—*Pr.* liv. 478; *P.J.* (3) xxv. 1167.

Dose.—1 to 10 grains.

Prescribing Notes.—Given in **pills** or **cachets**, also in **aqueous solution** assisted by the addition of Diluted Sulphuric or Diluted Hydrochloric Acid, 1 minim to each grain; it also dissolves readily in Tincture of Ferric Chloride.

One of the most pleasant ways of giving Quinine is in a **mixture** with Citric Acid, to be taken during **effervescence** with a solution containing Potassium Bicarbonate and Ammonium Carbonate. It is also given in solution with Hydrobromic Acid to diminish the tendency to Cinchonism. Milk covers the taste well. Effervescent Quinine Citrate is also a very palatable form.

When a large dose (say 10 grains) is given, it is best suspended in Water; the bitterness is not then so intense as when in solution.

It is best made into **pills** with liquid Glucose.

For **hypodermic injection** *see* other salts of Quinine, under each of which the solubilities are given. Of the neutral salts, the Lactate (1 in 4) is the most soluble; of the acid salts, the Hydrochloride (1 in 1).

Quinine is precipitated from aqueous solutions of its salts by alkalis. In the Ammoniated Tincture of Quinine the alkaloid is dissolved by the Alcohol.

Incompatibles.—All Alkalis and their Carbonates: all infusions containing Tannin throw down a Quinine Tannate, which Sulphuric Acid, instead of dissolving, helps in precipitating.

Official Preparations.—Pilula Quininæ Sulphatis and Tinctura Quininæ Ammoniata. Used in the preparation of Ferri et Quininæ Citras and Syrupus Ferri Phosphatis cum Quinina et Strychnina.

Foreign Pharmacopœias.—Official in all; Austr., Ger., Hung., Jap., Russ., and Swiss, Chininum Sulfuricum; Belg., Sulphas Quininæ; Dan., Norw. and Swed., Sulphas Chinicus; Dutch, Sulphas Chinini; Fr., Sulfate de Quinine Basique; Ital., Solfato di Chinina; Mex. and Port., Sulfato de Quinina; Span., Sulfato Quinico; U.S. Quininæ Sulphas.

Description.—Filiform silky white crystals, of an intensely bitter taste.

Considerable discussion has arisen from time to time on the subject of 'light' and 'heavy' Quinine. Chemically pure Quinine Sulphate naturally crystallises in hard crystals somewhat resembling Zinc Sulphate, and at one time it was considered that the light, feathery form was inseparable from the presence of traces of Cinchonidine. In fact, as Cuprea (Remijia) bark contains no Cinchonidine, manufacturers, using this variety alone, were obliged to add a certain proportion of this Sulphate to obtain their Quinine Sulphate in the 'light' form, which was universally in demand. It has more recently been discovered that the addition of a small quantity of Ammonium Sulphate to the crystallising liquid produces the same effect.—*C.D.* '92, i. 22.

Tests.—Soluble in about 800 parts of Water, giving a solution which has a bluish fluorescence. Entirely soluble in Water acidulated with a mineral acid. Aqueous solutions of Quinine salts yield with Solution of Ammonia white precipitates soluble in Ether and in excess of the Solution of Ammonia. When such aqueous solutions are treated first with Solution of Bromine or of Chlorine and afterwards with Solution of Ammonia, they become of an emerald-green colour, changing to red when mineral acids are added. Exposed to dry air, Quinine Sulphate effloresces until the 15 molecules of Water have been reduced to 4. It affords the reactions characteristic of Sulphates. 2·5 grammes of the freshly prepared salt should lose ·38 gramme of water by drying at 212° F. (100° C.). Heated to redness with free access of air, it burns without leaving any residue (absence of mineral impurity).

Quinine Sulphate when tested by the following methods should not afford any appreciable reaction characteristic of Cinchonine, Quinidine, Cupreine, or amorphous alkaloid, and should not yield more than a total of 3 p.c. of crystals of impure Cinchonidine by the following test.

Test for Cinchonidine and Cinchonine.—Dissolve 4 grammes of the Quinine Sulphate in 120 c.c. of boiling Water. Cool the solution slowly to 122° F. (50° C.), with frequent stirring. Separate, by filtration, the purified Quinine Sulphate which has crystallised out. Concentrate the filtrate by evaporation until it is reduced to 10 c.c. or less; transfer to a small stoppered flask, and, when cold, shake with 10 c.c. of Ether and half that amount of Solution of Ammonia. Set aside in a cool place for not less than 24 hours. Collect the crystals, which consist of Cinchonidine and Cinchonine combined with Quinine, on a tared filter, wash with a little Ether, dry at 212° F. (100° C.), and weigh. These should not amount to more than ·12gramme.

Test for Quinidine.—Dissolve 1 gramme of the Quinine Sulphate in 30 c.c. of boiling Water; cool, and filter. To the solution add Solution of Potassium Iodide, and a little Alcohol (90 p.c.) to prevent the precipitation of amorphous Hydriodides. Collect any separated Quinidine Hydriodide, wash with a little Water, dry, and weigh. The weight represents about an equal weight of crystallised Quinidine Sulphate. None or only the slightest traces should be obtained.

Test for Cupreine.—Shake the recrystallised Quinine Sulphate, obtained in testing the original Quinine Sulphate for Cinchonidine and Cinchonine, with 25 c.c. of Ether and 6 c.c. of Solution of Ammonia, and to this ethereal solution, separated, add the ethereal liquid and washings also obtained in testing the original Sulphate for the two alkaloids just mentioned. Shake this ethereal liquid with 6 c.c. of a 10 p.c. Solution of Sodium Hydroxide, adding Water if any solid matter should separate. Remove the ethereal solution. Wash the aqueous solution with more Ether, and remove the ethereal washings. Add Diluted Sulphuric Acid to the aqueous liquid heated to boiling, until exactly neutral. When cold, collect any crystallised Cupreine Sulphate on a tared filter; dry, and weigh. None or only the slightest traces should be obtained.

Test for Cinchonine and Amorphous Alkaloids.—Dissolve 1 gramme of the Quinine Sulphate in 30 c.c. of boiling Water, add 1 gramme of Sodium Potassium Tartrate. Allow to cool, with frequent stirring; filter. The solution when evaporated to small bulk should give little or no precipitate with Solution of Ammonia.

It has been shown by Cownley (*P.J.* '98, i. 412), who has criticised the B.P. test adversely, that Cinchonine, Quinine and Cupreine are never present in Quinine Sulphate of any known commercial manufacture. Moreover Cupreine occurs in Cuprea bark (*Remijia pedunculata*) (*P.J.* (3) xv. 221, 401), now seldom if ever employed by Quinine manufacturers and in any case it could only exist in Quinine Sulphate to the extent of a few hundredths p.c. It has also been shown (*ibid.*) that a yield of 3 p.c. of crystals of impure Cinchonidine (by the B.P. test) really means an admixture of 5·99 p.c. crystallised Cinchonidine Sulphate in Quinine Sulphate answering the B.P. requirements, while the 1885 B.P. stipulated that a Quinine Sulphate should not contain much more than 5 p.c. of Sulphates of other Cinchona alkaloids. 'It would therefore have been better for the Pharmacopœia, failing the insertion of a satisfactory test, to describe that limit of impurity, leaving its determination when necessary in the hands of those competent to undertake it' (Cownley, *P.J.* '98, i. 412). The most convenient and satisfactory test for the determination of Cinchonidine in Quinine Sulphate, is a modification of Paul's test (*P.J.* (3), vii. 673). It consists in re-crystallising 2 to 5 grammes of Quinine Sulphate from 100—120 c.c. of boiling water until in the last mother liquor no further indication of Cinchonidine is obtained. When the filtrate is concentrated to a very small bulk and agitated with Ether and Ammonia, Cinchonidine will crystallise out if left for 24 hours. The crystals so obtained represent the total amount of impure Cinchonidine in the sample under examination, but they contain a varying amount of Quinine, according to the quantity of Quinine present in the solution. In testing Quinine the object is to eliminate from solution as much Quinine Sulphate as possible before applying the Ether test, and in this respect the B.P. is extremely unsatisfactory. In Paul's test, according to Cownley, the crystals separating from Ether usually contain 70 p.c. of Cinchonidine. The amount of Cinchonidine Sulphate in commercial Quinine Sulphate varies from 0 to 12·34 p.c. and the amount of water from 8·61 to 16 p.c. (*P.J.* (3), xix. 665). There is no doubt that very little of the Quinine Sulphate used for dispensing purposes contains the amount of water represented by the formula given above (15 molecules) owing to the efflorescent nature of the salt. On that account it has been suggested that the more stable salt $(C_{20}H_{21}N_2O_2)_2H_2SO_4$, $2H_2O$ should be made official (Cownley, *P.J.* '96, ii. 525).

Preparations.

PILULA QUININÆ SULPHATIS. PILL OF QUININE SULPHATE. (NEW.)

Quinine Sulphate, 30 grains; Tartaric Acid, in powder, 1 grain; Glycerin, 4 grains; Tragacanth, in powder, 1 grain. Triturate the Quinine Sulphate with the Tartaric Acid; add the product to the previously mixed Glycerin and Tragacanth; make a mass.

Dose.—2 to 8 grains.

TINCTURA QUININÆ AMMONIATA. AMMONIATED TINCTURE OF QUININE. (ALTERED.)

Quinine Sulphate, 175 grains; Solution of Ammonia, 2 fl. oz.; Alcohol (60 p.c.), 18 fl. oz. Mix the Solution of Ammonia with the Alcohol; add the Quinine Sulphate; shake until a clear solution is produced; set aside for three days; filter. =(about 1 grain in 55 minims).

Formerly 1 grain in 60 minims. Alcohol (60 p.c.) is now used in place of Proof Spirit and less Ammonia is added.

Dose.—½ to 1 fl. drm.

When mixed with water the Quinine is precipitated in a fine state of division, but the particles soon aggregate and adhere to the sides of the glass; therefore this preparation should not be prescribed in mixtures, unless Mucilage of Acacia be used to suspend the Quinine.

When prepared with Ammonium Carbonate instead of Liquor, the Tincture does not precipitate so badly and it may be diluted with Water saturated with Carbonic Acid without any precipitation at all.

When first made, the Tincture usually deposits a little, so it is better to allow a day or two to elapse before filtering. It has been shown (*P.J.* (3) xxi. 511) that this deposit contains Cinchonidine.

(Not in the other Pharmacopœias.)

RESINA.

RESIN.

The residue left after the distillation of the Oil of Turpentine from the crude Oleo-resin (Turpentine) of various species of *Pinus*.

Solubility.—In almost all proportions of Alcohol (90 p.c.), Ether, and Oil of Turpentine, and in hot Olive Oil.

Medicinal Properties.—Important as an ingredient of ointments and plasters, but never used internally.

Official Preparations.—Emplastrum Resinæ and Unguentum Resinæ. Used in the preparation of Emplastrum Calefaciens, Emplastrum Cantharidis, Emplastrum Menthol, Emplastrum Picis, Emplastrum Plumbi Iodidi, Emplastrum Saponis.

Resin Plaster is contained in Emplastrum Belladonnæ, Emplastrum Opii, also in Emplastrum Calefaciens.

Foreign Pharmacopœias.—Official in all; U.S., Resina; Austr., Belg., Dutch, Ger., and Swiss, Colophonium; Dan., Norw., Russ., and Swed., Resina Colophonium; Fr., Colophone and Poix-resine; Hung., Colophonium Depuratum Flavum; Ital., Colophonia; Jap., Resina Pini; Mex., Brea; Port., Pez Loaro and Colophonia; Span., Resina Comum de Pino and Colofonia.

Description.—Translucent, of a light amber colour, compact,