ELIXIR QUININÆ AMMONIATUM.—Quinine Sulphate, 1; Ammonium Carbonate, 3; Alcohol, 25; Solution of Carmine, 0·25; Elixir of Orange, 50; Distilled Water, *q.s.* to produce 100.—*B.P.C.*

MISTURA QUININÆ.—Quinine Sulphate, 1 grain; Diluted Sulphuric Acid, *q.s.*; Distilled Water, to 1 fl. oz.—*London Ophthalmic.*

Quinine Sulphate, 1 grain; diluted Sulphuric Acid, 1 minim; Tincture of Orange, 10 minims; Water, to 1 fl. oz.—*St. Thomas's.*

This has been incorporated in the *B.P.C.*

MISTURA QUININÆ CUM FERRO.—Quinine Sulphate, 1 grain; Solution of Ferric Chloride, 10 minims; Water, to 1 fl. oz.—*St. Thomas's.*

This has been incorporated in the *B.P.C.*

PILULÆ METALLORUM.—Quinine Sulphate, 1 grain; Reduced Iron, 1 grain; Strychnine (alkaloid), $\frac{1}{20}$ grain; Arsenic Trioxide, $\frac{1}{20}$ grain; in one pill.—*U.S.N.F.*

Note.—A similar combination is known under the name of Aitken's Tonic Pills:—

Quinine Sulphate, 1 grain; Reduced Iron, $\frac{2}{3}$ grain; Strychnine (alkaloid), $\frac{1}{50}$ grain; Arsenic Trioxide, $\frac{1}{50}$ grain; in one pill.—*U.S.N.F.*

This has been incorporated in the *B.P.C.* as follows:—

Pilulæ Quininæ Sulphatis Compositæ. *Syn.* Aitkin's Tonic Pills.—Quinine Sulphate, $\frac{1}{2}$ grain; Reduced Iron, $\frac{1}{3}$ grain; Arsenious Anhydride, $\frac{1}{100}$ grain; Strychnine, $\frac{1}{100}$ grain; Extract of Gentian, *q.s.*, in 1 pill.—*B.P.C.*

Aitken's Tonic Pill.—Quinine Sulphate, 1 grain; Reduced Iron, $\frac{2}{3}$ grain; Arsenious Anhydride, $\frac{1}{50}$ grain; Strychnine, $\frac{1}{50}$ grain; Extract of Gentian, *q.s.*—*Pharm. Form.*

PILULA QUININÆ CUM FERRO.—Quinine Sulphate, 1 grain; Ferrous Sulphate, 1 grain; Extract of Gentian, 3 grains; in each pill.—*Brompton.*

Quinine Sulphate, 1 grain; Exsiccated Ferrous Sulphate, 1 grain; in each pill.—*St. Thomas's.*

This has been incorporated in the *B.P.C.*

RESINA.

RESIN.

Fr., Colophane; Ger., Kolophonium; Ital., Colofonia; Span., Colofonia.

A translucent, pale amber-coloured, brittle solid, having a terebinthinate odour. Readily reduced to powder. It is officially described as the residue from the crude Oleo-Resin of various species of *Pinus*, after the Oil of Turpentine has been removed by distillation.

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

Medicinal Properties.—Antiseptic, and slightly stimulant. It is an **ingredient** of plasters used for strapping wounds. The **ointment** forms a stimulating dressing for indolent ulcers and sores. 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.

Not Official.—Resina Carbolica, Resina Carbolisata.

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

Foreign Pharmacopœias.—Official in all as Colophonium; Span. (Colofonia and Resina commune) and U.S. (Resina).

Descriptive Notes.—The Resin of commerce is met with in various grades, from the nearly black Colophony to the water-white or almost colourless, transparent kind. The official variety apparently agrees with the characters of the grade known in trade as Amber Resin. It is transparent, amorphous and very brittle; the freshly fractured surface is shiny and slightly concave, with a faintly terebinthinate odour. The Resin of commerce varies in the amount of Turpentine Oil that it retains. The 'water-white' and 'window-glass' Resins are useful for colourless varnishes. The yellow opaque Resin is made by stirring Water into the Resin after distillation of the Oil of Turpentine, but it loses Water and becomes translucent when heated. Powdered Resin should not cohere into masses.

Tests.—Resin has a sp. gr. of 1·07 to 1·085, the *U.S.P.* states 1·070 to 1·080; the *P.G.* does not refer to a sp. gr. When heated it melts, when strongly heated it evolves heavy white vapours possessing an aromatic odour, and when ignited burns readily with a yellow flame, emitting a dense sooty smoke. It dissolves readily and completely in Alcohol (90 p.c.), Benzol, Carbon Bisulphide and Ether. The *U.S.P.* states that it is soluble in Acetic Acid (36 p.c. w/w), Alcohol (94·9 p.c.), Benzene, Carbon Bisulphide, Ether, fixed or volatile Oils, and in Potassium or Sodium Hydroxide Solutions. The *P.G.* states that it dissolves slowly in 1 part of Alcohol (90 p.c.), and in 1 part of Acetic Acid (96 p.c. w/w), also in Sodium Hydroxide Solution (15 p.c. w/w). The Acid value varies from 150 to 185, the Ester value from 0 to 12; the Saponification value from 179 to 193. The *U.S.P.* states the Acid value should not be less than 150, the *P.G.* 151·6 to 179·7. Neither the *U.S.P.* nor the *P.G.* includes an Ester or Saponification value. Neither an Acid, Ester nor Saponification value is included in the *B.P.* The presence of Turpentine Oil may be detected by the solubility of the Resin in Alcohol (90 p.c.). When ignited with free access of air it should burn leaving no weighable residue, indicating the absence of mineral impurities.

Acid Value.—A weighed quantity of 1 gramme of the Resin is dissolved in a sufficiency of Alcohol (94·9 p.c.), a few drops of Phenolphthalein Solution added, and the mixture titrated with Normal Volumetric Potassium Hydroxide Solution. The number of c.c. of Normal Volumetric Potassium Hydroxide Solution consumed multiplied by 0·05574 indicates the number of grammes of Potassium Hydroxide, and this figure expressed in mg. indicates the Saponification value of the Resin, which in this case should be not less than 150, *U.S.P.*

A weighed quantity of 1 gramme of the Resin is dissolved in 25 c.c. of Semi-normal Volumetric Alcoholic Potassium Hydroxide Solution, and after the addition of 10 drops of Phenolphthalein Solution the excess is titrated with Semi-normal Volumetric Hydrochloric Acid Solution; from 18·6 to 19·6 c.c. should be necessary to neutralise this excess, *P.G.*

Preparation.

EMPLASTRUM RESINÆ. Resin Plaster. *B.P.Syn.*—Adhesive Plaster.

Resin, 4; Lead Plaster, 32; Hard Soap, 2. (1 in 9½)

Now made with Hard Soap instead of Curd Soap.

Foreign Pharmacopœias.—Official in Austr., Lead Plaster 10, Wool Fat 1, Yellow Wax 1, Turpentine 1, Colophonium 1, Dammar 1; Belg. and Swiss, Lead Plaster 80, Elemi 5, Yellow Wax 5, Colophonium 5, Turpentine 5; Dan. and Swed., Lead Plaster 8, Colophonium 2; Dutch, Lead Plaster 70, Gum Elastic 10, Wool Fat 20; Ger., Lead Plaster 40, Solid Paraffin 2·5, Liquid Paraffin 2·5, Colophonium 35, Dammar 10, Caoutchouc 10, Petroleum Benzine 75; Hung., Lead Plaster 400, Purified Colophonium 100, Turpentine 25; Ital., Lead Plaster 40, Burgundy Pitch 7, Yellow Wax 3; Mex., Lead Plaster 100, Yellow Wax 10, Dammar 10, Colophonium 10, Turpentine 10; Norw., Lead Plaster 8, Yellow Wax 1, Mastic 1; Russ., Litharge 11, Olive Oil commune 10, Lard 10, Colophonium 8·5; and U.S., Lead Plaster 96, Rubber 2, Petrolatum 2; all (Emplastrum Adhæsivum). Jap. (Emplastrum Resina), Lead Plaster 80, Yellow Wax 6, Resin 14; Span., Emplasto de Resinas Aglutinante, Lead Plaster 60, Olive Oil 75, Turpentine 75, Yellow Wax 90, Elemi 180, Pine Resin 570.

UNGUENTUM RESINÆ. Resin Ointment. *N.O.Syn.*—Basilicon Ointment.

Resin, in powder, 8; Yellow Beeswax, 8; Olive Oil (by weight), 8; Lard, 6. (1 in $3\frac{3}{4}$)

Olive Oil and Lard used in place of Almond Oil and Simple Ointment, and the quantity of Beeswax increased.

Foreign Pharmacopœias.—Official in Austr. (Unguentum Basilicum), Yellow Wax 16, Olive Oil 36, Colophonium 12, Suet 12, Turpentine 12, Pitch 12; Dutch (Unguentum Resinosum Flavum), Yellow Wax 18, Colophonium 8, Sesame Oil 70, Turpentine 4; Fr. (Pommade de Styrax), Purified Liquid Storax 16, Colophonium 29, Purified Elemi 16, Yellow Wax 16, Olive Oil 23; Ger. (Unguentum Basilicum), Olive Oil 9, Yellow Wax 3, Colophonium 3, Suet 3, Turpentine 2; Mex. (Unguento Amarilla), Yellow Wax 6, Colophonium 5, Suet 4, Aceite 12; Norw. (Unguentum Basilicum Nigrum), Colophonium 12, Yellow Wax 12, Pitch 12, Suet 12, Turpentine 12, Olive Oil 40; Port. (Unguento de Resina), Yellow Wax 25, Resin 25, Oleo de Amendoin 50; Span. (Unguento de Altea), Turpentine 50, Althæa Root 100, Water 100, Yellow Wax 160, Pine Resin 160, Olive Oil 750; Swed. (Unguentum Terebinthinæ Resinosum), Colophonium 15, Suet 15, Turpentine 10, Yellow Wax 15, Olive Oil 45; Swiss (Unguentum Resinosum), Colophonium 9, Turpentine 9, Yellow Wax 17, Olive Oil 65; U.S. (Ceratum Resinæ), Rosin 35, Yellow Wax 15, Lard 50; also (Ceratum Resinæ Compositum), Rosin 225, Yellow Wax 225, Prepared Suet 300, Turpentine 115, Linseed Oil 135.

Not Official.

RESINA CARBOLICA (R.D.H.).—Resin, 4 parts; Carbolic Acid, 4 parts; Chloroform, 3 parts. Dissolve and filter.

Resina Carbolisata.—Carbolic Acid, 3·5; Resin, in powder, 4·5; Chloroform, 2·0.—*B.P.C.*

Not Official.

RESORCINUM.

RESORCIN.

METADIOXYBENZOLUM. RESORCINOL.

$C_6H_4(HO)_2$, eq. 109·22.

Fr., Résorcine; Ger., Resorcin; Ital., Resorcina; Span., Resorcina.

White, or nearly white, glistening, needle-shaped, or prismatic crystals, having a peculiar characteristic odour, and sweetish, pungent taste. It may be obtained by the destructive distillation of Brazilin, or by fusing Sodium Benzoldisulphonate with Sodium Hydroxide.

It should be kept in well-stoppered glass bottles of a dark amber tint and protected as far as possible from exposure to the light, as it has a tendency to acquire a pinkish tint. It is described in the *U.S.P.* as a diatomic Phenol and under the title of Resorcinol. On this account care should be taken not to confound it with the proprietary preparation known also under the name of Resorcinol, which is described below and which is a mixture of equal parts of Iodoform and Resorcin.

Solubility.—4 in 3 of Water; 4 in 3 of Alcohol (90 p.c.); 1 in 1 of Glycerin; 1 in 1 of Ether; 1 in 22 of Olive Oil.

Medicinal Properties.—A powerful antiseptic. It is also antipyretic, but it is very depressing to the heart, and is dangerous. As a **spray** (1 or 2 p.c.) in diphtheria and whooping-cough, *Pr.* liv. 381; 5 to 10 p.c. **solutions** in Glycerin; 5 to 10 p.c. **ointments** in skin diseases, *B.M.J.* '88, i. 435; *L.* '88, i. 570; '90, ii. 1347; '91, ii. 505, 1185; *T.G.* '90, 279. In acne rosacea, *Pr.* li. 380; in pruritus, *M.A.* '95, 436; in diarrhœa and gastric affections, and as a local germicide and stimulant in ulcers and in pharyngitis and chronic rhinitis, *Y.B.T.* '94, 463; in leucoplakia, *T.G.* '95, 181. Untoward effects when administered internally as a powder, *L.* '98, ii. 779, 836; internal administration of 3 grains taken every 4 hours, followed by appearance of Phenol-sulphates in the urine and kidney disturbance.—*B.M.J.* '01, ii. 1266. A watery solution of about 5 grains to the oz., combined with a little alkali employed as a spray, is recommended (*B.M.J.* '05, ii. 1680) in the treatment of common cold in the head, and as a mouth and nasal spray in influenza.—*Pr.* '07, i. 152.

Dose.—1 to 5 grains = 0·06 to 0·32 gramme.

Prescribing Notes.—*It is frequently prescribed in hair lotions and washes for removing dandruff, but when mixed with an alkali, e.g., Potassium Carbonate, the solutions rapidly darken in colour and acquire a strong green fluorescence, and such lotions frequently produce an unpleasant colouring effect on the hair which, once produced, is somewhat difficult to remove. It is also incompatible with Spiritus Ætheris Nitrosi.*

Antidotes.—White of Egg; wash out the stomach with Soda or Saccharated Lime, well diluted; stimulants; Atropine; Amyl Nitrite.—*Murrell.*

In large doses it produces profuse perspiration, flushing of the face, and giddiness. Dr. Murrell describes a case of poisoning by 2 drm. of it which nearly proved fatal.—*M.T.* '81, ii. 487.

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

Tests.—Resorcin melts, when pure, at 118° to 119° C. (244·4° to 246·2° F.), volatilising completely at a higher temperature. The *U.S.P.* gives 109° to 111° C. (228·2° to 231·8° F.); the *Fr. Codex* (1908) 119° C. (246·2° F.). It boils at 276° C. (528·8° F.). The *U.S.P.* gives the boiling point 276·5° C. (529·7° F.). It dissolves readily in Water, forming a clear solution, which is neutral in reaction towards Litmus paper, and which yields, on the addition of Ferric Chloride T.S., a deep violet colour, which changes to a brownish-yellow on the addition of Ammonia Solution. On gently warming 0·05 of a gramme with 0·1 of a gramme of Tartaric Acid and 10 drops of Sulphuric Acid a deep carmine-red liquid is obtained. 0·5 of a gramme, when mixed with 2 c.c. of Formalin Solution and 2 c.c. of Potassium Hydroxide Solution (5 p.c.), and the mixture heated to boiling, a deep red coloration is gradually developed.

The more generally occurring impurities are Catechol, Quinol, empyreumatic bodies, Phenol, and mineral impurities. Catechol gives, with Ferric Chloride T.S., a dark green coloration changing to violet-red on the addition of Ammonia Solution, which distinguishes it from Resorcin. Quinol forms green crystals of Quinhydrone on the addition of Ferric Chloride T.S., changing to yellow, sparingly soluble Quinone on the addition of an excess of the reagent. It also yields a white precipitate with neutral Lead Acetate Solution, whereas a solution of Resorcin yields no precipitate; Lead Subacetate Solution produces, however, a white precipitate in an aqueous solution of the salt. The concentrated aqueous solution should be colourless, indicating the absence of empyreumatic bodies,

and no odour of Phenol should be emitted when the concentrated solution is gently heated. When ignited with free access of air it should leave no weighable residue.

Preparations.

GARGARISMA RESORCINI.—20 grains to 1 fl. oz. Water.—*Throat.*

GLYCERINUM RESORCINI.—Resorcin 1, Distilled Water 1, Glycerin, 3. —*Guy's.*

LOTIO RESORCINI (Andeer's Lotion).—Resorcin 40 grains, Water 1 fl. oz. Used as an antiseptic and stimulant in foul and syphilitic ulcerations, and to allay irritation in chronic eczema and psoriasis.

This has been incorporated in the *B.P.C.*

PASTA RESORCINI FORTIOR (*Lassar*).—Resorcin 20, Zinc Oxide 20, Powdered Starch 20, Liquid Paraffin 40.

This has been incorporated in the *B.P.C.*

PASTA RESORCINI MITIS (*Lassar*).—Resorcin 10, Zinc Oxide 25, Powdered Starch 25, Liquid Paraffin 40.

This has been incorporated in the *B.P.C.*

PASTA ZINCI C. RESORCINO (*Ihle's Paste*).—Resorcin 10 grains; Zinc Oxide, Powdered Starch, Soft Paraffin and Wool Fat, of each, 120 grains.—*Middlesex.*

This has been incorporated in the *B.P.C.* under the title **Unguentum Resorcini cum Amylo**, with the synonym as above.

PIGMENTUM RESORCINI.—Resorcin 96 grains, Glycerin of Borax to 1 fl. oz.—*Throat.*

RESORCIN PLASTER MULL (*Unna*).—Contains $\frac{3}{4}$ grain to the square inch.

SPIRITUS CAPILLARIS (*Unna*).—Resorcin 60 grains, Castor Oil $\frac{1}{2}$ fl. drm., Eau de Cologne $1\frac{1}{2}$ fl. oz., Rectified Spirit to 6 fl. oz.

Spiritus Resorcini. *Syn.* Spiritus Capillaris; Spiritus Capillorum; Lotio Resorcini Composita.—Resorcin, 2·50; Castor Oil, 2·50; Cologne Spirit, 20; Alcohol, *q.s.* to produce 100.—*B.P.C.*

UNGUENTUM RESORCINI.—Resorcin 60 grains, Glycerin 1 fl. drm., Lanolin 2 drm., Soft Paraffin to 1 oz.—*London.*

This has been incorporated in the *B.P.C.* as follows:—Resorcin, 12·50; Glycerin, 12·50; Hydrous Wool Fat, 25; Soft Paraffin, *q.s.* to produce 100.

UNGUENTUM RESORCINI COMPOSITUM.—Resorcin, 8; Distilled Water, 8; Oil of White Birch, 8; Oxide of Zinc, 8; Vaseline, 32; Anhydrous Lanolin, 32. Dissolve the Resorcin in the Water and mix with the other ingredients.—*Bournemouth Formulary.*

This has been incorporated in the *B.P.C.* with slight modification.

TRIBROMO-RESORCIN.—Minute, white or whitish crystals. It is a powerful antiseptic and bactericide.—*P.J.* '99, ii. 216.

Resorcini Monacetas (Euresol).—A transparent yellow viscous mass, readily soluble in Acetone.

RESORCIN CAMPHOR.—A liquid obtained by heating together equal parts of Camphor and Resorcin. Is superior to mercurial ointment in removing pediculi.—*P.J.* '96, i. 229, 326.

RESORCINOL.—Obtained by melting together equal volumes of Resorcin and Iodoform. It is a red-brown powder, partially soluble in Water, soluble in Ether. Has been introduced as a substitute for Iodoform as a dressing.—*P.J.* '96, i. 446.

ANUSOL (Bismuth Iodo-resorcin-sulphonate) is employed in suppository form in the treatment of piles.—*P.J.* '96, ii. 378.

FLUORESCEIN (Resorcinol-Phthaleïn Anhydride).—An amorphous yellowish-red powder; almost insoluble in Water, in Alcohol (90 p.c.), and in Ether.

Prepared by the action of Phthalic Anhydride on Resorcin. It dissolves readily in solutions of the alkali hydroxides, *e.g.*, Sodium Hydroxide, forming **Sodium Fluorescein**, a yellowish or greyish-red powder readily soluble in Water. In the form of a 2 p.c. solution it has been used for staining the denuded spots of the cornea, and has thus been found useful in the diagnosis of corneal ulcers.

LIQUOR FLUORESCEIN.—Fluoresceïn 8 grains, Sodium Bicarbonate 12 grains, Distilled Water 1 fl. oz.—*London Ophthalmic.*

Not Official.

RHAMNI FRANGULÆ CORTEX.

Syn.—CORTEX FRANGULÆ.

The dried Bark of *Rhamnus Frangula*, L. Collected from the young Trunk and from the larger Branches, and kept at least one year before being used.

Official in *B.P.* 1885, but not in *B.P.* 1898.

Medicinal Properties.—Similar to those of Rhamnus Purshianus. A laxative or purgative for delicate constitutions and the aged.

A solid **Extract**, dose, 15 to 60 grains, was official in *B.P.* '85, and is now in Dutch, Russ. and Swed.; a **Fluid Extract**, dose, 1 to 4 fl. drm., was official in *B.P.* '85, and is now in Dan., Dutch, Fr., Ger., Norw., Russ., Swed., Swiss and U.S.; Swed. also has a **Syrup**. Fructus Rhamni Catharticæ is official in Belg. and Ger., also the **Syrup**.

Descriptive Notes.—The bark as found in commerce is a waste product, being derived from the wood known in trade as 'dogwood,' which is imported from Holland for use as gunpowder. The thin bark of the younger trunks and branches is preferable for use in medicine, the thicker bark of old trees being very bitter and nauseous. It requires to be kept a year before being used like that of *R. Purshianus*, the recently collected bark being liable to produce colic, nausea, and vomiting. The dried bark is in the form of thin quills of a dark greyish-brown or greenish-black colour externally, and has a brownish-yellow inner surface. It should not exceed $\frac{1}{25}$ inch (1 mm.) in thickness. The outer surface is covered with numerous elongated, transverse, whitish marks (lenticels); when the epidermis is abraded with the nail, a purplish-red or dull crimson layer is seen beneath, which forms a characteristic feature of the bark. It does not contain stone cells.

Preparations.

EXTRACTUM RHAMNI FRANGULÆ.—Rhamnus Frangula Bark, in No. 40 powder, is percolated with Proof Spirit (Alcohol 57 p.c.) until exhausted, the liquor is evaporated by a water-bath to an extract.—*B.P.* 1885.

The *B.P.C.* employs the Bark in No. 20 powder, and exhausts by percolation with Water.

EXTRACTUM RHAMNI FRANGULÆ LIQUIDUM.—Boil 16 of the Bark in successive quantities of Water; evaporate the liquors to 12, and when cold add 4 of Rectified Spirit, filter, and add Water *q.s.* to make 16.—*B.P.* 1885.

FLUIDEXTRACTUM FRANGULÆ.—Percolate 100 of Bark with a mixture of 50 of Alcohol (95 p.c.), with 80 of Water, reserve the first 80, and evaporate the remainder to a soft extract, which dissolve in the reserved portion and make up to 100.—*U.S.P.*

Average Dose.—15 minims = 0·9 c.c.

This has been incorporated in the *B.P.C.*

RHEI RADIX.

RHUBARB ROOT.

Fr., Rhubarbe de Chine; Ger., Rhabarber; Ital., Rabarbaro; Span., Ruibarbo.

Though called Rhubarb Root, it really consists chiefly of the erect Rhizomes of *Rheum palmatum*, L., *R. officinale*, Baill., and probably other species, collected in North-Western China and Tibet.

Medicinal Properties.—Cathartic and astringent; the purgative effect precedes the astringent, and therefore Rhubarb is useful in diarrhœa when an aperient is indicated. Stomachic tonic in small doses. Given in d y s p e p s i a, and in occasional but not in chronic constipation. It is non-irritant, suitable for delicate constitutions, and for increasing the effect of other cholagogues and cathartics; useful in hæmorrhoids. It is frequently combined with an antacid or carminative.

Dose.—3 to 10 grains = 0·2 to 0·65 gramme, for repeated administration; for a single administration, 15 to 30 grains = 1 to 2 grammes.

Prescribing Notes.—*May be given in* **cachets, pills, mixtures,** *or Compressed Tablets. The* **compound powder** *is also prescribed in* **cachets, capsules,** *etc.*

4 *grains of Powdered Rhubarb and* 1 *minim of 'Dispensing Syrup' make a nice* **pill.** *Sodium Bicarbonate in equal weight with Powdered Rhubarb counteracts the astringency, and covers the taste; the addition of Peppermint Water still further hides it; or* 1 *drop of Oil of Peppermint,* 30 *grains of Sugar, will disguise the taste of* 15 *grains of Powdered Rhubarb; or* 1 *drop of Oil of Caraway,* 30 *grains of Sugar, and* 10 *grains of Powdered Rhubarb, make a good* **draught** *with Water to* 1½ *fl. oz.*

Official Preparations.—Extractum Rhei, Infusum Rhei, Liquor Rhei Concentratus, Pilula Rhei Composita, Pulvis Rhei Compositus, Syrupus Rhei, Tinctura Rhei Composita.

Not Official.—Elixir Rhei, Extractum Rhei Compositum, Fluidextractum Rhei, Infusum Rhei Concentratum, Pulvis Rhei cum Magnesia, Mistura Rhei cum Soda, Pilula various, Pulveres various, Tinctura Rhei Aquosa, Vinum Rhei, Purgatin and Rumicin.

Foreign Pharmacopœias.—Official in all.

Descriptive Notes.—The official Rhubarb Root is attributed to *Rheum palmatum*, Linn., *Rheum officinale*, Baill., and probably other species (*Rheum palmatum* var. *Tanguticum Max.*, *U.S.P.*), and is stated to be collected in China and Tibet. The official description covers several varieties. The Chinese Rhubarb Root of commerce occurs either in transverse sections or split longitudinally, it varies in length and diameter, but averages 3 to 4 in. long and 2 to 3 in. broad, although pieces are sometimes met with as much as 6 or 8 in. long and broad in proportion. The outer surface is convex from having been scraped, or sometimes angular from having been sliced, and presents here and there stellate markings, due to the transversely cut medullary rays of lateral buds or of roots. The outer surface is brownish-yellow, but the broken surface pinkish-brown or greyish-brown; the substance is tough and hard, and gritty

when chewed. The taste is bitter and astringent, and the flavour disagreeable. Although the root of *Rheum officinale* is cultivated in England, only that collected in China and Tibet is official. The Shensi Rhubarb is considered the best, that of Sechuen and Kansuh are less valuable. The drug, which is produced chiefly in the provinces of Shensi, Sechuen and Kansuh, finds its way to Europe usually *viâ* Hankow, Shanghai and Canton, although the drug is also produced in other provinces and in Manchuria. The Shensi Rhubarb exhibits, mostly on the lighter and less compact pieces, a rhomboidal network of whitish veins, but none of the known species of Rheum possess this character, so that it is evidently derived from an undescribed species. In commerce the pieces formed by dividing the rootstock longitudinally are known as 'flats' and those cut transversely as 'rounds.' 'High dried' Canton Rhubarb has usually been dried by artificial heat, and when prepared in this way the pieces are apt to become rotten in the centre, hence, as a test of quality, transversely broken pieces are usually exhibited at the drug sales. The hardest and heaviest pieces are usually selected for trimming, which is done by filing. The English cultivated Rhubarb, prepared from *R. rhaponticum*, L., is less gritty than the Chinese and is less active as a purgative, but it gives a brighter yellow powder. The *R. officinale* grown in England is distinguishable from that of *R. rhaponticum* by its larger size and by the dark or blackish-red veins traversing it as compared with the reddish-brown veins of the latter species, which usually form more or less parallel lines on the longitudinal section, and radiate lines on the transverse one. In the Chinese Rhubarb, except in the very inferior kinds, the bark is entirely removed; the holes, through which the string is used for suspending the roots in drying, are dark coloured and irregular, and the outer surface of the pieces is convex. In English Rhubarb, which is always dried by stove heat, the outer surface is denuded of the outer layer only, and is always more or less shrunken and irregular, the internal portion is soft and can be easily indented, and the holes, when present, are round and have fresh edges, having been made with a rat-tail file to imitate the Chinese drug. The larger pieces of the English Rhubarb are mostly exported to the United States; the lateral roots, known as 'stick Rhubarb,' are sold at a cheap rate by herbalists. The powdered English Rhubarb, apparently from containing or absorbing more moisture, is liable to turn pink when mixed with Magnesia to form Gregory's Powder. In making aqueous preparations of Rhubarb, the use of pieces cut small, rather than coarsely powdered, gives brighter preparations, which are more easily filtered. The raphides being more abundant in Chinese Rhubarb than in English, the percentage of ash affords some indication of the kind used for the powder, that of Chinese Rhubarb yielding according to Hanbury 12·9 to 13·87 p.c. of ash, one sample, however, yielding as much as 43·27 p.c. English Rhubarb afforded 10·90 p.c. of ash.

The *P.G.* mentions that the sphæraphides measure up to 0·1 mm. and the roundish starch grains from 0·003 to 0·018 mm. (0·005 to

0·020 mm. *U.S.P.*) which are either simple or grouped two or three together and have an evident hilum.

Tests.—The ash of Rhubarb Root varies from 7 to 12 p.c. 12 samples of picked root examined in the author's laboratory yielded from 4·1 to 21·5 p.c., with an average of 9·85; 14 samples of the powder yielded from 6·7 to 12·1 p.c., with an average of 8·97.

Preparations.

EXTRACTUM RHEI. EXTRACT OF RHUBARB.

Rhubarb Root, exhausted with Alcohol (60 p.c.), and the resulting liquor evaporated to dryness.

Dose.—2 to 8 grains = 0·13 to 0·52 gramme.

Official in Austr., Dutch, Ger., Jap., Norw., Swed., Swiss and U.S., with Spirit and Water mixed; Belg., with Alcohol (60 p.c.); Dan., with Alcohol (70 p.c.); Fr., Hung., Ital., Mex., Port., Russ. and Span., with Water.

Mex. and U.S. have also a **Fluid Extract**, 1 in 1; Belg., Fluid Extract containing 30 p.c. of dry residue.

INFUSUM RHEI. INFUSION OF RHUBARB.

Rhubarb Root, in thin slices, 1; boiling Distilled Water, 20. Infuse 15 minutes; strain. (1 in 20)

Now 1 in 20 instead of 1 in 40, and the time is reduced.

Dose.—½ to 1 fl. oz. = 14·2 to 28·4 c.c.

Foreign Pharmacopœias.—Official in Belg., Fluid Extract 10, Potassium Carbonate 1, Cinnamon Water 89; Dan., Rhubarb 125, Sodium Carbonate 25, Distilled Water 2000, Concentrated Spirit 125, Cinnamon Water 150; Ital., Rhubarb 3, Sodium Carbonate 1, Water 50; Norw., Rhubarb 25, Sodium Bicarbonate 3, Distilled Water 170, Cinnamon Water 30; Swed., Rhubarb 10, Sodium Carbonate 2, Alcohol (64 p.c.), *q.s.*, Distilled Water, *q.s.* to make 100; all Infusum Rhei Alcalinum. Fr. (Tisane de Rhubarbe), Rhubarb 5, Distilled Water 1000; Span. (Infusion de Ruibarbo), Rhubarb 2, Water 50. *See* also Tinctura Rhei Aquosa, p. 1017.

LIQUOR RHEI CONCENTRATUS. CONCENTRATED SOLUTION OF RHUBARB.

10 of Rhubarb Root, percolated with Alcohol (20 p.c.), to yield 20. (1 in 2)

Dose.—½ to 1 fl. drm. = 1·8 to 3·6 c.c.

Tests.—Concentrated Solution of Rhubarb has a sp. gr. of 1·020 to 1·030; it contains about 12 p.c. w/v of total solids and about 18 p.c. w/v of Absolute Alcohol.

PILULA RHEI COMPOSITA. COMPOUND RHUBARB PILL.

Rhubarb Root, 3 oz.; Socotrine Aloes, 2¼ oz.; Myrrh, 1½ oz.; Hard Soap, 1½ oz.; Oil of Peppermint, 1½ fl. drm.; Syrup of Glucose (by weight), about 2¾ oz.

Dose.—4 to 8 grains = 0·26 to 0·52 gramme.

5 grains = about 1⅓ grain of Rhubarb and 1 grain of Aloes.

Official in Jap., Swiss and U.S.

PULVIS RHEI COMPOSITUS. COMPOUND POWDER OF RHUBARB. *B.P.Syn.*—GREGORY'S POWDER.

Rhubarb Root, 2; Light Magnesia, 6; Ginger, 1. (1 in 4½)

If a less bulky powder be desired, Heavy Magnesia is officially permitted to be employed.

Dose.—20 to 60 grains = 1·3 to 4 grammes.

Foreign Pharmacopœias.—Official in Austr., Magnesium Carbonate 4, Rhubarb 2, Elæosaccharum Fœniculi 4; Dan., Norw. and Swed., Magnesium Carbonate 1, Rhubarb 1, Elæosaccharum Fœniculi 1; Ger. and Jap., Magnesiæ cum Carbonate 10, Rhubarb 3, Elæosaccharum Fœniculi 7; Russ., Magnesium Carbonate 4, Rhubarb 1, Elæosaccharum Fœniculi 2; all Pulvis Magnesiæ cum Rheo. Jap. has also Pulvis Rhei Compositus, Rhubarb 2, Burnt Magnesia 6, Ginger 1. Swiss (Pulvis Magnesiæ Compositus), Magnesium Carbonate 5, Rhubarb 2, Elæosaccharum Fœniculi 3; U.S. (Pulvis Rhei Compositus), Rhubarb 25, Magnesium Oxide 65, Ginger 10.

Pulvis Rhei cum Magnesia. *Syn.* Improved Gregory's Powder.—Rhubarb Root, in powder, 22; Magnesium Carbonate, 66; Ginger, in powder, 11. —*B.P.C.*

SYRUPUS RHEI. Syrup of Rhubarb.

Rhubarb Root, 1; Coriander Fruit, 1; Refined Sugar, 12; Alcohol (90 p.c.), 4; Distilled Water, 12; should yield about 20 by weight.

B.P. directions are not very satisfactory. It is more convenient to make a (1 in 4) fluid Extract of Rhubarb with Alcohol (60 p.c.); evaporate 8 fl. oz. of the fluid Extract to 3 fl. oz.; mix this and 5 minims of Oil of Coriander with 24 oz. of Sugar, and add Water to make the weight 40 oz.; dissolve in the cold, and filter.

Dose.—½ to 2 fl. drm. = 1·8 to 7·1 c.c.

Foreign Pharmacopœias.—Official in Austr., Rhubarb 10, Borax 2, Spirits of Wine, diluted, 10, Water 90; after 24 hours filter, and to 10 of filtrate add 16 of Sugar; Dutch, Rhubarb 30, Sodium Carbonate 3, Water 180; to 150 of liquid add 248 of Sugar; Ger., Jap. and Russ., Rhubarb 10, Potassium Carbonate 1, Borax 1, Water 80; to 60 of filtrate add 20 of Cinnamon Water and 120 of Sugar; Swiss, Rhubarb 10, Potassium Carbonate 1, Borax 1, Tincture of Cinnamon 12, Simple Syrup 176; Hung., Rhubarb 20, Sodium Carbonate 4, Diluted Spirit 20, Cold Water a sufficiency; to 200 of filtrate add 340 of Sugar; Ital. (Sciroppo di Cicoria con Rabarbaro), Rhubarb 1, Juice of Chicory Leaves 12, Sugar 16; Swed., Rhubarb 5, Sodium Carbonate 1, Water a sufficiency; after filtration add to 37 of filtrate 63 of Sugar; Port. (Xarope de Rhuibarbo), Rhubarb 5, Water 35, Sugar 65; Mex. (Jarabe de Achicoria y Ruibarbo), Extract of Rhubarb 25, Simple Syrup 975; Belg., Fluid Extract of Rhubarb 50, Potassium Carbonate 5, Cinnamon Water 30, Simple Syrup 915; U.S., Fluid Extract 100, Spirit of Cinnamon 4, Potassium Carbonate 10, Water 50, Syrup to make 1000. All by weight except U.S.

Fr. has a Compound Syrup, and U.S. has also Syrupus Rhei Aromaticus.

TINCTURA RHEI COMPOSITA. Compound Tincture of Rhubarb.

Rhubarb Root, 2; Cardamom Seeds, ¼; Coriander Fruit, ¼; Glycerin, 2; Alcohol (60 p.c.), *q.s.* to yield 20. (1 in 10)

B.P. 1885 contained Saffron, but no Glycerin.

Dose.—½ to 1 fl. drm. = 1·8 to 3·6 c.c. for repeated administration; for a single administration, 2 to 4 fl. drm. = 7·1 to 14·2 c.c.

Foreign Pharmacopœias.—Official in Austr. (Tinctura Rhei Vinosa) and Hung. (Tinctura Rhei Darelli), Rhubarb 10, Orange Peel 2, Cardamom Seeds 1, Malaga Wine 100; in 100 of filtrate dissolve 15 of Sugar; Dutch (Vinum Rhei), Rhubarb 9, Cardamom 1, Malaga Wine 100; Ger. (Tinctura Rhei Vinosa), Rhubarb 8, Orange Peel 2, Cardamom 1, Sherry 100; filter, and in the filtrate dissolve a seventh part of Sugar; Jap. (Tinctura Rhei),

Rhubarb 10, Cassia 1, Cardamom 1, Alcohol 50, Distilled Water 50; Norw. and Swed. (Tinctura Rhei Amara), Rhubarb 10, Gentian Root 4, Cardamom 1, Alcohol (64 p.c.), 100; Russ. (Tinctura Rhei Vinosa), Rhubarb 8, Orange Peel 2, Cardamom 1, Sherry 100, Sugar 12; Swiss (Vinum Rhei Compositum), Rhubarb 8, Orange Peel 2, Cardamom 1, Vinum Meridianum Dulce 100; U.S. (Tinctura Rhei), Rhubarb 20, Cardamom 4, Glycerin 10, Alcohol and Water, each *q.s.* to make 100; also (Tinctura Rhei Aromatica), Rhubarb 20, Saigon Cinnamon 4, Cloves 4, Nutmeg 2, Glycerin 10, Alcohol and Water, each *q.s.* to make 100. All by weight except U.S.

Belg., Fr., Ital. and Mex. have a Simple Tincture, Rhubarb 1, Alcohol (60 p.c.) 5; Port., Rhubarb 1, Alcohol (65 p.c.) 5.

See also Tinctura Rhei Aquosa, given under Infusum Rhei.

Tests.—Compound Tincture of Rhubarb has a sp. gr. of 0·970 to 0·975; it contains about 15 p.c. w/v of total solids and about 50 p.c. w/v of Absolute Alcohol.

Not Official.

ELIXIR RHEI.—Rhubarb Root, in No. 12 powder, 5; Fennel Fruit, bruised, 2; Glycerin 3; Refined Sugar 4; a mixture of Alcohol (90 p.c.) 1, and Distilled Water 3, *q.s.* to produce 20.—*B.P.C. Formulary* 1901, now incorporated in the *B.P.C.* with the *syn.* Liquor Rhei Dulcis.

Dose.—1 to 3 fl. drm. = 3·6 to 10·6 c.c.

EXTRACTUM RHEI COMPOSITUM.—Ext. Rhei 3, Ext. Aloes 1, Resina Jalapæ ½, Soap 2.—*Ger.*

Extract of Rhubarb 6, Extract of Aloes 2, Jalap Resin 1, Soap 1.—*Austr.*, *Dutch* and *Swiss.*

Extract of Rhubarb 6, Extract of Barbados Aloes 2, Jalap Resin 1, Hard Soap 1.—*B.P.C.*

FLUIDEXTRACTUM RHEI.—100 of Rhubarb, in No. 30 powder, macerated in and subsequently percolated with a mixture of Alcohol (95 p.c.) 80, and Water 20; reserve the first 75 of the percolate, and evaporate the remainder to a soft extract, which mix with the reserved portion and make up with the menstruum to 100.—*U.S.P.*

Average Dose.—15 minims = 0·9 c.c.

This has been incorporated in the *B.P.C.*

INFUSUM RHEI CONCENTRATUM.—Rhubarb, in No. 10 powder, 40; Alcohol (90 p.c.), 25; Dilute Chloroform Water (1 in 1000), *q.s.* to make 100. —*Farr* and *Wright*, *P.J.* '06, i. 165 and '07, i. 622; *C.D.* '06, i. 252; *Y.B.P.* 1907, 250. Prepare by repercolation.

This appears in the *B.P.C.*

MISTURA RHEI CUM SODA.—Rhubarb Root, in powder, 5 grains, Sodium Bicarbonate 10 grains, Caraway Water to 1 fl. oz.—*St. Thomas's.*

This has been incorporated in the *B.P.C.*

Mistura Rhei et Sodæ.—Sodium Bicarbonate 3·5, Fluid Extract of Rhubarb 1·5, Fluid Extract of Ipecac. 0·3, Glycerin 35, Spirit of Peppermint 3·5, Water *q.s.* to make 100.—*U.S.P.*

PILULA RHEI ET COLOCYNTHIDIS ET HYDRARGYRI.—Compound Rhubarb Pill 1 grain, Compound Colocynth Pill 1 grain, Mercury Pill ½ grain in each pill.—*B.P.C.*

PILULA RHEI ET NUCIS VOMICÆ.—Compound Rhubarb Pill 3 grains, Extract of Nux Vomica ¼ grain, Alcoholic Extract of Belladonna ⅛ grain in each pill.—*St. Thomas's.*

The *B.P.C.* use the same formula as above, the quantities being 2⅛ grains, ¼ grain, ⅛ grain, respectively, with Milk Sugar to make a 4-grain pill.

PULVIS RHEI CUM HYDRARGYRO.—Rhubarb Root, in powder, 2 grains, Mercurous Chloride ½ grain, Ginger, in powder, ½ grain; dose for a child 12 months old.—*St. Thomas's.*

This has been incorporated in the *B.P.C.*

PULVIS HYDRARGYRI ET RHEI.—Rhubarb, in powder, 3, Mercury with Chalk 1, Sodium Bicarbonate 3.—*St. Mary's.*

Pulvis Rhei cum Hydrargyro et Soda. *Syn.* Baird's Aperient Powder.—Rhubarb Root 50, Mercury with Chalk 16·50, Sodium Bicarbonate *q.s.* to produce 100. Dose.—6 to 12 grains.—*B.P.C.*

PULVIS RHEI CUM SODA.—Rhubarb Root, in powder, 1 grain, Sodium Bicarbonate 2 grains; dose for a child 12 months old.—*St. Thomas's.*

This has been incorporated in the *B.P.C.*

TINCTURA RHEI AQUOSA.—Rhubarb 10, Potassium Carbonate 1, Sodium Borate 1, Boiling Distilled Water 90, Alcohol 9; after the lapse of an hour strain the solution by applying a slight pressure; with every 85 parts of the strained liquid mix Cinnamon Water 15. Prepare freshly when required.—*Ger.* and *Jap.*

This has been incorporated in the *B.P.C.*

Austr., Rhubarb 10, Borax 3, Spirits of Wine Diluted 20, Cold Water 80.

Dutch, Rhubarb 10, Sodium Carbonate 2, Cinnamon Water to produce 100.

Hung., Rhubarb 10, Sodium Carbonate 2, Cold Distilled Water 160, Alcohol (70 p.c.) 10.

Russ., Rhubarb 10, Borax 1, Potassium Carbonate 1, Distilled Water Ebullientis 85, Spirits of Wine (90 p.c.) 10, Cinnamon Water 15.

Swiss, Liquid Extract 10, Borax 1, Potassium Carbonate 1, Alcohol 8, Cinnamon Water 20, Water 60.

VINUM RHEI.—Rhubarb Root, in coarse powder, 1½ oz., Canella Bark 60 grains, Sherry 20 fl. oz.—*B.P.* 1885, *omitted in* 1898.

This has been incorporated in the *B.P.C.*, employing Detannated Sherry.

Official in Belg., 1 of Fluid Extract in 20.

PURGATIN, PURGATOL (Anthrapurpurin Diacetate).—A yellow, or brownish-yellow, micro-crystalline powder, insoluble in Water, sparingly soluble in Alcohol (90 p.c.). Introduced as a synthetic purgative belonging to the series of oxyanthraquinones.

Useful in chronic constipation occurring along with neurasthenia, hypochondria, or hæmorrhoids, where it is appropriately employed in place of Rhubarb and Aloes.

Rumicin, a dried extract from the Root of *Rumex crispus*, has been used as an eclectic preparation. It has properties similar to Rhubarb; dose, 1 to 5 grains = 0·06 to 0·32 gramme.

It must not be confounded with the crystalline substance Rumicin, which is allied to Chrysophanic Acid.

RHŒADOS PETALA.

RED-POPPY PETALS.

Fr., Coquelicot; Ger., Klatschrosenblumen; Ital., Rosolaccio; Span., Amapola.

The bright scarlet-coloured, fresh Petals of *Papaver Rhœas*, L., possessing a peculiar narcotic odour and a mucilaginous bitter taste.

Chiefly used as a colouring agent.

Official Preparation.—Syrupus Rhœados.

Foreign Pharmacopœias.—Official in Austr., Belg., Dutch; Fr. (Coquelicot); Mex. and Span. (Amapola); Swiss.

Descriptive Notes.—The fresh petals of *Papaver Rhœas* are Official. There are several forms or allied species, all with red petals, but differing in the size of the flower and the shape and hairiness of the ovary, as well as in the shape of the leaf segments. One of these

has a purplish-black spot at the base of each petal, but the scarlet colour of the petal is deeper than that of other forms, and this variety gives a deeper coloured syrup. The petals of the typical plant are crumpled when freshly unfolded, about 1½ to 2 in. (4 to 5 cm.) broad, and of a bright red colour. They have a slightly bitter taste and characteristic odour.

Tests.—Red-Poppy Petals contain about 16 p.c. of ash.

Preparation.

SYRUPUS RHŒADOS. SYRUP OF RED-POPPY.

Dissolve (with heat) 36 of Sugar in a strained infusion of Red-Poppy Petals, 13, in Distilled Water, 20; preserve with 2½ of Alcohol (90 p.c.); total weight should be 58. (1 in 3½)

Dose.—½ to 1 fl. drm. = 1·8 to 3·6 c.c.

This syrup is particularly liable to fermentation, and is therefore preserved by the addition of Alcohol (90 p.c.). In India and the Colonies the Alcohol may be increased up to twice the quantity ordered in the formula.

Foreign Pharmacopœias.—Official in Dutch and Mex.

Not Official.

RHUS TOXICODENDRON.

POISON IVY.

The fresh Leaves of *Rhus radicans*, L., were official in *U.S.P.* 1890; and a **Tincture** from them is given in doses of 1 to 5 minims for rheumatism. **Fluid Extract** (1 in 1) is also made.

Recently (August, 1908) attention has been called to the poisonous character of this plant, and that it produces an eruption in persons handling it; an alcohol solution of Lead Acetate applied to the rash affords speedy relief.—*P.J.* '08, ii. 232, 271.

Rhus glabra, L., (*U.S.*) and *Rhus aromatica*, Ait., have been used as tonics and astringents; given for nocturnal incontinence of urine. Both these can be supplied as **Fluid Extracts** (1 in 1); doses, 5 to 10 minims = 0·3 to 0·6 c.c.

RICINI OLEUM.

CASTOR OIL.

FR., HUILE DE RICIN; GER., RICINUSÖL; ITAL., OLIO DI RICINO; SPAN., ACEITE DE RICINO.

A colourless, or pale yellow, almost odourless, thick viscid fluid, possessing at first a mild and subsequently somewhat nauseous taste; expressed from the Seeds of *Ricinus communis*, L.

It should be kept in well-closed vessels and protected as far as possible from exposure to the air, as it has a tendency to gradually thicken.

Ricinoleic Acid is stated to be the active principle. The Seeds contain a toxic phytalbumose, **Ricin**, which is extremely poisonous; it is not contained in the Oil.

Solubility.—Entirely soluble in all proportions of Absolute Alcohol, Ether, Oil of Turpentine and Glacial Acetic Acid; 1 in $3\frac{1}{2}$ of Alcohol (90 p.c.).

Medicinal Properties.—A mild and speedy cathartic. It is the best purgative in constipation from indurated fæces, or after swallowing acrid substances. Used in diseases attended with irritation or inflammation of the bowels, as colic, and diarrhœa due to indigestible food, dysentery and the constipation of typhoid fever; the most suitable purgative after parturition, during pregnancy and after abdominal operations. The safest cathartic for infants, to whom a larger relative dose than to adults may be given; relieves infantile intestinal spasms. It may be administered in an enema with some mucilaginous or oily fluid.

Dropped into the eye, it soothes the irritation caused by a foreign body.

The decoction of the leaves of *Ricinus* applied to the breast is said to produce an abundant secretion of milk.

Dose.—1 to 8 fl. drm. = 3·6 to 28·4 c.c.

Prescribing Notes.—*In* **draught** *suspended with mucilage of Gum Acacia, or in* **capsules** *(see below).*

One of the least disagreeable modes of taking Castor Oil is to pour it on to some Milk or Cream contained in a wine-glass, the interior and edges of which have been moistened with the latter.

It is used as a solvent for alkaloidal bases in ophthalmic practice.

In the treatment of dysentery (*I.M.G.* '05, ii. 249, 280), 1 oz. of the Oil, with 30 minims Tincture of Opium and Milk diet.

In infantile diarrhœa administered in small repeated doses. A formula which has been found convenient is Oleum Ricini, 10 minims; Tincture of Rhubarb, 5 minims; Glycerin, 5 minims; Tragacanth, ½ grain; Peppermint Water, to 1 oz. 1 drm. to be given every 4 hours for the first 36 hours, and then less frequently.—*Pr.* lxxv. 507.

Official Preparation.—Mistura Olei Ricini. Contained in Collodium Flexile, Linimentum Sinapis, and Pilula Hydrargyri Subchloridi Composita.

Not Official.—Capsules of Castor Oil, Emulsio Olei Ricini, Mistura Olei Ricini, Enema Olei Ricini, and Oleum Ricini Aromaticum.

Foreign Pharmacopœias.—Official in all.

Tests.—Castor Oil has a sp. gr. of 0·960 to 0·968. The *B.P.* states from 0·950 to 0·970. Good medicinal samples of the Oil never possess so low a gravity as 0·950. The *U.S.P.* gives the gravity of 0·945 to 0·965 at 25° C. (77° F.); the *P.G.* 0·950 to 0·970. Ten good medicinal samples of the Oil examined in the author's laboratory had a sp. gr. of 0·960 to 0·966 with an average of 0·963. When cooled to 0° C. (32° F.) a crystalline flocculent deposit settles out, and when reduced to a temperature of about −18° C. (−0·4° F.) it forms a yellowish buttery mass. When exposed to the air it gradually thickens and dries, forming a varnish. The Oil contains a certain proportion of free acid, which may be determined by dissolving a weighed quantity of the Oil (5 grammes) in Alcohol (90 p.c.) 25 c.c., warming and titrating with Tenth-normal Volumetric Sodium Hydroxide Solution. The 10 samples referred to above showed from 1·05 to 3·5 p.c. with an average of 2·1 p.c. The Saponification value of the Oil ranges from 176 to 188. The *U.S.P.* gives 179 to 183; no figure is given in the *P.G.* The above-mentioned

10 samples showed from 176·4 to 187·6, with an average of 182·0. The Iodine absorption of the Oil varies from 85 to 90 p.c., the *U.S.P.* states not less than 84 nor more than 89; no figure is recorded in the *P.G.* The medicinal samples referred to above showed from 85·09 to 90·17, with an average of 87·5.

A determination of the optical rotation of the specimen affords a useful means of judging of its purity; the Oil is dextrogyrate, the optical rotation in a tube of 100 mm. being equal to +4° to +4·5°. The *B.P.* does not make any mention of a determination of free acid, it gives no figures for the Saponification value or for the Iodine absorption, nor does it refer to the optical rotation.

The more generally occurring impurities are fixed Oils other than Castor, such as Cottonseed Oil, Lard Oil, etc. Castor Oil is an exception to the usual characters of the fixed Oils in regard to its solubility in Alcohol. It should dissolve completely in all proportions of Absolute Alcohol, in Glacial Acetic Acid, and in 3½ times its volume of Alcohol (90 p.c.), indicating the absence of more than about 5 p.c. of fixed Oils other than Castor. The *B.P.* gives a test with Sulphuric Acid for detecting the presence of various fixed Oils including Cottonseed, and requires that when 3 c.c. of the Oil are dissolved in 3 c.c. of Carbon Bisulphide, the mixture should not assume a brown colour when shaken with 1 c.c. of Sulphuric Acid; the test is generally considered to be quite unreliable. A useful test for detecting the presence of other fixed Oils is that with Petroleum Ether, but not when carried out as directed in the *B.P.* The latter states that equal volumes of Castor Oil and Petroleum Ether do not yield a clear mixture if kept at 15·5° C. (60° F.), but that they yield a perfectly clear mixture if other fixed Oils be present. The *U.S.P.* description of the test is the more correct; it states that, when mixed with an equal volume of Petroleum Benzin the Oil yields at 17° C. (62·6° F.) a clear solution, but that at 15° C. (59° F.) it forms a turbid mixture. It has been remarked that the monograph requires complete revision, Saponification and Iodine values should be introduced, the Sulphuric Acid test needs revision, if retained, but is of little service.

Carbon Bisulphide and Sulphuric Acid.—If 3 c.c. of the Oil be shaken with 3 c.c. of Carbon Bisulphide and 1 c.c. of Sulphuric Acid, the mixture should not acquire a brown colour, *B.P.*; a blackish-brown colour, *P.G.* and *U.S.P.*

Iodine Absorption.—If 0·3 gramme of the Oil be dissolved in 10 c.c. of Chloroform in a 250 c.c. bottle or flask and 25 c.c. of a mixture of equal volumes of Alcoholic Iodine T.S. and Alcoholic Mercuric Chloride T.S. added, and if after standing for 8 hours protected from light, 20 c.c. of Potassium Iodide T.S. be introduced and the mixture diluted with 50 c.c. of Water, on titrating the excess of Iodine with Tenth-normal Sodium Thiosulphate Volumetric Solution an Iodine value of not less than 84 nor more than 89 should be obtained, *U.S.P.*

Preparation.

MISTURA OLEI RICINI. Castor Oil Mixture.

To 1½ of Mucilage of Gum Acacia add with trituration in small portions alternately, 3 of Castor Oil and a mixture of Orange-Flower Water (undiluted) 1 and Cinnamon Water 2½.

The Oil is now emulsified by means of Mucilage of Gum Acacia in place of saponification with Solution of Potassium Hydroxide, and Cinnamon Water replaces the Oils of Lemon and Cloves.

Dose.—*As a draught*, 1 to 2 fl. oz. = 28·4 to 56·8 c.c.

Not Official.

CAPSULES OF CASTOR OIL.—Flexible capsules containing 30 minims, or 60 minims, in each.

EMULSIO OLEI RICINI.—Castor Oil, ½ fl. oz.; Mucilage of Acacia, ½ fl. oz.; Syrup of Ginger, ½ fl. oz.; Cinnamon Water, 1 fl. oz.—*Squire.*

Castor Oil, ½ fl. oz.; Yolk of Egg, ¼ fl. oz.; Syrup, ¼ fl. oz.; Peppermint Water, 1 fl. oz.—*Squire.*

Either of these formulas yields a good emulsion.

MISTURA OLEI RICINI. *Syn.* Emulsio Olei Ricini.—Castor Oil, 6 fl. drm.; Mucilage of Gum Acacia, 3 fl. drm.; Orange-Flower Water, 2 fl. drm.; Cinnamon Water, to make 2 fl. oz.—*B.P.C.*

ENEMA OLEI RICINI.—Castor Oil, 2 fl. oz.; Mucilage of Starch, 18 fl. Castor Oil, 1 fl. oz.; Olive Oil, 5 fl. oz.

OLEUM RICINI AROMATICUM.—Gluside, 7½ grains; Sodium Bicarbonate, 7½ grains; Chloroform, 150 minims; Oil of Pimenta, 75 minims; Oil of Cassia, 75 minims; Oil of Cloves, 75 minims; Castor Oil, *q.s.* to make 40 fl. oz.—*Canadian Formulary.*

Amyl Acetate, 0·1; Gluside, 0·15; Alcohol (90 p.c.), 5; Castor Oil, *q.s.* to produce 100.—*B.P.C.*

ROSÆ GALLICÆ PETALA.

RED-ROSE PETALS.

Fr., Rose Rouge; Ger., Essigrose; Ital., Rosa Rossa; Span., Rosa Roja.

Dark purplish-red, velvety, claw-shaped petals, possessing a rosaceous odour, and a slightly acidulous, bitter, astringent taste. They usually occur in small, crumpled, conical masses, and are officially described as the fresh and dried unexpanded Petals of *Rosa Gallica*, L., from cultivated plants.

Medicinal Properties.—Used on account of their colouring matter and mild astringency.

Prescribing Notes.—*The Acid Infusion is prescribed with Glycerin of Tannin or Alum as an astringent gargle; it also forms a suitable vehicle for Magnesium Sulphate; the Syrup is used as a colouring agent, and the Confection as a pill excipient. The Nitric Acid Infusion is given with Quinine.*

Official Preparations.—Of the **petals,** Confectio Rosæ Gallicæ, Infusum Rosæ Acidum, and Syrupus Rosæ. The **confection** is contained in Pilula Aloes Barbadensis, Pilula Aloes et Asafetidæ, Pilula Aloes Socotrinæ, and Pilula Hydrargyri.

Not Official.—Fluidextractum Rosæ, Infusum Rosæ cum Acido Nitrico, Infusum Rosæ Acidum Concentratum, Mel Rosæ, Pulvis Rosæ Compositus, and Unguentum Rosatum.

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

Descriptive Notes.—There are several varieties of *Rosa Gallica* in cultivation, the flowers of which are met with in commerce. The petals of those cultivated in England obtain a higher price than 'Exotic

petals,' *i.e.*, those imported from France, Germany, Holland, etc., having a brighter red colour, a greater fragrance, and being less broken. The dried petals consist of the flower bud with the lower or calycine portion removed, and the buds are more or less broken up in drying; they have a purplish-rose tint, but are yellowish towards the base. The taste is feebly acid, astringent, and slightly bitter. The fragrance depends upon the variety under cultivation, that known as General Jacqueminot affording a fragrant product of good colour, but the colour depends partly also upon the maturity of the petal and the care taken in drying. Inferior specimens coloured with aniline dyes are sometimes offered, but these are readily detected by the absence of the yellow base of the petal, as the whole becomes reddened by the dye.

Tests.—Red-Rose Petals leave about 4 p.c. of ash when incinerated with free access of air.

Preparations.

CONFECTIO ROSÆ GALLICÆ. CONFECTION OF ROSES.

Fresh Red-Rose Petals, 1; Refined Sugar, 3. (1 in 4)

Used as a pill basis. Also applied in aphthous conditions of the mouth.

Official in U.S.

INFUSUM ROSÆ ACIDUM. ACID INFUSION OF ROSES.

Red-Rose Petals, dried and broken, ½ oz.; Diluted Sulphuric Acid, 2 fl. drm.; Distilled Water, boiling, 20 fl. oz.; infuse 15 minutes. (1 in 40)

A similar infusion was in use in 1674.

Prescribed with Alum it forms a good **gargle**, but Borax or Alkalis change the colour to green.

Dose.—½ to 1 fl. oz. = 7·1 to 14·2 c.c.

Foreign Pharmacopœias.—Official in Port. (Infuso de Rosas Composto), Red-Rose Petals, 5; Diluted Sulphuric Acid, 2; Boiling Water, 200.

SYRUPUS ROSÆ. SYRUP OF ROSES.

Dissolve (with heat) 30 of Sugar in an infusion of dried Red-Rose Petals, 2; Refined Sugar, 30; boiling Distilled Water, 20; the total weight should be nearly 46. (1 in 17¼)

Dose.—½ to 1 fl. drm. = 1·8 to 3·6 c.c.

Foreign Pharmacopœias.—Official in Belg., Fluid Extract 1, Simple Syrup 9; Mex., made from Rosa Centifolia; U.S., Fluid Extract 125, Dilute Sulphuric Acid 10, Sugar 750, Water, *q.s.* to make 1000.

Not Official.

FLUIDEXTRACTUM ROSÆ.—1000 grammes of Roses, in No. 20 powder, percolated with a mixture of 100 c.c. Glycerin, and 900 c.c. of Diluted Alcohol (Alcohol 50 p.c.) until the powder is exhausted. Reserve the first 750 c.c., and evaporate the remainder, at a temperature not exceeding 50° C. (122° F.), to a soft extract, dissolve this in the reserved portion, and make up with Diluted Alcohol to 1000 c.c.—*U.S.P.*

Official in Belg.

This has been incorporated in the *B.P.C.*, employing Alcohol (60 p.c.).

INFUSUM ROSÆ ACIDUM CONCENTRATUM.—Dried Red-Rose Petals, in No. 20 powder, 20; Diluted Sulphuric Acid and Alcohol (20 p.c.), of

each sufficient to make 100. Moisten the powder with some of the Alcohol containing one-fortieth its volume of Diluted Sulphuric Acid, macerate for 2 hours, then pack in a glass percolator and percolate slowly with more of the Acidulated Alcohol until 92½ has been collected. Add to this 7½ of Diluted Sulphuric Acid, set aside for 7 days, filter. Dose.—½ to 1 fl. drm. = 1·8 to 3·6 c.c.—*Farr* and *Wright*, *P.J.* '06, i. 165, and '07, i. 622; *C.D.* '06, i. 252; *Y.B.P.* 1907, 251.

This appears in the *B.P.C.*

INFUSUM ROSÆ CUM ACIDO NITRICO.—Rose Petals, broken small, 2; Diluted Nitric Acid, ½; cold Distilled Water, 40; infuse 2 hours, frequently stirring, strain, and add Powdered Sugar, 1.

MEL ROSÆ.—Fluid Extract of Roses 12 c.c., Clarified Honey, a sufficiency to make the product weigh 100 grammes.—*U.S.P.*

This has been incorporated in the *B.P.C.*

Foreign Pharmacopœias.—Official in Ger. and Jap., 1 of Rose Leaves is macerated with 5 of Alcohol (90 p.c.) for 24 hours; express and filter; mix with the filtrate 9 of Purified Honey and 1 of Glycerin, and evaporate to 10; both by weight. Mel Rosatum is also official in Austr., Dutch, Fr., Mex. and Swiss, but the formulas differ a good deal from one another.

PULVIS ROSÆ COMPOSITUS.—Oil of Rose and Chloroform, of each 1 (or combined 4 drops); Acacia, 145 grains; Sugar, 840 grains; Solution of Carmine, 13 drops. Useful as an agreeable diluent for powders such as Calomel, Grey Powder, and Jalapin, also as a colouring and flavouring agent in mixtures, ¼ or ½ oz. in 6 oz.—*Martindale.*

This has been incorporated in the *B.P.C.* as follows:—Oil of Rose, 0·10; Gum Acacia, in powder, 15; Solution of Carmine, 1·25; Refined Sugar, in powder, *q.s.* to produce 100.—*B.P.C.*

UNGUENTUM ROSATUM.—Alkanet Root, crushed, 13 grains; Otto of Roses, 1 minim; White Wax, 4 grains; Prepared Lard, 1 oz.

Alkanna Root, bruised, 3; White Beeswax, 1; Oil of Rose, 0·20; Lard, *q.s.* to produce 100.—*B.P.C.*

ROSÆ OLEUM.

OIL OF ROSE.

B.P.Syn.—Otto of Rose.

Fr., Essence de Rose; Ger., Rosenöl; Ital., Essenza di Rose; Span., Esencia de Rosa.

At a temperature of about 30° C. (86° F.), it is a pale yellow, or greenish-yellow, oily liquid, of about the consistency of Almond Oil. It has a very powerful rosaceous odour and somewhat sharp taste. At temperatures between 18° to 21° C. (64·4° to 69·8° F.), shining, acicular crystals, or glistening crystalline laminæ, separate out, and when further cooled the Oil sets to a semi-solid crystalline mass, which again melts when gently warmed.

It is officially described as the Oil distilled from the fresh plant of *Rosa damascena*, Miller. The *U.S.P.* describes it as a volatile Oil distilled from the fresh flowers of *Rosa damascena*, Mueller, and requires it to possess, when assayed by the process described in small type below, a Saponification value of not less than 10 nor more than 17. The *P.G.* describes it as a volatile Oil from the corolla of some varieties of roses, without defining any species.

It should be kept in well-stoppered glass bottles of a dark amber tint in a cool place and protected as far as possible from the light.

The Oil should be completely liquefied by heat and well mixed before being used for dispensing purposes.

The average composition of Otto of Rose is stated to be Geraniol 40 p.c., Citronellol 28 p.c., Phenyl-ethyl Alcohol, 1 p.c., Stearoptene 18 to 19 p.c. and small quantities of Linalool, Citral, Normal Nonylic Aldehyde, and other bodies.

The vehicle of the odour is the elæoptene (Rhodinol) alone, and the less stearoptene there is in an otto used for manufacturing purposes the better.—*C.D.* '96, ii. 349.

Medicinal Properties.—The principal use in pharmacy is as a perfume in various preparations.

Official Preparation.—Contained in Unguentum Aquæ Rosæ.

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

Tests.—Rose Oil is officially required to possess a sp. gr. of 0·856 to 0·860 at 30° C. (86° F.), the statement referring to the sp. gr. of the Oil at 30° C. (86° F.) as compared with Water at 15·5° C. (60° F.), *vide Digest of Researches and Criticisms Report for* 1898. The *U.S.P.* gives a sp. gr. of 0·855 to 0·865 at 25° C. (77° F.), the *P.G.* gives no figures for the sp. gr. The *Fr. Codex* (1908) gives 0·855 to 0·865 at 20° C. (68° F.). The *B.P.* limit of gravity is generally considered too high, it usually falls from 0·850 to 0·858. The Oil is lævogyrate; the optical rotation of good specimens being from − 1° 30′ to − 3°; neither the *U.S.P.* nor the *P.G.* includes a determination of the optical rotation. The congealing point lies between 19° and 22° C. (66·2° and 71·6° F.). The *B.P.* states that the congealing and melting points vary according to the proportion of crystalline matter, but should lie between 19·4° and 22·2° C. (67° and 72° F.), the *U.S.P.* gives the congealing point as between 18° and 22° C. (64·4° and 71·6° F.), and gives specific instructions as to the method to be adopted in determining the congealing point, which instructions appear below. The *P.G.* states that crystals commence to separate out at 18° to 21° C. (64·4° to 69·8° F.), melting again at a higher temperature. The *Fr. Codex* (1908) gives 23·5° C. (74·3° F.). The refractive index of the Oil lies between 1·459 and 1·464; neither the *B.P.*, *U.S.P.* nor *P.G.* refers to the refractive index. Useful information is afforded of the genuineness of an Oil by a determination of the Acid and Ester values, the Acid value varies from 0·5 to 3 and the Ester value from 8 to 16; the *B.P.* makes no reference either to the Acid or Ester value. The *U.S.P.* does not include an Ester value, but requires the Saponification value to be not less than 10 nor more than 17 as determined by the process given in small type below. The *P.G.* does not include either an Acid or an Ester value. The Oil contains from 18 to 23 p.c. of Stearoptene, and when the Stearoptene is carefully separated and purified it possesses a m.p. of from 33° to 35° C. (91·4° to 95° F.). The Iodine absorption has been suggested (*Analyst* '04, 175; *C.D.* '04, i. 398; '04, ii. 703) as a means of detecting adulterated samples. The Iodine absorption of genuine Otto was found to range from 187 to

194, that of artificial Oil from 221 to 254 for Oils containing Stearoptene, for those without Stearoptene, 261 to 279. Further information concerning the genuineness or otherwise of a specimen may be obtained by a determination of the percentage of Geraniol or Citronellol by acetylisation. The percentage of Geraniol generally present in genuine samples varies from 65 to 75 p.c., and occasionally may be as high as 76 p.c. Citronellol ranges from 25 to 35 p.c., Geraniol from 30 to 33 p.c.

The chief and most commonly occurring adulterant of Otto of Rose is Turkish Geranium Oil, the presence of which may be determined by the alteration which it causes in one or more of the above constants of the Oil. Geranium Oil lowers the sp. gr. and increases the Ester value, it also lowers the congealing point. In addition to Geranium Oil a specimen may contain Spermaceti, Paraffin Wax, Palma Rosa Oil and Guaiacum Wood Oil. Spermaceti and Paraffin Wax may be detected by a determination of the m.p. of the Stearoptene, and also the determination of its amount. Spermaceti, if present, may be recognised by a determination of the Saponification value of the separated Stearoptene, Spermaceti absorbing an appreciable amount of Potassium Hydroxide on saponification. Palma Rosa Oil, if present, may be detected by its influence on the Saponification value, and also by its effect on the Alcohol-content as determined by acetylisation. Guaiacum Wood Oil may be detected by the microscopical appearance of the crystals separating from the Oil on cooling, and by the isolation and a determination of the m.p. of the Alcohol, Guaiol; the pure Alcohol melts at 91° C. (195·8° F.). Guaiacum Wood Oil tends to increase the sp. gr. and the optical rotation of the Oil, to raise the congealing point and to slightly lower the Saponification value. Guaiacum Wood Oil leaves on evaporation a resinous mass amounting to about 16·2 p.c. Its presence is also indicated by the m.p. and by a determination of the Acetyl value of the Stearoptene.

The Oil of White Rose is stated to contain a large percentage of Stearoptene, and has therefore been used to rectify the decrease in Stearoptene-content caused by the addition of other adulterants. Parry does not see that a White Rose product should be regarded as an adulteration because it yields a few per cent. more Stearoptene. The *B.P.* monograph requires complete revision.

Determination of Melting Point.—Introduce about 10 c.c. of Oil into a test-tube of about 15 mm. diameter; insert a thermometer in such a manner that it touches neither the bottom nor the sides of the tube. Raise the temperature of the Oil in the tube from 4° to 5° above the saturation point by grasping it in the hand, and shake the tube gently. Allow the Oil to cool, and, when the first crystals appear, note the temperature. This is regarded as the congealing point; a second test should be made for confirmation, *U.S.P.*

Volumetric Determination.—A measured quantity of 2 c.c. of the Oil is accurately weighed out in a weighing bottle and transferred by means of a little Alcohol (94·9 p.c.) to a flask having a capacity of about 100 c.c.; 20 c.c. of Semi-Normal Volumetric Alcoholic Potassium Hydroxide Solution added, and after connecting with a reflux condenser, the mixture boiled during half an hour on a water bath; the mixture is then cooled, diluted with 50 c.c. of Distilled Water, a few drops of Phenolphthalein T.S. added, and the excess of Volumetric

Alkali Solution titrated with Semi-Normal Volumetric Sulphuric Acid Solution. The number of c.c. of Semi-normal Volumetric Sulphuric Acid Solution is subtracted from 20, the difference is multiplied by 27·87, and the product divided by the weight of Oil taken, the result being the Saponification value of the Oil.—*U.S.P.*

ROSÆ AQUA.

ROSE WATER.

Fr., Eau Distillée de Rose; Ger., Rosenwasser; Ital., Acqua Distillata di Rose; Span., Agua Destilada de Rosas.

A clear, colourless liquid, possessing a strong rosaceous odour, prepared by distillation from the flowers of *Rosa damascena*, Miller, and diluted, immediately before use, 1 to 2 of Distilled Water.

The Rose Water of commerce is a saturated solution of the essential Oil of the Rose flowers.

Medicinal Properties.—An agreeable vehicle for medicines; employed in making lotions and eye-washes.

Official Preparation.—Unguentum Aquæ Rosæ. Contained in Mistura Ferri Composita, and the 'Rose Basis' for Lozenges.

Foreign Pharmacopœias.—Official in Austr., Oil 5 drops, Warm Water 1000 grammes; Belg., Oil 0·3, Warm Water 1000; Dan., Oil 1, Tepid Distilled Water 10,000; Dutch, Oil 1, Water 5000; Fr., Mex., Port. and Span., 1 of petals in 1; Ger. and Jap., Oil 4 drops, Tepid Distilled Water 1000 c.c.; Ital., 1 in 2; Swiss, the Rose Water of commerce, undiluted; U.S. (Aqua Rosæ Fortior), the Rose Water of commerce (Aquæ Rosæ), diluted with equal parts of Water.

Preparation.

UNGUENTUM AQUÆ ROSÆ. Rose Water Ointment. *N.O.Syn.*—Cold Cream.

Heat until dissolved, Beeswax 1½ oz., Spermaceti 1½ oz., and Almond Oil (by weight) 9 oz.; transfer to a warmed mortar, and add gradually with trituration Rose Water (undiluted) 7 fl. oz.; finally mix in 8 minims of Oil of Rose, and continue stirring until cold.

A similar formula occurs in several of the Foreign Pharmacopœias, *see* p. 357.

Foreign Pharmacopœias.—Official in Mex., Rose Petals 1, Hog's Fat 1; Span., Rose Petals digested with an equal weight of Hog's Fat at a gentle heat for 3 days; U.S., Spermaceti 125, White Wax 120, Expressed Oil of Almond 560, Sodium Borate 5, Stronger Rose Water 190; Fr., (Cérat de Galien), White Wax 10, Almond Oil 40, Rose Water 25, all by weight; also Cérat à la Rose, White Wax 100 grammes, Vaseline 100 grammes, Carmine 1 gramme, Vaseline Oil 4 grammes, Otto of Rose 20 drops.

ROSMARINI OLEUM.

OIL OF ROSEMARY.

N.O.Syn.—Oleum Anthos.

Fr., Essence de Romarin; Ger., Rosmarinöl; Ital., Essenza di Rosmarino; Span., Esencia de Romero.

A colourless, pale yellow, oily, limpid liquid, possessing a characteristic camphoraceous odour, and an aromatic and cooling taste. It is distilled from the Flowering Tops of *Rosmarinus officinalis*, L.

Neither the *B.P.* nor the *P.G.* requires the Oil to contain any definite amount of Ester or of total Borneol. The *U.S.P.* requires it to contain not less than 2·5 p.c. of Ester calculated as Bornyl Acetate and not less than 10 p.c. of total Borneol.

It should be kept in well-stoppered glass bottles of a dark amber tint in a cool place and protected as far as possible from the light.

Rosemary Oil contains from 5 to 6 p.c. of Esters, chiefly Bornyl Acetate, and from 15 to 20 p.c. of Borneol. It also contains a mixture of dextro- and lævo-Pinene, Camphene, Cineol and Camphor The *B.P.C.* states that the chief constituents are about 6 p.c. of Borneol and from 17 to 20 p.c. of Bornyl Acetate and other esters.

That distilled in Britain is superior to the imported.

Solubility.—In all proportions of Absolute Alcohol; 2 in 1 of Alcohol (90 p.c.); sparingly in Alcohol (60 p.c.).

Medicinal Properties.—Aromatic and carminative. It is used in hair lotions and liniments as a stimulant; also used for its odour, which is disliked by insects.

Dose.—½ to 3 minims = 0·03 to 0·18 c.c.

Official Preparations.—Spiritus Rosmarini. Contained in Linimentum Saponis and Tinctura Lavandulæ Composita.

Foreign Pharmacopœias.—Official in Austr., Dutch, Ger., Hung., Jap., Russ., Swiss and U.S. (Oleum Rosmarini); Belg. (Rorismarini Essentia); Dan., Norw. and Swed. (Aether-oleum Rosmarini); Fr. (Essence de Romarin); Ital. (Essenza di Rosmarino); Port. (Essencia de Alecrim); Span. (Esencia de Romero). Not in Mex.

Tests.—Rosemary Oil has a sp. gr. of 0·900 to 0·920. The *B.P.* states 0·900 to 0·915, but the latter figure is regarded as too stringent. The *U.S.P.* states 0·894 to 0·912 at 25° C. (77° F.); the *P.G.* not under 0·900. It is dextrogyrate, the optical rotation being from + 1° to + 18°. The *B.P.* gives the optical rotation as not more than + 10° in a tube 100 mm. long. The *U.S.P.* states that the angle of rotation shall not be more than + 15° in a 100 mm. tube at a temperature of 25° C. (77° F.); *P.G.* does not give a figure for the optical rotation of the Oil. It is soluble in all proportions of Absolute Alcohol, and should dissolve in twice its volume of Alcohol (90 p.c.). The *U.S.P.* states that it is soluble in about one-half volume or more of Alcohol (90 p.c.), also in 2 to 10 volumes of Alcohol (80 p.c.). The *P.G.* that the Oil should afford a clear solution in half its weight of Alcohol (90 p.c.). Neither the *B.P.* nor the *P.G.* gives a method for determining the proportion of Ester in terms of Bornyl Acetate nor the total Borneol present; the former may be determined by saponification, the latter by acetylisation. The *U.S.P.* employs the saponification and acetylisation process described in small type below.

The more generally occurring impurities are Turpentine Oil, Petroleum Oil and Alcohol. Turpentine, if present in considerable quantity, may be detected by the optical rotation of the sample and if present in small proportion by the optical rotation of the first 10 p.c. of the distillate. It also causes a diminution in the sp. gr.

French Turpentine Oil is indicated by the Oil assuming a lævo-rotation, or by the lævo-rotation of the first 10 p.c. yielded on distillation. The *U.S.P.* requires the first 10 p.c. fraction to be dextrogyrate. Petroleum Oil is detected by the diminished solubility of the Oil in Alcohol (90 p.c.), and by the residue left on evaporating the Oil on a water-bath. Pure Rosemary Oil leaves only a slight amount of residue of a resinous character. The presence of Alcohol may be detected by the addition of a little solid Magenta. Magenta imparts no colour to the pure Oil, but the dye dissolves in the presence of Alcohol. Fractions of Camphor Oil have also been met with as adulterants of Oil of Rosemary, but their presence may be detected by the influence on the rotatory power or their sp. gr., or their effect on the solubility of the Oil in Alcohol (90 p.c.).

Notwithstanding the official requirements, as well as those of other Pharmacopœias, that the Oil should be dextrogyrate, undoubtedly genuine samples are found which are lævogyrate.

According to Parry (*C.D.* '06, i. 671) the lævorotatory constituent occurs in greater proportion when the stalks are included, and an inferior Oil is then obtained. Oils derived from carefully picked leaves yield fractions which are lævogyrate, the genuine lævorotatory Oil, containing a comparatively low percentage of Borneol, may be assumed to have been distilled from both leaves and stalks. A dextrorotatory Oil may, moreover, yield lævorotatory fractions, a first fraction of 10 p.c. having a lævogyrate optical rotation. The Spanish Pharmacopœia states that the Oil is lævogyrate. Schimmel is of opinion that in any case it will be well to continue exercising care in dealing with lævorotatory Rosemary Oils. He reports an authenticated sample of English Oil, examined in their laboratory, which possessed a sp. gr. of 0·9042, an optical rotation of -2° 49′, an Ester value of 9·7, and which was soluble 1 in about 5 of Alcohol, (80 p.c.), with very slight turbidity; the optical rotation of the first 10 p.c. distillate was -6° 10′. Samples of English Oils distilled during the years 1905, 1906, 1907 were indisputably genuine in character, and possessed optical rotations of -0° 24′ to -2° 48′.

Specimens of the various imported varieties examined in the author's laboratory in June 1893 showed optical rotations as follows:—

Eperte . . .	price 3*s.* 1*d.* per lb.,	rotation	-8°	soluble in S.V.R.	2	in	1
Extra . . .	,, 2*s.* 6*d.* ,, ,,	,,	-12°	,, ,, ,,	2	in	1
Super . . .	,, 1*s.* 9*d.* ,, ,,	,,	-33°	,, ,, ,,	2	in	9
Fine . . .	,, 1*s.* 3*d.* ,, ,,	,,	-40°	,, ,, ,,	2	in	10
French Turpentine .		,,	-57°	,, ,, ,,	2	in	8

Specimens examined in the author's laboratory within recent years all possessed a dextro-rotation varying from $+7^\circ$ to $+11^\circ$.

Volumetric Determination of Esters.—A measured quantity of 10 c.c. of the Oil is introduced into a tared flask, and its weight accurately determined. A measured quantity of 25 c.c. of Semi-normal Volumetric Alcoholic Potassium Hydroxide Solution is added, the flask connected with a reflux condenser, and the mixture boiled for 1 hour. It is then allowed to cool, and the excess of Semi-

normal Volumetric Alcoholic Alkali Solution is titrated with Semi-normal Volumetric Sulphuric Acid, using Phenolphthalein T.S. as an indicator of neutrality. The number of c.c. of Semi-normal Volumetric Sulphuric Acid Solution required is subtracted from 25, the difference multiplied by 9·734, and the product divided by the weight of Oil taken, the quotient representing the percentage of esters present in the Oil, expressed in terms of Bornyl Acetate. The residual Oil from the saponification, is washed repeatedly with Water, transferred to an acetylisation flask, mixed with 10 c.c. of Acetic Acid Anhydride and about 1 gramme of anhydrous Sodium Acetate, and boiled gently for 1 hour. The mixture is allowed to cool, the acetylised Oil is washed with Distilled Water and subsequently with Sodium Hydroxide T.S. until it is slightly alkaline to Phenolphthalein T.S., and is then dried by means of fused Calcium Chloride and filtered, *U.S.P.*

Volumetric Determination of total Borneol.—A measured quantity of 5 c.c. of the dry acetylised Oil prepared as above is transferred to a tared flask, of about a capacity of 100 c.c., and the weight accurately determined. 50 c.c. of Semi-normal Volumetric Alcoholic Potassium Hydroxide Solution is added, the flask connected with a reflux condenser, the mixture boiled for 1 hour; when cooled the excess of Semi-normal Volumetric Alcoholic Alkali Solution is titrated with Semi-normal Volumetric Sulphuric Acid Solution, using Phenolphthalein Solution as an indicator of neutrality. The number of c.c. of Semi-normal Volumetric Sulphuric Acid Solution required is subtracted from the number of c.c. of Semi-normal Volumetric Alcoholic Potassium Hydroxide used (50 c.c.). The difference is multiplied by 7·649, and the product divided by the weight of dry acetylised oil employed, less the product of the multiplication of the number of c.c. of Semi-normal Volumetric Alcoholic Potassium Hydroxide Solution absorbed by the acetylised oil by 0·021, the quotient represents the total percentage of Borneol present in the specimen under examination, *U.S.P.*

Preparation.

SPIRITUS ROSMARINI. Spirit of Rosemary.

Oil of Rosemary, 1; Alcohol (90 p.c.), *q.s.* to yield 10. (1 in 10)

In *B.P.* '85 it was 1 in 50.

Dose.—5 to 30 minims = 0·3 to 1·8 c.c.

Foreign Pharmacopœias.—Official in Austr., from leaves; Jap., 1 in 9; Port. (Espirito d'Alecrim), Rosemary 5, Water 2, Alcohol (85 p.c.) 10; Mex. (Alcoholato de Romero compuesto), Dried leaves 1, Lavender 1, Alcohol (80 p.c.) 10, Water 2; Russ., 1 in 100; Span. (Alcohol de Romero), Rosemary 1, Alcohol (60 p.c.) 2; Swiss (Spiritus Rosmarini Compositus), Lavender 1, Peppermint 1, Rosemary 1, Salvia 1, Wormwood 1, Alcohol 20, Water 50.

Unguentum Rosmarini Compositum official in Ger., Lard 16, Mutton Fat 8, Yellow Wax 2, Expressed Oil of Nutmeg 2, Oil of Rosemary 1, Juniper Oil 1; Swiss, Oil of Rosemary 1, Oil of Turpentine 3, Juniper Oil 6, Oil of Laurel 10, Yellow Wax 24, Lard 56.

Not Official.

RUTÆ OLEUM.

OIL OF RUE.

Fr., Essence de Rue; Ger., Rautenöl; Ital., Essenza di Ruta; Span., Aceite de Ruda.

A colourless, or pale yellow, oily liquid, possessing an intense, persistent, characteristic odour. It is distilled from the fresh Herb of *Ruta graveolens*, L.

Medicinal Properties.—Antispasmodic. A topical stimulant and rubefacient. Administered in the form of enema for flatulent colic in children.

Dose.—1 to 4 minims = 0·06 to 0·24 c.c.

Foreign Pharmacopœias.—Official in Belg., Port. and Span.

French Oil of Rue is stated by Schimmel to differ from the Algerian Oil in its congealing point, both contain about 90 p.c. of ketones, but the French Oil contains almost exclusively Methyl-nonyl-ketone, m.p. 15° C. (59° F.), the Algerian, Methyl-heptyl-ketone m.p. −16° C. (3·2° F.).

Power and Lees in the examination of an essential Oil of Rue, apparently of Algerian origin, found the following constituents:—Methyl-*n*-heptyl ketone, Methyl-*n*-nonyl ketone, Methyl-*n*-heptylcarbinol, Methyl-*n*-nonylcarbinol, a blue Oil of high and inconstant boiling point, Acetic Acid in combination with Alcohols, a basic substance having an odour of Quinoline, a mixture of free fatty acids, Methyl Salicylate, an ester of Valeric Acid, apparently Ethyl Valerianate, Pinene, Lævolimonene and Cineol. The two ketones represented about 80 p.c. of the Oil, and were present in about equal amounts. The two alcohols represented about 10 p.c., and were present partly in the uncombined state and partly as Acetic esters, the Methyl-*n*-heptylcarbinol preponderating. The two Terpenes, together with Cineol, represented about 1 p.c. of the Oil. There was very little Pinene, and the amounts of Limonene and Cineol were about equal. The amount of blue Oil was about ½ p.c., and finally there was separated from the non-ketonic portion of the Oil a small amount of undistillable viscous substance, which was probably a decomposition product.—*Report of the Wellcome Chemical Research Laboratories.*

Tests.—Oil of Rue has a sp. gr. of 0·833 to 0·840, it is dextrogyrate possessing an optical rotation in a 100 mm. tube of +2°, the solidifying point is 8° to 10° C. (46·4° to 50° F.). It dissolves to form a clear solution in an equal volume of Alcohol (90 p.c.) or in 2 to 3 parts of Alcohol (70 p.c.). It was official in the *B.P.* '85.

CONFECTIO RUTÆ.—Fresh Rue, bruised, 1½ oz.; Caraway Seeds, 1½ oz.; Bay Berries, 1½ oz.; Prepared Sagapenum, ½ oz.; Black Pepper, 2 drm.; Honey, 16 oz.; Distilled Water, as much as may be necessary.—*P.L.* 1851.

This has been incorporated in the *B.P.C.*

ENEMA RUTÆ.—Confection of Rue, 3 drm.; Infusion of Chamomile, to make 20 fl. oz.—*St. George's.*

Confection of Rue, 1; Decoction of Barley, *q.s.* to produce 100.—*B.P.C.*

Oil of Rue, 20 minims; Starch Enema, 6 oz.—*Westminster.*

Not Official.

SABINÆ CACUMINA.

SAVIN TOPS.

Fr., Sabine; Ger., Sadebaumspitzen; Ital., Sabina; Span., Sabina.

The fresh and dried Tops of *Juniperus Sabina*, collected in spring from plants cultivated in Britain. The Savin Tops imported from France are not always those of *J. Sabina.*

It was official in *B.P.* '85.

Medicinal Properties.—A powerful local and general irritant. The ointment is used for maintaining discharges from granulating or blistered surfaces. It is a powerful emmenagogue, but its use requires caution, as it may cause inflammation of the abdominal and pelvic viscera.

Dose.—4 to 10 grains = 0·26 to 0·65 gramme.

Antidotes.—Stomach-tube, emetics; Castor Oil, Linseed poultices to the abdomen, opiates and demulcents.

Foreign Pharmacopœias.—Official in all except Ger., Jap., Span. and Swed.

Descriptive Notes.—Savin Tops are usually supplied in this country in the fresh state from the cultivated shrub, of which there exist two or three varieties; less frequently in the dried state, in the form of woody twigs or branchlets, 6 to 9 inches (15 to 22·5 cm.) long or more; or imported from Italy