

AN INTRODUCTION
TO
MATERIA MEDICA
FOR INDIA :

*INCLUDING THE PREPARATIONS OF THE BRITISH
PHARMACOPŒIA, 1898,*

BY
C. F. PONDER, M.B., C.M.,
AND
D. HOOPER, F.C.S., F.L.S.

Calcutta :
THACKER, SPINK AND CO. CO.

1901.

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P R E F A C E.

THE present volume is produced with the view of introducing into British India a text-book on *Materia Medica* for students in Medical Colleges and a handbook for general practitioners.

Numerous works have been written on the subject of Indian *Materia Medica*, notably those of Ainslie, O'Shaughnessy, Waring, Dymock, Mohideen Sheriff and Kanny Lall Dey, but the materials have been discussed from the standpoint of local knowledge, and a large number of substances have been described which are difficult to procure or possess little or no medicinal activity, and therefore cannot be recommended for general practice. The "*British Pharmacopœia*," on the other hand, embraces a list of therapeutic agents of acknowledged efficacy, yet containing detailed descriptions of processes and tests which the ordinary medical student is seldom called upon to execute. The present work contains all the drugs and preparations of the last authorised edition of the *Pharmacopœia*, and to these are added more or less extensive references to about three hundred and fifty of the better known Indian drugs, many of which are capable of being employed as substitutes. While due importance is given to all active and poisonous preparations, everything is excluded which has not a direct bearing on the practical aspect of *Materia Medica*, whether of vegetable, animal or mineral origin.

Pharmacopœial drugs and preparations are known by the addition of the letters "B.P."; those occurring as official in the "*Pharmacopœia of India*" of 1868 will be recognised by the suffix "P.I."; while all others are non-official medicines.

The indigenous drugs of this country are further distinguished by being printed in italicised type, and the Hindustani names are used as the most suitable vernacular synonyms.

The arrangement of the vegetable portion is framed according to the natural classification now adopted by botanists, and all preparations, such as the extract, pill, syrup and tincture, are placed in one article under the heading of botanical origin. The active principles are, in the same manner, discussed under the scientific names of their appropriate raw products, and atropine will accordingly be found under *Belladonna* and Strychnine under *Nux-Vomica*. The few animal substances used in medicine are described under a convenient arrangement of Animals, Fishes and Insects. The inorganic elements and their salts are classified as Non-metals, Metalloids, Metals, Alkaline Earths and Alkalis, and the organic chemicals as belonging to the Paraffin Series of Hydrocarbons, Alcohols, Ethers, Chloroform, or Derivatives of Coal-tar of the Aromatic Series.

The scope of the work will be readily appreciated by the student or observer, and a few explanatory remarks may here be made on the several divisions under which it has been found necessary to consider each article.

The *Characters* and *Tests* of each substance are given in accordance with the official description, and distinguishing features are noticed which will assist in identifying allied or adulterated drugs. The tests used in recognising inorganic salts are fully explained, and tables of reactions of the chief elements and their compounds will be found serviceable to the practical student.

Doses are given in all cases where drugs are administered internally, and, where necessary, the best method of exhibition or administration of the dose is recommended.

Preparations: The official descriptions are abbreviated except in regard to operations which can be carried out in an ordinary dispensary. The strength of all preparations is given in the text.

The *Medicinal Properties* have been compiled from standard works, and chiefly from Sir T. Lauder Brunton's "Manual of Pharmacology, Therapeutics and Materia Medica." The results of observations made during an extensive practice are also laid under tribute; and diseases are enumerated for which each drug is specially adapted.

The *Chemical Composition* is restricted to a reference to the active principle or principles contained in each substance according to the most recent investigations. For further details concerning the chemistry of drugs the enquirer is referred to such works as the "Pharmacographia" and the "Pharmacographia Indica."

Practical notes on *Pharmacy* are incorporated at the end of the book, where also the Weights and Measures of the "British Pharmacopœia" are tabulated and compared with those of the metrical system.

Practical hints on *Dispensing* and *Incompatibles* will be found throughout the volume; these, it is hoped, will prove of service to the faculty in drawing up prescriptions as well as to the compounder in dispensing them.

In bringing together so large an amount of material and issuing it in a new form as an Indian Companion to the "British Pharmacopœia" of 1898, it is only natural to expect that defects will be noticed by specialists and others. Clearness and accuracy have been aimed at in compiling this addition to medical literature, but criticisms are freely invited, so that in preparing future editions they may be even more useful to the profession than the present one is intended to be.

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ERRATA.

Page	20,	line	4	<i>for</i> grains <i>read</i> minims.
„	38	„	17	<i>add</i> strength 4 per cent.
„	38	„	19	<i>add</i> warm until dissolved.
„	42	„	21	<i>for</i> fl. oz. <i>read</i> fl. drm.
„	78	„	16	<i>add</i> soluble in alcohol.
„	107,	last line		<i>for</i> deuretic <i>read</i> diuretic.
„	109,	line	5	<i>for</i> Pipula <i>read</i> Pilula.
„	111	„	31	<i>for</i> nutral <i>read</i> mitral.

VEGETABLE MATERIA MEDICA.

RANUNCULACEÆ.

ACONITI RADIX, B. P. Aconite Root.

The roots of *Aconitum Napellus*, Linn. collected in autumn from plants cultivated in Britain, and dried. It is found also in Northern India.

Characters: Aconite root varies usually from 2" to 4" in length, and from $\frac{1}{2}$ " to $\frac{3}{4}$ " in diameter at the upper extremity, gradually tapering below; colour, dark brown, marked with the scars and bases of broken rootlets, and crowned with the remains of a bud; fracture short; internally, whitish starchy; the transverse section exhibits a thick parenchymatous cortex, and a large stellate pith with about seven projecting angles; the groups of vessels are small and few in number; no marked odour; a small portion of the root cautiously chewed, causes a persistent tingling and numbness in the mouth.

It should not be hollow, nor spongy, and should not retain any portion of the stem.

Linimentum Aconiti, B. P. Liniment of Aconite.

(Strength 1 of Root in $1\frac{1}{2}$).

Preparation: Mix 20 oz. powdered Aconite root with 20 fl. oz. Alcohol (90 p. c.); set aside in a closed vessel for 3 days, agitating occasionally; transfer to a percolator; when the liquid ceases to pass continue the percolation with more Alcohol, (90 p. c.), allowing the liquid to drop into a receiver containing 1 oz. of Camphor, until 30 fl. oz. of the Liniment are produced.

Lin. Aconit. should not be applied to abraded surfaces as the Aconitine absorbed may produce symptoms of poisoning.

Tinctura Aconiti, B. P. Tincture of Aconite.

Dose. 5 to 15 mins.; if very frequently repeated 2 to 5 mins. (Strength 1 of Root in 20).

The strength of the present Tr. Aconit. is only about two-fifths that of the Brit. Pharm. 1885 preparation.

Preparation: Moisten 1 oz. powdered Aconite root with 4 fl. drms. of Alcohol (70 p. c.) and complete the percolation process so that the resulting Tincture measures 20 oz.

Aconitina, B. P. Aconitine. $C_{33}H_{45}NO_{12}$.

An Alkaloid obtained from Aconite root.

Characters: Colourless hexagonal prisms of the rhombic system; melting point 373° F.; a drop of even an extremely dilute solution (not more than $\frac{1}{10}$ p. c. solution should be used) when placed on the tongue produces a persistent tingling sensation.

Aconitine is very poisonous; it is much too dangerous for ordinary use. It is never used internally. Much of the Aconitine in the market, especially that coming from Germany, is impure and variable in its effects. English Aconitine is more reliable. Of this the commencing dose should not exceed one fourteen-hundredth part of a grain, and the total amount given in twenty-four hours should not exceed ten times this amount. As solutions of this alkaloid tend to decompose, they should be slightly acidulated with Hydrochloric Acid, or the crystalline Nitrate of Aconitine should be used.

On heating Aconitine slightly above its melting point it breaks up into Acetic Acid and a substance which has been named Isaconitine, and which on hydrolysis splits up into Benzoic Acid and Aconine.

Unguentum Aconitinæ, B. P. Aconitine Ointment.

Strength 2 p. c. of the Alkaloid.

Preparation: Rub 10 grns. Aconitine with 80 grns. Oleic Acid; gently warm the mixture until dissolved; add 410 grns. Lard; mix.

This ointment should not be applied in the vicinity of wounded or mucous surfaces, *e. g.*, the conjunctivæ.

Medicinal properties of Aconite are those of the alkaloid Aconitine present. It is **Anodyne, Antiphlogistic, Antipyretic**.

Externally. The Liniment, alone or mixed with equal parts of Soap Liniment, or Compound Camphor Liniment is used, painted and then rubbed on a skin surface as a local **sedative** in neuralgia, muscular rheumatism, painful joints, etc. As Chloroform facilitates the absorption of the alkaloid, the liniment is often applied along with Lin. Chlorof.

Internally Aconite is used as a **gastric sedative** in vomiting, and as an **anodyne** in neuralgia, especially tic-douloureux. Its chief use, however, is in the febrile condition due to commencing local inflammations, (*e. g.*, tonsillitis, etc.). Very small doses (2 to 5 minims of the tincture given at intervals of 15 minutes) soon lessen the rate of the heart and pulse, and produce a fall of temperature.

Actions: *Internally*, in *Medicinal doses* Aconite produces tingling, followed by numbness of the part with which it comes in contact; hence it is a **sedative** and **anodyne**.

After absorption into the blood it moderates the action of the heart and relaxes the arterioles of the skin and kidneys, thus reducing the frequency, force, and tension of the pulse, producing a general redness of the skin, with diaphoresis, and increasing the flow of urine; along with this the temperature is lowered. Thus it antagonises the fever process.

Chemistry. There is still an amount of uncertainty as to the chemistry of the different varieties of Aconite. Only one crystalline alkaloid, *i.e.*, Aconitine has been obtained, but several amorphous substances have been separated and named differently by different investigators.

Poisoning by Aconite. A large dose produces gastric pain, vomiting, and violent diarrhoea. After absorption it produces a sense of illness and muscular weakness; a feeling of tingling and numbness gradually spreads over the whole body, affecting the different parts in order of their sensitiveness, *viz.*, tongue, lips, finger tips, face, perineum, breasts, abdomen, and lastly the back.

With larger doses the symptoms begin after a few minutes by tingling and numbness in mouth and throat, extending over the body. In half to an hour there is some confusion of sight, sickness, vomiting and sense of impending death. The pulse becomes slow, weak, irregular, with the brain clear and pupils uncertain. Death takes place as a rule within two hours, but may be delayed for four or five hours.

Fatal dose of the root, 1 drm.; of the Brit. Pharm. 1885, Tincture 25 to 40 mins.; of the Liniment, 10 to 15 mins.; and of Aconitine $\frac{1}{22}$ grain.

Treatment: Emetics if in time; later, alcoholic stimulants and treat symptoms. Atropine antagonises the action of Aconite on the heart.

ACONITI FEROCIS RADIX, Nepal or Indian Aconite. (Bish, Metha Bish, Bikh. *Hind.*).

The dried root of *Aconitum ferox*, Wall. Indigenous in temperate and subalpine Himalaya.

Characters: Tuberous roots, 2" to 3" long, $\frac{1}{2}$ " to 1" in diameter at their upper end, more or less conical, with a dark shrivelled exterior; fracture shining, resinous, sometimes waxy, with colour varying from pale to deep brown; no odour; taste at first slightly bitter, afterwards a peculiar sense of numbness on the tongue and fauces.

Medicinal properties: Similar to those of ordinary Aconite but more virulent. It contains the alkaloid Pseudoaconitine which is regarded as being more powerful than Aconitine.

Indian Aconite is too variable and dangerous for use in the preparation of drugs meant for internal administration. It may however be used for liniments or other preparations meant for external application only.

The name *Bikh* or *Bish* is in Indian bazaars given to the roots of several varieties of Aconite (e. g., *A. ferox*, *A. Napellus*, *A. palmatum*, and *A. luridum*).

ACONITI HETEROPHYLLI RADIX.

The root of *Aconitum heterophyllum*, Wall. (*Atees* or *Atis* Hind.). Indigenous in western temperate Himalaya.

Characters: Ovoid tuberous roots tapering downwards to a point; about $1\frac{1}{2}$ " long and $\frac{3}{8}$ " in diameter, the surface slightly wrinkled longitudinally and greyish, and marked here and there with rootlet scars; on transverse section it is white, friable, starchy, marked with 5 or 6 concentrically arranged vascular bundles; no odour, taste bitter, without acidity or astringency.

Its characteristic bitterness distinguishes it from all other roots sold in the bazaars under the same name. Dr. Waring says of it "Every root should be broken across, and all which are not pure white, with a short starchy fracture and pure bitter taste should be discarded. Further, if on chewing a small piece, it cause a feeling of tingling, or peculiar sensation on the tongue, followed by even the smallest degree of numbness or altered sensation, it should on no account be used.

Medicinal properties: **Antiperiodic, Tonic**, especially useful in periodic fevers. Its active principle is Atisine, an intensely bitter but non-poisonous alkaloid.

Adult dose: As an antiperiodic 30 grns. of the powdered root every 3 or 4 hours, commencing at the close of the sweating stage and continuing during the intermission. As a tonic 5 to 10 grns. thrice daily.

HYDRASTIS RHIZOMA, B. P. Hydrastis Rhizome.

The dried rhizome and roots of *Hydrastis canadensis*, Linn., the Golden Seal.

Extractum Hydrastis Liquidum, B. P. Liquid Extract of Hydrastis.

Dose: 5 to 15 minims.

An Alcoholic Extract of a strength that, a given quantity contains the active principle of the same quantity of the drug.

Tinctura Hydrastis, B. P. Tincture of Hydrastis.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 10.)

Preparation: Moisten 2 oz. Hydrastis Rhizome in No. 60 powder with 2 fl. oz. Alcohol (60 p. c.); complete the percolation

process with Alcohol (60 p. c.) so that the resulting tincture measures 1 pint.

Medicinal properties: **Stomachic, Cholagogue, Astringent, Tonic.**

It contains two bitter alkaloids, Berberine, and Hydrastine, the latter distinguishable from the former by its giving no red colour with chlorine water.

COPTIDIS RADIX.

The dried root of the *Coptis Teeta*, Wall. Found in the Mishmi mountains, east of Assam. It is exported in small baskets each containing about 1 oz. of the root.

Characters: Woody rhizomes 1" to 3" long, about $\frac{1}{8}$ " in diameter, often contracted at one end into a short woody stem; externally yellowish brown, rough, irregular, more or less annulated, with short spiny points marking the remains of rootlets; internally, bright yellow, with a radiate appearance; odour none; taste persistently bitter; when chewed it tinges the saliva yellow.

The true *Coptis* is difficult to obtain; that to be had in the bazaars is largely adulterated.

Medicinal properties: A pure bitter tonic, resembling Calumba. It contains neither tannic nor gallic acid, but abounds in a compound of the alkaloid Berberine soluble in alcohol or water.

Dose: Of powdered root 10 to 15 grns. thrice daily. It may also be given as a **Tincture** (1 in 8 of alcohol, 50 p.c.) dose $\frac{1}{2}$ to 2 drms. Or an **Infusion** (1 in 32) dose 1 to 2 oz., thrice daily.

THALICTRUM FOLIOLOSUM, DC.

A herb common throughout temperate Himalaya, and the Khasia Hills.

The roots (*Pilijari*, i. e., yellow root Hind.) are exported to the plains, and sold in the bazaars.

Characters: About $\frac{1}{8}$ " diam., fibrous, fasciculate; externally dark brown; internally yellow; odour none; taste, very bitter.

It resembles Liquorice Root, but may be distinguished by its bitter taste.

Medicinal properties: A pure bitter Tonic without astringency. It is not blackened by the persalts of Iron. It contains a compound of the alkaloid Berberine soluble in alcohol or water.

Adult dose of powdered root, 5 to 10 grns. thrice daily, or as an **Infusion** (dose $\frac{1}{2}$ to 1 fl. oz. thrice daily) prepared by macerating 1 of the root cut small, in 40 of water for $\frac{1}{2}$ hour; and straining.

NIGELLA SATIVA, Sibth.

A plant cultivated in some parts of India for its seeds, which are known as **Small Fennel** or **Black Cummin**. These are small, black and triangular, resembling coarse gunpowder.

Medicinal properties : The seeds are **Carminative**. They contain a volatile oil. In the absence of other remedies of this class they may be used as a corrective to purgatives, &c.

A preparation known as Tincture of Mugrela was official in the *Beng. Pharm.* Dose : $\frac{1}{2}$ to 1 drm. Preparation : Macerate $4\frac{1}{2}$ oz. Nigella seeds in 40 oz. Alcohol (50 p. c.).

STAPHISAGRIÆ SEMINA, B. P. Stavesacre seed.

The dried ripe seeds of *Delphinium Staphisagria*, Linn. Found in Southern Europe.

Unguentum Staphisagriæ, B. P. Stavesacre ointment.

(Strength 2 of seeds in $11\frac{1}{2}$ of ointment).

Preparation : Digest 2 oz. crushed Stavesacre seeds with $8\frac{1}{2}$ oz. Benzoated Lard in a water bath for 2 hours ; strain and press through calico ; add 1 oz. yellow Beeswax ; stir till cold.

Medicinal properties : The ointment or powdered seeds are used externally as a **parasiticide** to destroy pediculi. Is rarely if ever used internally.

Its activity is due to an oil, the *Oil of Stavesacre* which is present in large quantity. The seeds also contain an alkaloid Delphinine which has actions resembling those of Aconitine.

CIMICIFUGÆ RHIZOMA, B. P. Cimicifuga. *Synonym*,
Actææ Racemosæ Radix.

The dried rhizome and roots of *Cimicifuga racemosa*, Ell., the **Black Snake Root** of the United States of America.

Extractum Cimicifugæ Liquidum, B. P. Liquid Extract of Cimicifuga. *Synonym*. Liquid Extract of Actæa Racemosa.

Dose : 5 to 30 mins.

An Alcoholic Extract, 1 fl. oz. of which contains the active principle of 1 oz. of Cimicifuga.

Tinctura Cimicifugæ, B. P. Tincture of Cimicifuga, *Synonym*,
Tincture of Actæa Racemosa.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 of rhizome to 10).

Preparation : Moisten 2 oz. Cimicifuga in No. 40 powder, with 1 oz. Alcohol (60 p. c.) ; complete the percolation process so that the resulting Tincture measures 20 oz.

Medicinal properties : A **Bitter Stomachic** and **Nerve Sedative** ; used in neuralgia, chorea, chronic rheumatism, and other nervous conditions, also in dysmenorrhœa. Its action is not understood.

In large dose Cimicifuga acts somewhat like Digitalis, slowing the heart and raising the blood pressure ; during excretion it stimulates the skin and the urinary and reproductive tracts.

It contains a volatile oil, a resin and some Tannic Acid.

AOTÆA SPICATA, Linn. The **Baneberry**. Found in the temperate Himalayas.

It is closely allied to the Black Snake Root of America.

Medicinal properties: **Nerve Sedative**. A Tincture of the root is prescribed.

MAGNOLIACEÆ.

MICHELIA CHAMPACA, Linn. (*Champa*, *Champak* Hind.).

A tall evergreen tree with yellow sweetly-scented flowers, indigenous in Bengal, Assam and Burma. It is cultivated commonly throughout India. A variety of camphor is distilled from the wood.

Medicinal properties: The bark is **astrigent, bitter and aromatic**, and may be used as an antiperiodic in doses of 10 to 30 grns. for an adult.

An Infusion (made by macerating 1 oz. powdered bark in 20 oz. water) is given in doses of 2 oz. every hour for 3 hours preceding, and for a like period following, a paroxysm of low intermittent fever.

ANISI STELLATÆ FRUCTUS.—Star Anise Fruit. The dried fruit of *Illicium verum*, Hook. f., cultivated in China. It is mentioned in the Brit. Pharm. as one of the sources of Anise oil.

Characters: Each fruit consists of eight brown boat-shaped carpels joined at their inner ends so as to form a star; each carpel containing a single reddish brown seed.

It contains a volatile oil, practically identical with that found in Anise fruit. (See *Pimpinella Anisum*.)

ANONACEÆ.

ANONA SQUAMOSA, Linn. The Custard Apple. (*Sharifa* Hind.).

A small tree cultivated throughout India for its fruit. The root is a **purgative**.

CANANGA ODORATA, Hook. Ylang-Ylang; Ilang.

A large evergreen tree cultivated in India, indigenous to Burma.

From its flowers a volatile oil is obtained, which is largely used in perfumery.

MENISPERMAÇEÆ.

CALUMBÆ RADIX, B. P. Calumba Root.

The dried transversely cut slices of the root of *Jateorhiza Columba*, Miers; a perennial herb growing in Eastern Africa.

Characters : Irregular, flattish, circular or somewhat oval slices, depressed towards the centre; from about 1" to 2" or more in diameter, and $\frac{1}{8}$ " to $\frac{1}{2}$ " or more in thickness, more or less uniformly yellow in colour, friable; the powder has a greenish tinge, which deepens on being moistened, and becomes browner with age; the outer part is thick, wrinkled brownish yellow, the centre softer, thinner greyish yellow; a fine dark line separates the two parts; odour musty; taste bitter.

Infusum Calumbæ, B. P. Infusion of Calumba.

Dose $\frac{1}{2}$ to 1 fl. oz.

Preparation : Infuse 1 oz. Calumba root thinly sliced, in 1 pint cold water for half an hour; strain.

Cold water is used so as not to dissolve out the starch which would render the Infusion more liable to decompose.

Liquor Calumbæ Concentratus, B. P. Concentrated Solution of Calumba.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 2).

Preparation : Macerate 10 oz. Calumba Root in No. 5 powder with 10 fl. oz. Distilled Water for 24 hours; press strongly; again macerate the residue with 10 fl. oz. Distilled Water for 24 hours; press strongly. Mix the expressed liquids and heat for 5 minutes to 180° F. When cold add $4\frac{1}{2}$ fl. oz. Alcohol (90 p. c.); set aside; decant or filter; add sufficient Distilled Water to make 20 oz.

Tinctura Calumbæ, B. P. Tincture of Calumba.

Dose : $\frac{1}{2}$ to 1 fl. drm.

Preparation : 2 oz. of Calumba root in No. 20 powder with 20 oz. Alcohol (60 p. c.). Prepare by the maceration process.

Medicinal properties : Calumba is a bitter tonic and sedative; used in gastric debility; to allay the nausea of pregnancy; and in dyspepsia accompanied by nausea and vomiting: often combined with other sedatives, e.g., Ac. Hydrocyan. dil., Bismuth, and alkalis, or acids. The infusion is often given with Liq. Ferri Perchlor.

Calumbæ contains a bitter yellow alkaloid, berberine combined with an acid, a neutral bitter principle, and much starch. It contains neither tannic nor gallic acid therefore may be given with the persalts of Iron.

PAREIRÆ RADIX, B. P. Pareira Root.

The dried root of *Chondrodendron tomentosum*, Ruiz and Pavon. Indigenous in Brazil.

Characters : Long twisted nearly cylindrical pieces, from about $\frac{3}{4}$ " to 2" or more in diameter, covered with a thin blackish brown

bark, and marked externally with longitudinal furrows, and transverse ridges and fissures; internally yellowish or brownish grey with well marked concentric or more or less eccentric crinated zones, the porous wood being separated into wedge shaped portions by large medullary rays, and when cut presenting a waxy appearance: no odour; taste bitter.

Extractum Pareiræ Liquidum, B. P. Liquid Extract of Pareira.

Dose: $\frac{1}{2}$ to 2 fl. drms.

An aqueous extract is first made of a strength that if evaporated it will yield a third part of its weight of extractive matter of firm consistence; to this aqueous extract add one-third part of Alcohol (90 p. c.).

Medicinal properties: Pareira is **Stimulant, Tonic, Diuretic**. Used in chronic inflammation and ulceration of the urinary tract. It may be combined with alkalis, Nitric acid, or Henbane, as desired.

It contains a bitter principle said to be identical with Beberine, also starch and resins. Its actions are not understood.

Incompatibles: Iodine solutions form a blue colour with the starch.

The *PARAIRÆ RADIX*, of the Indian Pharmacopœia was obtained from *Cissampelos Pareira*, Linn. It contains about $\frac{1}{2}$ p. c. Beberine.

Characters: Cylindrical, oval or compressed pieces, entire or split longitudinally, $\frac{1}{2}$ " to 4" diameter, and 4" to 4 feet long; bark greyish-brown, wrinkled longitudinally, crossed transversely by annular elevations; interior woody, yellowish-grey, porous, with well marked often incomplete concentric rings and medullary rays; taste at first sweetish and aromatic, afterwards intensely bitter.

The following preparations were used.

Decoction, *Dose*: 1 to 3 fl. oz. Preparation, 1 oz. Root sliced; boil for 15 minutes in 20 oz. water; strain; add water up to 20 oz.

Extract, *Dose*: 10 to 20 grns. An aqueous extract.

Liquid Extract, *Dose*: $\frac{1}{2}$ to 2 fl. drms.

Medicinal properties: Same as B. P. Pareira.

COCCULUS INDICUS. (*Kákmárí-ke-bing* Hind.).

The dried fruit of *Anamirta paniculata*, Colebr.

Characters: **Seeds**; rather larger than a pea, kidney-shaped, blackish brown and wrinkled, containing a yellowish oily bitter kernel, enclosed in a two-valved shell.

Medicinal properties: **Externally Insecticide**. It is not used internally.

An **ointment** (made of 1 part powdered seeds without the shells, in 8 of lard, ghee, or kokum butter), is used to destroy pediculi.

As it is a powerful poison, it should be used cautiously, and never applied to wounded or abraded surfaces.

PICROTOXINUM, B. P. Picrotoxin.

Dose: $\frac{1}{100}$ to $\frac{1}{25}$ grn.

A neutral principle obtained from the fruit of *Anamirta paniculata*, found in India and Burma.

Picrotoxin occurs as colourless prismatic crystals, inodorous; taste bitter; it is intensely poisonous. It is used internally to check the night-sweats of phthisis; externally as an ointment to destroy pediculi.

In large doses it causes intoxication, irritating the motor centres in the medulla and cord, causing spasm of the flexor muscles, and stimulating respiration. Applied externally to the head, as a cure for pediculi, it has been followed by convulsions and death.

Chloral Hydrate and Picrotoxin are mutually antagonistic in action.

TINOSPORÆ RADIX ET CAULES, (*Gulanha* Hind.).

The root and stem of *Tinospora cordifolia*, Miers. A climbing shrub growing on the *Nim*, and other high trees in India and Ceylon.

Characters: Dried transverse segments of shrunken woody stem, $\frac{1}{4}$ " to 2" in diameter, and $\frac{1}{2}$ " to 2" in length, covered with shrivelled bark, and sometimes warty prominences on the surface; no odour, taste very bitter.

Medicinal properties: **Bitter tonic**. Used in the debility following intermittent and other fevers.

An **Infusion** is the best preparation. It is prepared by macerating 1 oz. braised root in 10 oz. cold water, for 3 hours; adding aromatics, and straining. Dose $1\frac{1}{2}$ to 3 oz. thrice daily.

A dry aqueous **extract**, is known in Indian bazaars as *Palo* and *Satgilo*. It is a white pulverulent substance with a bitter taste, and is much esteemed by native practitioners for intermittent fevers.

COSCINIUM FENESTRATUM, Colehr. (*Jhārhalādi* Hind.) *Mara Munjil*, Tam.

A climbing plant indigenous in Western India.

Characters as met with in the bazaars: cylindrical woody stems, 1" to 4" diam. covered with thin corky bark; the wood is bright greenish-yellow, very porous, with conspicuous medullary rays, but without concentric zones; odour none; taste pure bitter.

Medicinal properties: Similar to those of *Calumba*. A **bitter tonic**, efficient and cheap; may be used in all cases where *Calumba*

is indicated. Prescribed as an **Infusion** or **Tincture**; preparation, strength and dose the same as the corresponding preparations of Calumba.

The stem contains Berberine.

COCULUS VILLOSUS, DC. (*Jamti-ki-bel* Hind.).

A climbing plant, common throughout India.

Medicinal properties: The root is a **bitter tonic**. The juice of the leaves mixed with water coagulates into a jelly-like mass which is used as a **demulcent**.

PERICAMPYLUS INCANUS, Miers.

The stems and roots (sold in the bazaars of Bengal as *Barak-Kanta*) are regarded by snake-charmers as an antidote to snake poison. A fluid extract of the root injected into the bitten part, is said by them to render the poison inert.

BERBERIDEÆ.

BERBERIS CORTEX. The root bark of different species of Berberis; *B. aristata*, DC., Nepal Barberry. *B. asiatica*, Roxb., the Indian Barberry. *B. Lycium*, Royle, the Ophthalmic Barberry. (*Chitra* Hind.).

All indigenous to the Nilgiris, and the drier temperate Himalaya.

Characters: Pieces 2" to 8" diam. 10" to 12" long, yellow, corky, almost inodorous, taste bitter, mucilaginous.

The following preparations are used.

Tinctura Berberis. Dose $\frac{1}{2}$ to 6 fl. drms. thrice daily. Preparation same as Tr. Calumba.

Infusum Berberis. Dose $1\frac{1}{2}$ to 3 oz. thrice daily. Preparation; Infuse 1 part Berberis Cortex, cut small, in 20 of boiling water in a covered vessel for 1 hour; strain.

Medicinal properties: **Tonic, Antiperiodic, Diaphoretic**, specially useful in malarious fevers. It contains the alkaloid **Berberine**.

PODOPHYLLI RHIZOMA, B. P. Podophyllum Rhizome.

The dried rhizome and roots of *Podophyllum peltatum*, Linn., the American May Apple. Indigenous in North America.

Podophylli Resina, B. P. Podophyllum Resin: known also as **Podophyllin**.

Dose: $\frac{1}{4}$ to 1 grn.

Extracted from Podophyllum rhizomes by Alcohol (90 p. c.); adding water to the tincture to precipitate the resin; washing and drying.

Characters: A pale yellow to deep orange amorphous powder

soluble in Alcohol (90 p. c.) or Ammonia; precipitated from the former by water; from the latter by acids.

Tinctura Podophylli, B. P. Tincture of Podophyllum.

Dose: 5 to 15 mins. Strength 1 fl. drm. contains 2 grns. Podophyllum Resin.

Preparation: To 18 fl. oz. Alcohol (90 p. c.) add 320 grns. Podophyllum Resin; set aside for 24 hours, occasionally agitating; filter; pass sufficient Alcohol (90 p. c.) through the filter to produce 1 pint.

Medicinal properties: A **Cholagogue Purgative**; producing a free watery motion after 10 or 12 hours. It is given in cases where brisk purging is required, and mercurials are contra-indicated. As it produces griping, it should be given with a carminative.

Podophyllum Resin is a powerful hepatic and intestinal stimulant.

PODOPHYLLUM EMODI, Wall. Indian Podophyllum, (*Papra*, *Papri*, *Bhavan-bakra* Hind.).

A herbaceous plant, indigenous to the temperate Himalaya. The leaves are lobed; the fruit, scarlet-red, and pulpy.

The rhizomes yield about 10 p. c. of a resin similar in action and equal in physiological activity to the Podophyllin obtained from *Podophyllum peltatum*.

NYMPHÆACEÆ.

NELUMBIUM SPECIOSUM, Wight. The Sacred Lotus. (*Kanwal* Hind.).

A large aquatic plant, with elegant sweet-scented white or red flowers.

Medicinal properties: The flowers are **astrigent, refrigerent** and recommended as a **cardiac tonic**. The leaves are used as cooling applications to the body in high fever. The root is **mucilaginous** and **demulcent**. The seeds are edible.

NYMPHÆA LOTUS, Linn. The Water-lily. (*Nilofar*. *Chota kanwal* Hind.).

An aquatic plant, grown in tanks and marshes throughout tropical India. There are three varieties,—the white, the red, and the blue.

Medicinal properties: Similar to those of the Sacred Lotus. The roots and seeds are edible.

PAPAVERACEÆ.

PAPAVERIS CAPSULÆ, B. P. Poppy Capsules.

The nearly ripe dried fruit of *Papaver somniferum*, Linn.

Characters: Rounded depressed or ovoid capsules with a thin dry brittle pericarp; usually 2" or 3" in diameter, suddenly con-

tracted below into a neck, and crowned above by the stellately arranged stigmas. The pericarp is pale yellowish-brown externally, and frequently marked with dark spots.

The sessile stellate stigma serves to distinguish it from *Colocynth* or Bael fruit.

Medicinal properties: **Anodyne**; similar to Opium. Its strength is very uncertain and so it is not suited for internal use. There are no official preparations.

A **Decoction** (made by boiling 2 of bruised Poppy Capsules in 30 of Distill'd water, in a covered vessel for 10 minutes, and straining) may be applied warm as an external anodyne application.

The capsules contain a small amount of **morphine**. Those grown in India are smaller in size, than those grown in England.

Poppy seeds contain none of the active principles of Opium, but they contain about 50 p. c. of a bland clear oil, which dries slowly on exposure to the air. This may be used as a substitute for olive oil.

OPIUM, B. P. Opium.

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

For making the Extract, the Tincture, and as a source of the Alkaloids, any variety of Opium which, when dry, contains not less than $7\frac{1}{2}$ p. c. Anhydrous Morphine may be used; for all other purposes only Opium is allowed which, when dried, contains from $9\frac{1}{2}$ p. c. to $10\frac{1}{2}$ p. c. of Anhydrous Morphine. Opium containing more than 10 p. c. of Anhydrous Morphine may be reduced by the additions of a weaker variety, or of Milk Sugar.

Dose of Opium $\frac{1}{2}$ to 2 grns.

Characters: Irregular rounded or flattened masses, weighing from 8 oz. to 2 lbs.; usually enveloped in the remains of poppy leaves; when fresh, plastic, coarsely granular, moist chesnut-brown, surface shining when rubbed smooth by the finger, becoming harder and darker on keeping; odour strong, peculiar narcotic; taste, nauseous, bitter.

Emplastrum Opii, B. P. Opium Plaster.

A local anodyne.

Preparation: Melt 9 oz. Resin Plaster on a water bath; gradually stir in 1 oz. Opium in very fine powder.

Extractum Opii, B. P. Extract of Opium.

Dose: $\frac{1}{4}$ to 1 grn.

An aqueous Extract containing 20 p. c. Morphine.

As a **direct sedative** Extract of Opium, being less stimulating, is preferred to powdered Opium.

Extractum Opii Liquidum, B. P. Liquid Extract of Opium.

Dose : 5 to 30 mins.

Contains $\frac{3}{4}$ grn. Morphine in 110 mins. Strength the same as that of Tr. Opii.

Preparation : Mix $\frac{3}{4}$ oz. Ext. Opii. with 16 fl. oz. Distilled Water ; set aside for an hour, stirring frequently ; add 4 oz. Alcohol (90 p. c.), set aside in a cool place for 24 hours ; filter. It should measure 20 oz.

Linimentum Opii, B. P. Liniment of Opium.

A local **anodyne** useful in rheumatic and other pains.

Preparation : Mix equal quantities of Tincture of Opium and Soap Liniment ; set aside for a few days ; filter.

Pilula Saponis Composita, B. P. Compound Pill of Soap ; formerly known as **Pilula Opii**.

Dose : 2 to 4 grns. Contains 20 p. c. Opium.

Anodyne and Soporific.

Preparation : Mix $\frac{1}{2}$ oz. Opium, $1\frac{1}{2}$ oz. Hard Soap, both powdered, $\frac{1}{2}$ oz. Syrup of Glucose ; form a mass.

Pulvis Opii Compositus, B. P. Compound Powder of Opium.

Dose : 2 to 10 grns. Contains 10 p. c. Opium.

Preparation : Mix together $1\frac{1}{2}$ oz. Opium, 2 oz. Black Pepper, 5 oz. Ginger, 6 oz. Caraway Fruit, $\frac{1}{2}$ oz. Tragacanth, all powdered.

1 part of this mixed, with 3 of Syrup made the B. P. 1885 **Confection of Opium**.

Tinctura Opii, B. P. Tincture of Opium. *Synonym* Laudanum.

Dose : 5 to 15 mins. for repeated administration, for a single administration 20 to 30 mins.

Prepared with Alcohol (90 p. c.) and Distilled Water so that 110 mins. contain $\frac{3}{4}$ grn. of Anhydrous Morphine ; or 15 mins. contains 1 grn. of Opium.

Tincture of Opium should be kept in well stoppered bottles to prevent evaporation of the Alcohol. It is recorded that on one occasion, a single drop of the tincture proved fatal to a very young infant ; probably this was from a bottle that had been left open, and so the alcohol having evaporated, a concentrated solution of Opium was given.

Tinctura Opii Ammoniata, B. P. Ammoniated Tincture of Opium.

Dose: $\frac{1}{2}$ to 1 fl. drm. Contains 5 grns. Opium in 1 oz., i.e., about one-sixth the quantity contained in Laudanum.

Preparation: Dissolve 1 fl. drm. Oil of Anise, and 180 grns. Benzoic Acid in 12 fl. oz. Alcohol (90 p. c.); add 3 fl. oz. Tincture of Opium, and 4 fl. oz. Solution of Ammonia; mix well; filter; add Alcohol (90 p. c.) to make 20 oz.

This was known formerly as **Scotch Paregoric**; the preparation has been modified.

Liquor Opii Sedativus. (Battley's). (Non-official).

Dose: 10 to 20 mins. Contains about 50 p. c. more Opium than Laudanum.

Medicinal properties of Opium; **Anodyne, Hypnotic, Astringent, Diaphoretic, Myotic.** It acts as a Myotic only after internal administration, not if applied locally to the conjunctiva.

In small doses ($\frac{1}{4}$ to 1 grn. for an adult) Opium acts first as a vascular and nervous **stimulant**, so that the individual is able to work better; or if he desires to exert his mind, his thoughts and powers of expression are increased; if he desires to sleep, a quiet sleep comes on, with the skin warm and moist. This is apt to be followed by slight nausea, headache, thirst, and constipation.

In moderate doses (1 to 2 grns. for an adult) it produces a brief stage of excitement, followed by a sleep so intense that there may be difficulty in waking him.

Its continued use in large doses impairs the appetite, digestion, intellect, and generally produces a depraved condition of health.

Uses: to relieve pain of nearly every kind, spasm, and inflammations; also in nervous diseases associated with defective circulation; in hæmorrhages; in chronic ulcers; and mucous discharges.

Actions: Opium applied to the unbroken skin is only occasionally absorbed. Its action applied by this channel is uncertain; it is more readily absorbed if applied by the endermic method or to wounded surfaces.

It is quickly absorbed by the mucous membranes of the mouth or alimentary canal. In the stomach ordinary doses may produce a brief stage of irritation (nausea, vomiting, &c.), but this is soon followed by diminished sensibility, hunger and pain being relieved, but appetite and gastric activity are diminished so that the digestion is impaired. In the intestinal canal it is an **anodyne** and **astringent**, tending to induce constipation.

After absorption into the blood it acts chiefly on the central nervous system more especially on the brain. After a brief

period of stimulation sleep and coma are produced, the pupils become contracted, and sometimes by its action on the spinal cord convulsions occur. On the circulatory system it acts first as a slight stimulant and afterwards as a sedative, hence its value as a hæmostatic. It diminishes all the secretions, except the sweat which it increases.

It is eliminated by the gastric mucous membrane, and by the liver; then passing on to the intestines is to a large extent reabsorbed.

Morphine is also excreted unchanged by the sweat, milk and urine; opium may therefore be given only cautiously to nursing women. It sometimes produces itching and skin eruptions.

Contraindications to the use of Opium :—

1. In congestion of the brain, shown by suffused eyes and contracted pupils.
2. In cases where the bronchial secretion is viscid, as in commencing bronchitis.
3. In children under 5 years of age, the proportionate dose must be greatly reduced.

Incompatibles : **Potassium Permanganate** is able to oxidise, and so to destroy the medicinal and toxic properties of an equal weight of Opium.

Other incompatibles are less important, the precipitates formed being as efficacious, provided the mixture is shaken before the dose is measured out. The following are the incompatibles usually stated :—

Alkalies, Alkaline Carbonates and Alkaline Earths precipitate the Morphine and Narcotine, causing the mixture to be turbid ;

Substances containing Tannin, precipitate the Codeine and Morphine as Tannates ;

Salts of Lead, Iron, Copper, Mercury, Zinc, or Liq. Arsenicalis cause precipitates of the Meconates, Sulphates, or colouring matter.

Chemistry : Opium is a very complex and variable substance, containing along with other substances, some 17 or more different alkaloids, two neutral substances and one or more acids.

The chief of these are :—

(a) **Alkaloids** : Morphine about 10 p. c.

Codeine " $\frac{1}{2}$ "

Narcotine " 5 "

(b) **Acid** : Meconic acid " 6 "

Apomorphine is produced artificially from Morphine by dehydration.

Meconic Acid : Occurs in nearly colourless crystals, very acid. With Ferric Chloride it gives a deep red colour. Physiologically it is inert.

Narcotine (better named Anarcotine) has no narcotic action whatever. It is a pure **Antiperiodic**, very useful in malarial fevers. The large proportion of Narcotin found in Indian Opium may explain the favour with which Opium is regarded by the natives of India.

Poisoning by Opium.

Fatal dose : 1 or 2 drops of the tincture may kill an infant. Four grns. Opium have killed an adult. But those who are habituated to the use of Opium can take with impunity very much larger doses.

Symptoms, begin to appear in adults in about $\frac{1}{2}$ to 1 hour after the drug has been swallowed; in children in from 10 to 15 minutes. In poisonous doses the preliminary stage of excitement is not seen.

After 1 or 2 hours the symptoms are : giddiness, stupor, tendency to sleep, eyelids closed, patient lying supine; breathing deep, slow and heavy; pulse full and slow; face flushed; surface moist and warm. He can be roused, but lapses into sleep.

In the advanced stage, the face is pale, lips livid, breathing stertorous and irregular; pulse quick and small; skin cold, covered with clammy sweat. He cannot be roused. Pupils contracted to pin points. Delirium is rarely seen at any stage. Death occurs from asphyxia.

In fatal cases death usually takes place about nine hours after the drug has been swallowed. The period of insensibility lasts about 12 hours. If this period has passed, recovery is nearly certain; occasionally however, the symptoms reappear, and death may occur later.

Treatment : In early stage give **Emetics** (Zinc Sulphate, Copper Sulphate, or Mustard); wash out the stomach with a weak solution of Potassium Permanganate until the fluid returns with its purple colour unchanged; repeat this every half hour for twelve hours; **prevent sleep** by walking the patient about and giving strong tea or coffee; maintain warmth; to combat failing respiration, apply artificial respiration, interrupted galvanic current, and inject subcutaneously Liq. Atrop. Sulph. every 10 minutes until the pupils dilate or the pulse is quickened.

Cases of **supposed opium poisoning** must be carefully differentiated from other kinds of coma. The odour of alcohol in the breath, does not in every case indicate that the patient is intoxicated, as alcohol might have been taken with a poisonous dose of opium, or malicious friends may have given it to the patient on his turning ill.

Coma with the odour of opium in the breath, pupils equal and contracted to a pin point would point to **Opium poisoning**. But,

Coma with pin point and equal pupils, may be due to hæmorrhage into the Pons Varolii.

Coma with the odour of alcohol in the breath, pupils equal and dilated, points to **intoxication**.

Coma with pupils unequally contracted, points to **apoplexy**.

Coma with albuminuria, slight œdema of the legs, and history suggestive of Bright's disease, point to **uræmic coma**.

Coma with history of preceding convulsive fit, points to **post-epileptic coma**.

INDIAN OPIUM, (*Afim*, *Afiyun* Hind.) Opium is largely manufactured in India where it is a Government monopoly, yielding a large revenue. Indian Opium is used exclusively at the Government Indian Medical Stores.

As compared with Turkish Opium, the Indian variety is notable for its low percentage of Morphine (average 3 to $8\frac{1}{2}$ p. c.) and large percentage of Narcotine (average 4 to 7 p. c.).

As the active principles of Opium are not readily volatilisable by heat, it is unlikely that they (to any extent at least) are introduced into the lungs when this drug is smoked. The evil effects of **opium smoking** as described, are probably due to the action of some as yet unknown product of its destructive distillation.

Opium is extensively consumed by the natives of India. Many regard it as a panacea, and use it largely as a prophylactic against malaria, cholera, dysentery, &c., and to relieve suffering in painful or wasting disease. Its moderate use in this way is not attended by injurious effects to any extent, while the benefit as now used was so decided that the Commission of 1895 reported that it would be unwise to restrict the sale of Opium in India.

CODEINA, *B. P.* Codeine.

An alkaloid, $C_{17}H_{18}(CH_3)NO_3 \cdot H_2O$. obtained from Opium or from Morphine.

Dose : $\frac{1}{4}$ to 2 grns.

Characters : Nearly colourless trimetric crystals; its aqueous solution has a bitter taste and an alkaline reaction; solubility, 1 in 80 of water, or of solution of ammonia; freely in alcohol (90 p. c.), chloroform, or in dilute acids.

Test : (1) With excess of Sulphuric Acid it forms a colourless solution; a small quantity of which when gently warmed on a water bath with a trace of Ferric Chloride develops a blue or bluish black colour, which on adding a trace of dilute Nitric Acid changes to bright scarlet, becoming orange.

(2) Moistened with Nitric Acid it becomes yellow (Morphia becomes red);

(3) Ignited in air it yields no ash.

CODEINÆ PHOSPHAS, B. P. Codeine Phosphate.

Dose : $\frac{1}{4}$ to 2 grns.

Characters : White crystals; taste slightly bitter; solubility, 1 in 4 of water; much less soluble in alcohol (90 p. c.).

It is the most soluble salt of Codeine.

Syrupus Codeinæ, B. P. Syrup of Codeine.

Dose : $\frac{1}{2}$ to 2 fl. drms. Strength, $\frac{1}{4}$ grn. Codein. Phosph. in 1 fl. drm. of Syrup.

Preparation : Dissolve 40 grns. Codeine Phosphate in $\frac{1}{4}$ fl. oz. Distilled Water; add $19\frac{3}{4}$ fl. oz. Syrup: mix.

Medicinal properties : Codeine is a ~~sedative~~ **expectorant** useful in coughs where Morphia cannot be borne, also in chronic laryngitis; also for **allaying** abdominal **pain** and irritability. In **diabetes**, doses of grn. 1 gradually increased to grn. 2, thrice daily, along with abstinence from starchy food, lessens the quantity of sugar in the urine.

The **Actions of Codeine** are similar to those of Morphine (*q.v.*) but its hypnotic action is less, and it rather stimulates the spinal cord and motor centres, so that with large doses there may be twitchings. Its most marked action is in lessening the irritability of the afferent nerves of the intestinal tract, and probably also of those of the other viscera.

Poisonous doses produce swimming movements, paralysis of hind legs, followed by a sudden shriek and convulsions. Death may occur at once, or recovery take place.

MORPHINE, B. P., Appendix. The precipitate obtained by adding solution of Ammonia in slight excess, to an aqueous solution of a pure Morphine salt; the precipitate being washed with water until free from ammonium salt.

Morphine ($C_{17}H_{19}NO_3 \cdot H_2O$) is the principal alkaloid obtained from Opium. It is very insoluble (1 in 1,000 cold water), therefore its soluble salts are usually prescribed. Alkalies with solutions of salts of morphine produce a precipitate of the less soluble alkaloid.

Morphinated Water, B. P., Appendix. A saturated solution of Morphine in Chloroform Water.

MORPHINÆ ACETAS, B. P. Acetate of Morphine.

Dose : $\frac{1}{8}$ to $\frac{1}{2}$ grn.

The carefully dried salt, obtained by neutralising Morphine with Acetic Acid.

Characters : A white crystalline, or amorphous powder. Solubility, 1 in $2\frac{1}{2}$ of water; 1 in 100 Alcohol (90 p. c.). When exposed to air it loses Acetic Acid.

As it tends, when in solution, to form a less soluble substance, a little Acetic Acid is added to its solutions to clear them.

Incompatibles : The same as Morphine Hydrochloride.

Liquor Morphinae Acetatis, B. P. Solution of Morphine Acetate.

Dose : 10 to 60 grns. Strength 110 mins. contain 1 grn. Morphine Acetate.

Preparation : Mix 1 fl. oz. Alcohol (90 p. c.) with an equal volume of water; add 38 mins. Diluted Acetic Acid; in this dissolve $17\frac{1}{2}$ grns. Morphine Acetate; dilute with Distilled Water to produce 4 fl. oz.

MORPHINÆ HYDROCHLORIDUM, B. P. Morphine Hydrochloride.

Dose • $\frac{1}{8}$ to $\frac{1}{2}$ grn.

Characters : Acicular prisms of a silky lustre, or a white powder consisting of minute cubical crystals, unchanged on exposure to air. Solubility, 1 in 24 of cold water; 1 in 1 of boiling water; 1 in 50 of Alcohol.

Reactions : (1) Moistened with Nitric Acid it yields an orange red. (2) Heated on a water bath for 10 or 15 minutes with a few drops Sulphuric Acid, cooled, and a few drops of Nitric Acid added, it gives a violet colour rapidly passing to blood red.

Incompatibles : The principal is Potassium Permanganate which destroys Morphine. Others are less important. Alkalis and Alkaline earths cause precipitation of the Alkaloid; astringent vegetable infusions or decoctions produce a precipitation of Tannate of Morphine. These are sufficiently overcome by ordering to shake the bottle.

Liquor Morphinae Hydrochloridi, B. P. Solution of Morphine Hydrochloride. *Synonym.* Solution of Hydrochlorate of Morphine.

Dose : 10 to 60 mins. Strength 110 mins. contain 1 grn. Morphine Hydrochloride.

Preparation : Mix 1 fl. oz. Alcohol (90 p. c.) with an equal volume of Distilled Water; add 38 mins. Dilute Hydrochloric Acid; in this dissolve $17\frac{1}{2}$ grns. Morphine Hydrochloride; dilute with sufficient Distilled Water to produce 4 fl. oz.

Suppositoria Morphinae, B. P. Morphine Suppository.

Strength, each contains $\frac{1}{4}$ grn. of Morphine Hydrochloride made up with Oil of Theobroma.

Trochiscus Morphinae, B. P. Morphine Lozenge.

Each contains $\frac{1}{36}$ grn. Morphine Hydrochloride made up with Tolu Basis.

Dose : One or two for a cough or laryngeal irritation.

Trochiscus Morphinae et Ipecacuanhae, B. P. Morphine and Ipecacuanha Lozenge.

Each contains $\frac{1}{36}$ grn. Morphine Hydrochloride and $\frac{1}{12}$ grn. powdered Ipecacuanha, made up with Tolu Basis.

Dose : One or two for a cough or laryngeal irritation.

MORPHINÆ TARTRAS, B. P. Morphine Tartrate. May be prepared by the combination of Morphine, and Tartaric Acid in molecular proportions.

Dose : $\frac{1}{8}$ to $\frac{1}{2}$ grn.

Characters : White powder, consisting of fine nodular tufts of minute acicular crystals; efflorescent at 68° F. Solubility, 1 in 11 of cold water; almost insoluble in Alcohol-(90 p. c.).

Liquor Morphinae Tartratis, B. P. Solution of Morphine Tartrate.

Dose : 10 to 60 mins. Strength 110 mins. contains 1 grn. Morphine Tartrate.

Preparation : Mix 1 fl. oz. Alcohol (90 p. c.) with an equal volume of Distilled Water; in this dissolve $17\frac{1}{2}$ grns. Morphine Tartrate; add sufficient Distilled Water to produce 4 fl. oz.

Injectio Morphinae Hypodermica, B. P. Hypodermic Injection of Morphine.

Dose : For subcutaneous injection 2 to 5 mins.

Strength 22 mins. contains 1 grn. Morphine Tartrate.

Preparation : Dissolve 50 grns. Morphine Tartrate in sufficient recently boiled and cooled Distilled Water to produce 1,100 mins.

Medicinal properties of Morphine : **Anodyne, Soporific.** It acts more rapidly and more agreeably than Opium, and is less exciting, therefore less likely to produce nausea or headache. It has no appreciable effect on biliary secretion.

As the Tartrate is more stable than the Acetate, it is preferred for hypodermic injection. The addition of Atropine to Morphine produces a greater sedative, and a less constipating effect.

APOMORPHINÆ HYDROCHLORIDUM, B. P. Apomorphine Hydrochloride.

The hydrochloride of an alkaloid $C_{17}H_{17}NO_2HCl$, obtained by heating Morphine or Codeine Hydrochloride in sealed tubes with Hydrochloric Acid.

Dose : $\frac{1}{20}$ to $\frac{1}{10}$ grn. by hypodermic injection; by the mouth $\frac{1}{10}$ to $\frac{1}{4}$ grn.

Characters : Small greyish-white shining needle-like crystals, turning green on exposure to light and air; without odour. Solu-

bility, 1 in 50 Water; more soluble in Alcohol (90 p. c.); the solutions being decomposed with production of a green colour when boiled. From solutions of Apomorphine Hydrochloride, solution of Sodium Bicarbonate throws down a precipitate, which becomes green on standing and then forms a solution which, with Ether, is purple, with Chloroform is violet, and with Alcohol (90 p. c.) is bluish green.

If the salt imparts an emerald green colour to 100 parts of water after shaking the mixture, it should be rejected.

Injectio Apomorphinæ Hypodermica, B. P. Hypodermic Injection of Apomorphine.

Dose for subcutaneous injection: 5 to 10 mins. It should be recently prepared.

Strength 110 mins. contains 1 grn. Apomorphine Hydrochloride.

Preparation: Boil 110 mins. Distilled Water for a few minutes; cool; add 1 min. Dilute Hydrochloric Acid; in this dissolve 1 grn. Apomorphine Hydrochloride; add, if necessary, sufficient recently boiled and cooled Distilled Water to produce 110 mins.

Medicinal properties: Emetic, Sedative, Expectorant.

Used as a hypodermic injection in cases where the stomach has ceased to absorb, *e.g.*, in Opium poisoning. Internally it is given as a sedative expectorant, to render the secretions more watery, and to decrease bronchial spasm.

Apomorphine is the most certain of all emetics, whether given by the mouth or hypodermically. It produces vomiting without much nausea or depression in from 5 to 20 minutes. After vomiting the nausea soon passes off. Large doses produce collapse.

RHŒADOS PETALA, B. P. Red Poppy Petals.

The fresh petals of *Papaver Rhæas*, Linn. Found commonly in the corn-fields of Britain.

Characters: Bright scarlet, transversely elliptical in outline, about 2" broad, surface smooth lustrous, margin entire; odour characteristic, somewhat unpleasant; taste slightly bitter.

Syrup Rhæados, B.P. Syrup of Red-Poppy.

Dose: $\frac{1}{2}$ to 1 fl. drm. This should be freshly prepared; as it is liable to ferment in hot weather.

Preparation: To 1 pint Distilled Water, kept hot in a water bath, add 13 oz. Red-Poppy Petals; stir frequently; afterwards, the vessel being removed, infuse for 12 hours; then press out the liquid; strain; add $2\frac{1}{4}$ lbs. Refined Sugar; dissolve by means of heat; cool; add $2\frac{1}{2}$ fl. oz. Alcohol (90 p. c.) and Distilled Water sufficient to produce 58 fl. oz.

Medicinal properties: Used only as a **colouring** agent. It contains a red colouring which is much darkened by alkalies. The Petals have a physiological action somewhat resembling Opium, but this is very feeble, and uncertain. It does not contain Morphine.

Red-Poppies, (*Lal post*, *Leila* Hind.) are found in Kashmir and occasionally in the gardens of the plains of India. The Capsules on incision yield a milky juice having a slightly narcotic odour.

ARGEMONE MEXICANA, Linn. The Mexican, or prickly Poppy, (*Fringhi*, Hind.).

A common weed growing throughout India, originally brought from Mexico.

A clear pale yellow, fixed oil, of disagreeable odour, is obtained by expression from the seeds, which in $\frac{1}{2}$ drm. doses is mildly **aperient**. The expressed yellow glutinous juice of the plant is used externally as a **stimulant** application to indolent ulcers.

CRUCIFERÆ.

SINAPIS ALBÆ SEMINA, B. P. White Mustard Seed.

The dried ripe seeds of *Brassica alba*, Boiss.

Characters: Seeds $\frac{1}{12}$ " diameter, weighing $\frac{1}{10}$ grain each; spheroidal; pale yellow; with a finely pitted and reticulated testa; externally hard, internally yellow and oily; without odour when entire or powdered; almost inodorous when triturated with water; in taste less pungent than Black Mustard seeds.

They somewhat resemble Colchicum seeds, but are smaller lighter in colour, and more spherical.

White Mustard is not cultivated in India.

SINAPIS NIGRÆ SEMINA, B. P. Black Mustard Seed.

The dried ripe seeds of *Brassica nigra*, Koch.

Characters: Seeds $\frac{1}{25}$ " diameter; $\frac{1}{50}$ grain weight; spherical or slightly ovoid in form; dark reddish-brown or greyish-brown; testa hard and minutely pitted, interior yellowish-green and oily; without odour when entire or powdered, but yielding a strong pungent odour when triturated with water; taste at first somewhat bitter, followed immediately by extreme pungency.

Black Mustard is cultivated to a small extent and is little known in India.

SINAPIS INDICÆ SEMINA. Indian or Brown Mustard Seed.

The seeds of *Brassica juncea*, H. f. & T., (*Rai*, Hind.). The Brown Mustard; cultivated largely throughout India; the seeds closely resemble those of Black Mustard, and have similar actions and uses.

The seeds contain a large proportion of a fixed oil, the **Mustard Oil** of the bazaars.

SINAPIS, B. P. Mustard.

The dried ripe seeds of *Brassica alba*, and *Brassica nigra*, powdered, and mixed.

Characters : **Mustard powder** is greenish-yellow, without odour if dry; taste, bitter pungent; if moistened, it exhales a characteristic pungent penetrating peculiar odour.

It should not give the reactions of either turmeric or starch.

Charta Sinapis, B. P. Mustard Paper.

Cartridge paper coated on one side with purified Mustard in Guttapercha Solution.

Before being applied to the skin the mustard paper should be immersed for a few seconds in tepid water.

Linimentum Sinapis, B. P. Liniment of Mustard.

Preparation : Dissolve 120 grns. Camphor in 4 fl. oz. Alcohol (90 p. c.) ; add $1\frac{1}{2}$ fl. drms. Volatile Oil of Mustard, and 5 fl. drms. Castor Oil; mix.

A Stimulating Liniment.

Oleum Sinapis Volatile, B. P. Volatile Oil of Mustard.

Distilled from Black Mustard Seeds after maceration with water, the fixed oil having first been expressed.

Characters : Colourless or pale yellow; odour intensely penetrating; taste very acrid; Sp. gr. 1.018 to 1.030.

Applied undiluted to the skin it produces almost instant vesication; diluted it is counterirritant.

Medicinal properties of Mustard: A powerful stimulant. Externally, rubefacient. Internally small doses used as a condiment; a teaspoonful to a tablespoonful in 10 oz. water is an useful emetic.

The action of Mustard depends on the presence of the official Volatile Oil. This is not present in unmoistened mustard; but is formed by the interaction of two substances, Myrosin and Myronate of Potassium. Black mustard contains a large excess of the Myronate, with only a slight proportion of Myrosin, so that this alone when acted on by water, yields a small proportion of the Volatile Oil. White mustard contains much Myrosin but no Myronate, so that the addition of water has no effect in producing the Volatile Oil. The best result is obtained by mixing the different kinds of mustard in such proportions that the Myrosin and Myronate will suffice to decompose each other.

All varieties of mustard contain a large quantity (nearly 33 p. c.) of a fixed oil. This is used largely in cooking, lighting, &c.

Mustard Poultice, *Cataplasma Sinapis*. (Non-official).

Preparation : Mix $2\frac{1}{2}$ oz. of Linseed Meal in 6 or 8 of boiling water. In a separate dish mix $2\frac{1}{2}$ oz. of Mustard in 2 or 3 oz. lukewarm water; stir the Linseed Meal and the Mustard together.

Rice Flour, or the Mustard alone may be used.

Used : As a counterirritant in inflammations or neuralgic pains.

An elegant substitute for a Mustard Plaster is to sprinkle on Impermeable Piline, a small quantity of a mixture of the Volatile Oil of Mustard (2 p. c.) and Spt. Camphor. (98 p. c.).

ARMORACIÆ RADIX, B. P. Horse-radish root.

The fresh root of *Cochlearia Armoracia*, Linn., collected from cultivated plants. Habitat, Europe and North America.

Characters : Nearly cylindrical except at the crown, where it is somewhat enlarged and marked with closely approximated semi-amplexicaul leaf-scars; $\frac{1}{2}$ " to 1" in diameter, and usually 12" or more in length; externally pale yellowish-white or brownish-white; internally whitish; inodorous when unbroken, but exhaling a characteristic pungent odour when scraped or bruised; taste very pungent.

Horse-radish somewhat resembles Aconite Root but is longer, less conical, lighter in colour and does not produce tingling when chewed. Some years ago in Dingwall, Scotland, a cook made the mistake of using aconite root instead of horse-radish as a flavouring; the result was that 10 of the guests were poisoned, and of these 3 died.

Spiritus Armoraciæ Compositus, B. P. Compound Spirit of Horse-radish.

Dose : 1 to 2 fl. drms.

Preparation : Take 5 oz. Horse-radish root scraped; 5 oz. dried Bitter Orange Peel, well bruised; 55 grns. bruised Nutmeg; $1\frac{1}{4}$ pints alcohol (90 p. c.); $1\frac{1}{2}$ pints Distilled Water; mix; distil 2 pints.

Medicinal properties of Horse-radish : **Stimulating, Stomachic.** Used as a condiment, and in atonic dyspepsia. It possesses much the same properties as mustard. The addition of water or weak spirit causes a decomposition similar to what occurs in mustard and produces an essential oil.

The fresh root of the Horse-radish tree, *Moringa pterygosperma*, Gaertn., may be used as a substitute.

LEPIDIUM SATIVUM, Linn. The Common Cress. (*Hálím*, Chansar, Hurf, Hind.).

A herb cultivated throughout India. The seeds contain a fixed oil, a volatile oil, and mucilaginous matter.

A decoction (1 in 20) of the seeds is used as a demulcent in diarrhoea.

RAPHANUS SATIVUS, Linn. The Radish, (*Muli, Muro*, Hind.).

An annual herb, cultivated throughout India. A foetid essential oil containing sulphur and allied to Volatile Oil of Mustard may be obtained from the seeds and root.

Medicinal properties : **Stimulant, Diuretic.** Its actions resemble those of Sulphur.

CAPPARIDEÆ.

CLEOME VISCOSA, Linn. The Wild Mustard. (The plant *Jangli húrúr*—the seeds *Churi-ajwan*, Hind.).

Medicinal properties : The fresh juice is **rubefacient, stimulant**; the seeds **carminative**; on expression they yield a fixed oil.

GYNANDROPSIS PENTAPHYLLA, DC. Caravella seeds. (*Húrúr*, Hind.).

An annual found in cultivated land in the plains of India. It has an odour resembling Asafetida only more delicate. The seeds are black, and kidney-shaped; they may be distinguished from those of *Cleome viscosa* by being rougher externally.

Medicinal properties : The juice of the plant contains an acrid essential oil resembling that of Mustard, and is used as a **local rubefacient or vesicant**.

The seed powdered may be used as a substitute for Mustard.

CRATÆVA RELIGIOSA, Forst. (*Barun*, Hind.). A tree cultivated in the vicinity of temples in Central India and Bengal.

Medicinal properties : **Aromatic, Bitter, Tonic.**

An infusion of the leaves (1 in 10 of boiling water) was official in the Beng. Pharm., and given in doses of 2 to 4 fl. oz. thrice daily.

CAPPARIS SPINOSA, Linn. The true Caper berry. (*Kabra*, Hind.). Indigenous in Panjab and Sind. From this plant are obtained the Capers in domestic use in Europe. They are used as a **condiment** in India.

Capers in contact with water undergo a change analogous to that which occurs in the case of Mustard.

CAPPARIS APHYLLA, Roth. (*Karel*, Hind.). Indigenous to North-West of India.

Medicinal properties : The dried flower buds and ripe fruit are used as **condiment**. The leaves bruised are used as a **vesicant**. Its actions resemble those of Mustard.

BIXINEÆ.

GYNOCARDIÆ SEMINA, Chaulmugra Seeds.

The seeds of *Gynocardia odorata*, R. Br., an evergreen tree indigenous to the forests of lower Himalayas and Burma.

Characters: About 1" long, ovoid, somewhat irregular from mutual compression. The testa, greyish-brown, smooth, fragile, contains a mass of oily albumen, and encloses an embryo with large heart-shaped three-nerved cotyledons.

They yield about 30 p. c. of a fixed oil.

Gynocardiæ Oleum. *Chaulmugra Oil.* The oil expressed from the seeds of the *Gynocardia odorata*.

Characters: Pale-brown, solid, readily melted by gentle heat with disagreeable taste and smell.

Dose: 5 or 6 mins. thrice daily, gradually increasing to 15 mins. after meals. May be given in milk, or as an emulsion with gum acacia.

Medicinal properties: A local **Stimulant and Nutritive**. It is given internally, and also as an inunction in chronic skin diseases, chronic rheumatism, gout, and secondary syphilis. It has been much lauded as a treatment for leprosy, but for this it is only a palliative, not a cure.

The oil sold in the bazaars is usually adulterated.

An Ointment may be made by mixing 1 of Chaulmugra oil with 4 of Lanolin or Vaseline.

HYDNOCARPUS INEBRIANS, Vahl. A tree of Southern India and Ceylon.

The expressed oil from the seeds has a reputation as a remedy for leprosy, and may be used as a substitute for Chaulmugra oil.

Dose: 10 mins. gradually increasing to 30 mins. or more.

BIXA ORELLANA, Linn. Annatto or Arnatto. (*Lutkan*, Hind.).

A plant extensively cultivated throughout India. By boiling the seeds in water an orange red dye is obtained, which is used for colouring butter, cheese and toilet preparations.

POLYGALACEÆ.

SENEGÆ RADIX, B. P. Senega Root.

The dried root of *Polygala Senega*, Linn. Habitat, North America.

Characters: Knobby rootstocks, with spreading tortuous rootlets, twisted and keeled. Odour distinctive; taste at first sweet, then acid.

Infusum Senegæ, B. P. Infusion of Senega.

Dose : $\frac{1}{2}$ to 1 fl. oz.

Preparation : Infuse 1 oz. Senega root in No. 10 powder, in 1 pint boiling Distilled Water for $\frac{1}{2}$ hour; strain.

Liquor Senegæ Concentratus, B. P. Concentrated Solution of Senega.

Dose : $\frac{1}{2}$ to 1 fl. drm.

Preparation : Make a mixture of 2 parts Alcohol (20 p. c.) with 1 of Alcohol (45 p. c.). Moisten 10 oz. Senega root in No. 20 powder with 4 fl. oz. of the mixture; pack in a closed percolator; set aside for 3 days; percolate with 21 fl. oz., the Alcohol added in 10 equal portions at intervals of 12 hours; continue percolation with the Alcohol so as to make 20 fl. oz.

Tinctura Senegæ, B. P. Tincture of Senega.

Dose : $\frac{1}{2}$ to 1 fl. drm. (*Strength* 1 in 5).

Preparation : Moisten 4 oz. Senega root in No. 40 powder with 4 fl. oz. Alcohol (60 p. c.); complete by the percolation process so that the total is 20 fl. oz.

Medicinal properties of Senega : **Stimulant, Expectorant, Diaphoretic, Diuretic.** Its taste is disagreeable, but is disguised by Spt. Chloroformi.

It is specially useful in the later stages of bronchitis, and in chronic cases where the amount of expectoration is large, and the patient enfeebled. It is not suited for acute cases, nor where the expectoration is viscid and scanty. Being a gastro-intestinal irritant it is contraindicated in cases of enfeebled digestion.

The active principle of Senega is Saponin (cf. Quillaya) which mixed with boiling water, forms a soapy emulsion. It is excreted by the bronchial mucous membrane, by the kidneys, and by the skin, to all of which it acts a stimulant.

KRAMERIÆ RADIX, B. P. Rhatany Root.

The dried root of (1) **Para Rhatany** a species of *Krameria* attributed to *Krameria argentea*, Mart.; or of (2) **Peruvian Rhatany**, *Krameria triandra*, Ruiz and Pavon.

Characters : **Para Rhatany**; cylindrical pieces with purplish brown smooth thick bark, and with deep transverse cracks at intervals, adhering firmly to the wood which is pale reddish brown: fracture short. **Peruvian Rhatany**; bark $\frac{1}{20}$ to $\frac{1}{10}$ " thick; readily separates, dark reddish brown externally; bright reddish brown internally; rough and scaly except in smaller pieces; fracture splintery.

The barks of both kinds have a strongly astringent taste, and when chewed tinge the saliva red. The wood is inodorous and nearly tasteless.

Extractum Krameriae, B. P. Extract of Krameria. *Synonym,*
Extract of Rhatany. An aqueous extract; obtained by percolation
and evaporation.

Dose : 5 to 15 grns.

Infusum Krameriae, B. P. Infusion of Krameria. *Synonym,*
Infusion of Rhatany.

Dose : $\frac{1}{2}$ to 1 fl. oz.

Used as an **astrigent** gargle for relaxed throat or local astrin-
gent.

Preparation : Infuse 1 oz. bruised Krameria root in 20 oz. boil-
ing Distilled Water for 15 minutes; strain.

Liquor Krameriae Concentratus, B. P. Concentrated Solution
of Krameria.

Dose : $\frac{1}{2}$ to 1 fl. drm. Strength 1 of Root in 2. Made with
Alcohol (20 p. c.).

Tinctura Krameriae, B. P. Tincture of Rhatany.

Dose : $\frac{1}{2}$ to 1 fl. drm. Strength 1 of Root in 5.

Preparation : Moisten 4 oz. Krameria root in No. 40 powder in
2 fl. oz. Alcohol (60 p. c.); complete the percolation process so
that the result is 1 pint.

Trochiscus Krameriae, B. P. Rhatany Lozenge.

Each contains 1 grn. Extract of Krameria mixed with Fruit
Basis.

Trochiscus Krameriae et Cocainae, B. P. Rhatany and Cocaine
Lozenge.

Each contains 1 grn. Extract of Krameria and $\frac{1}{20}$ grn. Cocaine
Hydrochloride made up with Fruit Basis.

Medicinal properties : Krameria is a powerful **Astringent** and
Tonic, useful in the same class of cases as Tannic Acid, Kino or
Catechu.

The Root powdered is used as an astringent dentifrice when
the gums are spongy.

Rhatany contains a substance whose actions are similar to those
of Tannic Acid; but is not precipitated by tartar emetic.
Rhatany therefore is not an antidote in poisoning by Antimony.

Incompatibles : Alkalis; Lime-water; salts of Iron and Lead;
Gelatine cause precipitates which interfere with the local action
of the drug.

TAMARISCINEÆ.

TAMARIX GALLICA, Linn. The Tamarisk, a shrub common in
Persia and Afghanistan.

GUTTIFERÆ.

CAMBOGIA, B. P. Gamboge.

A gum resin obtained from *Garcinia Hanburii*, Hook. f. From Siam.

Dose: $\frac{1}{2}$ to 2 grns.

Characters: Cylindrical solid or hollow rolls longitudinally striated on the surface, breaking with a smooth dull conchoidal fracture, tawny, changing to bright yellow when rubbed with water; no odour; taste acrid.

Pilula Cambogiæ Composita, B. P. Compound Pill of Gamboge.

Dose: 4 to 8 grns.

Preparation: Mix. 1 oz. Gamboge, 1 oz. Barbadoes Aloes, 1 oz. Compound Powder of Cinnamon, 2 oz. Hard Soap, all powdered with 1 oz. Syrup of Glucose; form a mass.

Medicinal properties: Gamboge is a **Drastic Hydragogue Purgative**. It is used in dropsies, cerebral hyperæmia also as an anthelmintic for tapeworm in doses of 10 to 15 grns. It is rarely used in Britain.

Gamboge acts powerfully on the intestinal glands but not on the liver; large doses cause violent irritation of the alimentary canal with vomiting and griping. It is therefore best given in small doses frequently until it operates.

CAMBOGIA INDICA, Indian Gamboge.

A gum resin obtained from *Garcinia Morella*, Desr., the Indian Gamboge tree.

Characters, medicinal properties and dose: In every respect like the B. P. Gamboge save that it occurs in irregular masses of various size and not in rolls.

GARCINÆ INDICÆ OLEUM, Kokum Butter. (*Kokum-kattel*, Hind.).

The concrete oil of the seeds of *Garcinia indica*, Chois.

Characters: The **Fruit** is spherical, about 2" in diameter, it is used to make acidulous drinks. It contains a purple pulp and seed, the latter yields about 20 p. c. of oil.

The **Oil** is solid, brittle, dirty pale yellowish, and in egg-shaped lumps of about 4 oz. in weight; taste bland, melting at the temperature of the body.

Medicinal uses: **Nutritive, Demulcent, slightly Astringent and Emollient**. Used as a substitute for Cod Oil, also in the preparation of ointments, suppositories, &c., replacing animal fats.

GARCINIA MANGOSTANA, Linn. Mangosteen Fruit.

Imported from Singapore.

Characters: About the size and shape of a small apple, with thick, woody, astringent rind.

Medicinal properties: The rind is an intestinal astringent. It may be made into a syrup, or given as a powder with aromatics. The internal portion of the fruit is used as a table fruit.

MESUA FERREA, Linn. (*Nagkesar*, Hind). A tree common in Eastern Hindustan, Burma and the Andamans.

The dried flowers are sold in the Bazars, and are used as a perfume, they yield a volatile oil. The pericarp of the fruit is astringent; the expressed oil of the seeds is much used as a stimulating embrocation in rheumatism; the bark and root (as Infusion or Tincture) is a bitter tonic.

CALOPHYLLUM INOPHYLLUM, Linn. Alexandrian Laurel.

A tree widely distributed over India. The kernels yield a fragrant fixed oil which is largely used as an external stimulating application for rheumatism.

TERNSTROMIACEÆ.

CAMELLIA THEA, Link. The tea plant. *Chha*, Hind.

Indigenous in Assam; extensively cultivated along the lower ranges and the plateau land of the foot of the Himalaya mountains, also in South India, and Ceylon.

Composition: Tea contains an alkaloid **Theine**, tannin and a volatile oil.

The seeds contain about 30 p. c. of a fixed oil somewhat resembling olive oil.

CAFFEINA, B. P. Caffeine. *Synonym:* Theine. $C_8H_{10}N_4O_2 \cdot H_2O$. Crystallised from aqueous solution it contains one molecule of water.

An alkaloid usually obtained from the dried leaves of *Camellia Thea*; or the dried seeds of *Coffea arabica*, Linn. It is present to the extent of about 5 p. c. in **Guarana** (a kind of cake made from the seeds of *Paullina sorbilis*, a plant of Brazil), 3 p. c. in the leaves of the **Tea plant** (*Camellia Thea*), and in the **Kolanut** (the seeds of *Cola acuminata*, a tree growing wild in Africa between the Congo and Sierra Leone), 1 p. c. in **Coffee** (the seeds of *Coffea arabica*), $\frac{1}{2}$ p. c. in **Paraguay tea** (the dried leaves of twigs of *Ilex paraguensis*).

Dose: 1 to 5 grns.; for sick headache 1 grn., every hour.

Characters: Colourless, silky, needle-like inodorous crystals; taste bitter; solubility 1 in 80 of cold water; very soluble in boiling water or alcohol (90 p. c.); also in saline solution of Salicylate or Benzoate of Soda, concentrated solutions made with these being suitable for hypodermic injection (e.g., Caffeina 20 grs, Sod. Salicyl. $17\frac{1}{2}$ grs. dissolved in water up to ℥ fl. drm.; strength 1 grn. in 3 mins.)

At 212° F. the crystals lose their water of crystallisation and at a higher temperature melt and volatilise without decomposition.

Caffeinæ Citras, B. P. Caffeine Citrate.

An unstable compound of Caffeine and Citric Acid; on the addition of more than 3 parts water it decomposes into the alkaloid and Citric Acid, and thus has no advantage over the pure alkaloid.

Dose : 2 to 10 grns.

Characters : A white powder, inodorous; taste acid and faintly bitter. Solubility 1 in 32 of water.

Caffeinæ Citras Effervescens, B. P. Effervescent Citrate of Caffeine.

Dose : 60 to 120 grns.; Strength 4 p. c. Caffeine Citrate.

Medicinal properties of Caffeine : **Cardiac Tonic, Diuretic.**

In small doses it is a **stimulant**, affecting specially the alimentary, circulatory, nervous, and urinary system. It is thus **sialagogue, stomachic**, and slightly **laxative**. It removes the feeling of fatigue and brightens the intellect. It strengthens and lengthens the cardiac systole, shortening the diastole, thus increasing the blood pressure and respiration.

Uses : In sick headaches and neuralgia, especially those of dyspeptic origin; a refreshing stimulant in fatigue. As a heart tonic it is more rapid in action than Digitalis and quite free from cumulative action. As a diuretic it is useful even in advanced cardiac and renal cases; it is best given either along with Digitalis, or alternating with it. If taken towards evening it may cause sleeplessness.

Large doses paralyse the central nervous system.

DIPTEROCARPEÆ.

DIPTEROCARPI BALSAMUM, P. I. Gurjun Balsam, or Wood Oil. (*Garjan-ka-tel*, Hind.).

Dose : $\frac{1}{2}$ to 1 drm. thrice daily, uncombined or in emulsion.

The Balsamic exudation obtained from the trunk of *Dipterocarpus turbinatus*, Gærtn. and other species found in the forests of Eastern India.

Characters : Transparent dark sherry-brown viscid liquid, with greenish opalescence on surface; odour and taste resembling Copaiba but less powerful.

Medicinal properties : **Stimulant, Diuretic.** Used especially for gonorrhœa and other conditions where Copaiba is indicated. It is used also as a stimulating external application for indolent ulcers. It has been recommended for leprosy, but for this it is

Gurjun oil is an oleo-resin. It is excreted by the genito-urinary tract to which it acts as a stimulant and antiseptic.

It is largely used as a natural varnish : also as an adulterant of Copaiba. On distillation it yields about 35 p. c. of a volatile oil, the remainder being a dark coloured viscid resin.

There are three varieties of Gurjun oil sold in the bazaars,—the pale, red, and dark brown.

SHOREA ROBUSTA, Roxb. The Sal tree. (*Sal*, Hind).

A large timber tree common throughout Bengal. The bark contains a variety of tannin and on boiling with water yields an extract which is used as an astringent.

A resinous exudation from this tree is sold in the bazaars as **Ral** or **Dhuna**. It varies in colour from a pale amber to a dark brown, has neither taste nor smell, and is soluble in turpentine or fixed oils. The finer qualities may be substituted for the Pine Resin of the B. P.

HOPEA ODORATA, Roxb. A large tree found in Burma. It yields a fragrant resin, **Rock-Dammar**. *Thengan*, Burm.

This resin, powdered, is used by the Burmese as a styptic ; dissolved in turpentine, it makes a varnish.

VATERIA INDICA, Linn. A large evergreen tree found in Southern India.

White Dammar ; Piney Resin, or Indian Copal, (*Sufed Damar*, Hind.) is the resin which exudes from incisions in its trunk. Specimens differ in colour, fragrance and density ; the better qualities being not unlike amber. It burns with a bright steady light and little smoke ; giving off a pleasant smell.

It forms a good substitute for the B. P. Pine Resin. Dr. Waring recommends the following as a good stimulating dressing :—White Dammar 5 oz., Lard or Kokum butter, 8 oz. Wax, 2 oz. ; melt with gentle heat, keep stirring until cool.

Piney Tallow or **Vegetable Butter** of Canara, a solid fatty oil resembling Kokum Butter is obtained from the fruit of *Vateria indica*. It may be used as a substitute for lard, &c., in the preparation of ointment ; also as a local stimulating application for chronic rheumatism, &c.

MALVACEÆ.

GOSSYPIUM, B. P. Cotton. *Synonym* Cotton Wool, (*Rui*, *Kapás*, Hind.).

The hairs of the seed of various kinds of *Gossypium* freed from fatty matter and impurities.

Characters : Long white soft filaments, each consisting of an elongated tubular cell, which under the microscope appears as a

without odour or taste. If properly prepared it is readily wetted by water and its reaction is neutral.

Cotton is prepared (1) by boiling with an alkali to remove the fat; (2) washing repeatedly with water; and (3) bleaching by using Chlorinated Lime and dilute Hydrochloric Acid.

Medicinal properties: **Protective.** Used as a local application to exclude air from ulcers, burns, &c.; to protect parts from cold, e. g., rheumatic joints; in respirators; in mouth and nose protectors for use in injurious trades; and as a filter to plug the orifice of bottles, &c., in bacteriological experiments so as to exclude micro-organisms.

Cotton wool is nearly pure cellulose.

Cotton Seed Oil. A bland fixed oil obtained by expression from the seeds, which contain nearly 25 p. c. It may be used as a substitute for Olive oil.

The Root bark of *Gossypium* as a Tincture (dried bark 1, Alcohol (50 p. c.) sufficient to percolate to 4 parts) is given in doses of 1 dr̄m. thrice daily as an **emmenagogue** and **parturient**.

PYROXYLINUM, B. P. Pyroxylin.

Is Dinitrocellulose. It is prepared by acting on Cotton wool by a mixture of equal parts of Nitric and Sulphuric Acids; washing and drying.

It is soluble in a mixture of equal parts of ether and alcohol (90 p. c.) and is used to prepare Collodium.

Gun Cotton is Trinitrocellulose. It is not soluble in any mixture of alcohol and ether.

COLLODIUM, B. P. Collodion.

Characters: A colourless liquid of the consistence of syrup with an odour of ether, and highly inflammable. It dries quickly on exposure to the air, leaving a thin transparent film which contracts on drying, and is insoluble in water or alcohol (90 p. c.).

Preparation: Add 1 of Pyroxylin to a mixture of 36 parts of Ether and 12 of Alcohol (90 p. c.). After a few days decant the clear fluid, and keep in a stoppered bottle.

Collodium Flexile, B. P. Flexile Collodion.

Preparation: Mix 48 parts Collodion with 2 of Canada Turpentine and 1 of Castor oil. This does not contract on drying.

Medicinal uses: Both varieties of Collodion are used as **protectives** to wounded or diseased parts.

The extreme inflammability of Collodion must be borne in mind, and a naked light kept at a distance.

ALTHÆA OFFICINALIS, Linn., the Marsh Mallow. (*Gul-khairi*, Hind.) Indigenous in Panjab and Kashmir.

Medicinal properties: The root is very mucilaginous, bland and unirritating. Decorticated and dried it is used as a powder in the preparation of pastilles and pill masses. It contains large quantities of mucilage and starch.

A **syrup** is used as a **demulcent** in irritation or inflammation of mucous membranes. **Preparation:** Macerate 3 of Althea root in 40 of water for 12 hours; strain, press, filter, until 32 have passed through; to this add 64 of sugar, dissolve, warm and heat the syrup to boiling; when cold skim and strain through flannel.

MALVA SYLVESTRIS, Linn. The common Mallow. (*Vilayati-kangai*, Hind.)

A herbaceous plant indigenous to the temperate Western Himalayas. A decoction of the seeds is employed internally as a **demulcent**.

HIBISCI CAPSULÆ, The fresh immature capsules of *Hibiscus esculentus*, Linn. The edible hibiscus, **Okra**, (*Ram, turai, Bhindi*, Hind.) A tall herbaceous annual, indigenous in the West Indies, but now naturalised in all tropical countries.

Medicinal properties: **Emollient, Demulcent, Diuretic**, An emollient poultice may be made from the fresh capsules bruised. A decoction (made by boiling 3 oz. fresh capsules in 30 oz. water, straining, sweetening and flavouring to taste) may be used as a mucilaginous drink in feverish conditions, also as a diluent diuretic in cystitis, dysuria and gonorrhœa.

It contains a large quantity of bland mucilage and starch. It is extensively used in India as an article of diet.

HIBISCUUS ROSA-SINENSIS, Linn. The petals yield a dark red juice which may be used as a substitute for litmus. It should be used fresh.

SIDA. The roots of *S. cordifolia*, Linn., and other species. (*Bala, Berela, Bariara*, Hind.) are used extensively (in the form of an infusion) as a **tonic, diaphoretic and alterative**.

ADANSONIA DIGITATA, Linn. The Baobab tree. (*Gorakh amali*, Hind.). An African tree, now domesticated along the Bombay Coast.

A decoction of the bark (1 oz. bruised bark, 20 oz. water, boil to one-third) may be used as an **antiperiodic** in intermittent fevers.

BOMBAX MALABARICUM, DC. The Silk-cotton tree, (*Semul*, Hind.) A large tree common throughout India.

The silky portion of the seeds is used as a substitute for cotton; the seeds yield a good non-drying oil.

An astringent gummy exudation from this plant is sold in the bazaars as **Mecharas**. It occurs as roundish dirty brown hollow tears, and is used as an **astringent** and local **styptic**.

STERCULIACEÆ.

OLEUM THEOBROMATIS, B. P. Oil of Theobroma. *Synonym* Cacao Butter.

A concrete oil obtained by pressing the warm crushed seeds of *Theobroma Cacao*, Linn. Indigenous to Tropical America.

Characters : Yellowish white solid lumps, breaking with a smooth fracture, odour of Cocoa; taste bland agreeable; melts at about 90° F.; does not become rancid on exposure.

Medicinal properties : **Emollient**: used for making suppositories. It consists chiefly of stearin and olein.

Cacao seeds pulverised and deprived of part of its fixed oil, form the bulk of the **Cocoa** sold in the shops as a beverage. They contain 1 to 2 p.c. of an alkaloid, **Theobromine**, which has actions somewhat like Caffeine, only more powerful.

Diuretin (non-official) is the Sodio-Salicylate of Theobromine; a powerful diuretic without other effects.

Dose : 10 to 30 grns. thrice daily.

COLA ACUMINATA, Schott. Syn. *Sterculia acuminata*. The Kola tree. Indigenous in Western Africa, it has been introduced into the Calcutta Botanical Gardens. It is used to prevent fatigue.

The seeds contain about 3 p. c. Caffeine. Various preparations are made, e. g., Kola wine, Kola chocolate, &c.

TILIACEÆ.

CORCHORUS CAPSULARIS, Linn., and *C. OLITORIUS*, Linn. The Jute plants, *Pat-san*, Hind.

An annual plant cultivated extensively in Bengal. The finely carded fibre from the stems forms the **Jute** of commerce. Jute may be used as a basis for antiseptic surgical dressings.

An Infusion of the leaves with Aromatics is used as a bitter stomachic.

GREWIA ASIATICA, Linn. (*Phalsa*, Hind.).

A moderately sized tree found throughout India. The fruit is consumed by the natives of India; from it a sherbet is made and a spirit is distilled.

An Infusion of the bark is used as a demulcent.

LINEÆ.

LINUM, B. P. Linseed. Known also as Flaxseed.

The dried ripe seeds of *Linum usitatissimum*, Linn.

Characters : Small brown glossy, nearly flat seeds; length $\frac{1}{6}$ " to $\frac{1}{4}$ "; ovate; somewhat obliquely pointed; surface smooth

minutely pitted; internally yellowish-white containing a narrow oily endosperm with two large oily cotyledons; without odour; taste mucilaginous oily.

Linum Contusum, B. P. Crushed Linseed.

Linseed reduced to a coarse powder. Used for making poultices.

Oleum Lini, B. P. Linseed oil.

The fixed oil expressed from Linseed at ordinary temperatures.

Characters: Viscid yellow; odour faint; taste bland; it gradually thickens on exposure, forming a hard transparent varnish. Solubility 1 in 10 of Alcohol (90 p. c.), and in Oil of Turpentine.

One pint Linseed oil makes a good laxative enema removing impacted fæces with little pain, or spasm.

Boiled Linseed oil, a drying oil, is used largely by painters, &c. It often contains lead, as litharge is added during the boiling.

Carron oil. Is a mixture of equal parts of Linseed Oil and Lime Water shaken to form a cream. A good application for scalds or burns.

Linseed Poultice. Mix 4 of Linseed Meal with 10 of boiling water, stirring constantly.

A valuable emollient application.

Linseed Tea. Dose *ad lib.* A good **Demulcent** drink.

Preparation: Infuse $2\frac{1}{2}$ drms. Linseed, and 50 grns. Liquorice Root powdered, in 10 oz. boiling water; strain.

Medicinal properties: Linseed is **Emollient**; **Demulcent**; **Nutritive**. Used in inflammatory conditions of the intestinal canal and urinary passages.

Linseed contains a large proportion of the official fixed oil which has a great affinity for oxygen, becoming thick and resinoid on exposure. After expression of the oil the remaining linseed meal consists chiefly of mucilage, and a little oil, but without either starch or sugar.

Linseed oil is excreted as a resinoid body by the kidneys, therefore is slightly diuretic.

COCÆ FOLIA, B. P. Coca Leaves.

The dried leaves of *Erythroxylum coca*, Lam., and its varieties. Imported from Bolivia and Peru.

They resemble the leaves of tea but are smaller and thinner, and have a slightly curved line visible on either side of the midrib.

Extractum Cocæ Liquidum, B. P. Liquid Extract of Coca.

Dose: $\frac{1}{2}$ to 1 fl. drm.

An Alcoholic Extract. Strength 1 of Coca leaves in 1 of Extract.

Medicinal properties: A nerve stimulant, sustenent and restorative.

Coca is much used by the Indians of South America, who chew it several times daily. It has the effect of lessening the desire for ordinary food, and permitting of long sustained exertion even without sleep.

Coca-leaves contain the alkaloid Cocaine, along with other substances the exact nature of which has not been definitely ascertained.

COCAINA, B. P. Cocaine.

An alkaloid obtained from Coca leaves.

Characters: Colourless monoclinic prisms; taste bitter, followed by a sensation of tingling and numbness; melts about 207° F.; solubility 1 in 10 of Alcohol (90 p. c.); insoluble in water or glycerine.

Unguentum Cocainæ, B. P. Cocaine Ointment.

Strength 2 p. c.

Preparation: Rub 20 grns. Cocaine with 80 grns. Oleic Acid; gently warm the mixture until cool; add 400 grns. Lard; mix.

Cocainæ Hydrochloridum, B. P. Cocaine Hydrochloride.

Dose: $\frac{1}{5}$ to $\frac{1}{2}$ grn.

Characters: Colourless needle-like crystals or crystalline powder. Its aqueous solution has a bitter taste, producing on the tongue a tingling sensation followed by numbness; applied to the eye it dilates the pupil. Solubility, 2 in 1 of cold water; 1 in 4 of Alcohol (90 p. c.).

Injectio Cocainæ Hypodermica, B. P. Hypodermic Injection of Cocaine.

Dose: By subcutaneous injection 2 to 5 mins.

Strength, 10 p. c., i. e. 10 grns. Cocaine Hydrochloride in 110 mins.

Preparation: Boil 6 fl. drms. Distilled Water; add $\frac{1}{2}$ grn. Salicylic Acid; cool; dissolve in this 33 grns. Cocaine Hydrochloride; add Distilled Water recently boiled and cooled sufficient to make 6 fl. drms.

Lamellæ Cocainæ, B. P. Discs of Cocaine.

Each contains $\frac{1}{50}$ grn. Cocaine Hydrochloride made up with Gelatine and some Glycerine.

Medicinal properties: Local Anæsthetic.

Uses: As a 4 p. c. solution to the eye or a 10 to 20 p. c. solution to the throat or other mucous membranes, applied once or twice at intervals of 3 or 4 minutes to produce anæsthesia for

Internally, it is used in sea sickness, in the vomiting of pregnancy, and as a general tonic, but its value as such is very doubtful.

Several cases of poisoning by hypodermic Injection of Cocaine have been reported; the action of the drug administered in this way is not fully understood.

Actions: Externally it has no action on the unbroken skin. Applied to mucous surfaces or injected below the skin it speedily paralyses the sensory nerves and contracts the vessels, thus producing *anæsthesia*, which lasts about 15 minutes. Internally, it is a *nerve stimulant, restorative and sustenent*. The *pupils dilate* by both internal and local application.

Larger doses cause fulness of the head, weariness, slight deafness, loss of memory and inability to control ideas.

Very large doses paralyse the posterior columns of the cord and the peripheral sensory nerves, the motor nerves and muscles being unaffected. Respiration and cardiac action is first quickened, then becomes irregular. Death takes place from respiratory failure.

Antidote in Cocaine poisoning.—Inhalations of Amyl Nitrite.

ZYGOPHYLLÆ.

GUAIACI LIGNUM, B. P. Guaiacum Wood.

The heart wood of *Guaiacum officinale* or *G. sanctum*. Linn. Habitat, West Indies. It yields about 25 p. c. of Resin, which is official. The wood touched with Nitric Acid or Mercuric Chloride becomes bluish green.

Guaiaci Resina, B. P. Guaiacum Resin.

Dose: 5 to 15 grains.

Characters: In large masses or rounded tears, brittle, breaking with a clean glassy fracture; thin splinters are translucent and reddish-brown to yellowish-green: the powder is gray but becomes green on exposure to light and air; when warmed the odour is balsamic. Solubility; about 90 p. c. is soluble in Alcohol, Ether or alkaline solutions. A solution in Alcohol (90 p. c.) applied to the inner surface of a raw potato gives a clear blue, (due to protoplasm).

It somewhat resembles Myrrh, Scammony, Benzoin and Aloes, but none of these have a greenish tinge.

Mistura Guaiaci, B. P. Guaiacum Mixture.

Dose: $\frac{1}{2}$ to 1 fl. oz.

Preparation: Triturate $\frac{1}{2}$ oz. Guaiacum Resin with $\frac{1}{2}$ oz. Refined Sugar and 35 grains powdered Tragacanth; add gradually 1 pint

Tinctura Guaiaci Ammoniata, B. P. Ammoniated Tincture of Guaiacum.

Dose : $\frac{1}{2}$ to 1 fl. drm.

Preparation : Mix $1\frac{1}{2}$ fl. oz. Strong Solution of Ammonia with 16 fl. oz. Alcohol (90 p. c.) ; add 4 oz. powdered Guaiacum Resin ; set aside in a closed vessel for 48 hours, shaking frequently ; filter ; dissolve 30 mins. Oil of Nutmeg and 20 mins. Oil of Lemon ; pass sufficient Alcohol (90 p. c.) through the filter to make 1 pint.

Trochiscus Guaiaci Resinæ, B. P. Guaiacum Resin Lozenge.

Each contains 3 grains Resin made with Fruit Basis.

Useful in commencing tonsillitis.

Medicinal properties of Guaiacum Resin, Stimulant, Diaphoretic, Alterative. It is used in chronic rheumatism, tonsillitis, dysmenorrhœa, gout and chronic syphilitic diseases. It should be pushed until it produce hot sweating.

Its action depends on its stimulating effect on the circulation and secretions of the skin and kidneys. In large doses the Resin is a gastro-intestinal irritant causing vomiting, purging, and constitutional disturbance.

Guaiacum contains several resins, and yields guaiacol on distillation.

Guaiacum wood is known as Lignum Vitæ.

A delicate test for the presence of Guaiacum in a solution is the addition of Ferric Chloride ; this produces a blue colour which is soluble in Chloroform.

TRIBULUS TERRESTRIS, Linn., a trailing plant common in Northern India. (*Gokhuru, chota gokhru*, Hind.).

Various parts of this plant, especially the fruit and root are used medicinally. A boiled decoction is drunk in large quantities as a diuretic and aphrodisiac.

RUTACEÆ.

CUSPARIÆ CORTEX, B. P. Cusparia Bark.

The dried bark of *Cusparia febrifuga*, DC. Habitat, Tropical America.

Characters : Flattish pieces or quills, grey outside, light-brown inside ; 4" to 5" long, 1" wide, $\frac{1}{2}$ " thick ; one edge cut obliquely or feathered ; odour musty ; taste bitter.

Infusum Cuspariæ, B. P. Infusion of Cusparia.

Dose : 1 to 2 fl. oz. (Strength 1 in 20.)

Preparation : Infuse 1 oz. Cusparia Bark in No. 20 powder with 20 fl. oz. boiling Distilled Water, in a covered vessel for 15

Liquor Cuspariae Concentratus, B. P. Concentrated Solution of Cusparia.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 2).

Medicinal properties of Cusparia, Aromatic, Bitter, Tonic, Anti-periodic: useful in atonic dyspepsia, and in convalescence after acute diseases. In tropical America it is used in place of Cinchona in treating malarious fever. It contains a volatile oil and a bitter substance.

Cusparia bark is also known as **Angustura bark** so named from the town of export. **False Angustura bark** obtained from the *Strychnos Nux-vomica* has been mistaken for the true bark, giving rise to accidents. It may be distinguished by the action of Nitric Acid; this with the false bark gives a deep red in the inner surface (due to Brucine) and an emerald green on the outer surface. With the genuine bark it gives a dull red colour on both surfaces.

BUCHU FOLIA, B. P. Buchu leaves.

The dried leaves of *Barosma betulina*, Bart. and Wendl. Habitat, South Africa.

Characters: Length $\frac{1}{2}$ " to $\frac{3}{4}$ "; colour dull greenish-yellow, outline rhomboid, ovate; rigid; when slightly moist, cartilaginous; surface devoid of hairs, somewhat warty; margin sharply denticulate; apex blunt, recurved; oil glands distinctly visible in the leaf especially near the margins. It has a powerful mint-like odour and a warm camphoraceous taste.

It somewhat resembles Senna, and Uva Ursi, but the margins of these leaves are entire.

Infusum Buchu, B. P. Infusion of Buchu.

Dose: 1 to 2 fl. oz. (Strength 1 in 20).

Preparation: Infuse 1 oz. Buchu leaves freshly broken with 1 pint Distilled Water, boiling in a covered vessel for 15 minutes; strain.

A suitable vehicle for saline diuretic remedies.

Tinctura Buchu, B. P. Tincture of Buchu.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5).

Preparation: Moisten 4 oz. Buchu leaves in 4 oz. Alcohol (60 p. c.), complete the percolation process so that the result be 1 pint.

Medicinal properties of Buchu: Tonic, Carminative, Diaphoretic and Antiseptic Diuretic. Used chiefly in urinary diseases, e.g., cystitis; also in dyspepsia and in chronic bronchitis.

stimulates the bladder and bronchi. In South Africa it is used in doses of 20 grains of the powdered leaves for diarrhoea and dysentery.

JABORANDI FOLIA, B. P. Jaborandi Leaves.

The dried leaflets of *Pilocarpus Jaborandi*, Holmes. Habitat Brazil.

Characters : Colour dull green ; oval-oblong or oblong-lanceolate, length $2\frac{1}{2}$ " to 4" ; obtuse or emarginate at the apex ; for the most part unequal at the base ; entire, coriaceous. The mature leaflets have a few hairs on the under surface ; on the upper surface the lateral veinlets are prominent ; when bruised they emit a slight aromatic odour : taste at first bitter aromatic, later pungent. When chewed they increase the flow of saliva.

Extractum Jaborandi Liquidum, B. P. Liquid Extract of Jaborandi.

Dose : 5 to 15 mins.

An alcoholic extract of a strength that a given quantity of the extract contains the active principle of a like quantity of the drug.

Tinctura Jaborandi, B. P. Tincture of Jaborandi.

Dose : $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 5).

Preparation : Moisten 4 oz. powdered Jaborandi leaves with $2\frac{1}{2}$ fl. oz. Alcohol (45 p. c.) ; complete the percolation process so that the resulting Tincture shall measure 1 pint.

PILOCARPINÆ NITRAS, B. P. Pilocarpine Nitrate.

The Nitrate of an alkaloid obtained from Jaborandi leaves.

Dose : $\frac{1}{20}$ to $\frac{1}{2}$ grain.

Characters : A white crystalline powder. Solubility, 1 in 8 of cold water ; slightly soluble in cold, freely soluble in hot Alcohol (90 p. c.). A dilute aqueous solution applied to the eye causes contraction of the pupil.

Medicinal properties : Jaborandi is a powerful and rapid diaphoretic and sialogogue. It is useful in renal dropsy and uræmia, removing both fluid and urea from the body, but because of its depressing effect should be used with caution in cases of cardiac debility. In such cases it should be given with alcoholic stimulants.

Jaborandi leaves contain a volatile oil and two alkaloids pilocarpine and jaborine ; the latter is antagonistic to the former, and resembles atropine in its action.

Pilocarpine stimulates the secreting nerves, and thus produces enormous secretion of saliva and sweat. This secretion lasts 2 to

weight may be lost. It increases the secretion of tears, of wax from the ears, and of mucus from the respiratory mucous membranes. It is also Myotic. Its action on the mammary gland is less certain. It only slightly stimulates the hepatic secretion.

It depresses the circulation and may produce profound collapse. It is excreted unchanged by the urine.

Atropine is directly antagonistic and should be used hypodermically, in case of excessive action of Pilocarpine.

Pilocarpine may be given in poisoning by Atropine or Belladonna.

PEGANUM HARMALA, Linn. The Syrian Rue. (*Harmal*, *Hurmul*, Hind.).

A shrub found in North-Western India; its odour is disagreeable and taste bitter.

The seeds are said to be narcotic, antispasmodic, emetic, emmenagogue. The powder is given in $\frac{1}{2}$ to 2 drms. doses.

TODDALIÆ RADIX. Toddalia Root.

The root bark of *Toddalia aculeata*, Pers.

(*Jangli-Kali-mirch*, Hind.). A climbing shrub, indigenous to the lower Himalayas at altitudes of 5,000 ft. Also in Western and Southern India.

Characters: Bitter, pungent aromatic bark with a yellow velvety epidermis. The central woody portion of the root is hard and white without odour or taste.

Composition: It contains Berberine and an essential oil.

Medicinal properties: **Aromatic, Tonic, Stimulant**. It may be given as a **Tincture**. **Dose**: $1\frac{1}{2}$ –3 drms. thrice daily. **Preparation**: Macerate $2\frac{1}{2}$ oz. Toddalia root-bark in 20 oz. Proof Spt. for 7 days occasionally agitating: strain, press, filter; and add Proof Spt. up to 20 oz.) or as an **Infusion**. **Dose**: 1 to 2 oz. thrice daily. **Preparation**: Infuse 1 oz. powdered Toddalia root-bark in 10 oz. boiling water for 1 hour, strain.

AURANTII CORTEX RECENS, B. P. Fresh Bitter-Orange Peel.

The fresh outer part of the pericarp of *Citrus Aurantium*, var. *Bigaradia*, Hook. f. Cultivated extensively in subtropical countries.

Characters: Externally deep orange or red, somewhat rough and glandular; on inner side there should be only a very small amount of the white spongy portion of the pericarp: odour pleasant, aromatic; taste bitter.

Aurantii Cortex Siccatus, B. P. Dried Bitter-Orange Peel.

The dried outer part of the pericarp of *Citrus Aurantium*, var.

Characters: Thin strips, the outer surface deep orange-red, rough and glandular; on the inner surface there should be only a very small amount of the white spongy portion of the pericarp; odour pleasant and aromatic, taste bitter.

Infusum Aurantii, B. P. Infusion of Orange Peel.

Dose: $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 20).

Preparation: Infuse 1 oz. Dried Bitter-Orange Peel, cut small, in 20 fl. oz. boiling Distilled Water, in a covered vessel for 15 minutes, strain.

Infusum Aurantii Compositum, B. P. Compound Infusion of Orange Peel.

Dose: $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 20).

Preparation: Infuse $\frac{1}{2}$ oz. Dried Bitter-Orange Peel, $\frac{1}{4}$ oz. Fresh or Dried Lemon Peel, both cut small, 55 grains Cloves in 20 fl. oz. boiling Distilled Water, in a covered vessel for 15 minutes, strain.

Syrupus Aurantii, B. P. Syrup of Orange.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Preparation: Mix 1 fl. oz. Tincture of Orange with 7 fl. oz. Syrup.

Tinctura Aurantii, B. P. Tincture of Orange.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 4).

Preparation: Take 5 oz. Fresh Bitter-Orange Peel, cut small, Alcohol (90 p. c.). Prepare by the maceration process. So that the resulting Tincture measures 20 fl. oz.

Prescribed with Mineral Acids, Quinine, and in Tonic Mixtures.

Vinum Aurantii, B. P. Orange Wine.

Wine made by the fermentation of a saccharine solution to which Fresh Bitter-Orange Peel has been added. It contains 10 to 12 p. c. by volume of Ethyl hydroxide.

Orange Wine should contain vegetable acids equal to $\frac{1}{2}$ p. c. Citric Acid. It is antiscorbutic.

Medicinal properties: Orange Peel combines the properties of a Bitter and an Aromatic. It is a mild tonic, carminative and stomachic. It contains about 2 p. c. of the volatile oil of Orange Peel (non-official), and a bitter substance.

The white spongy inner part of the rind is indigestible and useless.

The fleshy inside of the orange is a valuable antiscorbutic and extensively used as a table fruit.

Preparations of Orange Peel are blackened by Liebig's Ferri

AQUA AURANTII FLORIS, B. P. Orange-Flower Water.

The orange-flower water of commerce. Prepared by distillation from the flowers of *Citrus Aurantium*, var. *Bigaradia*, and diluted immediately before use with twice its volume of Distilled Water. It is a saturated solution of the volatile oil of the fresh flowers.

Characters: Colourless or with a slight greenish-yellow tint odour very fragrant.

Syrupus Aurantii Floris, B. P. Syrup of Orange-flower.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Preparation: To 16 fl. oz. boiling Distilled Water add 3 lbs. Refined Sugar; heat until dissolved; add 8 fl. oz. undiluted Orange-flower water; make the weight up to $4\frac{1}{2}$ lbs. by the addition of recently boiled Distilled Water.

Oleum Aurantii Florum *Synonym* Oil of Neroli. (Non-official).

A volatile oil distilled from fresh orange flowers with water.

Characters: A yellowish or brownish thin liquid with a powerful odour of orange flowers. If a little Alcohol be poured on the surface of the oil and the mixture gently undulated, a bright violet fluorescence will be observed.

Used only for flavouring.

LIMONIS CORTEX, B. P. Lemon Peel.

The fresh outer portion of the pericarp of the fruit of *Citrus medica*, var. *Limonum*, Hook. f. Cultivated extensively in subtropical countries.

Characters: Pale yellow, outer surface irregular with numerous glands containing the volatile oil. On the inner side there should be only a small amount of white spongy portion of rind: odour strong, characteristic, fragrant; taste, warm, aromatic, bitter.

The Fruit is ovoid or spherical, about 3" to 4" in diameter.

Oleum Limonis, B. P. Oil of Lemon.

• The oil obtained from the fresh Lemon Peel.

• *Dose*: $\frac{1}{2}$ to 3 mins.

Characters: Pale yellow; odour of lemon; taste warm, bitter aromatic.

Lemon oil is a volatile oil obtained by mechanical means from fresh Lemon Peel. It contains a large quantity of a variety of Terpene. The flavour is due to an aldehyde.

Syrupus Limonis, B. P. Syrup of Lemon.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Preparation : Macerate 1 oz. Fresh (or dried) Lemon Peel in thin slices or grated in $1\frac{1}{2}$ fl. oz. Alcohol (90 p. c.) for 7 days ; press ; filter ; add Alcohol (90 p. c.) sufficient to produce 2 fl. oz.

In 25 fl. oz. Lemon juice clarified by subsidence, dissolve by the aid of gentle heat 38 oz. Refined Sugar ; when cold mix with it the 2 fl. oz. of alcoholic liquid ; the product should weigh 4 lbs. 1 oz.

Tinctura Limonis, B. P. Tincture of Lemon.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 4).

Preparation : Take 5 oz. Fresh (or dried) Lemon peel, cut small, and 20 fl. oz. Alcohol (90 p. c.). Prepare by the maceration process.

Medicinal properties : Lemon Peel is **flavouring, aromatic, stomachic.** Useful in dyspepsia. The oil applied externally is **stimulant and rubefacient.**

Lemon peel contains a bitter substance and a volatile oil.

SUCCUS LIMONIS, B. P. Lemon Juice.

The freshly expressed juice of the ripe Lemon, the fruit of *Citrus medica*, var. *Limonum*.

Characters : A slightly turbid yellowish liquid, with a sharp acid taste ; should contain about 35 grs. Citric acid in the oz. 110 mins. Lemon Juice are neutralised by about $11\frac{1}{2}$ grains of Pot. Bicarb., by about $9\frac{1}{2}$ grains Sod. Bicarb. or by $16\frac{1}{2}$ grains Sod. Carb.

Medicinal properties : Antiscorbutic. Its actions are similar to those of Lime Juice.

LIME JUICE. The Juice of the fresh fruit of *Citrus medica*, var. *acida*. Cultivated in India.

The Lime fruit closely resemble the Lemon, but is smaller, has a smoother thinner rind ; with a less fragrant flavour.

Medicinal properties : Antiscorbutic, Refrigerent. Its actions depend on the organic salts present.

The Lime contains a larger proportion of Citric acid than does the Lemon.

Adult dose : 3 oz. daily, with sugar, diluted to make a pleasant drink.

BELÆ FRUCTUS ; Bael. The half ripe fruit of *Ægle Marmelos*, Corr., the Bengal Quince. (*Bel*, Hind.).

Characters as exported to England: Dried twisted slices or fragments, consisting of portions of the pericarp, with adherent pulp and seeds. The moistened pulp is mucilaginous.

The fruit is roundish, of the size of a large orange, with hard

better if used when fresh. On opening the bael, there are in the centre of the pulp, from five to eighteen cells, each containing one or more seeds in addition to glutinous matter.

The wood-apple, which resembles bael externally, has its seeds embedded in the pulp without cells.

Medicinal properties : **Astringent ; Antiscorbutic.** It is very useful in obstinate chronic dysentery and diarrhoea, in weak and dyspeptic patients, especially if there are signs of scurvy present. Other astringents are often added.

Dose : 2 oz. of the soft gummy fluid from the interior of the fruit, mixed with 3 or 4 oz. water, sweetened to taste and iced, for one dose. Repeat this twice or thrice daily. For children one-quarter to one-half of this quantity.

Bael seems to act as an intestinal tonic. It is astringent only if diarrhoea is present; under other conditions it is slightly aperient. The fully ripe fruit is sweet, aromatic, laxative.

Dietetic Bael : Sold in Calcutta, consists of dried Bael pulp carefully pulverised and mixed with arrowroot. It is useful when fresh bael of good quality cannot be obtained.

FERONIA ELEPHANTUM, Corr. The Wood-apple. (*Kaitha*, Hind.).

A tree cultivated throughout India. It yields a gum which may be used as a substitute for Gum Arabic.

A decoction of the unripe fruit is a powerful **astringent**, somewhat like Bael only more terebinthinate and less palatable.

The ripe fruit is **antiscorbutic**. The young leaves have an agreeable, aniseed-like aroma and are used as a **carminative** and **stomachic**.

SIMARUBEÆ.

QUASSIÆ LIGNUM, B. P. Quassia Wood.

The wood of the trunk and branches of *Picræna excelsa*, Lindl. Habitat, Jamaica.

Characters : Wood, dense, tough, yellowish; no odour; taste an intense, pure bitter.

• It somewhat resembles Sassafras, but is bitter, not aromatic.

Infusum Quassiæ, B. P. Infusion of Quassia.

Dose : $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 100).

A good vehicle for Iron preparations. • •

Preparation : Infuse 88 grains finely rasped Quassia Wood, in 20 fl. oz. cold water for 15 minutes, strain.

Cold water is used so as to dissolve out only the bitter principle

Liquor Quassiae Concentratus, B. P. Concentrated Solution of Quassia.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 10).

Preparation : Mix 2 oz. Quassia Wood in No. 40 powder with 2 fl. oz. Alcohol (20 p. c.) ; pack in a closed percolator ; set aside for 3 days ; percolate with 20 fl. oz. Alcohol (20 p. c.) added in 10 equal portions at intervals of 12 hours, continue percolation until the product measures 20 oz.

Tinctura Quassiae, B. P. Tincture of Quassia.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 10).

Preparation : Take Quassia Wood rasped 2 oz., Alcohol (45 p.c.) 20 fl. oz. Prepare by the maceration process.

Medicinal properties : Quassia is a non-astringent **Bitter Tonic** ; used in convalescence after acute diseases. It has the advantage of not causing constipation in headache. It is used also as an **anthelmintic** enema for thread worms.

Washing the exposed part with a weak infusion of Quassia gives protection against mosquitos, gnats and other noxious insects.

An efficient Fly-paper for poisoning flies, is made by dipping blotting paper in a sweetened solution of Quassia.

Quassia Wood contains a small quantity of a bitter, neutral substance. As it contains no tannin its soluble preparations are not blackened by the addition of a persalt of iron.

AILANTHUS EXCELSA, Roxb. (*Maharukha*, Hind.).

A large tree common in dry forests throughout India. The bark has a pleasant aromatic bitter taste, and is used as a **tonic** and **febrifuge**.

SAMADERA INDICA, Gaertn. (*Samadara*, Cing.).

A tree found in Western India and Ceylon. The wood contains a bitter principle and may be used as a substitute for Quassia.

PIORASMA QUASSIOIDES, Benn. (*Bharangi*, Hind.).

A small tree growing in the lower Himalayas. The wood is an efficient substitute for Quassia which it resembles.

BURSERACEÆ.

MYRRHA, B. P. Myrrh.

A gum-resin obtained from the stem of *Balsamodendron Myrrha*, Nees. Collected in Arabia and Abyssinia.

Dose : 10 to 30 grains in powder on pill.

Characters : Irregularly shaped tears or masses, varying in size ; externally reddish-brown or reddish-yellow, dry, brittle, the fractured surface irregular, somewhat translucent, colour rich

Tinctura Myrrhæ, B. P. Tincture of Myrrh.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5).

Preparation : Place 4 oz. Myrrh in coarse powder with 16 fl. oz. Alcohol (90 p. c.) in a closed vessel; set aside for 7 days with frequent agitation; filter; when the liquid ceases to drop, pass sufficient Alcohol (90 p. c.) through the filter to produce 20 oz.

Medicinal properties : Externally **stimulant antiseptic**; internally **stimulant** to the various mucous membranes, therefore **expectorant** and **emmenagogue**. Used in gargles; as a stomachic, in chronic respiratory affections, and in chlorosis with amenorrhœa.

Myrrh increases the leucocytes in the blood, hence its value in chlorosis. It is excreted largely by the genito-urinary mucous membranes, and thus acts as an uterine stimulant and emmenagogue.

It consists chiefly of a gum and an oleo-resin.

BALSAMODENDRON MUKUL, Hook. (*Maisa Gûgal*, Hind.).

A tree indigenous to Sind, Rajputana, Bengal, and Assam. It yields a gum-resin, the Gugul gum, or Indian Bdellium which is more mucilaginous than Myrrh.

Medicinal properties : Similar to those of Myrrh and (being cheaper) it may be used as a substitute for it.

CANARIUM COMMUNE, Linn. (*Jangli Badam*, Hind.).

A plant cultivated to a small extent in Southern India and Ceylon for its fruit, which has a taste resembling the almond. **East Indian Elemi** of the Pharmacopœia of India is a concrete resinous exudation very doubtfully referred to this tree.

The action of Elemi resembles that of Turpentine. It is used as a stimulating ointment, and is not administered internally.

The Kernels (Java Almonds) of the plant yield a bland oil which may be used as a substitute for Almond oil.

BOSWELLIA SERRATA, Roxb. (*Salga, Kundur, Gûgal*, Hind.).

A tree indigenous to the mountainous tracts of Central India. It yields a gum-resin similar to **olibanum** which has a balsamic resinous odour and a bitter aromatic taste.

Medicinal uses : Externally as a **stimulating ointment**. Internally it is excreted by the respiratory mucous membrane and hence may be used as an **antiseptic stimulating expectorant**.

MELIACEÆ.

AZADIRACTHÆ CORTEX, Nim bark. The bark of the Nim, Margosa or Indian Lilac Tree. *Melia Azadirachta*, Linn. (*Nim, Nimh*, Hind.) Cultivated throughout India.

Characters: If from trees above 3 years old, it is covered with thick scaly epidermis about $\frac{1}{2}$ inch thick. If from smaller branches, it is smooth, dull purple, with longitudinal lines of ash coloured epidermis about $\frac{1}{8}$ inch apart.

The active part is the inner layer of the bark.

Medicinal properties: **Astringent, Tonic, Febrifuge.** The powdered bark is given in 1 dr. doses thrice daily, or as a decoction prepared by boiling 2 oz. of the bruised inner layer of the bark with a few cloves, or a small piece of cinnamon, in 30 oz. water for 15 minutes and straining. When cold this is given in 2 oz. doses thrice daily.

Azadirachtæ Folia. Nim leaves.

Nim leaves bruised and moistened with tepid water are used as a **stimulating** poultice for chronic ulcers.

SOYMIDÆ CORTEX. Rohun Bark.

The bark of *Soymida febrifuga*, Juss., the Rohun Tree. (*Rohan*, Hind.). A large forest tree found in Central India.

Characters: Compact thick pieces, fibrous, colour rusty, taste bitter astringent.

It may be distinguished from the bark of *Strychnos Nux-vomica* by the absence of any red stain on applying Nitric Acid to its inner surface.

Medicinal properties: **Antiperiodic, Astringent, Tonic.** The best form of administration is 1 dr. of the powdered bark twice daily. A Decoction ($1\frac{1}{2}$ oz. Rohun Bark with 20 oz. water boiled for 15 minutes in a covered vessel and strained) is suitable for gargles, enemata, &c.

Rohun bark contains Tannic acid and a resinous bitter substance.

MELIA AZEDARACH, Linn., the Persian Lilac. (*Drek-Bakayan*, Hind.).

A large tree found in Western Himalayas.

Medicinal properties: The root-bark is **anthelmintic**. It may be given as a decoction (1 in 10 of water boiled down to half). Dose for a child. $\frac{1}{2}$ oz. repeated every 3 hours until it sensibly affects the stomach or bowels.

Large doses produce narcotic effects.

NAREGAMIA ALÂTA, W. & A., Goanese Ipecacuanha. Vern. *Tinpâni*, *Trifolio*.

A small woody shrub indigenous in Western and Southern India. The parts used are the root and slender stems divested of their leaves. Its actions are said to be similar to those of Ipec.

CELASTRINEÆ.

CELASTRUS PANICULATA, Willd. (*Malkóngni*, Hind.).

A shrub, found in Bengal, Burma and the Himalayas. By a rude form of distillation the natives obtain from the seeds a black empyreumatic oil known as **Oleum Nigrum** which in doses of 10 to 15 mins. twice daily is a powerful stimulant, diaphoretic and diuretic. •

It is said to be a remedy for Beri-beri.

EUONYMI CORTEX, B. P. *Euonymus* Bark.

The dried root-bark of *Euonymus atropurpureus*, Jacq.

Characters: Quilled or curved pieces; externally ashy grey with darker patches; internally whitish; odour faint characteristic; taste mucilaginous, afterwards bitter and acrid.

Extractum Euonymi Siccum, B. P. Dry Extract of *Euonymus*.

Dose: 1 to 2 grains.

An alcoholic extract containing about one-fifth of its weight of Calcium Phosphate.

Medicinal properties: **Cholagogue, Laxative.** It is a powerful hepatic, but feeble intestinal stimulant. It is used in bilious constipation, chronic malaria, and hepatic derangements.

It contains a bitter substance, a resin and a fixed oil.

Euonymin, (Non-official) a preparation containing a variable proportion of the resin and other ingredients.

RHAMNEÆ.

CASCARA SAGRADA, B. P. *Cascara Sagrada*; Sacred Bark.

Synonyms: **Rhamni Purshiani Cortex.** Habitat, North Pacific Coast.

The dried bark of *Rhamnus purshianus*, D C.

Characters: Quills of bark $\frac{1}{16}$ " thick; externally smooth greyish-white; beneath the surface and internally brownish, nearly smooth and striated longitudinally; fracture short; on inner surface fibrous; odour slight characteristic; taste bitter, nauseous, persistent. •

Extractum Cascaræ Sagradæ, B. P. Extract of *Cascara Sagrada*.

Dose: 2 to 8 grains. May be given in Pill.

An aqueous extract evaporated to dryness. •

Extractum Cascaræ Sagradæ Liquidum, B. P. Liquid Extract of *Cascara Sagrada*.

Dose: $\frac{1}{2}$ to 1 fl. drm. Strength 1 in 1. An aqueous extract with alcohol (20%) added.

Syrupus Cascaræ Aromaticus, B. P. Aromatic Syrup of Cascara.

Dose : $\frac{1}{2}$ to 2 fl. drms.

Preparation : Mix together 8 fl. oz. Liquid Extract of Cascara Sagrada, 2 fl. oz. Tincture of Orange, 1 fl. oz. Alcohol (90 p. c.), 3 fl. oz. Cinnamon Water, 6 fl. oz. Syrup.

Medicinal properties : Intestinal tonic, useful specially in chronic constipation, and atony of the alimentary tract.

Smaller doses than those stated above may be given on rising or at bed time, or thrice daily before meals. Large doses are purgative.

Cascara Sagrada contains much tannin and several resinoid bodies.

AMPELIDEÆ.

UVÆ, Raisins.

The dried, ripe fruit of *Vitis vinifera*, Linn., the Grape Vine. (*Munakka*, *Kishmish*, Hind.). Cultivated in all temperate regions of the world.

Characters : Fruit shrivelled, compressed, smooth, free from sugary or saline incrustations, agreeably fragrant ; pulp soft sweet.

Medicinal properties : **Demulcent, nutritious.** Used chiefly for flavouring.

Raisins contain grape sugar, Acid Tartrate of Potassium, malic acid, and gum. The skins yield tannin.

VINUM XERICUM, B. P. Sherry. A Spanish Wine.

Made by fermenting the unmodified juice of the grape freed from seeds, stems, and skins.

Characters : Pale yellowish-brown ; containing not less than 16 p. c. by volume of ethylic hydroxide. It contains also Acid Tartrate of Potassium, Acids, Ether, Sugar, &c. ; on these its medicinal properties depend.

VINUM RUBRUM, Red wine. A deep red alcoholic liquor ; made by fermenting the juice of red grapes with their skins.

SAPINDACEÆ.

SAPINDUS TRIFOLIATUS, Linn. A large tree common in Southern India. Cultivated in Bengal.

SAPINDUS MUKOROSI, Gaertn. The soap-nut tree of Northern India. (*Ritha*, Hind.).

Medicinal properties : Soap-nuts powdered are used in doses of 10 to 20 grs. as an expectorant ; 1 to 2 drms. as an emetic.

They contain a large amount of saponin, and are used as a substitute for soap.

ANACARDIACEÆ.

MASTICHE Mastic.

The resinous exudation obtained from the stems by incision of *Pistacia lentiscus*, Linn. Habitat; countries around the Mediterranean.

Characters: Small irregular pale yellow tears, brittle; becoming ductile when chewed; odour fragrant; taste resinous.

It somewhat resembles Gum Acacia, but is smaller, more yellow, smoother and more transparent.

Medicinal properties: **Stimulant, Diuretic**, but not used as such.

Used: As a temporary **stopping for carious teeth**. A solution of 2 parts Mastic dissolved in 1 of either Chloroform or Ether, and applied on cotton wool, remains as a firm plug after evaporation of the solvent.

Mastiche is an oleo-resin; in action similar to Turpentine.

PISTACIA INTEGERRIMA, Stewart.

A tree found on the mountains from Peshawar to Simla. It yields gall-like excrescences; hard, hollow, irregular, externally greyish, internally yellow; about 1" or more in size and shaped like a horn, hence their name (*Kakra singi*, Hind.). They contain nearly 75 p. c. tannin.

Medicinal properties: Intestinal **astringent**.

Adult dose: 20 grns. of the powdered galls combined with other astringents.

CHIAN TURPENTINE.

An oleo-resin obtained from *Pistacia Terebinthus*, Linn. Obtained from the island of Scio, in the Mediterranean; also from Afghanistan, Sind, &c., when it is known as Kabuli-mastaki or Bombay Mastic.

Characters: A soft solid with characteristic odour.

• *Medicinal properties*: Recommended in the treatment of **Cancer**.

• *Adult dose*: 5 to 10 grns.

Dr. Clay's Cancer Pill. Take of Chian Turpentine 3 grns. Sulphur 2 grns. Mix, one Pill. Dose one or more at a time.

MANGIFERA INDICA, Linn. The Mango tree. (*Am, Amb, Hind.*). Is common throughout India.

The fruit is egg-shaped, flattened slightly. It is largely used unripe, made into sherbet, pickles, chutney, &c.; ripe as a table fruit. The kernels are large flattened seeds; they contain about 10 p. c. of Tannic Acid.

Medicinal properties : The seed powdered, known as **amar kusi**, is used in 20 to 30 grns. doses as an anthelmintic for round worms. It may also be used as an intestinal astringent.

ANACARDIUM OCCIDENTALE, Linn. The Cashew tree. (*Kaju*, Hind.).

Indigenous to the sea coasts of India. A gum (containing true gum and bassorin), only partially soluble in water, exudes from the bark.

A bland oil similar to olive oil is obtained by expression from the seeds. The shell of the nut contains a black caustic fluid containing an acrid oil, and Anacardic Acid which may be applied to timber, books, &c., to prevent the attack of white ants. It is used by the natives of India as a vesicant but is dangerous.

Medicinal uses : The expressed oil may be used as a substitute for olive oil.

PISTACIA VERA, Linn. The Pistachio-Nut tree, (*Nuts, Pista*, Hind.).

A tree cultivated in Afghanistan. The nuts are used as food. The galls (*Gul-i-pisteh, Bazghang*, Hind.) formed on the leaves contain an oleo-resin and nearly 45 p. c. Tannin and may be used as an astringent.

SEMECARPUS ANACARDIUM, Linn. The Marking Nut Tree. (*Bhela, Bhilawa*, Hind.). A tree common on the temperate Himalayas and in Eastern Bengal.

A black oily acrid juice obtained from the seeds is used by the natives of India for marking cotton material. It is used in combination with lime water or caustic lime, and is insoluble in water; but if treated with a strong alkali it is soluble in Alcohol.

Medicinal properties : The juice of the nut is used by the natives of India as a counterirritant, but is too risky to be recommended.

MORINGEÆ.

MORINGA PTERYGOSPERMA, Gaertn. The Horse-radish tree of Anglo-Indians. (*Shajna*, Hind.).

Found in the lower Himalayas. Cultivated extensively in India and Burma for its leaves, flowers and immature capsules which are used for curries.

The root resembles in appearance and colour the European Horse-radish for which it is an efficient substitute.

The essential oil obtained by distillation with water is more pungent and offensive than mustard or garlic, and is used externally as a rubefacient.

The fresh root is acrid and vesicant, and as such the expressed juice is added to Mustard poultice. An infusion (of 1 in 20 boiling water allowed to stand two hours and strained) is given in

LEGUMINOSÆ.

GLYCYRRHIZÆ RADIX, B. P. Liquorice Root.

The peeled root and peeled subterranean stem of *Glycyrrhiza glabra*, Linn. Cultivated in England.

Characters: Long cylindrical pieces, smooth when fresh; powdery when dried; before being peeled dark brown, longitudinally wrinkled, not scaly, inside yellow; odour sickly and earthy; taste sweet, free from bitterness.

It somewhat resembles Pyrethrum and Taraxacum, but these have not a sweet taste.

Extractum Glycyrrhizæ, B. P. Extract of Liquorice.

An aqueous extract evaporated to the consistence of a soft extract.

Extractum Glycyrrhizæ Liquidum, B. P. Liquid Extract of Liquorice.

Dose: $\frac{1}{2}$ to 1 fl drm.

An aqueous extract with $\frac{1}{4}$ of its volume of Alcohol (90 p. c.) added.

Pulvis Glycyrrhizæ Compositus, B. P. Compound Powder of Liquorice.

Dose: 60 to 120 grns., as a mild aperient. It acts as a preparation of Senna.

Preparation: Take 2 oz. Senna, 2 oz. Liquorice root, 1 oz. Fennel Fruit, 1 oz. Sublimed Sulphur, 6 oz. Refined Sugar, all powdered; mix.

Medicinal properties: Liquorice is **Sialagogue**, **Demulcent**, **Expectorant**, specially useful in coughs originating in the upper respiratory tract.

Slowly chewed it is used to allay irritation of the pharynx or larynx. It is also used to **disguise the taste** of nauseous medicines; and as a basis for pills.

Liquorice contains starch, sugar, and a sweet principle, Glycyrrhizin. When a solution of Liquorice in water is treated with dilute Sulphuric Acid, Glycyrrhizin is thrown down as a tasteless precipitate; on addition of an alkali, its characteristic sweetness is developed.

SCOPARII CACUMINA, B. P. Broom tops.

The fresh and the dried tops of *Oxyris Scoparius*, Link. Found in hilly parts of Britain.

Characters: **Stem** dark green with long straight slender alternate branches, which are winged, tough, flexible glabrous; **leaves**

small, sessile, simple above, stalked and trifoliate below; odour if fresh, when bruised characteristic; if dry nearly odourless; taste bitter, nauseous.

Infusum Scoparii, B. P. Infusion of Broom.

Dose: 1 to 2 oz. (Strength 1 in 10).

Preparation: Infuse 2 oz. Broom Tops dried and bruised with 1 pint boiling Distilled Water, in a covered vessel for 15 minutes, strain.

Succus Scoparii, B. P. Juice of Broom.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Preparation: Bruise fresh Broom Tops: press out the juice; to every 3 volumes add 1 of Alcohol (90 p.c.); set aside 7 days; filter.

Medicinal properties: **Diuretic** in large doses emetic and purgative. Used chiefly in dropsy depending on chronic renal disease. It is contraindicated in acute renal condition.

Broom tops contain two active substances, one, scoparin supposed to be diuretic; the other, Sparteine, which is a Cardiac tonic and diuretic, more rapid but less persistent in action than Digitalis.

TRAGACANTHA, P. B. Tragacanth.

A gummy exudation obtained by incisions made in the stems of several species of *Astragalus*. It is known in commerce as Syrian Tragacanth.

Characters: White or yellowish-white flakes, curved, ridged, translucent, tough, elastic; without odour, nearly tasteless; with water it swells into a gelatinous mass, which is tinged faintly violet by solution of Iodine.

It resembles Scilla, but is thinner and less opaque.

Adult dose of Powdered Tragacanth; 20 grns. or more.

Glycerinum Tragacanthæ, B. P. Glycerin of Tragacanth.

An excipient for pill-making.

Preparation: Mix $\frac{1}{2}$ oz. Tragacanth with $1\frac{1}{2}$ fl. oz. Glycerin, add $\frac{1}{2}$ fl. oz. Distilled Water: triturate until a homogeneous paste is produced.

Mucilago Tragacanthæ, B. P. Mucilage of Tragacanth.

Preparation: Mix 60 grns. powdered Tragacanth with 2 fl. drms. Alcohol (90 p. c.), in a bottle; add Distilled Water sufficient to make 10 fl. oz.; shake immediately.

Pulvis Tragacanthæ Compositus, B. P. Compound Powder of Tragacanth.

Dose: 20 to 60 grains.

Preparation: Take 1 oz. Tragacanth, 1 oz. Gum Acacia, 1 oz. Starch, 3 oz. Refined Sugar, all in powder, mix.

Of this 15 grains is the proper quantity to add to each oz. of a mixture to suspend heavy powders.

The simple Tragacanth powder is preferable to the Compound Powder as it is less likely to ferment.

Medicinal uses: Chiefly to suspend heavy powders as Bismuth; and to make Cod oil emulsion.

Internally it acts at first as a demulcent. In the stomach it is partly converted into sugar, and so has a slight nutritive value.

Tragacanth consists principally of two kinds of gum: one soluble in water, like ordinary Gum Acacia, but precipitated by Acetate of Lead; the other, **Bassorin**, unfermentable, and nearly insoluble in water, but which on the addition of water swells up into a gelatinous mass, hence its value to suspend heavy powders.

Tragacanth gives more than 25 times the viscosity to water than a like quantity of Gum Acacia does.

PTEROCARPI LIGNUM, *B. P.* Red Sanders wood. *Synonym* Red Sandal-wood. (*Rukhtu-chandan, Lal-chandan, Hind.*).

The heart-wood of *Pterocarpus Santalinus*, Linn. f. A small tree found in Southern India.

Characters: Sliced or rasped pieces, externally dark reddish-brown, cut transversely, deep blood-red; aroma when warmed faint; taste slightly astringent.

Medicinal use: Only as a colouring agent. Used in making Tr. Lavand. Co. It may be used as a substitute for Cochineal.

It contains a resinoid colouring body.

KINO, *B. P.* Kino.

The inspissated juice obtained from incisions in the trunk of *Pterocarpus Marsupium*, Roxb., a large tree of Southern India. (*Bija, Bijasar, Hind.*).

Dose: Of powdered Kino 5 to 20 grains.

Characters: Small, angular, brittle, glistening, reddish-black fragments, translucent and ruby-red on the edges; without odour; astringent, tingeing the saliva blood-red; soluble in Alcohol (90 p. c.) partly soluble in water.

Pulvis Kino Compositus, *B. P.* Compound Powder of Kino.

Dose: 5 to 20 grains. (Contains 5 p. c. Opium).

Preparation: Take $3\frac{3}{4}$ oz. Kino, $\frac{1}{4}$ oz. Opium, 1 oz. Cinnamon Bark, all powdered; mix; keep in a closed bottle.

Tinctura Kino, *B. P.* Tincture of Kino.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 10).

Preparation: Mix 3 fl. oz. Glycerin with 5 fl. oz. Distilled Water; rub 2 oz. Kino powdered in a mortar with a sufficient quantity of the mixture to form a smooth paste, gradually adding the remainder of the mixture; transfer to a closed vessel; add 10 fl. oz. Alcohol (90 p. c.); set aside for 12 hours, frequently agitating; filter through a plug of cotton wool: pass through the filter sufficient Alcohol (90 p. c.) to form 1 pint.

The Glycerin is added to prevent gelatinisation. •

Medicinal properties: **Astringent.** Being only slightly soluble, its astringent action is most marked in the lower extremity of the intestinal canal.

Used in pyrosis and diarrhoea, and as a gargle in relaxed sore throat. Externally as a styptic; and an astringent application to indolent ulcers. •

Kino contains Kino-tannic acid, which with Ferrous salts gives a violet colour, turning green on exposure.

True Kino is rarely to be had in the bazars of India; that usually sold as Kino is the Butea Gum, or Bengal Kino. (See p. 67).

Incompatibles: Mineral acids, metallic salts, alkalis, alkaline carbonates and gelatine.

BOTANY BAY KINO is the product of various species of *Eucalyptus*, see *Eucalypti Gummi*.

BALSAMUM PERUVIANUM, B. P. Balsam of Peru.

A Balsam obtained from the trunk of *Myroxylon Pereiræ*, Klotzsch, after the bark has been beaten and scorched. Habitat, Central America.

Dose: 5 to 15 mins. •

Characters: A dark orange-brown, transparent viscid liquid: odour agreeable balsamic; taste acrid. Insoluble in water; solubility 1 in 1 of Alcohol (90 p. c.), but on the addition of 2 or more volumes of the Alcohol the mixture becomes turbid.

Medicinal properties: **Stimulant, Expectorant, Tonic.** Useful in chronic pulmonary and urinary conditions with excessive discharge. It may be given as an emulsion with mucilage or sugar and yolk of egg; externally it may be applied to chronic ulcers, &c.

Balsam of Peru contains Cinnamic Acid, Benzoic Acid, a Resin, and a Volatile oil.

BALSAMUM TOLUTANUM, B. P. Balsam of Tolu.

A balsam obtained by making incisions in the trunk of *Myroxylon Toluifera*, H. B. and K. Habitat, South America.

Dose: 5 to 15 grains as an emulsion with mucilage and sugar.

Characters: A soft solid, becoming harder on keeping; in thin films, of a yellowish-brown colour, but in bulk looks darker, odour

pressed between two warmed pieces of glass and then examined with a lens it exhibits an abundance of crystals of Cinnamic Acid, Soluble in Alcohol (90 p. c.).

Syrupus Tolutanus, B. P. Syrup of Balsam of Tolu.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 40 by weight nearly).

Preparation: Boil $1\frac{1}{4}$ oz. Balsam of Peru in 20 oz. Distilled Water for half an hour in a lightly covered vessel, stirring frequently; remove from the source of heat; add Distilled Water up to 16 oz.; when cold filter; add 2 lbs. Refined Sugar; dissolve by aid of a water bath; the product should weigh 48 oz.

Tinctura Tolutana, B. P. Tincture of Balsam of Tolu.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 10).

Preparation: Place 2 oz. Balsam of Tolu in 16 fl. oz. Alcohol (90 p. c.); set aside in a closed vessel; agitate occasionally until the balsam is dissolved; filter; pass sufficient Alcohol (90 p. c.) through the filter to produce 20 fl. oz.

Medicinal properties: Antiseptic; Stimulant; Tonic; Expectorant, diminishing the secretions.

Uses: Externally in chronic indolent ulcers, sore nipples and in parasitic skin diseases. Internally in chronic catarrh, asthma, rheumatism, also in gleet, etc., and for flavouring and disguising.

It is less powerful than Balsam of Peru; its constituents being the same but in different proportions.

PHYSOSTIGMATIS SEMINA, B. P. Calabar Bean.

The ripe seeds of *Physostigma venenosum*, Balfour. Habitat, Western Africa.

Characters: Chocolate-brown, oblong kidney-shaped, about 1" long, $\frac{3}{4}$ " broad and $\frac{1}{2}$ " thick; a broad dark furrow extends nearly the entire length of the curved margin; the testa is hard, thick, somewhat rough, and encloses two firm white starchy cotyledons, between which there is a large cavity; without odour or taste.

Extractum Physostigmatis, B. P. Extract of Calabar Bean.

Dose: $\frac{1}{4}$ to 1 grain; may be given thrice daily.

An Alcoholic extract evaporated to the consistence of a very soft extract and then 3 times its weight of Milk Sugar added.

Medicinal properties: Calabar Bean is highly poisonous; in over doses producing paralysis of the lower extremities, and death by asphyxia, in larger doses by cardiac paralysis. In medicinal doses it is regarded as an Intestinal Tonic, Laxative, and Antispasmodic in Tetanus, but these actions are questionable. It increases most of the secretions, and also produces irregular peristalsis. It has therefore been recommended for habitual constipation. After absorption it excites muscular spasm

depend on the proportion of alkaloids present in the specimen and as this varies, conflicting statements are given by different authorities. It is almost useless as an antidote in poisoning by Strychnine, Atropine, or Chloral.

Calabar Bean contains two alkaloids, **Physostigmine** (Synonym, **Eserine**) and Calabarine which have properties somewhat antagonistic to each other.

PHYSOSTIGMINÆ SULPHAS, B. P. Physostigmine Sulphate.

Synonym Eserine Sulphate.

The sulphate of an alkaloid obtained from Calabar Bean.

Dose: $\frac{1}{60}$ to $\frac{1}{20}$ grain.

Characters: Yellowish-white minute crystals, becoming red by exposure to light and air; very deliquescent, taste bitter; very soluble in water, soluble in Alcohol (90 p. c.).

Lamellæ Physostigminæ, B. P.

Discs of Gelatin with some Glycerin; each containing $\frac{1}{1000}$ grain Physostigmine Sulphate.

Medicinal properties: Myotic; used to neutralise the action of mydriatics.

Eye-drops of Eserine Sulphate are used of a strength of 2 to 4 grns. in 1 oz. water. Cocaine Hydrochlor. 1 p. c. may be added to relieve pain. The discs inserted beneath the eyelids are the most convenient form of administration.

HÆMATOXYLI LIGNUM, B. P. Logwood.

The heart wood of *Hæmatoxylon campechianum*, Linn. Habitat, Central America.

Characters: Chips or coarse powder of hard heavy wood; externally dull orange to purplish-red; internally, reddish-brown; odour slight agreeable; taste sweetish astringent; when chewed it colours the saliva pink.

The unfermented wood should be used.

It somewhat resembles Red Sandal wood, but is less dense and more astringent.

Decoctum Hæmatoxyli. Decoction of Logwood.

Dose: $\frac{1}{2}$ to 2 fl. oz.

Preparation: Boil 1 oz. Logwood in chips with 24 oz. Distilled Water for 10 minutes; towards the end of the time add 70 grains Cinnamon Bark; strain; pour sufficient Distilled Water over the contents of the strainer to make 20 fl. oz.

If Iron vessels be used the decoction is blackened.

The Decoction along with Ac. Sulph. Arom. makes a good prescription for the diarrhoea of phthisis.

Logwood contains Tannic Acid to which its action is due, and a substance *hæmatoxylin* which becomes red on exposure to light. In order to develop this colour in the wood it is fermented (oxidised) before being sent to market.

Incompatibles: Mineral Acids, Metallic Salts, Lime Water, Tartar Emetic.

ARAROA, B. P. Araroba. *Synonyms*, Goa powder, Crude Chrysarobin.

A substance found in cavities of the trunk of *Andira araroba*. Aguiar; freed from fragments of wood, dried, and powdered.

Characters: Brownish-yellow to umber-brown coloured powder without odour or taste. With hot chloroform it should yield at least 50 p. c. of Chrysarobin.

CHRYSAROBINUM, B. P. Chrysarobin.

A substance obtained from Araroba by extracting with hot chloroform, evaporating to dryness and powdering. It consists chiefly of a definite chemical substance also known as Chrysarobin but contains a varying proportion of Chrysophanic Acid.

Characters: Yellow crystalline powder, without odour or taste: slightly soluble in water, freely soluble in hot Alcohol (90 p. c.), or hot Chloroform.

It stains the skin and linen yellow. It partially dissolves in Liquor Potassæ, forming a yellow to reddish fluorescent solution, which gradually changes to carmine by absorption of oxygen from the air, and so becomes true Chrysophanic Acid.

Unguentum Chrysarobini, B. P. Chrysarobin Ointment.

Preparation: Triturate 20 grains Chrysarobin gradually with 480 grains Benzoated Lard previously melted, continue the heat until the Chrysarobin is dissolved: stir until cold.

Medicinal properties: Antiparasitic.

Use: Externally, in chronic psoriasis and parasitic skin diseases. It may be applied to the skin moistened with vinegar or saliva or as ointment. It is not given internally.

It should never be applied to the head, nor to a large surface of the body at one time, as it may produce irritation.

SENNA. Senna. The dried leaflets of various species of *Cassia*. Both Alexandrian and East Indian Senna are recognised in the B. P. Both varieties are characterised by being unequally oblique at their bases, and by being free from bitterness. This distinguishes Senna from other substances resembling it.

When Senna is ordered in the Pharmacopœia either the Alexandrian or the East Indian variety may be used.

Dose of powdered Senna, 10 to 30 grains

SENNA ALEXANDRINA, B. P. Alexandrian Senna.

The dried leaflets of *Cassia acutifolia*, Delile.

Characters: Pale greyish-green, thin, brittle leaflets, $\frac{3}{4}$ " to $1\frac{1}{4}$ " long; outline lanceolate or oval lanceolate, acute, entire, and unequal at the base; surface covered with minute hairs; veins on under surface distinct; odour faint, tea-like; taste mucilaginous, somewhat unpleasant.

SENNA INDICA, B. P. East Indian Senna. *Synonym* Tinnivelly Senna. *Sana*, Hind.

The dried leaflets of *Cassia angustifolia*, Vahl. Cultivated in Southern India.

Characters: 1" to 2" long, lanceolate, acute, thin, entire, smooth; green above, duller beneath, odour faint, tea like; taste mucilaginous, nauseous, sweetish.

Confectio Sennæ, B. P. Confection of Senna; known also as Lenitive Electuary.

Dose: 60 to 120 grains. (Strength of Senna, 1 in $10\frac{1}{2}$).

Preparation: Boil 12 oz. Figs and 6 oz. Prunes gently with 24 fl. oz. Distilled Water, in a covered vessel for 4 hours; add Distilled Water to make up the quantity to its original volume; incorporate 9 oz. Tamarind and 9 oz. Cassia Pulp; digest for 2 hours; rub the softened pulp of the fruits through a hair sieve, rejecting the seeds and other hard parts; to the pulp thus obtained add 30 oz. Refined Sugar and 1 oz. Extract of Liquorice; dissolve by gentle heat; while it is still warm add gradually a mixture composed of 7 oz. Senna and 3 oz. Coriander fruit, both finely powdered; mix thoroughly; make the weight of the resulting confection to 75 oz. either by evaporation or addition of Distilled Water.

Infusum Sennæ, B. P. Infusion of Senna.

Dose: $\frac{1}{2}$ to 1 fl. oz.; as a draught 2 fl. oz. (Strength 1 in 10).

Preparation: Infuse 2 oz. Senna and 55 grains sliced Ginger with 20 fl. oz. boiling Distilled Water, in a covered vessel for 15 minutes; strain.

This is the best preparation of Senna. If taken hot with milk and sugar it is hardly distinguishable from ordinary tea.

Liquor Sennæ Concentratus, B. P. Concentrated Solution of Senna.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 oz. Conc. Liq. equals 1 oz. of Senna).

An aqueous solution to which is added $\frac{1}{8}$ of Tr. Zingib. and $\frac{1}{10}$

Mistura Sennæ Composita, B. P. Compound Mixture of Senna. *Synonym Black Draught.*

Dose : 1 to 2 fl. oz. as a draught.

Preparation : Dissolve 5 oz. Magnesium Sulphate in 10 fl. oz. of Infusion of Senna; to this add a mixture containing 1 fl. oz. Liquid Extract of Liquorice, 2 fl. oz. Compound Tincture of Cardamoms, and 1 fl. oz. Aromatic Spirit of Ammonia; add Infusion of Senna to make 20 fl. oz.

Syrupus Sennæ, B. P. Syrup of Senna.

Dose : $\frac{1}{2}$ to 2 fl. drms. (Strength 10 of Senna in 23).

Tinctura Sennæ Composita, B. P. Compound Tincture of Senna.

Dose : $\frac{1}{2}$ to 1 fl. drm. for repeated administration; for a single administration 2 to 4 fl. drms. (Strength 1 in 5).

Preparation : Take 4 oz. Senna broken small, 2 oz. Raisins freed from seeds, $\frac{1}{2}$ oz. Caraway Seeds, $\frac{1}{2}$ oz. Coriander Seeds, both bruised, 20 fl. oz. Alcohol (45 p. c.). Prepare by the maceration process.

Pulvis Glycyrrhizæ Compositus, B. P. Compound Liquorice Powder, is a preparation of Senna specially useful as a habitual laxative in chronic constipation. Cf. Glycyrrhiza.

Medicinal properties of Senna : **Laxative or Purgative**, according to dose specially suited to infants, delicate females and old persons. To prevent nausea or griping it is best given with aromatics.

Senna is a feeble hepatic stimulant. The active ingredient is Cathartic Acid; this acts chiefly on the small intestine, increasing peristalsis and secretion, and producing purgation within about 5 hours. The use of Senna is not followed by a reactionary constipation, it may therefore be used habitually in chronic intestinal atony.

Cathartic Acid is absorbed into the blood, and is excreted by the kidneys and mammary gland, it may therefore produce purgation in infants at the breast.

CASSIÆ PULPA, B. P. Cassia Pulp.

The pulp obtained from the pods of *Cassia Fistula*, Linn., the Indian Laburnum. Habitat, East and West Indies. (*Amaltas*., Hind.).

Dose : 60 to 120 grains as a Laxative 1 to 2 oz. as a purgative.

Characters : The pods $1\frac{1}{2}$ to 2 feet long, $\frac{3}{4}$ to 1" in diameter, cylindrical, shortly stalked, blackish-brown, hard, indehiscent, the sutures marked by two smooth longitudinal bands; divided internally by thin transverse partitions into numerous cells, each containing a smooth flattish-oval, reddish-brown seed surrounded

The pulp is viscid nearly black; odour faint; taste sweet.

Medicinal properties: A simple **Laxative**; usually given in combination with other drugs. Large dose produce nausea, flatulence, and griping.

Cassia pulp contains Sugar with a purgative substance similar to that in Senna.

TAMARINDUS, B. P. Tamarinds.

The fruits of *Tamarindus indica*, Linn., freed from the brittle outer part of the pericarp and preserved with Sugar. Habitat Africa, but cultivated throughout the Tropics.

Characters: A reddish-brown moist sugary mass, containing strong branched fibres, and brown, shining seeds, each of which is enclosed in a tough membranous coat; taste agreeable, refreshing subacid.

Test for Copper. A piece of bright Iron left for 1 hour in contact with the pulp should not show any deposit of Copper.

Dose: $\frac{1}{4}$ -oz. and upwards.

Medicinal properties: **Refrigerent**, slightly **Laxative**. A watery infusion makes a cooling drink and as such is used in fevers.

Tamarinds contain Sugar, organic acids and salts.

The Tamarind tree is cultivated throughout India and Burma. (*Amlī, Ambica*, Hind.). The name from the Persian (Tamar-hindi) signifies Indian date.

The **East Indian** or **Black Tamarinds** occur in rounded cakes composed of black solid pulp more or less green from fibre and husk. The West Indian variety is known as **Red Tamarinds**.

COPAIBA, B. P. Copaiba. *Synonym, Copaiva.*

An oleo-resin obtained from the trunk of various kinds of *Copaifera*. Obtained from South America.

Characters: Viscid, transparent, pale golden-coloured liquid; odour peculiar aromatic, taste acrid bitter. Insoluble in water, soluble in ether or oils; with equal parts or less of Alcohol, (90 p. c.), it forms a clear solution, with more the solution is cloudy. It can dissolve $\frac{1}{4}$ its weight of Magn. Carb.

Dose: $\frac{1}{2}$ to 1 fl. drm. thrice daily.

May be given floating on Aromatic Water; or as an emulsion made by rubbing it with $1\frac{1}{2}$ times its bulk of mucilage, or yolk of egg and sugar, and then adding some Aromatic Water.

With Liq. Potassæ it forms a soap. Tr. Zingib. or Tr. Aurant. may be added to cover the taste.

Oleum Copaibæ, B. P. Oil of Copaiba.

Characters : Colourless or pale yellow, with odour and taste of Copaiba.

Dose : 5 to 20 mins.

Medicinal properties : **Stimulant** to mucous membranes. Used as an **expectorant** in chronic bronchitis with excessive secretion ; as a **diuretic** in dropsies of cardiac or hepatic origin, also in gonorrhœa and chronic cystitis.

It is contraindicated in acute inflammations, irritable conditions of the intestinal tract, and in renal disease.

Copaiba contains several resins dissolved in a volatile oil. It is excreted by the skin, and by the mucous membrane of the lungs, and kidneys, and in passing out, stimulates them. Its action in gonorrhœa seems to depend on its producing a large flow of anti-septic urine, so washing out the urethra.

In large doses it is a gastro-intestinal irritant, producing vomiting and purging. It often produces a skin eruption of rose-coloured spots, with intense itching, coming on suddenly, and affecting chiefly the back of the arms and legs.

The urine of patients taking Copaiba if treated with Nitric Acid, sometimes gives a deposit resembling albumen, but differing in that it disappears on heating.

ACACIÆ GUMMI, B. P. Gum Acacia.

A gummy exudation from the stem and branches of different varieties of *Acacia*. *Habitat*, Africa.

Characters : Spheroidal tears, opaque from numerous cracks ; colour white, yellowish or brownish ; odour none ; taste bland, mucilaginous ; soluble in water, insoluble in Alcohol (90 p. c.), Ether, or oils.

Mucilago Acaciæ, B. P. Mucilage of Gum Acacia.

Preparation : Rapidly rinse 4 oz. Gum Acacia with a little Distilled Water ; dissolve it in 6 fl. oz. Distilled Water in a closed vessel ; strain, (this is best done through well shrunk flannel).

Mucilage keeps best if stored in full bottles in a cool place.

Incompatibles : It is insoluble in Alcohol ; Sulphuric Acid chars it ; with Borax, Persalts of Iron or Subacetate of Lead the mucilage becomes gelatinous.

Medicinal properties : **Emollient ; Nutritive ; Demulcent.** Is used to suspend heavy powders, but for this Tragacanth is better ; to make powders into pills, but as these soon become hard, a solution of glycerine and mucilage acts better ; also to make emulsions.

Internally : Made into lozenges with other drugs, it is useful in coughs and sore throats, also in catarrhal inflammation of the stomach and intestines.

A good demulcent drink is made by mixing one part each of mucilage and syrup in 20 of water.

Gum Acacia consists chiefly of Calcium Arabate.

Gum Arabio. (*Babul-ka-gond*, Hind.) is the product of *Acacia Arabica* and other kinds of *Acacia* found in India. It is often substituted for the official Gum Acacia, but is inferior in quality and often mixed with impurities.

ACACIA BARK. (*Babul-ka-chal*, Hind.)

The bark of the *Acacia Arabica*, Willd., or Babla tree, common throughout Bengal. It contains about 20 per cent. of Tannin. A decoction (made by boiling $1\frac{1}{2}$ oz. of the powdered bark in 20 oz. water for ten minutes and straining) is given internally in doses of $1\frac{1}{2}$ to 2 oz. in diarrhoea, or it may be used as injection, or for any of the other purposes to which vegetable astringents are applied, either alone or combined with aromatics.

TRIGONELLA FÆNUM-GRÆCUM. The Fenugreek. (*Methi*, *Methika*, Hind).

An annual herb, cultivated in Kashmir, Panjab, Bombay and Madras.

The seeds are small mucilaginous with a faint odour. They are used in cooking, and as a constituent of condition powders for horses.

Medicinal properties: The seeds are used in India as a tonic and carminative.

INDIGOFERA TINCTORIA. The true Indigo plant. (*Indigo*; *Nil*, Hind.).

A shrub, erect, 2 to 3 ft. high; cultivated extensively throughout India for the dye it yields.

Indigotin (=indigo blue) has been prepared artificially.

Medicinal properties: Indigo is used as a stimulating application to chronic ulcers. Its value used internally as a nerve tonic is doubtful.

Indigo. B. P. Appendix. A blue pigment prepared from various species of *Indigofera*, Linn.

BABCHI SEEDS. Obtained from *Psoralea corylifolia*, Syn. *Trifolium unifolium*. (*Babchi*, *Babachi*, Hind.) They contain an oleo-resin which has been recommended as a specific for leucoderma. Any good results however are probably due to other substances mixed with them before application.

ALHAGI MAURORUM. The Persian Manna Tree. (*Iayasi*, Hind.).

A shrub indigenous to the deserts of Africa, South Western Asia and India. A saccharine substance called **Taranjabin**

exudes from its leaves and branches. This occurs as small brown granular tears mixed with leaves, stalks, &c., and has the actions of Manna.

SOLA. The spongy stems of *Æschynomene aspera*, the Sola plant, a small bush found in marshy land throughout India.

Uses : The spongy pith is made into sun hats, also as a substitute for surgical lint, cork, &c.

ABRI RADIX. Indian or Jamaica Liquorice. (*Gungaka-jar*, Hind.) The root of *Abrus precatorius*, Linn., a climbing plant, common throughout India.

Characters : The root is $\frac{1}{2}$ " to 1" diameter in varying lengths; externally pale brown; internally yellowish; without odour; taste, sweetish mucilaginous.

Medicinal properties : Similar to those of Liquorice and Sarsaparilla, for which it forms a reputed substitute.

The root may be made as a syrup by boiling 2 oz. of fresh *Abrus* roots with 1 oz. *Abelmoschus* capsule sliced, in 10 oz. water for half an hour, straining, then adding 8 oz. sugar or honey and boiling down to the consistence of a syrup.

Dose : 1 drm. to $\frac{1}{2}$ oz. to be given frequently in the coughs of children. This syrup must be made fresh as required as it does not keep well.

The seeds are bright scarlet with a black spot at one end, weighing about 1.75 grains each. They are used by Indian goldsmiths as weights, also as ornaments. They are poisonous and have been used for the criminal poisoning of cattle.

MUCUNA. Cowhage. (*Kiwachh*, Hind.).

The hairs of the legumes of *Mucuna pruriens*, DC., an annual climbing shrub. Common throughout India; cultivated for the sake of the legumes which are used as a vegetable.

Characters : The legumes are golden-brown, velvety, oblong, compressed, from 2" to 3" in length, covered with stiff hairs which produce intense irritation if incautiously handled.

Medicinal properties : The hairs mixed with honey are used as a **vermifuge** for round worms. The action is altogether mechanical.

BUTEÆ GUMMI, Bengal Kino; (*Palás-ké-gond*, Hind.) The inspissated juice of the stems of the *Butea frondosa*, *B. superba* or *B. parviflora*, Roxb.

Characters : Irregular shining fragments of a reddish colour, size $\frac{1}{4}$ " or less, with occasional pieces of greyish bark adhering taste astringent.

Medicinal properties : **Astringent.** It is milder in action than Catechu.

BUTEA SEEDS. (*Palás-ké-benj*, Hind.)

Characters : Thin, flat, oval or kidney-shaped, brown, about $1\frac{1}{2}$ " long; with hardly any taste or smell.

Medicinal properties : The kernel powdered in doses of 20 grns. thrice daily for three days, and followed by a cathartic on the fourth day, is given as an **Anthelmintic** for round worms.

Sprinkled over the wound it is used to destroy maggots.

CLITORIA TERNATEA, Linn. (*Aprajit*, Hind.)

An elegant climbing plant, indigenous in India and largely cultivated for its flowers.

The seeds roasted and powdered are given in doses of 1 drn. as a **purgative**; for this they may be advantageously combined with double their weight of Ac. Tart. Pot. and a small quantity of ginger. A syrup of the flowers may be used as a **colouring agent**.

PONGAMIA GLABRA, Vent. (*Karanj*, *Kiramál*, Hind.)

A moderately sized tree common throughout India. The seeds on expression yield about 25 p. c. of a thick yellowish-brown bitter oil known in some parts as **Hongē oil**, and used as an illuminant.

Medicinal properties : The oil is highly spoken of as a **stimulant**, and is used in skin diseases, also mixed with equal parts of lime or lemon juice as a liniment for rheumatic pains.

LENS ESCULENTA. (Syn.: *Ervum Lens*.) The Lentil (*Masúr*, Hind.) Is grown largely throughout India as a food. It formed the bulk of the invalid food once sold as **Revalenta**.

Medicinal properties : Used as a food it tends to prevent constipation.

LATHYRUS SATIVUS, Linn. (*Khesari*, Hind.)

A variety of pulse largely cultivated throughout India, for its seeds, which form a nutritious article of diet.

The continued uses of imperfectly cooked *Khesari* induces a peculiar form of paralysis. This is due to the presence of an undetermined substance which is dissipated if the cooking be sufficiently done.

OLEUM ARACHIDIS. Ground-nut Oil.

The oil obtained by expression from the seeds of *Arachis hypogæa*, Linn., the Ground-nut plant.

Characters : Limpid, clear, pale-yellow; with faint odour; taste bland.

Medicinal properties : A cheap and efficient substitute for olive oil.

BONDUCELLÆ SEMINA. Bonduc Seeds or Physic-nut.

The seeds of *Cæsalpinia (Guilandina) Bonducella*, Flem. grown in the tropics of both hemispheres. (*Karanju*, Hind.)

Characters : Ovoid, $\frac{1}{2}$ " or more in diameter, smooth, hard; externally greyish; internally white starchy with a pure bitter taste.

Medicinal properties : It is used as an **antiperiodic** in the milder form of intermittent fever in doses of 10 to 15 grns. of the powdered kernel with a like quantity of black pepper, thrice daily; also as a **bitter tonic**.

The seeds contain an oil and a bitter principle.

The root bark of the Bonduc shrub powdered in 10 grns. doses is also used for these purposes.

CÆSALPINIA SAPPAN, Linn. The Sappan wood (*Patang*, Hind.)

A small thorny tree cultivated in Central India.

The Sappan wood is solid, heavy, hard. It was largely used as a red **dye** for cotton goods.

It contains a crystalline colouring matter, Sappanin, and is a good substitute for logwood.

CÆSALPINIA CORIARIA, Willd. Divi-divi. The legumes contain much Tannin; powdered in doses of 40 to 60 grains they are astringent and antiperiodic.**CASSIA ALATA**, Linn. Ringworm Shrub. (*Dadmurdan*, Hind.)

A handsome shrub with a large erect racemes of yellow flowers, common throughout India.

Medicinal properties : **Antiparasitic**; used for ringworm, etc.

The fresh leaves are bruised with a little lemon or lime juice, or with a bland oil, and rubbed in over the affected area, twice daily until cured.

Other varieties of Cassia (*e. g.*, *C. Sophera*, *C. occidentalis*, *C. Tora*), have a similar medicinal property.

CASSIA AURICULATA, Linn. The bark is highly astringent, and may be used for gargles, enemas, &c., as a substitute for Tannic Acid.**BLACK CATECHU** (*Catechu nigrum*) Pegu Catechu or Cutch. (*Kath*, Hind.), is obtained from the wood of *Acacia Catechu*, Willd., common in the forests of India. It occurs usually in irregularly-shaped, blackish-brown masses; taste astringent and bitter.

Dose : 5 to 15 grains in powder. It may be given as an Infusion, a Tincture or a compound Powder. See B. P. Catechu.

Medicinal properties : A powerful **Astringent** superior in quality to Pale Catechu but less soluble.

ROSACEÆ.

AMYGDALA DULCIS, B. P. Sweet Almond. (*Meeta Badam*, Hind.).

The ripe seed of the *Prunus Amygdalus*, Stokes, var. *dulcis* Baill., known in commerce as Jordan Almond. Extensively cultivated in Southern Europe.

Characters: 1" long, nearly oblong, compressed, pointed at one extremity, rounded at the other; the testa is cinnamon-brown, thin, rough, the seed contains two large plano-convex oily cotyledons; taste bland, when triturated with water forms a white emulsion without marked odour.

Pulvis Amygdalæ Compositus, B. P. Compound Powder of Almonds.

Preparation: Steep 8 oz. Sweet Almonds in water until their skins can easily be removed; when thus blanched dry them with a soft cloth; expose them in a warm place so as to render them so dry as to be brittle; rub lightly in a mortar to a smooth consistence; mix. 1 oz. Gum Acacia and 4 oz. Refined Sugar, both powdered; and add this to the bruised almonds; rub the whole down to a coarse powder.

Mistura Amygdalæ, B. P. Almond Mixture.

Dose: $\frac{1}{2}$ to 1 fl. oz.

Preparation: Triturate 2 oz. Compound Powder of Almonds with a little Distilled Water so as to form a thin paste, gradually add Distilled Water up to 16 oz.; strain through fine muslin.

A suitable vehicle for expectorants, saline refrigerents, &c.

Medicinal properties: **Demulcent, Nutritive**; useful in catarrhal affections.

The cake left after the expression of the bland oil, contains no starch, and therefore, is employed instead of bread for diabetic patients.

AMYGDALA AMARA, B. P. Bitter Almond. The ripe seed of *Prunus Amygdalus*, Stokes, var. *amara*, Baill.

Characters: Resembles the Sweet Almond in general appearance, but is distinguished by being shorter and proportionately broader, by its bitter taste, and by the characteristic odour of its aqueous emulsion.

Its only medicinal use is as a source of the official fixed oil of which it contains nearly 50 per cent.

Bitter Almonds contain a nitrogenous body not present in Sweet Almonds, which, on being bruised with water, is decomposed into Prussic Acid and the volatile or *Essential Oil of Bitter*

non-poisonous, but it often contains a large quantity of Prussic Acid, also the *Artificial Oil of Bitter Almonds* is often substituted for it. This has much the same flavour as the natural oil, but is decidedly poisonous and has caused death.

OLEUM AMYGDALÆ. *B. P.* Almond Oil. The fixed oil expressed from the Bitter or Sweet Almonds.

Characters : Pale-yellow nearly inodorous ; taste bland, nutty.

The kernels of the Apricot and Peach yield a fixed oil known as *Ol. Amygdalæ Persicæ*, which resembles Almond Oil.

Medicinal properties : **Emollient ; Demulcent ; slightly Laxative.**

As a basis for ointments it is preferred to Olive Oil, as it makes a whiter ointment.

Dose : 1 to 4 drms. as a laxative.

Glycerine and Lime Juice is a mixture of equal parts of Almond Oil and Lime Water scented with Lemon.

PRUNUM, *B. P.* Prunes.

The dried ripe fruits of *Prunus domestica*, Linn. var. *Juliana*, DC. ; a variety of Plum. Grown in Southern Europe.

Characters : Shrivelled, ovoid, black, $1\frac{1}{4}$ " long, pulp brownish, without marked odour, taste sweet, bland, acidulous.

Medicinal properties : **Nutrient, Antiscorbutic, Laxative.** Used as a popular domestic remedy for chronic constipation ; it is more effective if stewed with Senna.

Adult dose : 2 oz. An average sized prune weighs $\frac{1}{4}$ oz.

The action of Prunes depends on the Sugar, Malic Acid, and indigestible matter present.

PRUNI VIRGINIANÆ CORTEX, *B. P.* Virginian Prune Bark. Known also as **Wild Cherry Bark.**

The bark of *Prunus serotina*, Ehrh., collected in autumn.

Characters : Curved pieces or irregular fragments $\frac{1}{12}$ " or more thick ; young bark covered by smooth, thin, reddish-brown, papery cork ; older bark rough and nut-brown externally ; finely striated or reticulated internally. The odour which is developed upon maceration with water resembles that of bitter almonds ; taste astringent, aromatic, bitter.

Syrupus Pruni Virginianæ, *B. P.* Syrup of Virginian Prune.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 3 in 20).

Specially useful in spasmodic coughs, with irritable throat,

Tinctura Pruni Virginianæ, B. P. Tincture of Virginian Prune.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5).

Preparation : Mix 4 oz. Virginian Prune Bark in No. 20 powder with $7\frac{1}{2}$ fl. oz. Distilled Water ; set aside in a closed vessel for 24 hours ; add $12\frac{1}{2}$ fl. oz. Alcohol (90 p. c.) ; complete the maceration process.

Medicinal properties : **Sedative** ; **Tonic** ; **Astringent** ; useful in general or local irritable debility.

It contains Tannin, also constituents which when treated with water develop Hydrocyanic or Prussic Acid.

OLEUM ROSÆ, B. P. Oil of Rose. *Synonym, Otto of Rose.*
Also known as **Attar**.

The oil distilled from the fresh flowers of *Rosa damascena*, Linn.

Characters : A pale yellow crystalline semi-solid with the strong fragrant odour of rose and a sweet taste. On cooling crystalline scales form.

Aqua Rosæ, B. P. Rose Water.

The Rose water of commerce (which is a saturated solution of Oil of Rose, prepared by distillation from the flowers of *Rosa damascena*, Linn.) ; diluted immediately before use with twice its volume of Distilled Water.

It is used as a vehicle for medicine and to make lotions.

Unguentum Aquæ Rosæ, B. P. Rose-Water Ointment.

Well adapted for disguising the unpleasant smell of certain ointments.

Preparation : Melt together $1\frac{1}{2}$ oz. White Beeswax, $1\frac{1}{2}$ oz. Spermaceti and 9 oz. Almond Oil ; pour the mixture into a warmed mortar ; add 7 fl. oz. Rose Water gradually with constant trituration ; add 8 minims Oil of Roses ; continue the trituration until cold.

Medicinal properties : Used only as a perfume.

The solid portion formed on cooling ordinary attar, is an odourless stearoptene. The fragrance is contained in the liquid portion. By oxidation the solid may be converted into the liquid compound, and by reduction the liquid changed into the solid.

Forty thousand roses are required to yield 1 oz. of good Attar.

ROSÆ GALLICÆ PETALA, B. P. Red-Rose Petals.

The fresh and dried unexpanded petals of *Rosa gallica*, Linn. ; from cultivated plants.

Characters : Little cone-like masses or separate, crumpled. The petals, velvety, deep purplish-red, passing into brownish-yellow

Confectio Rosæ Gallicæ, B. P. Confection of Roses.

Preparation : Beat together in a stone mortar 1 pound fresh Red Rose Petals, and 3 pounds Refined Sugar.

Used as a basis for pills, and as a mild astringent in aphthæ.

Infusum Rosæ Acidum, B. P. Acid Infusion of Roses.

Dose : $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 40.)

Preparation : To 20 fl. oz. boiling Distilled Water add 2 fl. drms. Dilute Sulphuric Acid; then add $\frac{1}{2}$ oz. Red Rose Petals dried and broken; infuse in a covered vessel for 15 minutes; strain.

Used as a gargle, or a vehicle for saline purgatives, quinine, &c.

Syrupus Rosæ, B. P. Syrup of Roses.

Dose : $\frac{1}{2}$ to 1 fl. drm.

Preparation : Infuse 2 oz. dried Red Rose Petals in 20 fl. oz. boiling Distilled Water for 2 hours; strain; press; heat the liquid to boiling point; filter; dissolve 30 oz. Refined Sugar in the liquid by gentle heat. The product should weigh 46 oz.

Medicinal properties : Red-Rose Petals are slightly **Tonic** and **Astringent**; but are used chiefly to give colour to mixtures.

Borax or alkalis change the colour to green.

CUSSO, B. P. Kousso.

The dried panicles of pistillate flowers of *Brayera anthelmintica*, Kunth. Obtained from Abyssinia.

Dose : $\frac{1}{4}$ to $\frac{1}{2}$ oz.; given in honey, or as an infusion the Cusso in coarse powder with 4 oz. boiling Distilled Water, and infused in a covered vessel for 15 minutes without straining.

Characters : Usually in somewhat cylindrical rolls consisting of panicles 1 to 2 feet long, flowers reddish-brown, numerous small or hairy stalks, odour balsamic; taste bitter, acrid.

Medicinal properties : **Anthelmintic**, specially for tapeworm; a purgative is sometimes necessary to expel the dead worm.

In large doses it is apt to produce intestinal irritation.

Cusso contains Tannic Acid, a volatile oil and a bitter acrid resin.

LAUROCERASI FOLIA, B. P. Cherry-Laurel leaves.

The fresh leaves of *Prunus Laurocerasus*, Linn.

Aqua Laurocerasi, B. P. Cherry-Laurel Water.

Dose : $\frac{1}{2}$ to 2 fl. drms. (Strength one-tenth p. c. of Hydrocyanic Acid; i.e., one-twentieth the strength of Diluted Hydrocyanic Acid, B. P.).

Medicinal properties : **Sedative**. Owing to the volatility of its essential ingredient it deteriorates on being kept.

Its action is altogether due to the Hydrocyanic Acid it contains.

QUILLAIA CORTEX, B. P., Quillaia Bark. *Synonym*, **Panama Bark**, known also as soap-bark.

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

Characters : Flat pieces, about $\frac{1}{8}$ " thick; outer surface, smooth brownish-white; inner surface, smooth, whitish; without odour, taste acrid, astringent; the powder is extremely irritating to the nostrils.

Tinctura Quillaiaæ, B. P. Tincture of Quillaia.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 20.)

Preparation : Moisten 1 oz. Quillaia Bark in No. 20 powder, with $\frac{1}{2}$ fl. oz. Alcohol (60 p. c.); complete the percolation process with Alcohol (60 p. c.) so that the resulting Tincture may measure 20 fl. oz.

Medicinal properties : **Expectorant**.

Owing to its irritating properties Quillaia should not be given in ulceration of the throat or alimentary canal.

Macerated with cold water it imparts to it a soapy character. Its Infusion froths easily; hence is added to lemonade, and other drinks to give them a head, also to form emulsions, and to retain fine powders in suspension. It is used also as a hair wash.

Action : Quillaia owes its virtue to a glucoside, **Saponin**, which is a powerful local irritant, anæsthetic, and muscular poison; taken internally it produces gastro-intestinal irritation.

Saponin exists also in Senega but in smaller quantity.

PRUNUS INSITITIA, Linn. The Bokhara Plum (*Alucha*, *Alu-bokhara*, Hind.).

The fruit of a tree indigenous to the Western Himalayas, sold in Indian bazaars by Afghan traders.

Medicinal uses : are the same as the English plum.

AGRIMONIA EUPATORIUM, Linn. Agrimony.

A herb common throughout India.

Medicinal properties : **Tonic, Astringent**.

PYRUS CYDONIA, Linn. *Synonym*, **Cydonia vulgaris**, Pers. The common Quince. (*Bihî*, Hind.). Cultivated in Northern India.

The **Seeds** (*Bhi-dāṇa*, *Bhi-ka-bij*, Hind.), are met with in the bazaars. They are $\frac{1}{2}$ " long, ovate, flattened, pointed at both extremities, reddish-brown and often 10 to 15 adhering together. They contain a large proportion of a peculiar kind of mucilage.

Medicinal properties : **Demulcent**, useful in dysentery; may be given as a decoction.

COMBRETACEÆ.

MYROBALANS. The *Chebolic* or *Black Myrobalans*.

The dried fruit of a large tree, the *Terminalia Chebula*, Retz., found wild in the forests of India (*Har, Harra*, Hind.).

Characters: Ovoid, about 1" long, tapering towards the lower extremity, round or obscurely five or six-sided, furrowed longitudinally, smooth yellowish-brown, taste astringent.

Beleric Myrobalans, (*Bahera, Barla*, Hind.).

The fruit of *Terminalia belerica*, Roxb. a large tree indigenous to India and Burma.

Medicinal properties: The unripe fruit is **purgative**; the ripe fruit is **astringent** and is used in dysentery and diarrhoea.

A decoction (made by boiling the pulp of 6 Myrobalans, 1 drm. Cloves or Cinnamon both bruised in 4 oz. water or milk for ten minutes and straining may be given for one dose) as a **cholagogue laxative**.

Triphála (= three fruits) composed of Chebolic, Beleric, and Emblic myrobalans, is a favorite domestic aperient of the natives of India.

The fruit powdered and mixed with a bland oil is used externally as a **stimulating ointment**.

The dried fruit contains a large quantity of a kind of Tannic Acid. Chebolic myrobalans are largely used in tanning.

THE INDIAN ALMOND. (*Jangli Badam*, Hind.).

The kernel of the fruit of *Terminalia Catappa*, Linn., a large ornamental tree cultivated throughout India.

It yields about 50 p. c. of a fixed oil (known as **Country Almond Oil**), having the taste and odour of, but slightly darker than, Almond Oil. It may be used as an ordinary bland oil.

MYRTACEÆ.

CARYOPHYLLUM, B. P. Cloves.

The dried flower-buds of *Eugenia caryophyllata*, Thunb. Imported from Malay Peninsula.

Characters: Dark-brown, wrinkled, nearly cylindrical calyx tube, about $\frac{5}{8}$ " long, tapering below, surmounted by 4 teeth, between which is a pale coloured ball consisting of the undeveloped flower; odour and taste pungent and aromatic. When indented with the nail it emits an oil which has a strong fragrant odour.

Infusum Caryophylli, B. P. Infusion of Cloves.

Dose: $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 40.)

Preparation: Infuse $\frac{1}{2}$ oz. bruised Cloves with 20 fl. oz. boiling Distilled Water in a covered vessel, for 15 minutes; strain.

Medicinal properties: Stimulant, Carminative. Slightly, astringent. Used in flatulence, atonic dyspepsia, to prevent griping, and to flavour.

Cloves contain a large quantity of the Volatile Oil of Cloves (offic.) on which its action depends. It contains also some tannin, resin, and gum.

Cloves (*Lavanga*, Hind.), are now cultivated in Southern India. They are used by the natives as a condiment and masticatory.

Oleum Caryophylli, B. P. Oil of Cloves.

The oil distilled from Cloves.

Dose : $\frac{1}{2}$ to 3 mins.

Characters : Colourless or pale yellow when newly distilled, but becoming reddish-brown on keeping, having the strong odour and taste of Cloves. The oil is heavier than water.

Medicinal properties : Stimulant, Aromatic, Carminative. It is a typical aromatic oil; used chiefly to qualify other medicines; and as a local application to carious teeth.

PIMENTA, B. P. Pimento.

The dried fully grown unripe fruit of *Pimenta officinalis*, Lindl., the Allspice tree. Cultivated in West Indies.

Characters : Dark reddish-brown, nearly globular two-celled fruit, size $\frac{1}{5}$ " to $\frac{1}{3}$ " in diameter; pericarp rough externally, brittle.

Odour and taste warm aromatic, characteristic, somewhat resembling that of Cloves.

In appearance it resembles Black Pepper, but differs from it by being crowned with the teeth of the calyx.

Aqua Pimentæ, B. P. Pimento Water.

Preparation : 8 oz. bruised Pimento; 2 gallons water; distil one-half.

Medicinal properties : Stimulant, Carminative, Astringent. Its actions are similar to those of Cloves.

Pimento contains a volatile oil, and a large quantity of tannin.

Oleum Pimentæ, B. P. Oil of Pimento.

The oil distilled from Pimento.

Dose : $\frac{1}{2}$ to 3 mins.

Characters : Yellowish or yellowish-red when recently distilled, but gradually becoming darker; odour and taste of Pimento.

Medicinal properties : Stimulant, Carminative.

OLEUM CAJUPUTI, B. P. Oil of Cajuput.

The oil distilled from the leaves of *Melaleuca Leucadendron*, Linn. (*M. cajuputi*, Roxb.). Imported from Singapore.

Dose: $\frac{1}{2}$ to 3 grains on Sugar, or in a bland liquid.

Characters: Bluish-green; odour penetrating, camphoraceous; taste aromatic, bitter, camphoraceous.

The greenish tint is said to be due to copper from the vessels in which it is distilled.

Spiritus Cajuputi, B. P. Spirit of Cajuput.

Dose: 5 to 20 mins. (Strength 10 p. c. of oil.)

Preparation: 1 fl. oz. Cajuput Oil added to Alcohol (90 p. c.) sufficient to make 10 fl. oz.

Medicinal properties: **Stimulant, Antispasmodic, Diaphoretic.** Used in colic, dropsies, chronic rheumatism, &c. Also applied on lint for toothache.

Externally 1 part Cajuput Oil mixed with 2 of Olive Oil is used as a **stimulating liniment** for rheumatic or other chronic pains, and for chronic skin diseases, *e.g.*, psoriasis, &c.

Cajuput Oil is sold in the Calcutta bazaars. (*Kayaputi-ka-tel*, Hind.).

OLEUM EUCALYPTI, B. P. Oil of Eucalyptus.

The oil distilled from the fresh leaves of different varieties of *Eucalyptus*. Obtained from Australia.

Dose: $\frac{1}{2}$ to 3 mins.; may be given on Sugar.

Characters: Pale straw coloured, becoming darker and thicker by exposure; odour aromatic camphoraceous; taste spicy, pungent, cooling; soluble in Alcohol.

Unguentum Eucalypti, B. P. Eucalyptus Ointment.

Preparation: Melt together 4 oz. Hard Paraffin and 5 oz. White Soft Paraffin, add 1 oz. Oil of Eucalyptus; stir until cold.

Medicinal properties: **Deodoriser; Stimulating; Antiseptic.** Used as a **deodoriser**; inhalation in diphtheria and respiratory diseases accompanied by foetid or profuse discharges. Internally a respiratory and urinary antiseptic; also antiperiodic. As an antipyretic it is rather disappointing.

It is used extensively as a surgical antiseptic. **Eucalyptus Gauze** is made with about 5 p. c. of the oil. **Eucalyptus Wool** and **Lint** with 10 p. c. of the oil.

Eucalyptus Oil is an antiseptic more powerful than Quinine; the old oxygenated oil being even more powerful than that newly distilled. Applied to the skin and evaporation prevented, it is a local irritant. In medicinal doses diluted, it is a **Carminative**, and after absorption into the blood is antiperiodic and slightly antipyretic. It is excreted unchanged by the lungs and kidneys, disinfecting the respiratory and urinary passages.

If swallowed undiluted, it causes burning in the mouth, throat and stomach. Large doses produce gastro-intestinal irritation, paralysis and death from cessation of respiration.

Eucalyptus trees have been largely planted in malarious districts, in order that the volatile oil exhaled from their leaves may render the place more healthy. *Eucalyptus Globulus*, the Blue Gum tree, is extensively cultivated on the Nilgiris.

EUCALYPTI GUMMI, B. P. Eucalyptus Gum.

A ruby coloured exudation or so-called **red gum** from the bark of *Eucalyptus rostrata*, Schlecht, and some other species of *Eucalyptus*. Imported from Australia.

Dose : 2 to 5 grains.

Characters : In grains or small masses : tough, thin fragments transparent ruby-red or garnet-red ; taste very astringent, chewed it adheres to the teeth and tinges the saliva red. Cold water dissolves about 85 p. c. It is entirely soluble in Alcohol (90 p. c.).

Trochiscus Eucalypti Gummi, B. P. Eucalyptus Gum Lozenge.

Each contains 1 grain Red Gum made up with Fruit Basis.

Useful for relaxed throat ; also as a preventive for sea sickness. 3 or 4 lozenges being taken during the day.

Medicinal properties : **Astringent**, specially useful in relaxed throat and diarrhœa. The gum adheres with great pertinacity to mucous surfaces, hence its efficacy as an astringent.

PSIDIUM GUYAVA, Linn. The Guava, (*Am, amrut, Hind.*).

Var. *pyriferum*, the white Guava tree. Var. *pomiferum*, the red Guava tree.

The fruit when stewed forms guava jelly.

The bark both of the root and stem contains Tannic acid.

Medicinal properties : The bark is **astringent**. It contains about 25 p. c. Tannic Acid.

EUGENIA JAMBOLANA, Linn. (Synonym, *Syzygium Jambolanum*). The **Black Plum**, *Jambul, Jaman, Hind.*

The tree is common nearly all over India.

The fruit when unripe is **astringent** and used (as a Syrup) in chronic diarrhœa, when ripe is **sub-acid**, edible, **antiscorbutic**.

The bark is used as an **astringent** decoction, and gargle.

MYRTUS COMMUNIS, Linn. The Myrtle (*Hab-ul-as, Hind.*).

A shrub cultivated throughout India. A volatile oil is distilled from the leaves which has the properties of other essential oils.

LYTHRACEÆ.

WOODFORDIA FLORIBUNDA, Salisb. (*Dha Dhaura*, Hind.).

A large shrub common in many parts of India.

The flowers are bright red, and for tanning are used as a dye. They contain about 20 p. c. Tannic Acid.

Medicinal properties: Intestinal **Astringent**.

HENNA, Camphire. (*Mhendi, Hena*, Hind.).

The leaves of *Lawsonia alba*, Lam., a small fragrant shrub common throughout India.

The seeds yield a dye used for staining the finger nails a dull orange.

The flowers yield a volatile oil used as a perfume.

Medicinal properties: The fresh leaves are astringent and have been recommended (beaten into a paste with vinegar or lime juice and applied as a poultice) to relieve the painful condition known as *burning of the feet*.

GRANATI CORTEX, B. P. Pomegranate Bark.

The dried bark of the stem and root of *Punica Granatum*, Linn., *Dalim, Anar*, Hind. Much cultivated in warm countries.

Characters: Irregular curved or channelled pieces 2" to 4" long, $\frac{1}{2}$ " to 1" wide. Root bark, outer surface rough yellowish-gray, marked with conchoidal depressions; the stem bark, smoother with frequently minute lichens; the inner surface yellow tinged with brown, no odour; taste astringent, bitter.

In India the bark can be obtained fresh as required.

Decoctum Granati Corticis, B. P. Decoction of Pomegranate Root.

Dose: $\frac{1}{2}$ to 2 fl. oz. (Strength 1 in 5.)

It should be given at intervals of half an hour; the bowels having been freely moved by castor oil the day before, and solid food abstained from until the worm is passed.

Preparation: Boil 4 oz. Pomegranate Root in No. 10° powder with 24 fl. oz. Distilled Water in a suitable vessel for 10 minutes; strain; pour sufficient Distilled Water over the strainer to make 20 fl. oz.

Medicinal properties: Vermifuge, **Anthelmintic** for Tapeworm. Effective both in fresh and in dried condition.

The **Rind**, of the fruit (*Dalim chal*, Hind.), contains tannin; is very astringent, and may be used as a substitute for Tannic Acid. It may be used as a Decoction, (1 in 10), with aromatics and Opium.

POMEGRANATE FRUIT, The fruit of the *Punica Granatum*, Linn., *Anar*, *Darim*, Hind.

Characters : Irregularly spherical, about 3" in diameter ; hard, leathery, brownish rind, enclosing a great number of reddish berries compressed together into irregular angular forms.

Medicinal properties : The pulp is sweet, slightly acid, cooling. It is used to prepare cooling drinks.

TURNERACEÆ.

DAMIANA. Obtained from Mexico.

The leaves contain a bitter substance, a resin and a volatile oil.

Medicinal properties : **Tonic, Carminative, Diuretic, Aphrodisiac.**

Liquid Extract of Damiana, is a preparation of the leaves made by exhausting with Proof Spirit so that one part of the Extract represents one part by weight of the drug.

Dose : 30 to 60 mins.

Extract of Damiana, the liquid extract evaporated down to a soft mass ; dose 5 to 10 grns.

PASSIFLOREÆ.

PAPAIN, *Papayotin* or *Vegetable Pepsin*.

The digestive ferment extracted from the juice of the unripe fruit of *Carica papaya*, Linn. the Papaya tree.

Characters : An amorphous, whitish powder.

Dose : 2 to 10 grns.

Medicinal properties : **Digestive.**

Actions : Papain dissolves animal proteids, acting best in neutral or weakly alkaline solution. Some doubt has recently been expressed as to its utility, it having been found that the results of its action are not the same as those of ordinary digestion.

The **Papaya tree** (*Papaya*, *Papaya amba*, Hind.), originally brought from America, is now extensively grown throughout India. It may be recognised by its plain straight stem with, at the top, a tuft of palmately lobed leaves. The fruit is largely used in a table fruit, and is an excellent **stomachic** and **antiscorbutic** as well as being a food.

The Juice of the fruit is said to have the property of rendering tough meat tender.

CUCURBITACEÆ.

COLOCYNTHIDIS PULPA, B. P. Colocynth Pulp.

The dried pulp of the fruit of *Citrullus Colocynthis*, Schrad., freed from seeds. Obtained from the Mediterranean Coasts and in India. (*Indrayan*, Hind.)

Characters: Broken up pulp, light, spongy, yellowish-white, without odour, taste very bitter.

Extractum Colocynthidis Compositum, B. P. Compound Extract of Colocynth.

Dose: 2 to 8 grains.

An alcoholic extract, with Aloes, Scammony, Soap, and Cardamoms added.

Pilula Colocynthidis Composita, B. P. Compound Pill of Colocynth.

Dose: 4 to 8 grains.

Preparation: Triturate 2 fl. drms. Oil of Cloves, with $\frac{1}{4}$ oz. powdered Potassium Sulphate; add 1 oz. powdered Colocynth Pulp; mix; add 2 oz. Barbadoes Aloes and 2 oz. Scammony Resin, both powdered; mix thoroughly; add Distilled Water sufficient to form a mass.

A safe and efficient purgative. This was Dr. Gregory's favorite pill.

Pilula Colocynthidis et Hyoscyami, B. P. Pill of Colocynth and Hyoscyamus.

Dose: 4 to 8 grains.

Preparation: Mix 2 oz. Compound Pill of Colocynth with 1 oz. Extract of Hyoscyamus; form a mass.

This was Dr. Christison's favorite pill.

Medicinal properties: Colocynth is a **Drastic hydragogue cathartic**; usually prescribed with other remedies (*e.g.*, Hyoscyamus) to prevent griping.

• It is specially useful as a derivative in cerebral congestions and dropsies. Along with Blue pill it is used as an occasional purge in bilious derangement. It should be avoided in pregnancy and in irritable conditions of the intestinal canal.

Colocynth is a powerful hepatic and intestinal stimulant, rendering the bile more watery, and increasing the secretion of biliary matter.

It contains a glucoside to which it owes its activity, also a resin.

Large doses produce gastro-enteritis with bloody stools and

Cucumis trigonus, Roxb., and **C. Hardwickii**, Royle, are said to possess the purgative properties of Colocynth.

ELATERIUM, B. P. Elaterium.

A sediment from the juice of the fruit of *Ecballium Elaterium*, A. Rich. Cultivated in Britain.

Dose : $\frac{1}{10}$ to $\frac{1}{2}$ grain. A little Hyoscyamus added will prevent Nausea.

Characters : Light, friable, flat or slightly curved opaque cakes, $\frac{1}{10}$ " thick, pale-green to yellowish-grey in colour; fracture granular; odour faint tea like; taste acrid, bitter.

Elaterinum, B. P. Elaterin, $C_{20}H_{28}O_5$.

The active principle of Elaterium.

Dose : $\frac{1}{40}$ to $\frac{1}{10}$ grain.

Characters : Small hexagonal scales, taste bitter, almost entirely insoluble in water, sparingly soluble in Alcohol (90 p. c.), readily soluble in chloroform.

Pulvis Elaterini Compositus, B. P. Compound Powder of Elaterin.

Dose : 1 to 4 grains. (Strength $2\frac{1}{2}$ p. c.).

Preparation : Triturate 5 grains Elaterin with 195 grains Milk Sugar in a mortar until a fine powder is produced.

Medicinal properties : Elaterium is most powerful a **hydragogue cathartic**, specially useful in cardiac and renal dropsies and in cerebral congestion.

To debilitated or aged persons it must be given with caution.

Large doses may cause gastro-enteritis, or a fatal collapse.

TRICHOSANTHES DIOICA, Roxb. (*Parwar, Palwal*, Hind.).

A common climbing plant cultivated in many parts of India as a food.

Medicinal properties : The dried pulp of the unripe fruit is **purgative** and has actions resembling those of Colocynth.

BRYONIA EPIGÆA, Rottb., is valued by the natives of India as an **Alterative Tonic** in syphilis and chronic dysentery.

PUMPKIN. Vegetable Marrow.

The fruit of *Cucurbita pepo*, Linn. (*Kumra*, Beng.; *Petha*, Hind.) extensively cultivated throughout India and used in curries.

Medicinal properties : The seeds (dose 2 oz. freshly decorticated seeds made into an emulsion), also the expressed oil (in $\frac{1}{2}$ oz. doses every 2 hours) are **anthelmintic** specially for tapeworm. In both cases a dose of Castor Oil should be given 2 hours later.

CACTEÆ.

OPUNTIA DILLENII, Haw. (*Synonym, Cactus indicus*). The Pear. (*Phani-manasa. Nag-phana*, Hind.)

A native of America, now naturalised in India.

Medicinal properties : A syrup made from the fruit is used as an expectorant in asthma, &c.

UMBELLIFERÆ.

CONII FOLIA, B. P. Conium Leaves.

The fresh leaves and young branches of *Conium maculatum*, Linn., the Hemlock plant, collected when the fruit begins to form. Indigenous in Britain.

Characters : Fresh leaves ; smooth, arising from a smooth stem with dark purple spots.

Dried leaves ; full green colour, with odour of mice which is more fully developed on rubbing the leaves with Liq. Potassæ.

Succus Conii, B. P. Juice of Conium.

Dose : 1 to 2 fl. drms.

The expressed juice of the bruised fresh leaves and young branches of *Conium maculatum*, with to each three parts one part Alcohol (90 p. c.) added.

Unguentum Conii, B. P. Conium Ointment.

Evaporate 2 fl. oz. Juice of Conium to one-eighth of its volume, at a temperature not exceeding 140° F. ; add $\frac{3}{4}$ oz. Hydrous Wool Fat. ; mix by trituration.

CONII FRUCTUS, B. P. Conium Fruit.

The dried full grown unripe fruit of *Conium maculatum*, Linn.

Characters : The drug as met with in commerce ; the mericarps are usually separate, each is devoid of hairs and possesses five irregular more or less crenate primary ridges, the endosperm is deeply grooved on the commissural surface, and in the transverse section of the mericarp, no vittæ are visible. No marked odour or taste, but when rubbed with Liq. Potassæ a strong mousy odour is developed.

It somewhat resembles Anise, Caraway, and Dill, but differs from them in having no vittæ.

Tinctura Conii, B. P. Tincture of Conium.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5.)

Preparation : Moisten 4 oz. Conium Fruit recently reduced to No. 40 powder, with 4 fl. oz. Alcohol (70 p. c.) ; complete the percolation process so that the result measures 20 fl. oz.

Medicinal properties: **Anodyne, Antispasmodic, Narcotic**; in over doses poisonous. The strength of the preparations is very variable, therefore the effects and doses are uncertain and the drug little used as a medicine.

It rapidly loses its virtues in a hot climate.

The active principle of Conium is a volatile liquid alkaloid which is readily dissipated on the addition of an alkali, by heat, or on exposure; hence this drug gives varying results. When applied externally as an anodyne it often altogether fails.

Internally large doses produce irritation and vomiting. Absorbed into the blood it causes weakness of the knees, confusion of vision, giddiness, thickness of speech. It is excreted by the urine unchanged.

Poisonous doses produce paralysis commencing at the extremities and gradually proceeding upwards. The intellect remains clear to the last; death occurs by paralysis of respiration. Conium was the substance used to poison Socrates, the classical account of whose death gives a good description of the effects of Hemlock in poisonous doses.

Hemlock poisoning. **Antidotes** **Emetic** to empty the stomach; after absorption into the blood nothing can be done except to treat the symptoms by **stimulants** internally; **warmth**, externally and **artificial respiration** long continued.

Incompatibles: Caustic Alkalies, Vegetable Acids, Astringents.

ASAFETIDA, B. P. Asafetida.

A gum-resin obtained by incision from the root of *Ferula foetida*, Regel., and probably other species. Obtained from Afganistan and extreme western Himalaya. (*Hingra*, Hind.)

Dose: 5 to 15 grains, in the form of pill or emulsion.

Characters: Irregular masses of tears, usually about $\frac{3}{4}$ " in diameter, joined together by a darker soft material; the tears when broken are at first milk-white but change to pink, then to dull yellowish-brown. When fresh it has a pleasant odour, but soon acquires a strong alliaceous smell due to the evolution of hydrogen sulphide from the volatile oil which contains sulphur. Taste bitter acrid and like garlic. With water it forms an emulsion. The freshly broken surface touched with Nitric Acid, assumes for a short time a fine green colour.

It somewhat resembles Galbanum, Ammoniacum, and Benzoin, but these may be distinguished by their odour.

Tinctura Asafetidae, B. P. Tincture of Asafetida.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5).

Preparation: Place 4 oz. bruised Asafetida in a closed vessel with 15 fl. oz. Alcohol (70 p. c.); set aside for 7 days with occasional agitation; filter; pass through the filter. Alcohol (70 p. c.)

Medicinal properties : Of *Asafetida* ; **Stimulant, Antispasmodic, Expectorant.**

Used : Internally in hysteria, especially that occurring about the menopause ; in chronic bronchitis ; in whooping cough ; and an emulsion of 30 grains. *Asafetida* in 4 oz. water is given as an enema for tympanitis.

Asafetida is an oleo-gum resin and contains a considerable proportion of Sulphur. Its odour makes it disagreeable to take.

It has been used in cattle plague.

GALBANUM, B. P. Galbanum.

A gum-resin obtained from *Ferula galbaniflua*, Boiss. and Buhse, and probably other species. Habitat Persia.

Dose : 5 to 15 grains in pill or emulsion.

Characters : In **tears** or agglutinated masses ; the tears rounded irregular, about size of a pea ; externally orange-brown ; internally yellowish-white or bluish-green, mixed with transverse slices of the root ; hard and brittle in cold weather, but on gently heating become soft and ductile ; the **masses** are irregular in form and vary from yellowish-brown to translucent green ; odour characteristic, aromatic, not disagreeable ; taste bitter, unpleasant, resembling garlic.

It is differentiated from *Ammoniacum*, *Asafetida*, and *Benzoin* by its odour.

Pilula Galbani Composita, B. P. Compound Pill of Galbanum.

Synonym, Compound Pill of Asafetida.

Dose : 4 to 8 grains ; useful in the dyspepsia of hysterical women.

Preparation : Heat together 2 oz. each of *Asafetida*, Galbanum. Myrrh, and Syrup of Glucose on a water bath, stirring until the mass is uniform in consistence.

Medicinal properties : **Stimulant, Expectorant.**

Used in chronic bronchitis with much wheezing and profuse discharge ; externally as a stimulating application to indolent swellings.

Its actions are similar to those of *Asafetida* but less powerful.

Galbanum consists of a gum-resin and a volatile oil.

AMMONIACUM, B. P. Ammoniacum.

A gum-resin exuded from the flowering and fruiting stem of *Dorema Ammoniacum*, D. Don., and probably other species ; collected in Persia and the Punjab.

Characters : Irregular masses, consisting of tears, pale yellowish-brown externally, milky white to pale brownish-yellow internally, hard and brittle when cold, but readily softening with heat ; odour faint characteristic, but not alliaceous ; taste, bitter, acrid.

It somewhat resembles *Asafetida*, *Galbanum* and *Benzoin*, but can be distinguished from these by its odour.

Emplastrum Ammoniaci cum Hydrargyro, B. P. Ammoniacum and Mercury Plaster.

Contains 12 oz. Ammoniacum, 3 oz. Mercury, 56 grains Olive Oil, 8 grains Sulphur, incorporated and evaporated to a suitable consistence.

A stimulating Mercurial preparation useful in chronic swelling, hyarthrosis, syphilitic rheumatism, &c.

Mistura Ammoniaci, B. P. Ammoniacum Mixture.

Dose : $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 32.)

A stimulating expectorant given along with squill and similar remedies.

Preparation : Triturate $\frac{1}{4}$ oz. Ammoniacum in coarse powder thoroughly with 1 fl. oz. Distilled Water so as to form a thin paste; gradually add 4 fl. drms. Syrup of Tolu and $6\frac{1}{2}$ fl. oz. Distilled Water, triturating until the mixture assumes a uniform milky appearance; strain through muslin.

Medicinal properties : **Antispasmodic ; Stimulant ; Expectorant.** Used as a antiseptic expectorant in chronic bronchitis with profuse expectoration, also as a constituent of plasters meant to strengthen the skin and promote absorption.

Ammoniacum consists of a gum-resin and a volatile oil.

FÆNICULI FRUCTUS, B. P. Fennel Fruit.

The dried ripe fruit of *Fœniculum capillaceum*, Gilib., collected from cultivated plants.

Characters : Oblong, more or less curved about $\frac{1}{4}$ " long, and $\frac{1}{10}$ " in diameter, capped by a stylopod and two styles, devoid of hairs, greenish brown or pale yellowish-brown. The fruit readily separates into its two mericarps, each having five primary ridges and exhibits in transverse section six large vittæ; odour aromatic; taste aromatic, sweet, agreeable.

It somewhat resembles Caraway and Anise. It is larger than Conium and has prominent vittæ.

Aqua Fœniculi, B. P. Fennel Water.

Preparation : Take 1 lb. Fennel fruit, Water 2 gallons; distil one half.

Medicinal properties : **Carminative.**

It contains an aromatic oil similar to Oil of Anise.

F. vulgare, Gaertn, (*Saurif*, Hind.), cultivated throughout India.

ANISI FRUCTUS, B. P. Anise Fruit.

The dried ripe fruit of *Pimpinella Anisum*, Linn.; common in Southern Europe, Persia and Northern India. (*Saurif*, *Anisum*, Hind.)

Characters: Ovoid, laterally compressed, about $\frac{1}{5}$ " long and $\frac{1}{12}$ " broad, greyish brown, altogether covered with short hairs; the two mericarps united by a common stalk, each with five pale slender entire ridges; a transverse section exhibits about fifteen oil tubes. Odour agreeable, aromatic; taste sweetish, aromatic.

It somewhat resembles Conium, but this consists of only single mericarps, smooth-grooved on the face, with crenate ridges, and no oil tubes.

Aqua Anisi, B. P. Anise Water.

Preparation: 1 lb Anise fruit, Water 2 gallons; distil one-half.

Dose: $\frac{1}{2}$ to 1 oz.

Oleum Anisi, B. P. Oil of Anise. A volatile oil distilled from Anise fruit, or from the fruit of *Illicium verum*, Hook. fil., the Star Anise.

Dose: $\frac{1}{2}$ to 3 mins.

Characters: Very pale yellow with the odour of Anise; taste mildly aromatic.

Medicinal properties: Stimulant, Aromatic, Carminative, Expectorant.

Used as a flavouring addition to cough mixtures.

Anise contains an aromatic oil on which its action depends.

ANETHI FRUCTUS, B. P. Dill Fruit.

The dried ripe fruit of *Peucedanum graveolens*, Benth. and Hook. f., an annual cultivated in England, Southern Europe, and India, (*Sowa*, *Soja*, Hind.).

Characters: The two mericarps of which the fruit is composed, are usually separate, and freed from the pedicel: each seed is oval-flat with broad membranous wings, about $\frac{1}{6}$ " long and $\frac{1}{10}$ " broad; colour brown; each mericarp exhibits on transverse section six vittæ; odour and taste aromatic.

The fruit somewhat resembles Anise, Conium, Caraway and Fennel, but differs from them in being winged.

Aqua Anethi, B. P. Dill Water.

Preparation: Take 1 lb of Dill fruit; 2 gallons Water; distil one half.

Oleum Anethi, B. P., oil of Dill.

The oil distilled from Dill fruit.

Dose : $\frac{1}{2}$ to 3 mins. on Sugar, or in emulsion.

Characters : Pale yellow colour ; odour of Dill ; taste sweet aromatic.

Medicinal properties : **Stimulant, Aromatic, Carminative.**

Used in the flatulence or hiccough of infants, sometimes combined with Sodium Bicarbonate, or given in a teaspoonful of Lime Water.

The action of Dill fruit depends on the volatile oil it contains.

CARUI FRUOTUS, B. P. Caraway Fruit.

The dried fruit of *Carum Carui*, Linn., a biennial herb, cultivated in Germany and England. It is found wild at high elevations in the Himalayas. (*Shia-jira*, Hind.)

Dose : Of powdered seeds 5 to 20 grains.

Characters : Mericarps usually separate ; each about $\frac{1}{5}$ " long, and $\frac{1}{25}$ " broad ; curved, tapering at each end, brown with five longitudinal ridges, odour aromatic, taste agreeable spicy.

It somewhat resembles Conium and Fennel, but these have neither ridges, nor a spicy taste.

Aqua Carui, B. P. Caraway Water.

Preparation : Take 1 lb of Caraway fruit, water 2 gallons ; distil one-half.

May be given in doses of 1 oz. or more.

Oleum Carui, B. P. Oil of Caraway.

The oil distilled from Caraway fruit.

Dose : $\frac{1}{2}$ to 3 mins ; on Sugar, or in emulsion.

Characters : Pale yellow ; odour of Caraway ; taste aromatic.

Medicinal properties : **Aromatic, Stomachic, Carminative.** Used in flatulent colic, and as an adjunct to other medicines.

The active constituent of Caraway is the official volatile oil.

SUMBUL RADIX, B. P. Sumbul Root.

The dried transverse slices of the root of *Ferula Sumbul*, Hook. f. Obtained from Russia and India.

Characters : Pieces varying in size ; on outer surface a dusky brown papery transversely wrinkled cork, with short bristly

Tinctura Sumbul, B. P. Tincture of Sumbul.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 10).

Preparation : Take 2 oz. bruised Sumbul Root, 20 fl. oz. Alcohol (70 p. c.) ; prepare by the maceration process.

Medicinal properties : Nervous tonic, acting somewhat like Valerian,

It contains a resin, and a volatile oil.

CORIANDRI FRUCTUS, B. P. Coriander Fruit.

The dried ripe fruit of *Coriandrum sativum*, Linn. Cultivated in Britain and in India. (*Dhaniá*, Hind.).

Dose : 20 to 60 grains.

Characters : Nearly globular, about $\frac{1}{5}$ " in diameter, uniformly brownish-yellow ; glabrous. The two mericarps usually remain closely united and are crowned by the calyx teeth and stylopod ; primary ridges wavy and inconspicuous ; secondary ridges straight and more prominent ; the transverse section exhibits two vittæ on the commissural surface of each mericarp ; odour aromatic ; taste agreeable.

Its action depends on the official oil it contains.

Oleum Coriandri, B. P. Oil of Coriander.

The oil distilled from Coriander fruit.

Dose $\frac{1}{2}$ to 3 mins., on Sugar, or in emulsion.

Characters : Pale yellow ; with odour and taste of Coriander.

Medicinal properties : **Stimulant, Aromatic, Carminative.** Used to flavour medicines and prevent griping. It is specially suitable to disguise the taste of Senna or Rhubarb.

HYDROCOTYLES FOLIA. Pennywort Leaves.

The leaves of *Hydrocotyle asiatica*, Linn., the Indian Pennywort. Common throughout India. (*Khulakhudi*, Hind.).

Characters : Leaves long, petioled, reniform, crenate, $\frac{1}{2}$ " or more long ; when fresh no odour, but bruised they exhale a peculiar aromatic odour somewhat resembling Ivy ; taste pungent, bitter, disagreeable.

Medicinal properties : **Alterative, Tonic** ; applied locally **stimulant** ; useful in secondary syphilis and chronic skin diseases.

Its activity resides in a bitter oleo-resin and a peculiar form of tannic acid.

The powdered leaves may be given in doses of 3 to 8 grains, or

CUMINUM CYMINUM, Linn. Camin.

A plant cultivated in North-West India; (*Zira*, Hind.). The fruit is used as a spice. It owes its value to an essential oil.

Medicinal properties: **Stomachic**, **Carminative**; prescribed in chronic diarrhœa and dyspepsia.

PTYCHOTIS FRUCTUS. Ajwain Fruit.

The fruit of *Carum copticum*, Benth.; the Ajwain or Omum plant. Cultivated in India. (*Ajowan*, Hind.).

Characters: Minute umbelliferous fruits, covered with minute tubercles; odour aromatic resembling Thyme; taste pungent, bitter.

Oleum Ptychotis. Oil of Ajwain or Omum.

The aromatic oil distilled from Ajwain fruit.

Dose: $\frac{1}{2}$ to 3 mins. on sugar, or in emulsion.

Characters: Pale yellow with odour and taste of Ajwain.

Aqua Ptychotis. Ajwain or Omum Water. (*Ajwain-ka-arrak*, Hind.).

Dose: 1 to 2 fl. oz.

Preparation: Take 20 oz. bruised Ajwain seeds, 2 gallons water; distil a gallon.

Medicinal properties of Ajwain; **Stimulant**, **Carminative**, **Antispasmodic**. Used in flatulence, diarrhœa, &c. Its action depends on the presence of an essential oil.

The fruits are one of the sources of **Thymol** (*q. v.*).

APIUM GRAVEOLENS, Linn. Celery. (*Ajmodh*, Hind.).

The root is **diuretic**, and is prescribed in anasarca.

FERULA ALLIACEA, Boiss. (*Hing*, Hind.).

A fragrant plant indigenous to Afghanistan and Persia. It is the source of the finer qualities of Asafetida sold in Indian bazars.

PETROSELINUM SATIVUM, Hoff. Parsley.

A culinary herb cultivated in India.

The source of **Apiol**, a greenish-brown oily liquid, odour peculiar, taste disagreeable.

Medicinal properties: Apiol is useful in amenorrhœa and dysmenorrhœa. It is given in doses of 2 or 3 minims in capsule.

CAPRIFOLIACEÆ.

SAMBUCI FLORES, B. P. Elder flowers.

The flowers of *Sambucus nigra*, Linn., separated from the stalks,

Characters: Small; calyx, superior, five-toothed; corolla flat, rotate, deeply five-lobed, creamy white, with five-stamens inserted in the tube; anthers yellow; odour faint sweetish; taste bitterish.

Aqua Sambuci, B. P. Elder-flower water.

Preparation: Take 10 lbs. fresh Elder flowers (or an equivalent quantity of the flowers preserved while fresh with common salt), Water 5 gallons; distil one-fifth.

Medicinal properties: **Stimulant**; used only as a vehicle for collyria and lotions. Its virtues reside in an essential oil.

RUBIACEÆ.

CINCHONÆ RUBRÆ CORTEX, B. P. Red Cinchona Bark.

The dried bark of the stem and branches of cultivated plants of *Cinchona succirubra*, Pavon. Indigenous to tropical South America; now extensively cultivated in India.

Characters: Quilled or incurved pieces, coated with periderm, length 2" to 12" or more, the bark $\frac{1}{10}$ " to $\frac{1}{4}$ " thick; outer surface reddish-brown, more or less rough from longitudinal ridges which are most apparent in the branch bark, with numerous warts often running into lines on the larger pieces; in some varieties marked with numerous transverse cracks which have not thickened edges; inner surface brick-red or deep reddish-brown, irregularly and coarsely striated; fracture short fibrous in the smaller, and finely fibrous in the larger, pieces; powder brownish or reddish-brown; no marked odour; taste bitter, somewhat astringent.

Except when used for obtaining the alkaloids or their salts, the bark should yield between 5 and 6 p. c. of total alkaloids, of which not less than half should consist of quinine and cinchonidine.

Extractum Cinchonæ Liquidum, B. P. Liquid Extract of Cinchona.

Dose: 5 to 15 mins.

A liquid Extract containing 5 grains of the alkaloids of Red Cinchona Bark in 110 mins.

Infusum Cinchonæ Acidum, B. P. Acid Infusion of Cinchona.

Dose: $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 20.)

Preparation: Mix 1 oz. Red Cinchona Bark in No 40 powder, with 20 fl. oz. boiling Distilled Water, in a covered vessel; add 2 fl. drms. Aromatic Sulphuric Acid; infuse for one hour, strain.

Tinctura Cinchonæ, B. P. Tincture of Cinchona.

Dose: $\frac{1}{2}$ to 1 fl. drms. Prepared with Alcohol (70 p. c.) and

Tinctura Cinchonæ Composita, B. P. Compound Tincture of Cinchona.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength $\frac{1}{2}$ grn. of alkaloids in 110 mins.)

Preparation : Mix 1 oz. Dried Bitter Orange Peel well bruised, $\frac{1}{2}$ oz. Serpentry Rhizome in No. 40 powder, 28 grains Cochineal in powder, and 55 grains Saffron, with 10 fl. oz. Alcohol (70 p. c.) ; set aside in a closed vessel for 7 days, agitating frequently ; strain ; press the marc ; mix the liquids ; add 10 fl. oz. Tincture of Cinchona and enough Alcohol (70 p. c.) to produce 20 fl. oz. ; set aside for 24 hours ; filter.

Medicinal properties : Cinchona is bitter, **Tonic, Antiperiodic,** and slightly **astringent**. It is used in malarial fever, full doses being given 3 to 5 hours before the paroxysm begins ; also in chronic fevers ; neuralgias ; and erysipelas. The powdered bark may be used as an **antiseptic astringent** application to foul ulcers.

Cinchona bark is known also as **Peruvian** or **Jesuit's bark**. It was first brought from Peru to Europe by the Jesuits, and became known as a febrifuge through its having cured the Countess of Chinchon of fever in 1640.

Cinchona Febrifuge or Quinetum. The mixed alkaloids of red bark, consisting of quinine, cinchonidine, cinchonine, quinidine, and amorphous alkaloids.

Characters : A buff coloured powder, odour peculiar, taste disagreeable, bitter, nauseous ; insoluble in water, but soluble in acids.

Actions : Like quinine, but often causes nausea and gastro-enteric irritation when given in large doses. A good remedy in simple intermittent fevers, and other conditions for which quinine is given ; it is specially useful in chronic and masked malaria, and as a tonic.

Dose : 1 to 10 grns. thrice daily.

Cinchonidinæ Sulphas. A salt of one of the alkaloids of Cinchona.

Dose : 1 to 10 grns.

Characters : Colourless silky needle-like crystals. Slightly more soluble in water than Quinine Sulphate. Its solution affords a crystalline precipitate with Sodium Tartrate, is laevorotatory toward polarised light, and gives a white precipitate insoluble in Ether on the addition of Ammonia.

Action : Similar to Quinine, but not quite so powerful.

Cinchoninæ Sulphas. A salt of one of the alkaloids of

Characters: Hard, short, colourless, prismatic crystals: very soluble in water; solution dextrorotatory towards polarised light; and gives a white precipitate insoluble in ether on the addition of Ammonia.

Action: similar to Quinine, but slower in action. In large doses it causes nausea, vomiting and derangement of the bowels, and so is inferior in usefulness.

Quinidinæ Sulphas. A salt of one of the alkaloids of Cinchona. *Characters*: White silky crystals, slightly soluble in water; the solution gives a crystalline precipitate with Potassium Iodide and is dextrorotatory towards polarised light.

Action and dose: Same as Quinine.

Quinine and Quinidine are nearly equal in value as febrifuges. Cinchonidine is as efficient in slightly larger doses. Cinchonine is not so good, and has the disadvantages of causing nausea, vomiting and intestinal derangement.

Quinina ($C_{20}H_{24}N_2O_2 \cdot 3H_2O$), is the chief alkaloid of Cinchona. It may be prepared for dispensary purposes by adding an alkali to the solution of any of its salts, when it is precipitated as the trihydrate. It is sparingly soluble in water, but readily forms salts, which being more soluble are preferred.

The Hydrochloride and the Sulphate of Quinine are official.

QUININÆ HYDROCHLORIDUM, B. P. Quinine Hydrochloride.

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

Dose: 1 to 10 grains.

Characters: Crystals resembling those of Quinine Sulphate, but somewhat larger; solubility 1 in 35 of cold water, 1 in 3 of cold Alcohol (90 p. c.), very soluble in boiling water or Alcohol (90 p. c.).

Medicinal properties: Similar to the Sulphate, from which it differs chiefly in being much more soluble.

Tinctura Quininae, B. P. Tincture of Quinine.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 2 grns. in 110 mins.).

Preparation: Dissolve 175 grains Quinine Hydrochloride in 20 fl. oz. Tincture of Orange.

Vinum Quininae, B. P. Quinine Wine.

Dose: $\frac{1}{2}$ to 1 fl. oz. (Strength 1 grn. to 1 oz.).

Preparation: Dissolve 20 grains Quinine Hydrochloride in 20 fl. oz. Orange wine; set aside; filter if necessary.

Quininæ Hydrochloridum Acidum, B. P. Acid Quinine Hydrochloride.

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

Dose : 1 to 10 grains.

Characters : White crystalline powder, soluble in less than its own weight of water.

QUININÆ SULPHAS, B. P. Quinine Sulphate.

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

B. P. Dose : 1 to 10 grains.

Adult dose : As a Tonic 1 to 3 grns. thrice daily ; as an anti-periodic in malarial fever much larger doses are given.

A pleasant way of taking Quinine is in a mixture containing Citric Acid, to which a solution of Bicarbonate of Potash or of Ammonia is added and drunk during effervescence.

It may be prescribed dissolved in water with Sulphuric Acid. If just sufficient acid to dissolve the Quinine is added, the alkaline secretion of the mouth precipitates a portion of the Quinine, and this produces a lasting bitter taste in the mouth. If an excess of the acid be used, the bitter taste rapidly disappears.

To prevent headache, Quinine may be given with Diluted Hydrobromic Acid, or with Tincture of Orange, or Spirit of Ether.

Characters : Filiform silky white crystals of an intensely bitter taste ; 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 with solution of ammonia yield a white precipitate, soluble in ether or in excess of solution of ammonia.

Incompatibles : Alkalis and Alkaline Carbonates cause precipitation of the alkaloid. Preparations containing Tannin precipitate the insoluble Quinine Tannate.

Pilula Quininæ Sulphatis, B. P. Pill of Quinine Sulphate.

Dose : 2 to 8 grains.

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

Tinctura Quininæ Ammoniata, B. P. Ammoniated Tincture of Quinine.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 2 grns. in 110 mins.).

Added to pure water it forms a whitish mixture, due to precipi-

When added to mixtures, Mucilage should be added to prevent the precipitated alkaloid adhering to the sides of the glass.

Preparation : Mix. 2 fl. oz. Solution of Ammonia with 18 fl. oz. Alcohol (60 p. c.) ; add 175 grains Quinine Sulphate ; shake until a clear solution is obtained ; set aside for 3 days ; filter.

Medicinal properties : In small doses Quinine is a **stimulating tonic** ; in larger doses it is **antipyretic, antiperiodic, antineuralgic**. It is a specific for all affections due to malaria.

As an **ecbolic** Quinine does not initiate uterine action, but when labour has begun, it intensifies the contractions, without destroying their intermittent character. Given in 10 to 15 grns. doses twice or thrice at intervals of 1 to 2 hours, it is therefore most valuable before the birth of the child.

A 1 p. c. solution in water makes a good **antiseptic** wash for absorbent surfaces.

In the alimentary canal it acts as an ordinary **bitter** ; small doses improving the appetite and digestion. Continued thus for a length of time it is a **tonic**. Larger doses continued may derange the appetite and produce ill health.

Quinine is rapidly absorbed into the blood as the hydrochloride. Small doses act as a circulatory and cerebral stimulant ; large doses diminish metabolism, hence it is **antipyretic**. It destroys low forms of animal and vegetable life, and hence has a specific action on the microbes causing malarial fever. It also benefits neuralgia and other disorders recurring at regular intervals.

Large medicinal doses have their maximum effect in about 5 hours. In malaria Quinine is most beneficial if given about 4 hours before the paroxysms come on.

In bilious conditions Quinine often fails until a cholagogue has been given ; sometimes the addition of Morphine increases its effect. It is more readily absorbed if given in solution.

Excessive doses produce a feeling of tightness across the forehead, ringing in the ears, deafness, diminution of power of sight and feeling.

Larger doses may produce staggering gait, muscular and circulatory weakness. In some cases complete deafness has resulted.

Very large doses may produce delirium, convulsions, and death.

IPECACUANHÆ RADIX, B. P. Ipecacuanha Root.

The dried root of *Psychotria Ipecacuanha*, Stokes. Imported from Brazil.

Dose : as an **expectorant** $\frac{1}{4}$ to 2 grains ; as an **emetic** 15 to 30 grains. Even larger doses are given in acute dysentery.

Characters : Twisted pieces about 3" long and $\frac{1}{4}$ " thick ; consisting of a white central portion which is inert and a cortical

a number of brown rings strung on a thread; odour peculiar; taste acrid, bitter.

It usually is sold as a light brown powder.

Acetum Ipecacuanhæ, B. P. Vinegar of Ipecacuanha.

Dose : 10 to 30 mins. as an **expectorant**.

Preparation : Mix 1 fl. oz. Liquid Extract of Ipecacuanha, 2 fl. oz. Alcohol (90 p. c.), 17 fl. oz. Diluted Acetic Acid; filter; add Dilute Acetic Acid to make 20 fl. oz.

Extractum Ipecacuanhæ Liquidum, B. P. Liquid Extract of Ipecacuanha.

Dose : as an **expectorant** $\frac{1}{2}$ to 2 mins.; as an **emetic** 15 to 20 mins.

A liquid extract standardised to contain 2 to $2\frac{1}{4}$ grains of the alkaloid of Ipecacuanha root in 110 mins.

Pilula Ipecacuanhæ cum Scilla, B. P. Pill of Ipecacuanha with Squill.

Dose : 4 to 8 grains. (Contains 5 p. c. Opium).

A useful expectorant in chronic coughs, &c.

Preparation : Mix 3 oz. Compound Powder of Ipecacuanha, 1 oz. Squill, 1 oz. Ammoniacum, both powdered, and Syrup of Glucose a sufficiency; form a pill mass.

Pulvis Ipecacuanhæ Compositus, B. P. Compound Powder of Ipecacuanha. *Synonym, Dover's Powder.*

Dose : 5 to 15 grains. (Contains 10 p. c. Opium).

Preparation : Mix $\frac{1}{2}$ oz. Ipecacuanha Root, $\frac{1}{2}$ oz. Opium, 4 oz. Potassium Sulphate, all powdered.

Medicinal properties : Dover's powder is a gastric **sedative**, in doses of 3 grains it relieves heartburn, an **intestinal antiseptic** and **astringent**, combined with Calomel it is useful in diarrhœa and dysentery; **anodyne**, **diaphoretic**, and combined with quinine as a **hypnotic** in pneumonia.

Trochiscus Ipecacuanhæ, B. P. Ipecacuanha Lozenge.

Each contains $\frac{1}{4}$ grn. powdered Ipecacuanha Root, made up with Fruit Basis.

Vinum Ipecacuanhæ, B. P. Ipecacuanha Wine.

Dose : as an **expectorant** 10 to 30 mins.; as an **emetic** 4 to 6 fl. drms. repeated until it operates.

Used also as a throat spray in chronic bronchitis, and asthma.

In 1 drop doses frequently repeated, it relieves some forms of

Preparation : Mix 1 fl. oz. Liquid Extract of *Ipecacuanha*, with 19 fl. oz. Sherry : set aside for 48 hours ; filter.

Medicinal properties of Ipecacuanha : **Local Sedative** ; applied externally to the bites or stings of noxious insects.

Internally in large doses, it is **Emetic** used to empty an overloaded stomach or in poisoning ; to render expectoration more watery, and so more easily coughed up ; and as a specific in acute dysentery. In small doses Diaphoretic and **Expectorant**. In still smaller doses ($\frac{1}{4}$ grn.) a **Gastric Stimulant**.

Actions : Rubbed into the skin *Ipecacuanha* is an irritant often producing a pustular eruption. Inhaled, its powder produces coryza and sometimes asthma.

In medicinal doses taken into the stomach it acts as a powerful gastric and hepatic stimulant, but has no effect on the intestines except that of slightly increasing the mucous secretion. After absorption into the blood it tends to increase the watery secretions, so liquefying the bronchial secretion, and rendering it more easily expectorated ; it also is diaphoretic.

Its action in curing **dysentery** is probably to be explained by the fact that it is one of the most powerful of cholagogues ; the large doses given producing an excessive flow of bile, which acts as an intestinal antiseptic.

In **poisonous** doses it acts as a prompt emetic ; or if retained is a powerful gastro-intestinal irritant producing congestion and ecchymosis. Injected subcutaneously it produces death by cardiac paralysis.

Ipecacuanha root contains two alkaloids **Emetine** and **Cephæline**, and a glucoside, **Ipecacuanhic Acid**.

CATECHU, *B. P.* Catechu. *Synonym*, Catechu Pallidum, also known as Gambier or Pale Catechu, (*Kuth*, Hindi ; *Papri*, Beng.).

An extract of the leaves and young shoots of *Uncaria Gambier*, Roxb. From Singapore.

Dose : 5 to 15 grains in powder.

Characters : Cubical reddish-brown pieces, each side measuring about one inch, also in square sticks. No odour ; taste bitter, astringent, then sweetish ; soluble in boiling water.

Pulvis Catechu Compositus, *B. P.* Compound Powder of Catechu.

Dose : 10 to 40 grains.

An aromatic astringent.

Preparation : Mix 4 oz. Catechu, 2 oz. Kino, 2 oz. Krameria Root, 1 oz. Cinnamon, 1 oz. Nutmeg, all powdered.

This should be kept in a stoppered bottle.

Tinctura Catechu, B. P. Tincture of Catechu

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5.)

Preparation : Take 4 oz. of Catechu in coarse powder, 1 oz. bruised Cinnamon, 20 oz. Alcohol (60 p. c.) ; prepare by the maceration process.

Trochiscus Catechu, B. P. Catechu Lozenge.

Each contains 1 grain Catechu made up with Simple Basis.

Medicinal properties : **Astringent** similar to Tannic Acid.

The lozenge is used in sore-throat and in relaxed conditions of the uvula, also chewed before food by persons suffering with pyrosis. The compound powder and the tincture are much used in diarrhoea.

Catechu contains a yellow colouring matter (Catechin) and Catechu-tannic acid.

Incompatibles : Alkalies, metallic and alkaloidal salts, and Gelatine.

RANDIA DUMETORUM, Lam. (*Main phal*, Hind.).

A thorny shrub common throughout India. The fruit is about the size of a small apple, round, two celled, many seeded, and crowned with the rim of the calyx, odour sweetish sickly.

Medicinal properties : **Emetic, Expectorant, Antispasmodic.**

Adult dose of the pulp dried and powdered ; **Emetic** 15 to 60 grns. ; **Expectorant** 5 to 10 grns.

Its active principle is Saponin.

The bruised root thrown into the water is said to intoxicate fish which are then caught and eaten.

RUBIA CORDIFOLIA, Linn. The Indian Madder (*Manjit*, Hind.).

The root of a climbing plant found on the hilly districts of India. It yields a red dye, and is used as for colouring medicinal oils, and dyeing.

COFFEA ARABICA, Linn. Coffee (*Kafi, Kawa*, Hind.).

Extensively cultivated in Southern India. Its action depends on the alkaloid Caffeine (*q. v.*).

It is used in neuralgia and migraine. A strong infusion is used as a stimulant in Opium poisoning.

MORINDA CITRIFOLIA, Linn. The Indian Mulberry (*Al*, Hind.).

A bush found wild or cultivated nearly all over India. The

VALERIANÆ.

VALERIANÆ RHIZOMA, B. P. Valerian Rhizome.

The dried erect rhizome and root of *Valeriana officinalis*. Linn., collected in autumn. Indigenous in Britain.

Characters : Short, erect, entire or sliced ; externally dark yellowish brown, giving off numerous slender brittle roots 3" or 4" long ; internally whitish or yellowish ; odour strong disagreeable ; taste, unpleasant, slightly bitter.

It somewhat resembles Serpenteria, Arnica, and Veratrum, but is distinguishable by its odour.

Tinctura Valerianæ Ammoniata, B. P. Ammoniated Tincture of Valerian.

Dose : $\frac{1}{2}$ to 1 fl. drm.

Preparation : Mix 30 mins. Oil of Nutmeg, 20 mins. Oil of Lemon, 2 fl. oz. Solution of Ammonia, 18 fl. oz. Alcohol (60 p. c.), 4 oz. Valerian Rhizome in No. 40 powder ; prepare by the maceration process.

Medicinal properties : Nervous stimulant, Antispasmodic ; useful in hysteria, &c.

The chief active principle of the root is a volatile oil which by oxidation in the air is changed into valerianic acid.

The valerianates are prepared synthetically from Amylic Alcohol.

VALERIANA WALLICHII, DC. Indian valerian ; indigenous to temperate Himalaya. (*Tagar, Nahani, Asarun, Hind.*).

Its composition is similar to, and it may be used as a substitute for true Valerian.

VALERIANA HARDWICKII, Wall., has also similar properties. It is used medicinally in Nepal and Northern India.

NARDOSTACHYS JATAMANSI, DC. Indian Spikenard or *Jatamansi*.

The rhizome, found on the high mountainous regions of Nepal, Sikkim and Bhutan.

Characters : Short pieces, about $\frac{1}{4}$ " in diameter, covered with coarse dark hair-like fibres ; odour fragrant ; taste aromatic bitter. Old worm-eaten portions should be rejected as useless.

It yields on distillation an essential oil.

Medicinal properties : Antispasmodic : a good substitute for

Dose of powder: 30 to 40 grns.; or it may be given as an Infusion (1 in 40 of boiling water, allowed to stand 1 hour and strained), dose 2 oz., thrice daily, or **Tincture** (1 part bruised Jatamansi in 8 of Proof Spirit), dose 1 to 2 drms.

Indian Spikenard is used chiefly as a perfume, also to increase the growth and darken the colour of the hair.

COMPOSITÆ.

PYRETHRI RADIX, *B. P.* Pyrethrum Root, known also as Pellitory Root.

The dried root of *Anacyclus Pyrethrum*, DC., the common Pellitory; collected chiefly in Algeria, and obtainable in India (*Akarkara*, Hind.).

Characters: Unbranched pieces 2" to 4" in length, $\frac{1}{2}$ " thick, cylindrical or tapering towards either end; externally brown, longitudinally wrinkled; fracture short, showing large medullary rays with numerous dark resin-ducts scattered throughout; odour characteristic; taste pungent, when chewed it excites a warm prickling sensation in the mouth and an abundant flow of saliva.

Tinctura Pyrethri, *B. P.* Tincture of Pyrethrum.

Preparation: Moisten 4 oz. Pyrethrum Root in No. 40 powder with 3 fl. oz. Alcohol (70 p. c.); complete the percolation process so as to make 20 oz.

Medicinal properties: A powerful local **Sialagogue**. Used in dryness or paralysis of the mouth or tongue.

The Tincture is applied on cotton wool to carious teeth, or, diluted as a mouth wash.

Pyrethrum contains a volatile oil and an alkaloid.

SANTONINUM, *B. P.* Santonin.

A crystalline principle $C_{15}H_{18}O_8$, prepared from Santonica, the dried unexpanded flower-heads of *Artemisia maritima*, var. *Stechmanniana*, Besser. Imported from Russia; but the species is found also on the higher western Himalaya, (*Kirmálá*, Hind.).

Dose: 2 to 5 grains.

For children 2 or 3 grains may be given along with an equal quantity of Rhubarb Powder or a dose of Castor oil; it should be given each alternate evening until the worm is passed; 3 such doses are usually sufficient.

Characters: Colourless flat rhombic prisms, fusible, volatile when gently heated; sparingly soluble in water; taste feebly bitter. Sunlight renders it yellow; on the addition of warm alcoholic solution of potassium hydroxide it yields a violet-red colour.

Trochiscus Santonini, B. P. Santonin Lozenge.

Each contains 1 grain Santonin made up with Simple Basis.

Medicinal properties: **Anthelmintic**, effective for both round and thread worms. It should be followed by a purgative.

Santonin is best given in the evening as it sometimes deranges the vision, causing all objects to appear first blue then yellow or green. It is excreted by the kidneys and colours the urine yellow.

Large doses produce giddiness, vomiting, which may go on to convulsions, and death.

ANTHEMIDIS FLORES, B. P. Chamomile Flowers.

The dried expanded flower-heads of *Anthemis nobilis*, Linn., collected from cultivated plants. Grown in Europe, and sold in the bazars. (*Babuna-ka-phul*, Hind.).

Characters: $\frac{1}{2}$ " to $\frac{3}{4}$ " in diameter, hemispherical, nearly white; the involucre composed of several rows of oblong bracts, with membranous margins; the receptacle solid, conical, densely covered with concave, blunt, narrow, scaly bracts; the florets mostly ligulate and white; odour aromatic; taste bitter.

Extractum Anthemidis, B. P. Extract of Chamomile.

Dose: 2 to 8 grains.

An aqueous extract evaporated down to a soft consistence.

Oleum Anthemidis, B. P. Oil of Chamomile.

The oil distilled from Chamomile Flowers.

Dose: $\frac{1}{2}$ to 3 mins. on sugar, or in emulsion.

Characters: Pale blue or greenish blue, gradually changing to yellowish brown. Odour and taste of Chamomile Flowers.

Medicinal properties: **Aromatic, Stomachic, Tonic.**

Chamomile Flowers contain a small proportion of a volatile oil, also a bitter resinous principle.

TARAXACI RADIX, B. P. Taraxacum Root.

The fresh and the dried roots of *Taraxacum officinale*, Wiggers; the **Dandelion** plant, (*Dūdal*, *Baran*, *Kanphūl*, Hind.). Naturalised in the temperate area of the Himalaya, Tibet, and Nilgiris.

Characters: When fresh, tap-shaped roots; frequently 12" or more in length, and $\frac{1}{2}$ " or more in diameter; externally smooth, dark brown; internally white; easily broken, and giving out a milky bitter inodorous juice which on exposure becomes brownish:

Extractum Taraxaci, B. P. Extract of Taraxacum.

Dose : 5 to 15 grains three or four times daily.

A soft extract, made by straining and evaporating the expressed juice of fresh Taraxacum Root.

Extractum Taraxaci Liquidum, B. P. Liquid Extract of Taraxacum.

Dose : $\frac{1}{2}$ to 2 fl. drms.

An alcoholic extract so prepared that 1 fl. oz. is the equivalent of 1 oz. of dried Taraxacum Root.

Succus Taraxaci, B. P. Juice of Taraxacum.

Dose : $\frac{1}{2}$ to 2 fl. drms.

The expressed juice of bruised fresh Taraxacum Root 3 parts, with 1 part Alcohol (90 p. c.), added, set aside for 7 days and filtered.

It should be kept in a cool place.

Medicinal properties : A mild laxative ; often given with Podophyllin.

Taraxacum is a feeble hepatic stimulant ; it contains a bitter principle, Taraxacin, with sugar, and inulin.

ARNICÆ RHIZOMA, B. P. Arnica Rhizome. *Synonym*, Arnicæ Radix.

The dried rhizome and roots of *Arnica montana*, Linn. Found in the mountains of Central and Southern Europe.

Characters : Cylindrical, dark brown, 1" to 2" long, $\frac{1}{6}$ " to $\frac{1}{4}$ " thick ; curved, rough from scars of leaves, numerous long slender fibres ; odour faintly aromatic ; taste acrid, bitter.

Tinctura Arnicæ, B. P. Tincture of Arnica.

Preparation : Moisten 1 oz. Arnica Rhizome in No. 40 powder, with 1 fl. oz. Alcohol (90 p. c.), complete the percolation process so that the result measures 20 fl. oz.

Medicinal properties : Stimulant, irritant. Not used internally. Large doses are poisonous.

Uses : The tincture mixed with hot water and applied externally on lint, is a popular remedy to promote absorption after bruises and sprains. But equally good results are obtainable from the application of Rectified Spirit and water.

Arnica should not be applied to abraded or wounded surfaces,

EUPATORIUM AYAPANA, Vent. (*Aya pana*, Hind.).

A shrub introduced into India from Brazil.

The whole plant is aromatic, bitter, subastringent.

Medicinal properties : **Stimulant, Diaphoretic, Tonic.** May be given internally as an infusion. The bruised leaves form a stimulating application to chronic ulcers.

The fresh plant contains a volatile oil and a neutral substance, named Ayapanin.

CHRYSANTHEMUM CORONARIUM, Linn. Cultivated throughout India. The Root chewed is sialagogue, having actions resembling Pyrethrum.

BLUMEA DENSIFLORA, DC. A weed common in the province of Tenasserim.

It yields a stearoptene said to be identical with **camphor** : as also do various other varieties of *Blumea*, e.g., *B. balsamifera*, DC. *B. lacera*, DC. *B. eriantha*, DC.

Medicinal properties : are similar to Camphor.

ECLIPTA ALBA, Hassk. (*Moch-rand*, *Babri*, Hind.). A weed common throughout India.

Medicinal properties : The expressed juice of the root is used as **laxative cholagogue** ; its actions are similar to those of *Taraxacum*.

ARTEMISIA VULGARIS, Linn. The Indian Wormwood. (*Nagdona*, Hind.). Common throughout the hill tracts of India.

Medicinal properties : **Antispasmodic, Vermifuge Tonic.** An infusion of the leaves and flowering tops is used as a Stomachic Tonic.

It contains a volatile oil known as *Dona-ka-atar* and a bitter principle.

VERNONIA ANTHELMINTICA, Willd.

The seeds, or properly the fruits, (*achenes*) of this plant which is common in waste places throughout India are known as *Somraj* or *Bukchi*.

Characters : Dark brown, $\frac{1}{8}$ " long, covered with whitish scattered hairs, cylindrical, tapering towards the base, marked with about 10 paler longitudinal ridges, and crowned with a circle of short, brown scales ; taste nauseous bitter.

Medicinal properties : **Vermicide** to round worms.

Adult dose : 30 grns. in honey, repeated after a few hours and followed by an aperient.

The seeds are ground up into a paste with lime juice.

LACTUCA SCARIOLA, Linn. var. *sativa*. The Lettuce. (*Kahu*, *Salad*, Hind.).

Found wild on the western Himalaya, and extensively cultivated throughout India.

Medicinal properties : **Antispasmodic, Sedative, Anodyne**. The inspissated juice is known as Lactucarium or Lettuce Opium.

The plant contains Hyoscyamine, and the ash is rich in nitrates.

CAMPANULACEÆ.

LOBELIA, B. P. Lobelia.

The dried flowering herb, of *Lobelia inflata*, Linn. Imported from North America.

Characters : Stems, angular, channelled, furnished with narrow wings; often purplish, with one celled hairs, and the scars of alternate leaves. The leaves irregularly toothed and hairy. The capsule; inflated two-celled, and when mature contains minute oblong reticulated brown seeds; odour irritating; taste, at first not marked, but after chewing burning, acrid.

Tinctura Lobeliæ Ætherea, B. P. Ethereal Tincture of Lobelia.

Dose : 5 to 15 mins.; may be repeated every 2 or 3 hours. (Strength 1 in 5.)

Preparation : Moisten 4 oz. Lobelia in No. 40 powder, with 2 fl. oz. of Spirit of Ether, complete the percolation process so that the resulting Tincture may measure 20 fl. oz.

Medicinal properties : **Antispasmodic, Diaphoretic, Expecto-rant**. Used chiefly in spasmodic asthma, or other respiratory affections, accompanied by dyspnoea.

As an Emetic it is too hazardous to be recommended.

Lobelia resembles Tobacco in action, only that the feeling of burning in the alimentary canal is greater.

In large doses, it is a gastro-intestinal irritant, producing vomiting, pain, purging, and, after absorption into the blood, great depression and collapse. Death occurs by paralysis of respiration.

In *poisoning* by Lobelia give emetics until the stomach is emptied; then demulcents and stimulants internally and externally.

Lobelia contains two alkaloids, one amorphous and active named Lobeline, and the other crystalline named Inglatine.

ERICACEÆ.

UVÆ URSI FOLIA, B. P. Bearberry leaves.

Characters: Yellowish-green, obovate, coriaceous, smooth leaves, about $\frac{3}{4}$ " long, reticulated beneath, margins entire; no definite odour; taste very astringent.

The leaves somewhat resembles Senna, but these are unequal at the base; also Buchu, but these are toothed.

Infusum Uvæ Ursi, B. P. Infusion of Bearberry.

Dose: $\frac{1}{2}$ to 1 fl. oz. twice or thrice daily. (Strength 1 in 20).

Preparation: Infuse 1 oz. Bearberry leaves in 20 fl. oz. boiling Distilled Water, for 15 minutes; strain.

Medicinal properties: **Astringent, Diuretic.** Used chiefly in catarrh of the genito-urinary passages.

Bearberry leaves contain about 33 p. c. Tannic and Gallic Acids; also a bitter crystalline glucoside which is excreted as *Hydroquinone-sulphuric Acid*, and this when oxidised becomes a **stimulating antiseptic** imparting a brownish tinge to the urine.

Incompatibles: The same as those of Tannic Acid.

OLEUM GAULTHERIÆ. Oil of Wintergreen.

A volatile oil distilled from *Gaultheria procumbens*, Linn.

Dose: 10 to 15 mins. every 4 hours.

Characters: Colourless, yellow or reddish liquid; odour strong, aromatic, peculiar; taste sweet, warm aromatic.

Medicinal properties: Internally **Antirheumatic, Carminative;** mixed with equal part of Olive Oil it forms a local application externally for rheumatic pain.

In its action Oil of Wintergreen corresponds closely to that of Salicylate of Sodium.

The bulk of what is sold as Oil of Gaultheria is really Oil of Birch, a pure Salicylate of Methyl.

Artificial Oil of Gaultheria is made synthetically.

GAULTHERIA FRAGRANTISSIMA, Wall. Indian Wintergreen.

Found in Burma, Ceylon and Nilgiris.

The leaves yield a volatile oil which consists almost entirely of Methyl Salicylate. It may be used as a substitute for the true Oil of Wintergreen.

SAPOTACEÆ.

GUTTA PERCHA. The concrete juice of *Dichopsis Gutta*, Benth., and of several trees of this order.

Characters: Light brown pieces, tough, flexible, plastic above, 120° F. Insoluble in water, Alcohol, alkaline solutions, or dilute acids. Soluble in Turpentine, Carbon Bisulphide or Benzol; almost entirely soluble in Chloroform.

Medicinal uses: To make splints; as Gutta Percha tissue it is used to prevent evaporation from applications; and as a solution to be painted on a surface as a protective. Not used internally.

Indian Gutta percha is the product of *Dichopsis elliptica*, Benth., a tree common in Southern India. It has the objection of being very brittle.

BASSIA BUTYRACEA, Roxb. The Indian Butter tree.

A deciduous tree of the sub-tropical Himalaya (*Phulwa*, *Phulwara*, Hind.). The seeds on expression yield a white inodorous concrete oil, which is used as an external application for rheumatism and skin diseases.

BASSIA LATIFOLIA, Roxb. (*Mahua*, Hind.).

The seeds yield about 30 p. c. of a concrete oil, which becomes rancid on exposure, and therefore is unsuited for pharmaceutical operations. The flowers and seeds are used as articles of food, and the flowers, which contain a large proportion of sugar, yield an alcoholic liquor by fermentation.

EBENACEÆ.

DIOSPYRI FRUCTUS, the fruit of *Diospyros Embryopteris*, Pers.

A tree found in forest tracts throughout India.

Characters: Yellowish rusty, about the size of a small apple covered with rubiginous farina, eight-seeded, with much mucilaginous and astringent juice.

Medicinal properties: Intestinal Astringent.

An **extract** (made by evaporating the expressed juice to dryness) is given in doses of 1 to 5 grns., thrice daily for diarrhoea and dysentery.

STYRACEÆ.

BENZOINUM, B. P. Benzoin.

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

Characters: Agglutinated masses of tears; or flat or curved tears, usually 2" long and $\frac{1}{2}$ " thick or less; externally reddish-brown or yellowish; internally milky white; brittle, softens on being

warmed, when further heated it yields fumes of Benzoic Acid; almost entirely soluble in Alcohol (90 p. c.) and in Liquor Potassæ.

It has an agreeable odour recalling that of Vanilla in the case of Siam Benzoin, and of Storax in the case of Sumatra Benzoin.

Tinctura Benzoini Composita, B. P. Compound Tincture of Benzoin.

Synonym, Friar's Balsam. Known also as Traumatic Balsam.

Dose: $\frac{1}{2}$ to 1 fl. drm. May be triturated with mucilage or yolk of egg.

Preparation: Place 2 oz. Benzoin in coarse powder, $1\frac{1}{2}$ oz. Prepared Storax, $\frac{1}{2}$ oz. Balsam of Tolu, and 160 grains Socotrine Aloes, with 16 fl. oz. Alcohol (90 p. c.), in a closed vessel; set aside for 2 days, frequently agitating; filter; pass sufficient Alcohol (90 p. c.), through the filter to make 20 fl. oz.

Medicinal properties: **Aromatic, Stimulant, Expectorant, Antiseptic, Styptic.**

The Compound Tincture is applied externally to indolent ulcers and wounds; and as a sedative inhalation, 60 mins. in one pint hot water is used in subacute laryngitis, tracheitis, bronchitis, and phthisis; also given internally in chronic coughs.

Benzoin is composed of about 14 p. c. Benzoic Acid combined with various resins.

Benzoin, (*Luban*, Hind.) is extensively used in India as an incense.

Acidum Benzoicum, B. P. Benzoic Acid.

C_6H_5COOH , obtained from Benzoin by sublimation; also more cheaply from toluene, hippuric acid, and other organic compounds.

Dose: 5 to 15 grains. May be given in pills or wafer paper.

Characters: Light feathery crystalline plates and needles: when pure, flexible, nearly colourless, odourless; when obtained from benzoin has an agreeable odour due to traces of other substances; volatilises in the vapour of water. Solubility, 1 in 400 cold water, 1 in 17 boiling water, 1 in 3 of Alcohol (90 p. c.), entirely in fixed or volatile oil. Borax increases its solubility in water nearly four fold; with solution of Alkalis or Calcium hydroxide it forms **Benzoates**. On the addition of Hydrochloric Acid, to any save a very weak solution of a benzoate, Benzoic Acid is precipitated. A solution of a benzoate with a dilute solution of Ferric Sulphate gives a flesh-coloured precipitate.

Trochiscus Acidi Benzoici, B. P. Benzoic Acid Lozenge.

Each contains $\frac{1}{2}$ grain Benzoic Acid made with Fruit Basis.

Medicinal properties: Benzoic Acid is **Stimulant, Antiseptic,**

than the benzoates. It diminishes bronchial secretion. It remains unaltered in the blood, but is excreted by the kidneys as hippuric acid and therefore is a **remote antalkali**.

Uses : In foetid pulmonary disease, generally as an inhalation ; in phosphatic urine and cystitis ; and in pharmacy to preserve fats and infusions.

SYMPLOCOS RACEMOSA, Roxb. The Lodh Tree. (*Lodh*, *Lodra*, Hind.).

A small tree indigenous in the lower hills of Bengal, Assam and Burma. The bark known as **Lotur Bark**, is soft, friable, fawn coloured and is used in dyeing.

Medicinal properties : A mild **astrigent**.

In doses of 20 grns. the powdered bark mixed with sugar twice or thrice daily for three or four days, is given in menorrhagia.

OLEACEÆ.

OLEUM OLIVÆ, B. P. Olive Oil.

The oil expressed from the ripe fruit of the Olive, *Olea europæa*, Linn. Grown in Southern Europe.

Characters : Pale yellow or greenish-yellow, odour faintly agreeable ; taste bland oleaginous ; on being cooled it partially congeals, the temperature at which this occurs varying in different samples. Solubility : 1 in 2 of Ether, partially in Alcohol (90 p. c.).

Medicinal properties : **Emollient, Demulcent, Laxative, Anthelmintic, Nutritive**. Used in the preparation of liniments, ointments and plasters ; as a food, as a demulcent in case of irritant poisoning ; it should not be given in cases of Phosphorus poisoning as it dissolves the phosphorus, thus rendering it more readily absorbed.

As a laxative enema, also as an enema for thread-worms followed by a purge.

Adult dose : $\frac{1}{2}$ to 1 oz. as a laxative, but rarely so used.

Olive oil contains about 72 p. c. of a fluid glyceride (= **Olein**) and 28 p. c. of a solid fat (= **Palmitin**).

SAPO DURUS, B. P. Hard Soap.

Soap made with Sodium Hydroxide and Olive oil ; containing 30 p. c. of water.

Dose : 5 to 15 grains, may be given as an antacid.

Characters : Greyish-white, dry, without odour, taste alkaline ; kept in dry air becomes horny and pulverisable ; soluble in Alcohol

Emplastrum Saponis, B. P. Soap Plaster.

Preparation : Melt separately at as low a temperature as possible ; 6 oz. Hard Soap, $2\frac{1}{4}$ lbs. Lead Plaster, 1 oz. Resin, mix ; evaporate with constant stirring to a proper consistence.

Pipula Saponis Composita (see Opium).

Medicinal properties : Soap is **Laxative, Antacid**. Used chiefly as a **detergent**, and to make pills.

An Enema, made by dissolving Hard Soap sufficient to form a lather in 20 fl. oz. warm water, is used to clear out hardened fæces from the large intestines.

SAPO MOLLIS, B. P. Soft Soap.

Soap made with Potassium Hydroxide and Olive Oil.

Dose : 5 to 20 grns. may be given as an antacid.

Characters : Yellowish-white or yellowish-green, of an unctuous consistence, without odour ; soluble in Alcohol (90 p. c.), or in water, especially if warmed.

Medicinal properties : Is more **alkaline** than Hard Soap. Used, externally applied to the skin, in chronic and subacute eczema, and other skin diseases. Must be used with caution, as if too much be applied it may produce irritation.

Linimentum Saponis, B. P. Liniment of Soap ; known popularly as Opodeldoc.

Preparation : Dissolve 2 oz. Soft Soap, in 4 fl. oz. Distilled Water ; dissolve 1 oz. Camphor, and 3 fl. drms. Oil of Rosemary, in 16 fl. oz. Alcohol (90 p. c.), mix the solutions ; set aside for a week ; filter.

An excellent vehicle for embrocations in chronic painful affections.

GLYCERINUM, B. P. Glycerin or Glycerol, a trihydric Alcohol $C_3H_5(OH)_3$ associated with a small percentage of water ; obtained by the interaction of alkalis, or of superheated steam with fats or fixed oils.

Dose : 1 to 2 fl. drms.

Characters : A clear colourless syrupy fluid ; sp. gr. 1.260, no odour, taste sweet ; when decomposed by heat it evolves irritating vapours ; miscible with water or Alcohol (90 p. c.) ; insoluble in Chloroform, Ether, or fixed Oil ; hygroscopic ; a solvent of many substances.

Suppositoria Glycerini, B. P. Glycerin Suppositories.

Usual sizes 30, 60 or 120 grains. Each contains 70 p. c. of Glycerin.

Preparation : Place $\frac{1}{2}$ oz. Gelatin cut small in a weighed evaporating dish with sufficient Distilled Water to cover it; let stand for 2 minutes; pour off the excess of Distilled Water; set aside until the Gelatin is quite soft; add $2\frac{1}{2}$ oz. Glycerin; dissolve on a water bath; evaporate until the mixture weighs 1,563 grains. Pour the products into suitable moulds of the required size.

Dispensing Syrup (non-official), is a mixture of Glycerin, Syrup, and Mucilage of Acacia in equal parts. Used as an excipient for pills.

Medicinal properties of Glycerin. *Externally :* **Antiseptic, Emollient**; useful in cases where a desiccant effect is desired. Being absorbed through the skin it has the power of carrying into the circulation certain drugs that may be dissolved in it.

Internally used to **sweeten** astringent mixtures; also as a **demulcent**. In suppositories and enemata. Or as an anal injection 15 to 30 mins., undiluted, or diluted with an equal quantity of water. It is **laxative**.

As a **nutritive** it is inferior to Cod oil.

Very large doses destroy the blood corpuscles.

Glycerin is a bye-product in soap making; the fats being saponified with caustic alkalis, forming soap and glycerin; or fats may be decomposed by superheated steam, forming free fatty acids and glycerin.

ACIDUM OLEICUM, B. P. Oleic Acid.

Hydrogen Oleate $\text{CH}_3(\text{CH}_2)_7\text{CH} : \text{CH}(\text{CH}_2)_7\text{COOH}$: obtained by the saponifying action of alkalis and subsequent action of acids; or by the action of superheated steam upon the olein of fats; usually not quite pure.

Characters : A straw-coloured liquid, odour sometimes faintly rancid; no taste; reaction slight acid; exposed to the air it becomes brown and more acid; insoluble in water; soluble in Alcohol (90 p. c.), Chloroform or Ether; Sp. gr. about .900, it becomes semisolid at about 40°F . melting again at about 60°F .

Medicinal properties : **Solvent.**

As Oleic acid penetrates the cutaneous tissues more readily than fats, it is used as a **Vehicle** for active drugs intended for constitutional action: such combinations are termed Oleates.

JASMINUM SAMBAC, Ait. The Arabian Jasmine, (*Balphul*, *Motiya*, *Mogra*, Hind.).

Cultivated in India. The leaves yield an aromatic oil, similar to that of the Spanish Jasmine.

Medicinal uses : Both flowers and leaves are **lactifuge**; two or

JASMINUM GRANDIFLORUM, Linn. The Spanish Jasmine, (*Jati*, *Chambeli*, Hind.).

Found in the temperate Himalayas. From the flowers a volatile oil, the Otto of Jasmine, is prepared. This is much used as a perfume.

APOCYNACEÆ.

STROPHANTHI SEMINA, B. P. *Strophanthus* Seeds.

The dried ripe seeds of *Strophanthus Kombé*, Oliver, freed from the awns. These are used in Africa as an arrow-poison.

Characters: Oval acuminate seeds, about $\frac{3}{5}$ " long and $\frac{1}{6}$ " broad, colour greenish-fawn, covered with silky appressed hairs: the seeds are flattened and provided on one side with a longitudinal ridge running from the centre to the apex; the base is narrowed, obtuse; the nucleus is white only: the cotyledons are straight, surrounded by a thin endosperm: Sulphuric acid colours this and sometimes the cotyledons dark green (presence of Strophanthin); odour characteristic; taste bitter.

Extractum Strophanthi, B. P. Extract of *Strophanthus*.

Dose: $\frac{1}{4}$ to 1 grain. (Strength 1 in 2).

The active principle extracted first with Ether, then with Alcohol (90 p. c.), with Sugar of Milk added to make the specified strength.

Tinctura Strophanthi, B. P. Tincture of *Strophanthus*.

Dose: 5 to 15 mins. (Strength 1 in 40).

Preparation: Pack $\frac{1}{2}$ oz. *Strophanthus* Seeds in No 30 powder in a percolator; moisten with 1 fl. drm. Alcohol (70 p. c.); set aside 48 hours; pour on successive quantities of Alcohol (70 p. c.), percolating slowly until 10 fl. oz. of the percolate has been obtained; filter; add Alcohol (70 p. c.) up to 20 fl. oz.

This contains only half the proportion of *Strophanthus* that was in the B. P. 1895 preparation.

Medicinal properties: **Cardiac Tonic**, acting more quickly than *Digitalis*, and not cumulative in its effects. It is especially useful in cases of mitral disease with anasarca.

The active principle, **Strophanthin**; is a crystalline glucoside, colourless, opaque, brittle, with acid reaction, and intensely bitter taste; soluble in Water or Alcohol (90 p. c.). Adult dose of Strophanthin: $\frac{1}{300}$ to $\frac{1}{200}$ grn.

Several plants of the same genus, as *S. Wallichii* are found in tropical India. Their medicinal properties have not yet been investigated.

ALSTONIAE CORTEX, Dita bark, Alstonia bark.

The bark of *Alstonia scholaris* R. Br. A tree common throughout India. (*Chhatian*, Hind.).

Characters: Thick irregular pieces, contorted, easily broken; epidermis, rough greyish; bark cinnamon coloured, internally lighter in colour, spongy; no odour, taste bitter.

Tinctura Alstoniae. *Preparation*: Bark 1, Alcohol (50 p. c.) 8 parts. *Dose*: 1 to 2 fl. drms.

Infusum Alstoniae. *Preparation*: 1 part Bark in 20 of boiling water; infuse 1 hour; strain. *Dose*: 1 to 8 fl. oz. as a Tonic.

Medicinal properties: **Astringent, Febrifuge, Tonic.**

Dose: Of powdered bark 3 to 5 grains; often combined with small doses of Ipecacuanha and Gentian.

The bark yields Ditamine and other alkaloidal principles, also an inferior kind of India rubber.

KURCHI, CONESSI or TELLICHERRY BARK. (*Karchi*, *Kureya* or *Dudhi*, Hind.). The bark of the *Holarrhena* or *Wrightia antidysenterica*. A small tree common in India.

Characters: Dirty buff colour, spongy, taste bitter.

Actions and uses: **Astringent, Febrifuge, Anthelmintic.** Used in dysentery and diarrhoea.

A solid and a liquid Extract, also a Decoction are prepared.

The seeds (*Indrajab*; *Tita-indrajao*) are also used as a powder for the same purposes.

NERIUM ODORUM, Soland. The sweet-scented Oleander. (*Kaner*, *Kanel*, Hind.).

A small evergreen shrub indigenous to Afghanistan, cultivated in India for its flowers. There are two varieties, one with red the other white flowers. All parts of the plant are very poisonous. The seeds of the Yellow Oleander (*Thevetia nerifolia*), have been mistaken by children for almonds with fatal results.

Medicinal properties: Somewhat similar to Digitalis. But all parts of the plant are very poisonous. It is too uncertain in effect to be recommended as a remedy.

ASCLEPIADEÆ.

HEMIDESMI RADIX, B. P. Hemidesmus Root.

The dried root of *Hemidesmus indicus*, R. Br.

Characters: Nearly cylindrical, long, rigid, tortuous, longitudinally furrowed; about $\frac{1}{4}$ " in diameter, reddish-brown or dark-brown with annular cracks; when fractured, the interior is light

Hemidesmus somewhat resembles Sarsaparilla, Senega, and Ipecacuanha, but none of these have annular cracks, also, its odour serves to distinguish it.

Syrupus Hemidesmi, B. P. Syrup of Hemidesmus.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in $10\frac{1}{2}$).

Used as a flavouring agent. As it readily ferments this is not a suitable preparation for the tropics.

Preparation : Infuse 4 oz. Hemidesmus Root, bruised, in 20 fl. oz. boiling Distilled Water, in a covered vessel for 4 hours; strain; set the infusion aside until clear; decant the clear portion; add 28 oz. Refined Sugar; dissolve by gentle heat. The weight should be 42 oz.

Medicinal properties : **Diuretic, Flavouring.**

Hemidesmus is found throughout India, and is known as **Indian Sarsaparilla** (*Magrabu, Hindi salsu, Hind. ; Nannari, Tam.*). It is used there as an alterative in place of Sarsaparilla, in kidney disease, syphilis and rheumatism, but is not satisfactory.

Infusion of Hemidesmus was official in the Indian Pharmacopœia and is the best preparation for use in the tropics.

Dose : 2 or 3 oz. thrice daily. If sugar and milk be added, it is very palatable, and may be used in the same way as tea.

Preparation : Infuse 1 oz. bruised root in 10 oz. boiling water for 1 hour and strain.

The chemistry of Hemidesmus root is not correctly known. Its reputation as an alterative is probably due to its being used as a vehicle for Iodides by Hindu practitioners. As its virtue is mainly in the bark, the smaller roots are more efficacious than the larger ones.

CALOTROPIS CORTEX.

The dried root bark of *Calotropis gigantea*, R. Br., and *C. procera*, R. Br. Swallow-wort (*Madar, Mudar, Ak, Hind.*). Collected during April and May, from sandy soils; washed and partly dried in the open air. The bark is then removed, dried, and powdered. It should be preserved in well corked bottles.

Medicinal properties : In doses of 2 to 5 grns. it is an **Alterative Tonic**; in doses of 30 to 60 grns. it is an **Emetic**. It is regarded as an efficient substitute for Ipecacuanha in Dysentery, &c.

TYLOPHORÆ FOLIA.

The dried leaves of *Tylophora asthmatica*, W. and A. A small twining plant found throughout Northern and Eastern India.

Characters : Leaves 2" to 3" in length, entire, ovate, roundish, acuminate, cordate at the base, glabrous above, downy beneath; smell when bruised heavy disagreeable.

Adult dose : As an emetic 40 to 50 grns. ; as an expectorant and diaphoretic 4 to 8 grns.

Medicinal properties : Emetic, Diaphoretic, Expectorant, a good substitute for Ipecacuanha.

The leaves contain a crystalline alkaloid.

DÆMIA EXTENSA, R. Br. (*Sagowani*, Hind.).

A climbing plant indigenous in Southern India. The leaves are Emetic and Expectorant.

Adult dose : 10 grns. as an expectorant.

They contain an alkaloid.

GYMNEMA SYLVESTRE, R. Br. (*Mera-singi*, Hind.).

A shrubby climbing plant common in Central and Southern India. The leaves when chewed deaden for a time the sense of taste to sweet and bitter substances.

The powdered root dusted on the wound along with a decoction given internally is regarded by the natives of India as a remedy for snake bite.

The leaves contain a resinoid body named Gymnemic Acid.

LOGANIACEÆ.

NUX VOMICA, B. P. *Nux Vomica*.

The dried ripe seeds of *Strychnos Nux-vomica*, Linn. ; from India and Ceylon.

Characters : Rounded discs about 1" in diam. and $\frac{1}{4}$ " thick, with central scar on one surface, ashy grey, glistening, with short satiny hairs ; internally horny and slightly translucent, no odour ; taste very bitter.

Dose : 1 to 4 grns. in powder.

Extractum Nucis Vomicae, B. P. Extract of *Nux Vomica*.

Dose : $\frac{1}{4}$ to 1 grain. (Strength 5 p. c. Strychnine).

The Liquid Extract evaporated down to the consistence of a moderately firm extract with Milk-Sugar added so as to give the required strength.

Extractum Nucis Vomicae Liquidum, B. P. Liquid Extract of *Nux Vomica*.

Dose : 1 to 3 mins. (Strength $1\frac{1}{2}$ grns. Strychnine in 110 mins.).

Tinctura Nucis Vomicae, B. P. Tincture of *Nux Vomica*.

Dose : 5 to 15 mins. (Strength $\frac{1}{4}$ grn. Strychnine in 110 mins.).

Preparation: Mix 2 fl. oz. Liquid Extract of Nux Vomica with 3 fl. oz. Distilled Water; add Alcohol (90 p. c.) up to 12 fl. oz.; filter.

Medicinal properties: Depend on the alkaloid Strychnine present. In small doses **Tonic**; in large doses a nervous and general stimulant; larger doses are **poisonous**.

Sick headache is relieved by $\frac{1}{2}$ min. Tr. Nuc. Vom. in 1 dr. Water, every 10 minutes; also frontal headache may be prevented by 5 mins. before meals.

Nux Vomica contains two alkaloids, Strychnine and Brucine in varying proportions; also a fat, a glucoside named loganin, and an acid, igasuric acid.

Brucine acts in much the same way as Strychnine, but is less powerful, slower in action, more rapidly eliminated, and not cumulative in its effects. With Nitric Acid it gives a red colour; thus differing from Strychnine which remains uncoloured.

STRYCHNINA, B. P. Strychnine.

An alkaloid $C_{21}H_{22}N_2O_2$ obtained from the dried ripe seeds of *Strychnos Nux-vomica*, and from other species of *Strychnos*.

Dose: $\frac{1}{60}$ to $\frac{1}{15}$ grain.

Characters: Trimetric prisms, colourless or very pale yellow, without odour, very sparingly soluble in water, but communicating to it an intensely bitter taste.

Solubility, 1 in 700 water: 1 in 150 cold Alcohol (90 p. c.).

Strychninæ Hydrochloridum, B. P. Strychnine Hydrochloride.

Dose: $\frac{1}{60}$ to $\frac{1}{15}$ grains.

Character: Small colourless trimetric prisms which readily effloresce in the air.

Solubility, 1 in 35 of Water; 1 in 60 Alcohol (90 p. c.).

Liquor Strychninæ Hydrochloridi, B. P. Solution of Strychnine Hydrochloride.

Dose: 2 to 8 mins. (Strength 1 grain Strychnine Hydrochloride in 110 mins.).

Preparation: Dissolve $17\frac{1}{2}$ grains Strychnine Hydrochloride in 1 fl. oz. Alcohol (90 p. c.); mix with sufficient Distilled Water to make 4 fl. oz.

The hypodermic dose of Liquor Strychnine Hydrochloride is 2 mins.

Medicinal properties: **Bitter Tonic, Nervous Stimulant.**

When twitching of the fingers occurs it shows that the patient is fully under the influence of the drug.

For snake bites, Strychnine administered hypodermically has been recommended, but in the case of poisonous Indian snakes the results are disappointing.

Strychnine taken into the mouth and stomach has all the actions of an ordinary bitter tonic. It stimulates peristaltic action in the intestines, so lessening constipation. After absorption into the blood its chief action is that of a nervous stimulant, acting especially on the motor centres in the spinal cord. Small doses long continued increase the sensibility of touch, taste, and hearing. Medicinal doses have a general tonic influence, specially useful in chronic cases, *e.g.*, reflex or functional paralyses, and in paralyses due to the poisoning of lead, alcohol, or tobacco. Its stimulating action on the respiratory centre makes it useful in chronic respiratory diseases, *e.g.*, bronchitis, emphysema, phthisis.

It is excreted by the urine, sweat, and saliva. But this proceeds slowly, and thus it may be several days before the whole of the drug is eliminated. Cumulative action must therefore be guarded against.

Poisonous doses of Strychnine: The symptoms, which begin 5 minutes or sometimes later after the drug has been swallowed are, sudden violent convulsions in all the muscles, limbs extended, toes bent, hands clenched, opisthotonos, muscles of abdomen rigid and painful, jaws affected later, fits go off completely, but return after 1 or 2 minutes; mind unaffected. It may kill by exhaustion or by fixation of chest muscles, or spasm of heart. Death occurs 15 to 20 minutes after convulsions begin.

Lethal dose: $\frac{1}{2}$ grain and upwards, but recovery has ensued on taking 3 grains.

Treatment: Evacuate the stomach before convulsions begin by employing Emetics; if too late for this give Apomorphine hypodermically; Chloroform the patient and wash out the stomach.

For spasms, anaesthetise the patient with Chloroform or Ether; give Chloral Hydrate (10 grains) hypodermically, or (1 dr.) by enema; later artificial respiration.

Eight times its weight of Morphine will antagonise the effects of Strychnine.

The *NUX VOMICA TREE* is an evergreen about 40 ft. in height. It is found commonly throughout tropical India.

The Bark (*Kuchla*, Hind.) known in Europe as "False Angustura Bark" was on one occasion sold in the London drug market by mistake as *Cusparia* bark. It has been frequently mistaken in India for "Kurchi," the bark of *Holarrhena antidysenterica*.

This is dirty white and buff coloured externally, while the bark of the *Nux Vomica* tree is grey with bright rust-coloured patches of cork and white warty excrescences; its taste also is a more

intensely bitter; and on the application of Nitric Acid to the inner surface of the bark a bright red stain is produced. The wood, bark, and leaves of various species of *Strychnos* contain Brucine.

STRYCHNOS IGNATII, Linn. St. Ignatius Bean. A tree growing in the Phillipine Islands.

The seeds contain Strychnine and Brucine. They are sometimes used in the manufacture of the alkaloid Strychnine and its salts.

STRYCHNOS POTATORUM, Linn.

A small tree found in Bengal and Southern India.

The seeds are known as the **Clearing Nut**. They are non-poisonous and have the peculiar property of rapidly clearing muddy water. They are sliced, and rubbed on the inner sides of unglazed earthen vessels which are then filled with the muddy water which it is desired to purify. This action is due to the presence of albumen.

FAGRÆA FRAGRANS, Roxb. A small evergreen tree found in Burma and the Andamans.

The bark is used in the treatment of Malarial fever.

GELSEMII RADIX, B. P. Gelsemium Root.

The dried rhizome and roots of *Gelsemium nitidum*, Mich., the Caroline Jasmine. Indigenous in United States of America.

Tinctura Gelsemii. Tincture of Gelsemium.

Dose: 5 to 15 mins. (Strength 1 in 10.)

Medicinal properties: A respiratory and nervous sedative. Used chiefly in facial neuralgia, toothache and rheumatism.

Gelsemium contains an alkaloid gelsemine associated with several other constituents. As some of these are very poisonous, and as their relative proportion varies in different specimens, this drug should be used with caution.

Poisonous doses paralyse the sensory track of the spinal cord: Motor paralysis follows later; this is shown by giddiness, numbness, tremors, feeble pulse, and weak heart; the respiration becomes increasingly difficult, and death occurs from paralysis of respiration.

Treatment: Emetics, stimulants, and artificial respiration.

GENTIANACEÆ.

GENTIANÆ RADIX. B. P. Gentian Root.

The dried rhizome and root of *Gentiana lutea*, Linn. From the

Characters: Nearly cylindrical pieces, entire or longitudinally split; varying in length; about 1" or less thick; externally yellowish-brown and longitudinally wrinkled. The rhizome also has closely approximated encircling leaf-scars, and often terminates in a bud; internally reddish-yellow; if moist, it is tough; if dry, brittle; odour heavy peculiar; taste at first sweet then bitter.

Extractum Gentianæ. *B. P.* Extract of Gentian.

Dose: 2 to 8 grains.

An infusion evaporated to the consistence of a soft extract. Used chiefly as an excipient in pill-making.

Infusum Gentianæ Compositum. *B. P.* Compound Infusion of Gentian.

Dose: $\frac{1}{2}$ to 1 fl. oz.

Preparation: Infuse $\frac{1}{4}$ oz. Gentian Root, thinly sliced, $\frac{1}{4}$ oz. Dried Bitter Orange Peel, cut small, $\frac{1}{2}$ oz. Fresh (or dried) Lemon Peel, cut small, with 20 oz. boiling Distilled Water in a covered vessel for 15 minutes; strain.

Tinctura Gentianæ Composita. *B. P.* Compound Tincture of Gentian.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Preparation: Take 2 oz. Gentian Root cut small, $\frac{3}{4}$ oz. Dried Bitter Orange Peel, $\frac{1}{4}$ oz. Cardamom Seeds, all bruised, 20 fl. oz. Alcohol (45 p. c.). Prepare by the maceration process.

Medicinal properties: Gentian is a simple **Bitter Stomachic**, and general **Tonic**. It is used in atonic dyspepsia.

Its action depends on the presence of gentio-picrin, a crystalline bitter glucoside, soluble in water or dilute spirit.

CHIRATA, B. P. Chiretta.

The dried plant of *Swertia Chirata*, Ham., collected when in flower. Indigenous in Northern India.

Characters: Stem 3 ft. or more long, smooth, brown or purplish-brown in colour, slightly winged and much branched above, rounded below, containing a large continuous easily separable pith; branches slender elongate, decussate; leaves opposite, ovate, glabrous, entire, with 3 to 7 lateral veins; flowers small numerous paniced; fruits superior, bicarpellary, unilocular.

It somewhat resembles Lobelia, but the latter is not bitter.

Infusum Chiratæ, B. P. Infusion of Chiretta.

Dose: $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 20).

Preparation: Infuse 1 oz. Chiretta, cut small, with 20 fl. oz.

Liquor Chiratae Concentratus, B. P. Concentrated Solution of Chiretta.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 2).

Preparation : Moisten 10 oz. Chiretta in No. 40 powder with 5 fl. oz. Alcohol (20 p. c.); pack in a closed percolator; set aside 3 days; percolate with Alcohol (20 p. c.), added in 10 portions of 2 fl. oz. each time, at intervals of 12 hours, if necessary continue percolation so that the product measures 20 fl. oz.

Tinctura Chiratae, B. P. Tincture of Chiretta.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 10.)

Prescribed in 5 min. doses with acids and Tincture of Orange to form an acid tonic mixture.

Preparation : Moisten 2 oz. Chiretta in No. 40 powder with 2 fl. oz. Alcohol (60 p. c.). Complete the percolation process with Alcohol (60 p. c.) so as to make 20 fl. oz.

Medicinal properties : A pure Bitter Tonic without astringency, in action resembling Gentian. It may be given with Iron preparations.

Chiretta is an annual erect plant common throughout the hilly parts of Northern India. (*Charayatah, Kirayat, Hind.*)

Quite a number of species of *Swertia* are found throughout the Himalayas, e.g., *S. angustifolia*, Ham., *S. pulchella*, Ham., and *S. decussata*, Nimmo, and *S. corymbosa*, Wight, in the Deccan. These and possibly other species possess properties similar to Chiretta, and may be substituted for it.

EXACUM BICOLOR, Roxb. (*Bara Chiretta, Hind.*).

Is common throughout Orissa and the Madras Presidency. The dried plant is an aromatic tonic and is sold as country Chiretta.

ENICOSTEMA LITTORALE, Blume. (*Chota Kiraiyata, Hind.*).

A herb found throughout the plains of India, especially near the coast, and is known as *Chota Chiretta*. It is a stomachic tonic.

GENTIANA KURROO, Royle. Indian Gentian. (*Karu, Kuthi, Hind.*).

Indigenous to Western Himalaya at elevations of from 5,000 to 10,000 ft.

Medicinal actions : Similar to those of Gentian for which it forms a good substitute.

PEDALINEÆ.

PEDALIUM MUREX, Linn. The Burra Gokerú (*Bará-Ghókrú,*

Common in Southern India. A succulent, small-sized herb, with yellow flowers, and 4-angled, spiny fruits, exhaling a musky odour when bruised.

The leaves, fruit, or stems, if steeped in water, render it temporarily mucilaginous, without imparting to it colour, odour, or taste. A cold watery infusion of this, freshly made, is used as a **Mucilaginous drink**, and as a diuretic in gonorrhœa, dysuria, &c.

Dose : 10 oz. or more every morning for ten successive days.

SESAMI OLEUM. Til or Jinjelli Oil.

Sesamum indicum, Linn., is an annual herb about 3' high, extensively cultivated throughout the warmer parts of India.

The expressed oil of the seeds is purchasable in Indian bazaars, (*Til-ka-tel*, Hind.), and is largely exported.

Characters : clear, limpid, non-drying, amber-coloured, odourless, tasteless.

If of good quality it is equal to, and may be used as a substitute for Olive Oil.

The seeds and leaves are **demulcent** and **emollient**.

CONVOLVULACEÆ.

SCAMMONIÆ RADIX, B. P. Scammony Root.

The dried root of *Convolvulus Scammonia*, Linn.

From Syria and Asia Minor.

Scammonia Resina, B. P. Scammony Resin.

Dose : 3 to 8 grains.

The Resin obtained from Scammony Root by treating with Alcohol (90 p. c.) ; evaporating nearly the whole of the Alcohol ; pouring the residue into Distilled Water to precipitate the resin ; washing ; drying.

Characters : Brownish translucent pieces, brittle, fracture resinous ; odour sweet, fragrant ; it does not alone form an emulsion with water. It differs from Jalap resin in being almost entirely soluble in Ether.

Is entirely soluble in Alcohol (90 p. c.), or in solution of Potash.

Pilula Scammonii Composita, B. P. Compound Scammony Pill.

Dose : 4 to 8 grains.

Preparation : Mix 1 oz. Curd Soap in powder, 1 oz. Jalap Resin, 1 oz. Scammony Resin, 3 fl. oz. Tincture Ginger : dissolve with slight heat : evaporate on a water-bath until the mass is of a

Pulvis Scammonii Compositus, B. P. Compound Powder of Scammony.

Dose : 10 to 20 grains.

Preparation : Mix 4 oz. Scammony Resin, 3 oz. Jalap, 1 oz. Ginger, all powdered.

Scammonium, B. P. Scammony.

A gum-resin obtained by incisions from the living root of *Convolvulus Scammonia*, Linn.; known in commerce as *Virgin Scammony*.

Dose : 5 to 10 grains.

Characters : Irregular pieces of varying size, externally brown, dark grey, or nearly black, brittle; the freshly exposed surface is glossy resinous, more or less porous and uniformly dark brown in colour; thin fragments are brown and somewhat translucent, easily reducible to an ash grey powder; odour characteristic; taste acrid; it should yield 70 p. c. resin soluble in ether.

With water it forms an emulsion, so differing from the resin.

Medicinal properties : Scammony is a **drastic purgative**; as it produces considerable griping, it is rarely given alone. It is used where brisk action is desired.

It affects the hepatic function only slightly, but is a powerful intestinal irritant.

The active principle is the official resin. This does not act until it meets the alkaline secretions of the duodenum.

JALAPA, B. P. Jalap.

The dried tubercles of *Ipomœa Purga*, Hayne. Imported from Mexico, and cultivated at Ootacamund and Mussoorie.

Characters : Ovoid masses of varying size, covered with a thin, brown, wrinkled cuticle; when cut, yellowish-grey with brown concentric rings.

Jalap is usually purchased as a light brownish powder, with faint smoky odour, and sweetish acrid nauseous taste.

Dose : 5 to 20 grains.

Extractum Jalapæ, B. P. Extract of Jalap.

Dose : 2 to 8 grains.

An alcoholic and an aqueous extract mixed together and evaporated to a firm consistence.

Pulvis Jalapæ Compositus, B. P. Compound Powder of Jalap.

Dose : 20 to 60 grains. (Strength 1 of Jalap in 3).

Preparation : Mix 5 oz. Jalap, 9 oz. Acid Potassium Tartrate, and 1 oz. Ginger; all powdered.

Tinctura Jalapæ, B. P. Tincture of Jalap.

Dose : $\frac{1}{4}$ to 1 fl. drm.

Prepared so that 110 mins. contains $1\frac{1}{4}$ grains of the Resin.

Jalapæ Resina, B. P. Jalap Resin.

The Resin obtained from Jalap.

Dose : 2 to 5 grains.

Characters : Dark brown opaque fragments, translucent at the edges, brittle, breaking with a resinous fracture, readily reducible to a pale brown powder; odour sweetish; taste acrid; readily soluble in Alcohol (90 p. c.), but yielding not more than 10 per cent. to ether.

Medicinal properties : **Hydragogue Cathartic**, specially useful in renal dropsy and cerebral affection. Usually combined with Acid Tartrate of Potassium or Calomel. Large doses act within 2 hours, producing several watery stools.

Jalap contains about 10 p. c. of the official Resin. This consists almost entirely of a glucoside, insoluble in ether.

Jalap is a moderately powerful hepatic and a powerful intestinal stimulant. It does not act until mixed with bile in the duodenum. It has no action on the skin or mucous membrane, nor on the nervous or urinary system.

It should be avoided in conditions of intestinal irritation.

PHARBITIS SEMINA. Kaladana.

The seeds of *Ipomœa hederacea*, Jacq. (*Pharbitis nil*, Chois.), which grows wild and is cultivated in India.

Characters : Black, angular, $\frac{1}{4}$ inch long, having the form of a segment of an orange, smell heavy, taste at first sweetish, then acrid.

Dose : Of Kaladana powdered 20 to 60 grns.

Compound Kaladana Powder. *Dose* 40 to 60 grns.

Preparation : Mix 7 parts Kaladana, 7 parts Cream of Tartar, or Rock Salt, and 1 of Ginger, all powdered.

Pharbitisin or Kaladanæ Resina.

Dose : 5 to 8 grains.

Prepared as Jalap Resin.

Medicinal properties : **Purgative** like Jalap, only less active.

IPOMÆA TURPETHUM, R. Br. Turpeth Root. (*Pitohri*, *Nisoth*, *Tarbud*, Hind.).

The root dried and powdered is used as a cathartic and sometimes called **Indian Jalap**. Its action is uncertain, possibly due to the admixture of other varieties of root. The preparation and dose are the same as Compound Jalap powder.

ARGYREIA SPECIOSA, Sweet. The Elephant Creeper. (*Sa-mandar-ká-pát.*, Hind.).

A common Indian twining plant. The leaves are applied by the natives of India as a local stimulant.

SOLANACEÆ.

CAPSICI FRUCTU , *B. P.* Capsicum.

The dried ripe fruit of *Capsicum minimum*, Roxb. ; powdered, it is known as **Cayenne pepper** ; that from Nepal having the finest flavour.

Characters : Membranous pods, about $\frac{1}{2}$ " or more long, and $\frac{1}{4}$ " in breadth, conical, pointed, smooth, shrivelled, dull orange-red, enclosing 10 to 20 small roundish flat seeds ; odour characteristic ; taste intensely pungent.

Tinctura Capsici, *B. P.* Tincture of Capsicum.

Dose : 5 to 15 mins. (Strength 1 in 20).

Preparation : Take 1 oz. Capsicum in No. 20 powder, 20 fl. oz. Alcohol (70 p. c.). Prepare by the maceration process.

Unguentum Capsici, *B. P.* Capsicum Ointment. (Strength 1 in $5\frac{1}{2}$ nearly).

Preparation : Digest 120 grains Capsicum fruit bruised, 60 grains Spermaceti, and 1 oz. Olive Oil on a water bath for 1 hour, occasionally stirring ; strain ; set aside to cool without stirring.

Useful as a local application in Myalgia, Sciatica, &c.

Tinctura Capsici Fortior, Non-Official, Dr. Turnbull's Tincture, formerly known as Linimentum Capsici : made by percolating 10 of powdered Capsicum with Alcohol (90 p. c.) to produce 30.

Used : Externally as a **counter-irritant** for swollen chilblains, but not when the skin is broken. A small dossil of cotton wool, dipped in this Tincture, is a good remedy for toothache. It is used by aurists as a counter-irritant, painted behind the ear.

Medicinal properties : Capsicum is a powerful irritant, both externally and internally. Large doses produce gastro-enteritis. It is used externally as a **rubefacient** and **counter-irritant** in muscular rheumatism. Internally as a **condiment** (cayenne pepper) ; as a stimulating gargle ; as a pungent carminative and stimulant to dispel the craving in dipsomaniacs ; in choleraic

Dose of Capsicum, $\frac{1}{2}$ to 1 grn. powdered in pill.

The active principle of Capsicum is an acrid oleo-resin, volatile at high temperatures. Several varieties of Capsicum are grown in India (*Lal merich*, Hind.).

ATROPEÆ.

ATROPA BELLADONNA, Linn., the Deadly Nightshade, is a herbaceous perennial, with a disagreeable heavy smell, growing up every year as a bush to nearly 4 feet high.

All parts of the plant are poisonous, and fatal results have followed the eating of its berries. Its root has been mistaken for parsnips. The expressed juice from the leaves or infusion from the root if dropped into the eye dilates the pupil. Its action as a mydriatic has long been used to enhance female charms by enlarging the pupil and making the eye more bright and lustrous, hence the name Belladonna, which means beautiful lady.

Its actions are due to the alkaloid Atropine present in it.

BELLADONNÆ FOLIA, B. P. Belladonna Leaves.

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

Characters: Leaves with short stalks, alternate below, in unequal pairs above; length 3" to 8"; broadly ovate, acute, entire glabrous or nearly so; corolla gamopetalous campanulate, dingy-purple; the leaf on transverse section exhibits bi-collateral vascular bundles; the mesophyll contains numerous cells filled with minute crystals of calcium oxalate.

Extractum Belladonnæ Viride, B. P. Green Extract of Belladonna.

Dose: $\frac{1}{2}$ to 1 grain.

The expressed juice of Belladonna leaves evaporated to a soft extract.

Succus Belladonnæ, B. P. Juice of Belladonna.

Dose: 5 to 15 mins.

The expressed juice of Belladonna leaves and branches with one part Alcohol (90 p. c.), added to each 3 parts.

Belladonnæ Radix, B. P. Belladonna Root.

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

Characters: Nearly cylindrical pieces, entire or longitudinally split; about $\frac{1}{2}$ " in diameter, and 6 to 12" or more in length; externally pale greyish-brown, and finely wrinkled longitudinally; transverse fracture short; internally white starchy; within and

mostly near the cambium ring are numerous scattered groups of vessels and fibres which should not exhibit a prominently radiate arrangement; most of the parenchymatous cells contain small compound starch cells, and some are filled with minute crystals of calcium oxalate.

Extractum Belladonnæ Alcoholicum, B. P. Alcoholic Extract of Belladonna.

Dose: $\frac{1}{4}$ to 1 grain. Strength 1 p. c. of the alkaloids of Belladonna Root.

Suppositoria Belladonnæ, B. P. Belladonna Suppository.

Each contains about $\frac{1}{60}$ grain of the alkaloids of Belladonna Root.

Preparation: Take 18 grains Alcoholic Extract of Belladonna and Oil of Theobroma sufficient for 12 suppositories, proceed as directed for Tannic Acid suppositories.

Extractum Belladonnæ Liquidum, B. P. Liquid Extract of Belladonna.

A liquid extract containing $\frac{3}{4}$ grain of the alkaloids of Belladonna Root in 110 mins.

Emplastrum Belladonnæ, B. P. Belladonna Plaster. (Strength $\frac{1}{2}$ p. c. of the alkaloids of Belladonna Root).

Preparation: Evaporate 4 fl. oz. Liquid Extract of Belladonna until reduced to 1 fl. oz.; add 5 oz. Resin Plaster previously melted; mix.

Used as an absorbent, to diminish the secretion of milk.

Linimentum Belladonnæ, B. P. Liniment of Belladonna.

Preparation: Dissolve 1 oz. Camphor in 6 fl. oz. Alcohol (90 p. c.) add 10 fl. oz. Liquid Extract of Belladonna, 2 fl. oz. Distilled Water and Alcohol (90 p. c.), sufficient to produce 20 fl. oz.; set aside, for 24 hours; filter.

Smeared on the part and covered with lint it is used to relieve pain and tension, also as an absorbent in the clotting of varicose veins; to avert threatened abscess formation, and to suppress the secretion of milk.

Tinctura Belladonnæ, B. P. Tincture of Belladonna.

Dose: 5 to 15 mins. (Strength $\frac{1}{20}$ grn. alkaloid in 110 mins.).

Preparation: To 2 fl. oz. Liquid Extract of Belladonna add Alcohol (60 p. c.), sufficient to make 30 fl. oz., set aside 24 hours; filter.

Unguentum Belladonnæ, B. P. (Strength 0.6 p. c. of the alkaloids of Belladonna root).

Preparation : Evaporate 2 fl. oz. Liquid Extract of Belladonna on a water-bath until reduced to $\frac{1}{4}$ fl. oz., add $2\frac{1}{4}$ oz. Benzoated Lard; mix.

ATROPINA, B. P. Atropine.

An Alkaloid, $C_{17}H_{23}NO_3$, obtained from the leaves or root of Belladonna.

Dose : $\frac{1}{200}$ to $\frac{1}{100}$ grain.

Characters : Colourless needle-like crystals. Solubility, 1 in 300 of Water, readily in Alcohol (90 p. c.).

Unguentum Atropinæ, B. P. Atropine Ointment. (Strength 2 p. c.).

Preparation : Rub. 10 grains Atropine with 40 grains Oleic Acid; gently warm the mixture until dissolved; add 450 grains Lard; mix.

Atropinæ Sulphas, B. P. Atropine Sulphate.

Made by neutralising Atropine with dilute Sulphuric Acid.

Dose : $\frac{1}{200}$ to $\frac{1}{100}$ grain.

Characters : Nearly colourless crystals. Solubility, 1 in 10 of Alcohol (90 p. c.) 1 in 1 of Water.

Lamellæ Atropinæ, B. P. Discs of Atropine.

Discs of Gelatin with some Glycerin each containing $\frac{1}{5000}$ grain Atropine Sulphate.

Liquor Atropinæ Sulphatis, B. P. Solution of Atropine Sulphate.

Dose : $\frac{1}{2}$ to 1 min. (Strength 1 grain in 110 mins.).

Preparation : Dissolve $17\frac{1}{2}$ grains Atropine Sulphate and 2 grains Salicylic Acid in sufficient recently boiled and cooled Distilled Water to produce 4 fl. oz.

Medicinal properties of Belladonna, **Mydriatic, Anodyne, Antispasmodic, Lactifuge.**

Used : Locally as a **mydriatic**; in the form of liniment, ointment or plaster as a local **anodyne**; and to check secretions.

Internally it is used as an **antispasmodic**, in asthma and whooping cough. Habitual constipation has been successfully treated by giving $\frac{1}{8}$ to $\frac{1}{2}$ gr. Ext. Bellad. on rising, and continuing this for a fortnight. It is used also in the treatment of nocturnal incontinence of urine; and for atonic conditions of the generative organs leading to nocturnal emission.

Atropine diluted, applied locally to the eye, dilates the pupil and paralyzes accommodation; applied to the skin or mucous surfaces it reduces the sensibility of motor and sensory nerves. Dilute solutions contract, and strong solutions dilate (paralyze) the blood vessels. It can be absorbed from the skin, and produce constitutional symptoms. After absorption it dilates the pupil and paralyzes accommodation; it diminishes all the secretions, except the urine, which it slightly increases, as also the frequency of micturition.

It is excreted unchanged by the urine, and its effects pass off after 10 to 12 hours.

Small doses increase the action of the intestinal muscles, raise the blood pressure and temperature, and stimulate the nervous system generally.

Large doses arrest peristalsis, lower the blood pressure and temperature, and paralyze the nervous system.

Poisoning by Atropine produces dryness of mouth and throat, dilatation of pupils, dimness of vision, bright redness of skin, quickening of pulse and respiration, talkative delirium and sometimes convulsions. Later there is complete paralysis, coma, with failure of heart and respiration and death due to asphyxia. As the patient recovers the delirium returns.

Treatment: Emetics, cold to head, and small doses of Morphia with Antimony.

Incompatibles: **Caustic Alkalis** decompose **Atropine**.

HOMATROPINÆ HYDROBROMIDUM, B. P. Homatropine Hydrobromide.

The hydrobromide of an alkaloid prepared from tropine. (Atropine acted on by Barium Hydrate splits up into Tropic Acid and Tropine).

Dose: $\frac{1}{80}$ to $\frac{1}{20}$ grain.

Characters: White crystalline powder, or aggregation of minute trimetric crystals; solubility 1 in 6 of water, 1 in 18 of alcohol (90 p. c.).

Lamellæ Homatropinæ, B. P. Discs of Homatropine.

Discs of Gelatin with some Glycerin, each containing $\frac{1}{100}$ grain of Homatropine Hydrobromide.

Medicinal properties: **Mydriatic**; it acts quite as rapidly as Atropine, and its effects disappear in one-fourth of the time. Used with Cocaine it acts still more quickly and powerfully.

HYOSCYAMI FOLIA, B. P. Hyoscyamus Leaves; known also as Henbane.

The fresh leaves and flowers with the branches of *Hyoscyamus*

from the flowering biennial plants. It grows wild and is cultivated in Britain.

Extractum Hyoscyami Viride, B. P. Green Extract of Hyoscyamus.

Dose : 2 to 8 grains.

A soft Extract, small doses of which are added to purgative pills to prevent griping.

Succus Hyoscyami, B. P. Juice of Hyoscyamus.

Dose : $\frac{1}{2}$ to 1 fl. drm.

Preparation : Take of the expressed juice of Hyoscyamus leaves 3 parts, Alcohol (90 p. c.) 1 part: set aside 7 days; filter.

Tinctura Hyoscyami, B. P. Tincture of Hyoscyamus.

Dose : $\frac{1}{2}$ to 1 fl. drm. In sleeplessness this dose may be repeated every 1 or 2 hours until sleep comes on.

Preparation : Moisten 2 oz. Hyoscyamus leaves in No. 20 powder with 2 fl. oz. Alcohol (90 p. c.), and complete the percolation process so that the result measures 20 fl. oz.

Medicinal properties : **Mydriatic, Sedative.** Its actions are nearly the same as those of Belladonna, but it is less active; and its sedative action is rather prominent due probably to the hyoscine present. It is used as a **sedative** in cerebral excitement where Opium (owing to its constipating effect) is contraindicated; as a **sedative laxative**, and to relieve irritability of the bladder.

Incompatibles : The alkaloids of Hyoscyamus are destroyed by caustic alkali.

Hyoscyamus contains two alkaloids, both isomeric with Atropine, **Hyoscyamine**, a crystalline alkaloid (which acted on by an alkali becomes changed into Atropine, conversely Atropine can be changed into Hyoscyamine), and **Hyoscine**, a syrupy alkaloid.

Hyoscinae Hydrobromidum, P. B. Hydrobromide of Hyoscine; **Scopolamine Hydrobromide.**

The hydrobromide of an alkaloid contained in Hyoscyamus leaves, and certain other plants of the same Natural Order.

Dose : $\frac{1}{200}$ to $\frac{1}{100}$ grain.

Characters : Colourless transparent rhombic crystals, permanent in the air; without odour; taste acrid, slightly bitter. Soluble in 1 of Water or 13 of Alcohol.

Medicinal properties : A powerful **sedative**, very useful in nervous excitement specially where there is much violence or mania. It may be given hypodermically or by the mouth.

Henbane seeds are procurable in the Indian bazaars (*Khora-sani Ainain*, Hind.) and are used largely in native medicine.

Hyoscyaminæ Sulphas, B. P. Hyoscyamine Sulphate.

The sulphate of an alkaloid contained in *Hyoscyamus* leaves and certain other plants of the same order.

Dose: $\frac{1}{200}$ to $\frac{1}{100}$ grain.

Characters: A crystalline powder deliquescent, odourless, taste bitter acrid.

Medicinal properties: **Sedative**, but inferior to Hyoscine hydrobromide.

HYOSCYAMUS MUTICUS, Linn. Mountain Hemp. Grows in Sind. A powerful poison producing furious delirium, the symptoms resembling those of Belladonna. Contains hyoscyamine.

It is used for criminal purposes and as a narcotic.

STRAMONII FOLIA, B. P. Stramonium Leaves.

The dried leaves of *Datura Stramonium*, Linn., the Thorn apple.

Characters: Ovate petiolate leaves, 4" to 6" long, unequal at base, margin sinuate-dentate, apex acuminate; upper surface dark greyish-green, minutely wrinkled; under surface paler; odour heavy characteristic, taste unpleasant bitter.

These are smoked to relieve the paroxysm of Asthma.

Tinctura Stramonii, B. P. Tincture of Stramonium.

Dose: 5 to 15 mins. (Strength 1 in 5).

Preparation: Moisten 4 oz. Stramonium leaves in No. 20 powder with Alcohol (45 p. c.). Complete the percolation process so that the resulting Tincture may measure 20 fl. oz.

Stramonii Semina, B. P. Stramonium Seeds.

The dried ripe seeds of *Datura Stramonium*, Linn. •

Characters: Dark-brown, about $\frac{1}{6}$ " long, kidney-shaped, flattened; surface with reticulate depressions, minutely pitted; no marked odour, taste slightly bitter.

Extractum Stramonii, B. P. Extract of Stramonium.

Dose: $\frac{1}{4}$ to 1 grain.

An Alcoholic Extract of the powdered seeds evaporated to a firm consistence.

Medicinal properties: **Antispasmodic, Sedative**; used in asthma and other convulsive coughs.

Incompatibles: **Caustic Alkalis** destroy the efficacy of this drug.

Stramonium leaves and seeds contain an alkaloid Daturine probably allied to, if not identical with Atropine or Hyoscine.

Its actions are very similar to those of Atropine, only it has a specially depressing effect on the nerves of the bronchi.

DATURA STRAMONIUM, Linn., and *D. Metel*, Linn. (*Dhatūra*, Hind.) are indigenous in India, chiefly on the temperate Himalayas.

TABACI FOLIA. Tobacco Leaf.

The dried leaves of *Nicotiana Tabacum*, Linn., the Tobacco plant.

The essential principle of Tobacco is a poisonous liquid alkaloid Nicotine, which acts on the heart; in large doses causing profound depression.

Virginian Tobacco is the strongest variety; it contains about 6 p. c. of the Alkaloid. Tobacco juice is a powerful insecticide.

Medicinal properties : **Sedative, Narcotic, Emetic** : It is sometimes smoked to relieve asthma: but probably the relief obtained is due to pyridine, or some other products of the destructive distillation, and not to the alkaloid. It is occasionally used as snuff for affections of the head. It is rarely if ever used in medicine.

DATURÆ FOLIA ET SEMINA.

The leaves and seeds of *Datura fastuosa*, var. *alba*, Linn. The **Datura** plant common throughout India. (*Saféd-dhatūra*, Hind.).

Characters : **Leaves** ovate, acuminate, repandly-toothed, unequal at base, downy, emitting especially when bruised a peculiarly heavy disagreeable odour.

Seeds, $\frac{3}{8}$ " long, flattened, kidney-shaped, dark-brown; taste disagreeable bitter acrid.

Medicinal properties : **Antispasmodic, Sedative**, similar to those of *D. Stramonium*.

An Extract and a Tincture may be prepared in the same way as the corresponding preparations of *Stramonium*.

DATURA FASTUOSA, the Black Datura (*Kala-dhātūra*, Hind.), has large purple flowers; is similar in actions to the white variety.

The Datura plants have been used for a long time in India, to produce the intoxication necessary to enable crimes to be perpetrated. The Thugs (professional datura poisoners), were named *Daturias*.

DULCAMARA. The dried young branches of *Solanum Dulcamara*, Linn., the Bitter-sweet.

Grows in Europe and temperate Asia.

Characters : Branches $\frac{1}{4}$ " in diameter, light hollow cylindrical, taste bitter, subsequently sweet.

Medicinal properties : **Alterative, Diaphoretic, Diuretic**, similar but inferior to *Hemidesmus*. It contains, in common with several other species, the alkaloid solanine.

An Infusion may be used in doses of 1 to 2 fl. oz.

Preparation: Infuse 1 oz. bruised *Dulcamara* in 10 oz. boiling water for one hour; strain.

SOLANUM NIGRUM, Linn. Common throughout India. (*Gurkamai*, Hind.).

A fluid Extract of the leaves and stems is used in dropsy. Its actions are similar to those of *Dulcamara*.

WITHANIA COAGULANS, Dunal. **Vegetable Rennet**, (*Panir-band*, Sind.)

A small shrub, common in the Panjab and Sind. The dried fruits are used for coagulating milk for cheese making. The fresh ripe fruits are used as an emetic. When dried they are used as a stomachic.

SCROPHULARINEÆ.

DIGITALIS FOLIA, B. P. Digitalis Leaves.

The dried leaves of *Digitalis purpurea*, Linn., the purple Foxglove; collected from plants commencing to flower.

Dose in powder: $\frac{1}{2}$ to 2 grains.

Characters: From 4 to 16 inches long, and up to 6 inches broad, with a winged petiole; broadly ovate, lanceolate, subacute, crenate, upper surface rugose, downy, under surface paler and densely pubescent; odour faint agreeable, like tea; taste bitter and unpleasant.

It somewhat resembles *Matico*, but is less deeply reticulated.

Infusum Digitalis, B. P. Infusion of Digitalis.

Dose: 2 to 4 drms. (Strength 1 in 160).

Preparation: Infuse 60 grains Digitalis leaves in No. 20 powder with 20 fl. oz. boiling Distilled Water, in a covered vessel for 15 minutes, strain.

Used as a Diuretic.

Tinctura Digitalis, B. P. Tincture of Digitalis.

Dose: 5 to 15 mins. (Strength 1 in 8).

Preparation: Moisten $2\frac{1}{2}$ oz. Digitalis Leaves in No. 20 powder with 2 fl. oz. Alcohol (60 p. c.), complete the percolation process so that the resulting Tincture measure 20 fl. oz.

Used as a Cardiac Tonic.

Incompatibles: With Ferric preparations Digitalis forms a black inky solution (due to Tannic Acid); but this clears upon adding a little Phosphoric or Sulphuric Acid.

Medicinal properties : **Cardiac Tonic, Stimulant, Sedative**, for this the Tincture is best; **Diuretic**, for this the Infusion is best; the reason being that alcohol and water, dissolve out different active principles.

Absorbed into the blood *Digitalis* acts chiefly on the circulatory system, lengthening and strengthening the contractions of the ventricle, thus diminishing the frequency and increasing the force of the heart's beat, producing increased arterial tension, and stimulating the circulation generally. Thus it is a **cardiac Sedative** if the heart is acting rapidly, and a **tonic, or stimulant**, if it is acting feebly, (shown by a small weak pulse, with defective circulation, pulmonary congestion, dyspnoea, &c.). It is used for all forms of cardiac valvular disease, aortic incompetence, in which the increased diastole would permit a greater reflux of blood, and so risk a cerebral anæmia which might be disastrous.

In *full doses* *Digitalis* relaxes the renal arteries, therefore is a **diuretic**.

To get the full tonic effect of *Digitalis* it must be accompanied by nutritious and easily digested food; other Tonics, especially Iron, help materially.

Excessive doses of Digitalis produce vomiting and diarrhoea, increase the frequency and diminish the force of the heart, therefore the arterial tension decreases and the circulation fails. There is also diminution of urine. *Still larger doses* cause the heart's action to become weak, irregular, and finally to cease in diastole; the respiration stopping as the result of the general circulatory failure.

Treatment of poisoning by Digitalis. Empty the stomach by emetics; keep patient in the recumbent position; treat the cardiac depression by stimulants, (externally, warmth, and internally, hot strong tea or coffee, and alcohol).

The Chemistry of *Digitalis* is very complex. Five different principles have been isolated (a) **Digitalin**, (or *Digitalin Verum*) a granular glucoside soluble in alcohol, but nearly insoluble in water, having the actions of *Digitalis* in a marked degree, (b) **Digitonin**, a crystalline substance resembling Saponin: soluble in water but insoluble in alcohol. The other principles are less important, and differ in action and solubility.

Digitalin is a name given to several different substances sold as the essential principle of *Digitalis*. Of these that known as **Digitalin Verum** (or true Digitalin) is the best. Other varieties are, **Amorphous Digitalin** (Homolle); **Crystalline Digitalin** (Nativelle); and **German Digitalin**; but these are uncertain in quality, and contain other principles than pure Digitalin. Their action and dose therefore vary very much.

The dose of Digitalin Verum is $\frac{1}{270}$ grn. every 2 or 3 hours.

PICRORHIZA KURROOA, Benth. (*Kutki, Katki*, Hind.)

short brittle dark-coloured pieces sometimes contorted, about $\frac{1}{4}$ " in diameter at the upper extremity, tapering downwards, with remains of leaves above, and rootlets: taste bitter.

In doses of 10 to 20 grns. it is a **bitter stomachic**: 30 to 40 grns. an **antiperiodic**. It is combined with aromatics.

It must be carefully distinguished from other drugs sold in the bazaars under the name of *Kutki*, e. g., from the *Kala Kutki*, which is the poisonous Black Hellebore.

The bitter principle is a glucoside Picrorhizin.

ACANTHACEÆ.

ANDROGRAPHIS CAULES ET RADIX, (*Kariyat*, *Creyat*, Hind.).

The dried stalks and root of *Andrographis paniculata*, Nees. Common all over India.

Characters: Stem usually with root attached about 12" long, quadrangular, lightish-brown pieces; taste persistently bitter.

Compound Tincture of Kariyat.

Dose: 1 to 4 drms. in an equal quantity of water.

Preparation: Mix Creat cut small, 6 oz., Myrrh, and Aloes powdered, of each 1 oz., Proof Spt. 40 oz. Macerate 7 days, occasionally agitating, strain, press, filter, and add Proof Spt. up to 40 oz.

Useful in constipation, associated with torpidity of bowels.

Medicinal properties: A bitter **Tonic**, in action resembling Quassia.

HYGROPHILA SPINOSA, J. And., Synonym, *Asteracantha longifolia* (*Talma-khana*, Hind.).

The roots, leaves, and seeds, are used as a **demulcent** and **diuretic** in dropsical cases.

From the roots a **decoction** is made by boiling 1 oz. in 20 oz. water for ten minutes and straining.

Dose: 1 to 2 oz. every hour.

From the leaves an **Acetum** may be prepared by macerating 2 oz. freshly dried leaves in 16 oz. Distilled Vinegar for 3 days; then pressing and straining.

Dose: $\frac{1}{2}$ to $1\frac{1}{2}$ oz. thrice daily.

The seeds are also used.

ADHATODA VASICA, Nees. (*Arúsa*, *Rús*, Hind., *Bakas*, Beng.).

A shrub common throughout India.

All parts of the plant are bitter and aromatic. The leaves, root, and bark are used as **stimulating expectorant** in chronic res-

RHINACANTHUS COMMUNIS (*Palak-juhi*, Hind.; *Nagamulli*, Tam.).

A small shrub cultivated in Southern and Western India. The fresh root bruised and mixed with lime juice is very effective in arresting parasitic skin diseases, e.g., dhobis' itch (*Tinea circinata tropica*).

VERBENACEÆ.

CLERODENDRON INFORTUNATUM, Gaertn. (*Bhant*, Hind.).

Common throughout Bengal and Malabar.

Medicinal properties: Tonic. An efficient substitute for Chiretta. The juice of the fresh leaves is used as a vermifuge.

CLERODENDRON INERME, Gaertn. (*Sangkupi*, Hind., *Koivel*, Mar.) India and Ceylon, wild or cultivated, near the sea.

Medicinal properties: The leaves are an **alterative tonic** in scrofulous and venereal affections, and have a reputation as a febrifuge.

The leaves are mucilaginous, bitter and fragrant.

LABIATÆ.

OLEUM ROSMARINI, B. P. Oil of Rosemary.

The oil distilled from the flowering tops of *Rosmarinus officinalis*, Linn.

Dose: $\frac{1}{2}$ to 3 mins.

Characters: Pale-yellow, odour of rosemary, taste warm camphoraceous. Solubility 1 in 2 of Alcohol (90 p. c.).

Spiritus Rosmarini, B. P. Spirit of Rosemary.

Strength: 1 part in 9 parts of Alcohol (90 p. c.).

Medicinal properties: **Stimulant, Carminative**; the same as other aromatic oils.

Used chiefly in liniments. Its odour has the property of driving off insects.

OLEUM LAVANDULÆ, B. P. Oil of Lavender.

The oil distilled from the flowers of *Lavandula vera*, DC.

Dose: $\frac{1}{2}$ to 3 mins.

Characters: Pale yellow, odour of Lavender, taste hot, bitter, aromatic. Solubility 1 in 3 of Alcohol (70 p. c.).

Spiritus Lavandulæ, B. P. Spirit of Lavender.

Dose: 5 to 20 mins. (Strength 10 p. c.).

Preparation: To 1 oz. Oil of Lavender add Alcohol (90 p. c.),

Tinctura Lavandulæ Composita, B. P. Compound Tincture of Lavender.

Dose : $\frac{1}{2}$ to 1 fl. drm.

Preparation : Take 75 grains each of Cinnamon bark and Nutmeg, 150 grains Red Sanders wood, 20 oz. Alcohol (90 p. c.), prepare by the maceration process. Then add 45 mins. Oil of Lavender, 5 mins. Oil of Rosemary.

Used to colour Liq. Arsenicalis.

Medicinal properties. Lavender Oil is **Aromatic, Stimulant, Carminative.** It is a mixture of a terpene, and a stearoptene.

OLEUM MENTHÆ PIPERITÆ, B. P. Oil of Peppermint.

The oil distilled from fresh flowering Peppermint, *Mentha piperita*, Sm.

Dose : $\frac{1}{2}$ to 3 mins.

Characters : Pale-yellow, or greenish-yellow when recently distilled, gradually becoming darker by age ; odour of Peppermint, taste strong penetrating aromatic, followed by a sensation of coldness in the mouth. Soluble 1 in 4 of Alcohol (70 p. c.).

If a portion of the oil be cooled to 17° F., and a few crystals of Menthol added, a considerable separation of Menthol should take place.

Aqua Menthæ Piperitæ, P. B. Peppermint Water.

Dose : 1 to 2 oz.

Preparation : Take 77 mins. Oil of Peppermint, Water $1\frac{1}{2}$ gallons ; distil two-thirds.

It may also be prepared by triturating a portion of the Oil with twice its weight of Calcium Phosphate, and five hundred times its volume of water, then filtering.

Spiritus Menthæ Piperitæ, B. P. Spirit of Peppermint.

Dose : 5 to 20 mins. (Strength 10 p.c.).

Preparation : To 1 fl. oz. Oil of Peppermint add Alcohol (90 p. c.), sufficient to make 10 fl. oz. ; mix.

Medicinal properties : Powerful **Carminative, Antiseptic.** Used to relieve flatulence and colic, and as an adjunct to purgative medicines. Applied externally it relieves facial neuralgia.

Peppermint oil is an aromatic volatile oil. Its principle constituent is Menthol. Dementholised Peppermint oil is known as Menthén and is used to adulterate the genuine oil.

Peppermint Syrup. *Adult dose* : $\frac{1}{2}$ to 1 oz.

Preparation : Mix 10 mins. Spt. Peppermint with 1 oz. simple Syrup.

Peppermint Lozenges of various sizes are used to relieve

MENTHOL, B. P. Menthol.

A crystalline substance ($C_6H_9\text{-OH-CH}_3\text{-C}_8H_7$) obtained by cooling the oil distilled from the fresh herbs of *Mentha arvensis*, DC., var. *piperascens et glabrata*, Holmes, and of *Mentha piperita*, Sm.

Dose: $\frac{1}{2}$ to 2 grains.

Characters: Colourless needle-like crystals, or fused crystalline masses, volatile; with taste and smell of Peppermint; sparingly soluble in Water, soluble in Alcohol (90 p. c.), Chloroform, Ether, or Oils.

It forms an oily liquid if rubbed up with an equal quantity of Thymol, Chloral Hydrate, or pure Carbolic Acid; or 3 parts Menthol with 2 of Camphor.

Emplastrum Menthol, B. P. Menthol Plaster.

Preparation: Melt together 1 oz. yellow Beeswax and $7\frac{1}{2}$ oz. Resin; when the temperature approaches 165° F. add $1\frac{1}{2}$ oz. Menthol; stir until dissolved.

Medicinal properties: Menthol is a local anæsthetic and antiseptic. It is used to relieve non-inflammatory pains, e.g., neuralgias, either in the form of a pencil lightly rubbed over the painful part; or as an Alcoholic solution, or mixed with Camphor, Carbolic Acid, &c. painted in. Its solutions may be used for toothache.

Menthol is known as Peppermint Camphor.

OLEUM MENTHÆ VIRIDIS, B. P. Oil of Spearmint.

The oil distilled from fresh flowering spearmint, *Mentha viridis*, Linn.

Dose: $\frac{1}{2}$ to 3 mins.

Characters: Pale-yellow, or greenish-yellow when recently distilled, becoming darker by age; odour and taste of the herb.

AQUA MENTHÆ VIRIDIS, B. P. Spearmint Water.

Preparation: Take of Oil of Spearmint 77 mins., water $1\frac{1}{2}$ gallons; distil two-thirds.

Medicinal properties: Carminative, Antiseptic.

Its actions are similar to those of Peppermint Oil but less powerful.

MENTHA ARVENSIS, Linn. The Marsh mint. (*Pudina*, Hind.).

Is found in the temperate Himalaya. It yields an aromatic oil similar to Peppermint.

THYMOL, B. P. Thymol.

A crystalline substance ($C_6H_8\text{-OH-CH}_3\text{-C}_3H_7$) obtained from the

punctata (horsemint) and *Carum copticum* (Omum Seeds); purified by recrystallisation from alcohol.

Dose: $\frac{1}{2}$ to 2 grains.

Characters: Large oblique prismatic crystals, odour like thyme: taste aromatic, pungent; solubility, 1 in 1,500 water, freely soluble in Alcohol (90 p.c.), Ether, Olive Oil or alkaline solutions. The crystals sink in cold water, but on heating to 120° F., they melt, rise to the surface, and readily volatilise; a solution of 2 of Thymol in 1 of Glacial Acetic Acid, heated with 2 of Sulphuric Acid becomes reddish-violet.

Thymol is prepared by distilling the oil, the more volatile portion forming the commercial **Oil of Thyme**; the less volatile portion on exposure to a low temperature yielding Thymol.

Medicinal properties: **Deodorant, Antiseptic.** Used chiefly as a deodorant.

Thymol is more active as an antiseptic than Carbolic Acid, with the further advantages of having a more pleasant odour, and a less irritating effect on animal tissues.

Internally its actions are similar to those of Turpentine, but having no special therapeutical value and being expensive, it is little used internally.

There are no official preparations.

Liquor Thymolis. A 1 p.c. solution in Alcohol (90 p.c.).

This may be diluted to any extent without precipitation; 1 part Liq. Thymol. diluted with 15 of water, equals in strength a saturated aqueous solution.

Vapor Thymolis. Mix Thymol 6 grns., Alcohol (90 p.c.) 1 drm., Light Magnes. Carb. 3 grns., Water 1 oz., take of this 1 drm. in a pint water at 140° F. for each inhalation. A stimulating disinfectant.

Gauze and Wool with 5 p.c. Thymol are sold as antiseptic dressings.

Aristol—Non-official.

An Iodine derivative of Thymol. A reddish powder insoluble in water, but soluble in Ether, Chloroform, and Fixed Oils.

Action: Similar to Iodoform, but having the advantage of being nearly odourless.

Used as a dusting powder, or a 10 per cent. ointment.

ANISOMELES MALABARICA, R. Br.

An aromatic plant common in Southern India,

Medicinal properties: **Antiperiodic, Carminative, Stomachic.**

MICROMERIA CAPITELLATA, Benth. Found on the Western-Ghats.

Medicinal properties: Aromatic, Carminative, resembling Peppermint.

It contains a volatile oil.

PLANTAGINEÆ.

ISPAGHULÆ SEMIMA. Ispaghul or Spogel seeds.

The seeds of the *Plantago ovata*, Forsk. Imported mostly from Persia; they are procurable in most Indian bazaars (*Isbaghol*, Hind.).

Characters: Ovate elliptical, boat-shaped, about $\frac{1}{8}$ " long, pinkish-grey; steeped or boiled in water they yield a large quantity of tasteless mucilage.

Medicinal properties: Demulcent; an adjunct to astringent remedies.

Uses: A decoction (1 in 60) makes a cooling drink in fevers, dysuria, &c. In chronic diarrhoea and dysentery it may be given as powder (dose $\frac{1}{2}$ to 2 drms. mixed with $\frac{1}{2}$ drm. sugar), or a decoction (1 in 40), or the whole seeds steeped for 15 minutes in water, and the resulting mucilaginous mass swallowed. Externally, a good emollient poultice may be made of the seeds moistened with water.

Dose: The decoction may be given in large quantities.

POLYGONACEÆ.

RHEI RADIX, B. P. Rhubarb Root.

The erect rhizome or so-called root of *Rheum palmatum*, Linn.; *Rheum officinale*, Baill., and probably other species. Collected in China and Tibet, deprived of part of its cortex and dried.

Dose: 3 to 10 grains for repeated doses; for a single dose 15 to 30 grains.

The taste of Rhubarb may be disguised by adding an equal quantity of Sod. Bicarb. with an aromatic.

Characters: Irregularly shaped pieces, covered with bright yellowish-brown powder; internally, marbled with fine wavy greyish and reddish lines; the pieces have often a hole made for a string to suspend them while drying; odour, peculiar, slightly aromatic; taste, bitter, feebly astringent; gritty between the teeth.

Extractum Rhei, B. P. Extract of Rhubarb.

Dose: 2 to 8 grains.

Infusum Rhei, B. P. Infusion of Rhubarb.

Dose : $\frac{1}{2}$ to 1 fl. oz. (Strength 1 to 20).

Preparation : Infuse 1 oz. Rhubarb Root in thin slices with 20 fl. oz. boiling Distilled Water, in a covered vessel for 15 minutes ; strain.

Liquor Rhei Concentratus, B. P. Concentrated Solution of Rhubarb.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 2).

Preparation : Moisten 10 oz. Rhubarb Root in No. 5 powder with 5 fl. oz. Alcohol (20 p.c.) ; pack in a closed percolator ; set aside for 3 days ; percolate with $1\frac{1}{2}$ fl. oz. Alcohol (20 p.c.) on ten successive occasions at intervals of 12 hours ; continue percolation with more Alcohol (20 p.c.) until the product measures one pint.

Pilula Rhei Composita, B. P. Compound Rhubarb Pill.

Dose : 4 to 8 grains.

Preparation : Mix 3 oz. Rhubarb Root, $2\frac{1}{4}$ oz. Socotrine Aloes, $1\frac{1}{2}$ oz. Myrrh, $1\frac{1}{2}$ oz. Hard Soap, all powdered, $1\frac{1}{2}$ fl. drms. Oil of Peppermint, $2\frac{3}{4}$ oz. Syrup of Glucose ; form a mass.

Pulvis Rhei Compositus, B. P. Compound Powder of Rhubarb. *Synonym, Gregory's Powder.*

Dose : 20 to 60 grns. for adults ; for children 5 to 10 grns.

Preparation : Mix 2 oz. Rhubarb Root, 6 oz. Light Magnesia, 1 oz. Ginger, all powdered.

If a less bulky powder be desired Heavy Magnesia may be employed.

Syrupus Rhei, B. P. Syrup of Rhubarb.

Dose : $\frac{1}{2}$ to 2 fl. drms. (Strength 1 in 20).

The B. P. preparation is somewhat intricate. It may be made simply as follows :—

Take 4 fl. oz. Liquor Rhei Concentratus ; add 5 mins. Oil of Coriander, and 24 oz. Sugar ; add Water up to 40 oz. by weight ; dissolve in the cold ; filter.

Tinctura Rhei Composita, B. P. Compound Tincture of Rhubarb.

Dose : $\frac{1}{2}$ to 1 fl. drm. for repeated administration ; for a single administration 2 to 4 fl. drms.

Preparation : Moisten 2 oz. Rhubarb Root in No. 20 powder, $\frac{1}{4}$ oz. Cardamom Seeds, $\frac{1}{4}$ oz. Coriander Seeds, both bruised, with 2 fl. oz. Alcohol (60 p.c.), proceed with the percolation process until 18 fl. oz. of the product is obtained ; agitate ; set aside for 48 hours ; filter ; add 2 fl. oz. Glycerine.

Medicinal properties: Rhubarb in small doses is a **bitter stomachic tonic** and **astrigent**. In larger doses, it is at first **purgative**, acting in about 6 or 8 hours, and later **astrigent**. It is specially useful in dyspepsia with constipation, and in diarrhoea due to irritating matter in the intestinal canal.

The **astringency** of Rhubarb is due to a variety of Tannic Acid; the **colouring** matter is a glucoside which splits up into sugar and chrysophanic acid; and the **purgative** principle, as in Senna leaves, is cathartic acid.

Rhubarb when chewed is a **sialagogue**.

In large doses, the cathartic acid acts earliest, hence it is **purgative**; but later the tannic acid acts and hence it is **astrigent**. Rhubarb is a certain though not powerful hepatic stimulant. As it tends to produce griping it should be accompanied by a carminative. The colouring matter present tends to stain the excretions (fæces, urine) a yellowish colour.

Mistura Rubrum, *Non-official*, Laxative Red Mixture.

Preparation: Take of Rhubarb Powder 8 grns., Light Magnesia 24 grns., Aromatic Spirit of Ammonia 16 mins., Syrup a sufficiency, Anise Water up to 1 oz.; mix.

(Of this one drachm equals 5 grns. Gregory's Powder.)

Dose: One teaspoonful to one dessertspoonful for a child. It may be repeated in teaspoonful doses every 2 hours until the bowels are freely moved.

A good palatable **Aperient** for children, useful in alimentary trouble with constipation, and in commencing diarrhoea to clear away irritating material.

RHEUM EMODI, Wall. Indian Rhubarb.

This and other allied species supply a variety of Rhubarb; but it is of inferior and variable quality.

THYMELACEÆ.

MEZEREI CORTEX, *B. P.* Mezereon Bark.

The dried bark of *Daphne Mezereum*, Linn., of *D. Laureola*, Linn., or of *D. Gnidium*, Linn. Habitat, Europe.

Characters: Strips long thin flattened, or quills of various lengths; flexible, tough, fibrous; externally, olive-brown to deep purplish-brown, inner surface white silky; it readily separates into two layers; odour none; taste acrid, burning.

Medicinal properties: **Irritant, Vesicant.** An ointment is used to keep blisters open, or the bark may be first steeped in hot vinegar and kept in contact with the skin by a bandage.

Internally it is diuretic and alterative. It was formerly used in the treatment of exanthematic diseases.

ARISTOLOCHIACEÆ.

SERPENTARIÆ RHIZOMA, B. P. Serpentry Rhizome.

The dried rhizome and root of *Aristolochia Serpentina*, Linn. (Virginian Snake root) or of *A. reticulata*, Nutt. Habitat, Southern States of North America.

Characters: The rhizome of *A. Serpentina*; tortuous slender, about 1" long and $\frac{1}{8}$ " in diameter; bears on the upper surface the remains of aerial stems, on its under surface numerous wiry interlacing roots often about 3" in length; colour dull yellowish brown; odour camphoraceous; taste strong, aromatic, bitter.

The rhizomes and roots of *A. reticulata* resemble those of the former plant but are longer and thicker and the roots are straighter.

Infusum Serpentariæ, B. P. Infusion of Serpentry.

Dose: $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 20).

Preparation: Infuse 1 oz. Serpentry Rhizome in No. 10 powder with 20 fl. oz. boiling Distilled Water, in a covered vessel for 15 minutes; strain.

Liquor Serpentariæ Concentratus, B. P. Concentrated Solution of Serpentry.

Dose: $\frac{1}{2}$ to 2 fl. drms. (Strength 1 in 2).

Preparation: Moisten 10 oz. Serpentry Rhizome in No. 40 powder, with 5 fl. oz. Alcohol (20 p.c.); pack in a closed percolator; set aside for 3 days; percolate with 2 fl. oz. Alcohol (20 p.c.), on ten occasions at intervals of 12 hours; continue percolation with more Alcohol (20 p.c.), until the product measures 20 fl. oz.

Tinctura Serpentariæ, B. P. Tincture of Serpentry.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5).

Preparation: Moisten 4 oz. Serpentry Rhizome in No. 40 powder with 4 fl. oz. Alcohol (70 p.c.); complete the percolation process so that the resulting Tincture measures 20 fl. oz.

Medicinal properties: A **Stimulating Tonic, Diaphoretic and Diuretic.**

Used in low fevers, atonic dyspepsia, nervous depression, chronic rheumatism.

It contains an essential oil, tannin and a bitter substance.

ARISTOLOCHIA INDICA, Linn. The Indian Birthwort (*Isarmul*, Hind.).

A twining perennial shrub, common throughout India. The root is very bitter and nauseous.

Medicinal properties : **Stimulant, Tonic and Stomachic.** It has a considerable reputation among natives as a remedy for the bites of poisonous insects.

It contains an aromatic oil, a colouring principle, and an alkaloid.

ARISTOLOCHIA BRACTEATA, Retz. (*Gandhani*, Hind.). The plant is a native of the Deccan.

Medicinal properties : It increases or induces uterine contraction and has an undoubted anthelmintic action.

PIPERACEÆ.

PIPER NIGRUM, B. P. Black Pepper (*Kali-mirch*, *Gol-mirch*, Hind.).

The dried unripe fruit of *Piper nigrum*, Linn., the Pepper Vine; grown in Hindustan.

Characters : Roundish, inferior, about $\frac{1}{5}$ " diameter; externally blackish-brown, pericarp thin, deeply and reticulately wrinkled, contains a single seed which is hard, smooth, pale brownish; odour aromatic; taste pungent, bitter.

It somewhat resembles Pimento, but this has a calyx; also Cubebs, but these are stalked.

Confectio Piperis, B. P. Confection of Pepper.

Dose : 60 to 120 grains, twice or thrice daily.

Preparation : Mix together 2 oz. Black Pepper, 3 oz. Caraway Seeds, both in fine powder, with 15 oz. clarified Honey.

Useful in hæmorrhoids of old or enfeebled persons.

Medicinal properties : Black Pepper is **Carminative, Stimulating, Stomachic.** It is used largely as a condiment and in intermittent fevers as an adjuvant to other antiperiodics. As it stimulates the mucous membrane it is used in hæmorrhoids and gonorrhœa. Externally it is used as a **rubefacient** and **counterirritant** like mustard. An Infusion (1 part of bruised pepper in 80 of boiling water) makes a stimulating gargle for relaxed throat.

Pepper contains a **resin** which possesses the aromatic smell and pungent taste of pepper; a **volatile oil**, isomeric with turpentine, and 2 to 8 p.c. of **Piperine**, an alkaloid, neutral, inodorous, tasteless, isomeric with Morphine.

Piperine is official in the Pharmacopœia of the United States of America, and used (in doses of 2 to 8 grains) as an **antipyretic** in intermittent fevers.

The Pepper-Vine is a perennial climbing shrub, indigenous to Southern India. It is now cultivated extensively throughout South-Eastern Asia.

White Pepper, (*Safed-gol-mirch*, Hind.), is ordinary black pepper with the pericarp removed.

PIPER CHABA, Hunter. Syn. *P. officinarum*. (*Chal, Chavi*, Hind.), the true **Long Pepper**, Habitat, Java and Sumatra.

It is 1" or more in length, cylindrical greyish-brown, odour mild aromatic; taste acrid, pungent.

Also **Piper longum**, Linn., (*Pipul Pipli*, Hind.). Habitat, Southern and North-Eastern India and Ceylon.

Medicinal properties: **Carminative**, but not much used. Its constituents and actions are like those of *P. nigrum*.

CUBEBAE FRUCTUS, B. P. Cubebs or Tailed Pepper.

The dried full grown, unripe fruit of *Piper Cubeba*, Linn., (*Kabáb-chini*, Hind.). Habitat, Java and Sumatra.

Dose: 30 to 60 grns.

Characters: Globular, about $\frac{1}{8}$ " in diameter, brownish. The pericarp is reticulately wrinkled, thin, brittle, and abruptly prolonged at the base into a slender rounded stalk which is about one and a half times the length of the globular portion within which is a single seed attached by the base; odour strong, aromatic; taste aromatic, bitter. The crushed fruit imparts a crimson colour to sulphuric acid.

It resembles Pimento or Black Pepper, but unlike these has a stalk.

Oleum Cubebæ, B. P. Oil of Cubebs.

The oil distilled from Cubebs.

Dose: 5 to 20 mins. may be given in water with Mucilage and Sugar.

Characters: Colourless or greenish-yellow with odour of Cubebs and camphoraceous taste.

Tinctura Cubebæ, B. P. Tincture of Cubebs.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5).

Preparation: Moisten 4 oz. Cubebs in powder with 2 fl. oz. Alcohol (90 p.c.); complete the percolation process, so that the resulting Tincture measure 20 fl. oz.

The taste may be disguised by adding an equal quantity of Tincture of Orange.

Medicinal properties: **Stimulant to mucous membranes**, especially of the urinary organs. Used in chronic bronchitis and in gonorrhœa after the acute symptoms have subsided.

In small doses it is **carminative**, in large doses a **gastro-intestinal irritant**. Its chief action is produced as the oil is being excreted by the mucous membrane of the urinary system, lungs and skin. It is more pleasant to take than Copaiba, and acts in the same ways. It also sometimes produces a rash.

PIPER BETLE, Linn. *Synonym*, **Chavica Betel**, Betel Pepper (*Pán, Tambuli*, Hind.).

A twining plant cultivated largely throughout India.

Medicinal properties: Betel leaves warmed, smeared with oil and applied to the chest act as a **rubefacient**, and so relieve deeper seated congestions, *e.g.*, bronchitis, congestion of the liver, etc. They are used also to reduce glandular swellings, and as an anti-galactagogue.

Betel leaf contains an essential oil, which treated with Caustic Potash yields "betel-phenol," a powerful antiseptic which gives the leaves their peculiar odour. It is largely used as a masticatory (*Pán-supari*), along with areca nut, catechu, aromatics, and a little shell-lime.

MYRISTICÆ.

MYRISTICA, B. P. Nutmeg.

The dried seeds of *Myristica fragrans*, Houtt., divested of its testa, cultivated in Malay, (*Jaéphal*, Hind.).

Characters: Ovoid, about 1" long; externally greyish-brown with reticulated furrows; internally greyish-red, with dark brownish-red veins so that on transverse section it has a marbled appearance, odour strong, pleasantly aromatic; taste aromatic, warm, bitterish.

It somewhat resembles Areca Nut, but this has not the strong aromatic odour.

Oleum Myristicæ, B. P. Oil of Nutmeg.

The oil distilled from Nutmeg.

Dose: $\frac{1}{2}$ to 3 mins.

Characters: Pale yellow, with odour and taste of Nutmeg.

Spiritus Myristicæ, B. P. Spirit of Nutmeg.

Dose: 5 to 20 mins. (Strength 10 p.c.).

Preparation: To 1 fl. oz. Oil of Nutmeg add Alcohol (90 p.c.), sufficient to form 10 fl. oz. If not clear, agitate with a little powdered talc and filter.

Medicinal properties: **Aromatic, Stimulant, Carminative**. Used chiefly for flavouring and to cover the taste of nauseous remedies (*e.g.*, Rhubarb).

Adult dose: Of powdered Nutmeg 5 to 15 grns.

Nutmeg contains in addition to the Volatile Oil, which is official, a fixed oil known as the Expressed Oil of Nutmeg. This is an orange-coloured firm concrete oil with odour of Nutmeg; used externally as a **stimulant** inunction, and in plasters for chronic rheumatism.

Macis, Mace (*Jaipatri*, Hind.). The arillus of *Myristica fragrans*.

Characters : Narrow bands about 1" long, branched and lobed above, united to broader bands below, brownish-orange, when pressed, fatty; odour fragrant; taste warm and aromatic.

Medicinal properties : Same as Nutmeg.

The **Indian Nutmeg** (*Jangli Jaephali*, Hind.) and **Indian Mace** (*Rampatri*, Hind.) are the products of *Myristica malabarica*, Lamk. They resemble the true Nutmeg and Mace in action, but are larger in size, and much inferior as a remedy.

LAURINEÆ.

CINNAMONI CORTEX, B. P. Cinnamon Bark.

The dried inner bark of shoots from the truncated stocks of the cultivated *Cinnamomum zeylanicum*, Breyn., grown in Ceylon, and known as Ceylon Cinnamon (*Dalchini*, Hind.).

Dose : Of powdered Cinnamon 10 to 20 grains.

Characters : Closely rolled quills, each about $\frac{3}{8}$ " in diameter and containing smaller quills; thin, brittle, splintery; externally, light yellowish-brown, with little scars or holes, and faint shining wavy lines; internally, darker brown, odour fragrant; taste warm, sweet, aromatic.

Pulvis Cinnamoni Compositus, B. P. Compound Powder of Cinnamon. *Synonym*, **Pulvis Aromaticus**.

Dose : 10 to 40 grains.

Preparation : Mix together 1 oz. each of Cinnamon Bark, Cardamom Seeds, and Ginger, all powdered.

Tinctura Cinnamoni, B. P. Tincture of Cinnamon.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5).

Preparation : Moisten 4 oz. Cinnamon powder in No. 40 powder, with 4 fl. oz. Alcohol (70 p.c.); complete the percolation process so that the resulting Tincture may measure 20 fl. oz.

Oleum Cinnamoni, B. P. Oil of Cinnamon. The Oil distilled from Cinnamon Bark.

Dose : $\frac{1}{2}$ to 3 mins.

Characters : Yellowish, becoming redder with age, odour and taste of the bark; it sinks in water.

Oil of Cinnamon may be distinguished from Oil of Cassia by mixing 4 drops in 2 drms. of Alcohol and adding 1 drop Liq. Ferri Perchlor. The Oil of Cinnamon becomes greenish-blue, the Oil of Cassia becomes brown and after a time cloudy.

Aqua Cinnamoni, B. P. Cinnamon Water.

Preparation : 1 lb. bruised Cinnamon Bark, 2 gallons water;

Spiritus Cinnamoni, B. P. Spirit of Cinnamon.

Dose : 5 to 20 mins. (Strength 10 p.c.).

Preparation : Mix 1 fl. oz. Oil of Cinnamon with Alcohol (90 p.c.) sufficient to form 10 fl. oz.

Medicinal properties : Cinnamon Bark is an **aromatic carminative** because of the volatile oil, and **astringent** because of the Tannic Acid. It is one of the best of intestinal astringents, being specially useful in chronic dysentery, or with chalk in diarrhœa.

The Oil and preparations made from it, are **Carminative**, but not astringent.

Cassia bark (q.v.) is often used as a substitute or adulteration, but may be recognised by being rougher, thicker, taste somewhat bitter, less aromatic and more starchy. With Iodine a decoction of Cinnamon cooled gives a dark bluish-grey colour, which is permanent only on adding excess of Iodine. Cassia gives a strong blue which is much more permanent.

Cinnamon Leaves (*Tejpat*, Hind.). Obtained from *Cinnamomum Tamala*, Nees., and other species. Extensively used by the natives of India as a condiment.

Characters : 6" or more long, $1\frac{1}{2}$ " broad, olive-green, upper surface oblong, obtuse, pointed, entire, with 3 principal nerves and 2 smaller marginal ones, running from base to apex of the leaf, venation finely reticulated; odour, like a mixture of Cloves and Cinnamon.

CASSIA LIGNEA, Cassia Bark (*Dalchini*, Hind.). The bark of *Cinnamomum Tamala*; common on the Himalayas, Eastern Bengal and Burma; and *C. Cassia*, Blume, cultivated in Assam. It is used as a substitute for and to adulterate true Cinnamon (*q.v.*); the leaves are used by natives of India as a condiment.

Action : Same as Cinnamon, only weaker and less delicate.

Oil of Cinnamon Leaves. Prepared in Ceylon by maceration in sea water and subsequent distillation. It is dark-yellow or brown with taste and odour like cloves; 1 c. c. dissolved in 5 c. c. Alcohol (90 p.c.) and *test solution of ferric chloride* added, gives a decided blue; cinnamon bark oil treated in the same way gives a pale-green colour.

Medicinal properties : Similar to those of Clove oil.

CAMPHORA, B. P. Camphor.

A white crystalline substance obtained from *Cinnamomum Camphora*, Nees.; purified by sublimation. Imported from China and Japan (*Kopper*, Hind.).

Characters: Whitish, translucent, crystalline masses, fissured; or in rectangular tablets, or pulverulent masses known as flowers of Camphor; odour powerful penetrating; taste pungent bitter, followed by a sensation of cold; floats on water; volatilises slowly at ordinary temperatures; burns readily with a bright smoky flame, tough, but if moistened with spirit, ether, or chloroform, can be readily powdered. Solubility 1 in 700 water; 1 in 1 of alcohol (90 p.c.), 1 in 4 of olive oil; 4 in 1 of chloroform, very soluble in ether. It forms a liquid when triturated with chloral hydrate, menthol, phenol, or thymol.

Aqua Camphoræ, B. P. Camphor Water.

Preparation: Dissolve 70 grains Camphor in Alcohol (90 p.c.) sufficient to form $\frac{1}{2}$ fl. oz.; add this in successive portions to 1 gallon Distilled Water shaking after each addition; agitate occasionally until all the Camphor is dissolved.

Used chiefly as a vehicle for Medicine.

Linimentum Camphoræ, B. P. Liniment of Camphor.

Synonym, Camphorated Oil.

Lin. Camph. is used for rubbing on the chests of children in pulmonary diseases, also sprinkled on cotton-wool and wrapped round the throat in tonsillitis and pharyngitis.

Preparation: Dissolve 1 oz. Camphor in 4 fl. oz. Olive Oil.

Linimentum Camphoræ Ammoniatum, B. P. Ammoniated Liniment of Camphor. *Synonym, Compound Liniment of Camphor.*

Preparation: Dissolve $2\frac{1}{2}$ oz. Camphor and 1 fl. drm. Oil of Lavender, in 12 fl. oz. Alcohol (90 p.c.); add gradually 5 fl. oz. strong Solution of Ammonia, shaking them together until after adding Alcohol (90 p.c.) sufficient to produce 20 fl. oz., a clear solution is formed.

A stimulating liniment. Used for neuralgia and chronic rheumatic pains.

Spiritus Camphoræ, B. P. Spirit of Camphor.

Dose: 5 to 20 mins. in milk or sugar. (Strength 10 p.c.).

Preparation: To 1 oz. Camphor add Alcohol (90 p.c.) sufficient to form 10 fl. oz.

Mixed with warm water, Camphor Spirit used to bathe the nostrils, relieves the irritation of a common cold. It is used also as an inhalation ($\frac{1}{2}$ to 1 drm. in 10 oz. hot water).

In cholera and diarrhoea 3 minims repeated every 15 minutes until the diarrhoea ceases.

Rubini's Camphor Essence or Spiritus Camphoræ Fortior, *Non-Official*, is a saturated solution in Alcohol (90 p.c.). It is about eight times stronger than B. P. Spirit of Camphor.

Tinctura Camphoræ Composita, B. P. Compound Tincture of Camphor. *Synonym, Paregoric. Paregoric Elixir.*

Dose: $\frac{1}{2}$ to 1 fl. drm. For a child 2 to 5 mins. Strength $\frac{1}{4}$ grain Opium in each fl. drm.

Given with an equal quantity of Tr. Squills to allay spasmodic cough in bronchitis and in phthisis.

Preparation: Dissolve 40 grains Benzoic Acid, 30 grains Camphor, 30 mins. Oil of Anise, in 18 fl. oz. Alcohol (60 p.c.); add 585 mins. Tincture of Opium, and Alcohol (60 p.c.) sufficient to produce 20 fl. oz.

Medicinal properties: Camphor is at first **stimulant**, then **sedative**, **antispasmodic**, **diaphoretic** and slightly **antiseptic**.

Uses: Externally as a **counterirritant** to relieve pain. Its compound with Carbolic Acid is **Anodyne**, and is used as an anæsthetic dressing for carious teeth.

Internally it is used as a **carminative** in acid dyspepsia and the diarrhœa which results from this; as a **cardiac stimulant** in collapse; as an **antiseptic** expectorant in catarrh coryza and bronchitis. With opium it is given in British cholera.

The actions of Camphor correspond nearly with those of the volatile oils.

In medicinal doses it stimulates the bodily functions generally, producing a pleasant glow over the body with diaphoresis and allaying nervous irritation. It is excreted unchanged by the lungs, and skin.

Large doses produce giddiness and tendency to sleep.

Poisonous doses produce convulsions, lividity of countenance, stupor, arrest of urinary secretions.

Treatment of poisoning by Camphor: Emetics or stomach pump; stimulants and warmth to the extremities.

Borneo Camphor obtained from *Dryobalanops aromatica*, Gaertn., differs from ordinary Camphor in the same way as aldehyde differs from alcohol, i.e., it has two atoms more of hydrogen, and by oxidising agents it can be converted into ordinary Camphor. Unlike ordinary Camphor it sinks in water. It is valued more highly by the Chinese.

SASSAFRAS RADIX, B. P. Sassafras Root.

The dried root of *Sassafras officinale*, Nees. Habitat, North America.

Characters: Large branched pieces more or less covered with bark. **Bark**, rough greyish-brown externally, internally smooth glistening, rusty-brown; odour agreeable aromatic; taste peculiar aromatic, slightly astringent. **Wood** soft, light in weight, greyish-

The chips or shavings somewhat resemble Quassia, but are browner, and have an aromatic odour.

Medicinal properties: Stimulating, Diaphoretic. It contains a volatile oil and a small amount of Tannic Acid.

CINNAMOMUM GLANDULIFERUM, Meissn.

A large tree yielding the **Nepal Camphor Wood**. *Syn.* Nepal Sassafras (*Nepali Mulligiri*, Vern.). Habitat, North-Eastern India.

Medicinal properties: Stimulant, Diaphoretic. It contains an essential oil somewhat similar to Camphor.

LITSÆA SEBIFERA, Pers. (*Garbijaur*, Hind.).

The bark known as *Maida lakri* is a popular remedy for diarrhoea, in Bengal; and externally as an application to bruises.

SANTALACEÆ.

OLEUM SANTALI, B. P. Oil of Sandal Wood. *Synonym*, Oil of Santal Wood.

The oil distilled from the wood of *Santalum album*, Linn.

Dose: 5 to 30 mins.

Characters: Somewhat viscid, pale yellow, odour strongly aromatic, taste pungent, spicy; soluble in Alcohol.

Medicinal properties: Stimulating, Antiseptic, like Copaiva, but less disagreeable.

It may be given suspended in Mucilage with Tincture Orange. Its nauseous taste is best overcome by giving it in capsules.

The Sandal wood tree (*Chandal*, *Sandal*, Hind.), is grown throughout Southern India.

The wood is used by the wealthy in cremating their dead and for fancy carved work. The oil is used as a perfume.

EUPHORBIACEÆ.

CASCARILLA, B. P. Cascarilla.

The dried bark of *Croton Eluteria*, Benn. From the West Indies.

Characters: In quills 1" to 3" or more long, $\frac{1}{6}$ " to $\frac{1}{2}$ " in diameter, or in small curved pieces; outer layer dull-brown or dark-grey longitudinally wrinkled cork, with frequent small longitudinal and transverse cracks, more or less covered with silver-grey patches with minute black spots: it easily separates disclosing a brown or dark-grey inner layer marked with longitudinal and transverse furrows; fracture short resinous; odour agreeable aromatic specially when burned; taste aromatic, bitter.

It somewhat resembles pale cinchona bark. But is smaller.

Infusum Cascarillæ, B. P. Infusion of Cascarilla.

Dose : $\frac{1}{2}$ to 1 fl. oz. (Strength 1 in 20).

Preparation : Infuse 1 oz. Cascarilla in No. 10 powder in 20 oz. boiling Distilled Water in a covered vessel for 15 minutes ; strain.

Unless some preservative be added (*e.g.* compounded with an aromatic tincture), this infusion will scarcely keep good for more than a few hours in hot climates.

Tincturæ Cascarillæ, B. P. Tincture of Cascarilla.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5).

Preparation : Moisten 4 oz. Cascarilla in No. 40 powder with 3 fl. oz. Alcohol (70 p. c.), complete the percolation process so that the resulting tincture measures one pint.

Incompatibles : Dilute Mineral Acids cause a minute flocculent deposit of the resin.

Medicinal properties : Stimulant, Aromatic, Tonic, Expectorant. Useful in atonic dyspepsia, chronic bronchitis, etc. Its action depends on the bitter substance, volatile oil, and resin it contains.

OLEUM CROTONIS, B. P. Croton Oil.

The oil expressed from the seeds of *Croton Tiglium*, Linn., grown in East Indies, Ceylon.

Dose : $\frac{1}{2}$ to 1 min.

Characters : Brownish-yellow, viscid ; odour rancid, disagreeable taste, acrid. Soluble in Oils, Turpentine, or Alcohol (90 p.c.).

Linimentum Crotonis, B. P. Liniment of Croton Oil.

(Strength of Croton Oil, 1 in 8).

Preparation : Mix together 1 fl. oz. Croton Oil, $3\frac{1}{2}$ fl. oz. Oil of Cajuput, and $3\frac{1}{2}$ fl. oz. Alcohol (90 p.c.).

A stimulating Liniment, rarely used, as it tends to produce severe pustules, which on healing leave unsightly cicatrices.

Medicinal properties : A powerful **hydragogue purgative**. Used in cases where rapid and efficient action is required, *e.g.*, in apoplexy. It is a convenient purgative for unconscious or insane people.

Croton Oil should not be given in inflammatory condition of the intestines, nor to feeble persons.

In the case of an over-dose, give an Emetic (*e.g.* Zinc. Sulph.), and check the diarrhœa by mucilaginous drinks and opium.

A Solution of 1 p.c. Croton Oil in Olive Oil is used to promote the growth of the hair.

Croton Oil consists of two portions, one insoluble in Alcohol, which is purgative, but non-resisting, the other soluble in

Alcohol, vesicating, nauseating and irritating, but not purgative in the same doses. It is a feeble hepatic stimulant.

Croton Seeds. Non-official. (*Jamál gota*, Hind.) may be bought in the Indian bazaars.

Characters: About size of a coffee seed, oval, rounded, with a thin brittle dull brownish-grey shell containing an albuminous kernel; without odour; taste at first mild, then acrid and pungent.

It resembles Castor oil seeds, but these are bright, polished, and mottled.

As they spoil by keeping, it is best to use freshly collected seeds. The leaf embryo found between the two halves of the kernel is said to cause violent griping and vomiting.

Other varieties of Croton found in India (e.g., *C. oblongifolius*, Roxb.) are purgative like *C. Tiglium*.

OLEUM RICINI, B. P. Castor Oil.

An oil expressed from the seeds of *Ricinus communis*, Linn. Exported largely from Calcutta (*Arandi-ká-tél*, Hind.).

Dose: 1 to 8 fl. drms.

For adults; $\frac{1}{4}$ to 1 oz.; for infants 1 to 2 drms. Half these quantities taken on an empty stomach is, as a rule, sufficient to produce purgation. It may be taken poured on some milk, in a wine glass, the interior and edges of which have been moistened with the milk; or in brandy, or peppermint water. As an **Enema** 2 oz. Castor oil with 18 oz. Mucilage of Starch. An **Emulsion** may be made of Castor Oil and Mucilage of Acacia of each $\frac{1}{2}$ oz. Syr. Zingib. $\frac{1}{4}$ oz., Cinnamon Water 1 oz.

A good way to give it to infants is as follows:—

Take the Castor Oil, add an equal quantity of warm milk and a little syrup or sugar. Shake briskly in a bottle and let it be drunk at once.

Characters: Viscid, pale-yellow, odour slight, taste at first bland, later acrid, unpleasant.

Solubility 1 in 5 of Alcohol (90 p.c.), in all proportions of Ether, or Oil of Turpentine.

The seeds somewhat resemble Croton Seeds *q.v.*

Mistura Olei Ricini, B. P. Castor Oil Mixture.

Dose: As a draught, 1 to 2 fl. oz.

Preparation: Place in a mortar $1\frac{1}{2}$ fl. oz. Mucilage of Gum Acacia; add to it, alternately, in portions with constant trituration 3 fl. oz. Castor Oil and a mixture of 1 fl. oz. Orange flower water of commerce and $2\frac{1}{2}$ fl. oz. Cinnamon Water.

Medicinal properties: A mild **Cathartic**: specially useful in cases of intestinal irritation. It is the safest cathartic for

women, and infants. The emulsion, in small doses repeated every hour, is a specific for infantile dysentery.

Castor Oil $\frac{1}{4}$ to $\frac{1}{2}$ oz. with 5 to 10 mins. Tr. Opii, relieves commencing diarrhoea due to irritating matter in the intestines.

The oil, or a poultice of Castor Oil plant leaves, applied to the breasts, promotes the secretion of milk.

Castor oil acts as a mild, speedy, non-irritant and safe purgative, producing one or more liquid stools in about 5 hours and followed by a sedative action. It stimulates the intestinal gland, but not the liver.

The chemistry of Castor oil has not been satisfactorily settled. It contains several fatty acids, to one of which its purgative action is attributed. A powerful poison is found in the seeds, the bulk of which remains in the cake after expressing the oil, hence the cake which is given as food to cattle, has proved fatal. Three of the seeds have produced poisonous results to an adult.

The best quality of Castor oil is the cold drawn. Other qualities are on sale; the cheaper varieties are used for lubricating machinery and as lamp oil.

The leaves of the plant are used as food for a variety of silkworm, producing Eri silk, *Atticus ricini*.

CAOUTCHOUC, B. P. India-rubber.

The prepared milk juice of *Hevea brasiliensis*, Muell., and probably other species; known in commerce as pure Para rubber. Imported from South America.

Characters: Elastic masses of varying thickness, brownish-black externally; mottled with a pale tint internally; insoluble in water ethylic alcohol, alkaline solutions or dilute acids; soluble in chloroform, oil of turpentine, carbon bisulphide, benzol, or petroleum spirit; heated to about 257° F., it melts, remaining soft and adhesive after cooling; odour characteristic, somewhat empyreumatic, almost tasteless.

Liquor Caoutchouc, B. P. Solution of India-rubber.

Preparation: Cut 1 oz. India-rubber into fine shreds; place it in a well-stoppered bottle containing a mixture of 10 fl. oz. Benzol and 10 fl. oz. Carbon Bisulphide; set in a cool place; agitate occasionally until solution is effected.

India-rubber is used extensively for making waterproof clothing and sheeting, also as a solvent for certain drugs.

KAMALA, KAMELA.

The powder consisting of minute glands and stellate hairs from the capsules of a small evergreen tree, *Mallotus philippinensis*, Mall., found throughout India.

Characters: Fine granular mobile brick-red, or purplish-red, powder. It scarcely mixes with water; soluble in alcohol, chloroform, and ether.

Medicinal properties: **Purgative, Vermicide** to *Tænia*.

Dose: $\frac{1}{2}$ to 2 drms. of the powder suspended in gruel, mucilage, honey, or syrup. The worm will come away in the 3rd or 4th stool. A purgative after the drug is helpful.

Kamala is the source of the orange-brown dye used for silks.

BALIOSPERMUM AXILLARE, Blume. (*Danti*, Hind.).

The seeds of this have **purgative** properties similar to those of *Croton Tiglium*. The root is also cathartic.

EMBLIC MYROBALANS, (*Amla*, Hind.).

The fruit of *Phyllanthus Emblica*, Linn., a medium sized tree common throughout India.

Characters: When **fresh**, round, about $\frac{3}{4}$ " in diameter with 6 valves projecting externally, pulp fleshy acidulous enveloping white angular seeds. When **dry** somewhat hexagonal, wrinkled, blackish-grey; odour aromatic; taste acidulous, astringent.

Medicinal properties: Intestinal **astrigent**. It is used in diarrhoea and dysentery.

It contains Tannic and Gallic acids, and is used in tanning.

JATROPHA CURCAS, Linn. The Physic Nut plant.

An evergreen plant common in Southern India. The seeds yield a pale yellow oil which is used as a **purgative** in doses of 12 to 15 drops, but is uncertain in action. It often causes griping, which may be corrected by Lime Juice. In larger doses it is an acro-narcotic poison.

Diluted with a bland oil it forms a **stimulating liniment** for chronic rheumatism.

It is also **Styptic**, and protective when applied to a bleeding surface.

The milky Juice which exudes from the stem being used in the same manner as Collodion.

ACALYPHA INDICA, Linn. An annual common throughout India. (*Rupi*, Hind.).

The expressed juice of the fresh leaves in doses of 1 drm. is used as an **emetic** and **expectorant** for children. It acts like Ipecacuanha.

MANIHOT UTILISSIMA, Pope. Manioc. Sweet Cassava.

A native of Brazil, is cultivated in Assam and Southern India.

From its tubers is prepared the food stuff **Tapioca**.

Bitter Cassava is poisonous; its roots containing Hydrocyanic

URTICACEÆ.

CANNABIS INDICA, B. P. Indian Hemp.

The dried flowering or fruiting tops of the female plant of *Cannabis sativa*, Linn., the **Common Hemp**; from which the resin has not been removed. Grown in India.

Characters : In compressed, rough, dusky green masses, consisting of the branched upper part of the stem, bearing leaves and pistillate flowers or fruits, matted together by a resinous secretion. The upper leaves of the plant are simple alternate, 1-3 partite; the lower are opposite and digitate, and consist of 5 to 7 linear-lanceolate leaflets with distinctly serrate margins. The fruit is one-seeded and supported by an ovate-lanceolate bract. Both leaves and bracts bear external oleo-resin glands and one-celled curved hairs, the bases of which are enlarged and contain cystoliths.

Extractum Cannabis Indicæ, B. P. Extract of Indian Hemp.

Dose : $\frac{1}{4}$ to 1 grain.

Preparation : Exhaust Indian Hemp in coarse powder with Alcohol (90 p.c.), by percolation; evaporate the percolate to the consistence of a soft extract.

Tinctura Cannabis Indicæ, B. P. Tincture of Indian Hemp.

Dose : 5 to 15 mins.

It is better to begin with a small dose as the amount of resin present is uncertain.

Preparation : Dissolve 1 oz. Extract of Indian Hemp in 18 fl. oz. Alcohol (90 p.c.); filter if necessary; add Alcohol (90 p.c.) sufficient to produce 1 pint.

To prevent precipitation of the resin, mix 1 dr. Mucilage in 2 drms. water, add the tincture, and dilute.

Medicinal properties : **Sedative, Anodyne, Antispasmodic, Hypnotic**; used to relieve pain; to soothe the cough of phthisis; in tetanus and convulsions; and in insanity and delirium; combined with Belladonna in whooping cough.

The drug loses its strength owing to decomposition, if kept longer than two or three years.

Indian Hemp acts chiefly on the brain, producing an agreeable delirium, characterised by vivid imagination and rapid mental activity, with a kind of double consciousness, the special form depending largely on the character of the individual. This is followed by deep sleep. The sensory nerves are benumbed, the pupils dilated, and the urine increased. Its action on the respiration, circulation and temperature varies. The effects of a moderate dose lasts not more than two hours, and there are no after effects.

Compared with Opium, Indian Hemp, has the advantages that it does not nauseate, nor check the secretions (therefore does not constipate), is less likely to produce headache, and the sleep is more natural. Its disadvantages are the preceding delirium and the varying activity of the drug, for which reason it is generally replaced by Chloral.

It contains a volatile oil and a resin **Cannabin**. This resin (*Charas*, Hind.), which is the essential part, develops at different stages of the plant's growth, depending on elevation and climate. In the plains it is yielded by the unfertilised flower tops (**Ganja**); on the lower hills of the Punjab by the mature fruits and dried leaves (**Bhang**); and at an elevation of 6,000 to 8,000 feet it exudes naturally from the leaves, stem and fruit; in temperate countries this resin is almost entirely absent. In Europe and America the plant is cultivated for its fibre, which is used for making ropes, coarse cloth, and the seed used for feeding cage birds. A fixed oil, obtained, by compression, is used for making paints, varnish and a kind of soap, and in Russia for burning in lamps.

An Arabian preparation named **Hashish** was used about the middle of the eleventh century by the founder of a Moslem sect in Persia to intoxicate for their work those of his followers who were deputed to secretly murder his enemies—hence the names "**Hashishin**," *hemp-eater*, which anglicised has become assassin.

LUPULUS, *B. P.* Hops. *Synonym*, *Humulus*.

The dried strobiles of *Humulus Lupulus*, Linn., collected from cultivated plants; cultivated in Britain.

Characters: The strobiles; $1\frac{1}{4}$ " long, oblong-ovoid or rounded consisting of a number of imbricated greenish-yellow membranous stipules and bracts attached by a hairy zig-zag axis. Each of the bracts enfolds at its base, a small rounded achene which like the rest of the bract is sprinkled with yellow glands; odour aromatic characteristic; taste bitter, aromatic, somewhat astringent.

Infusum Lupuli, *B. P.* Infusion of Hops.

Dose: 1 to 2 fl. oz. (Strength 1 in 20).

Preparation: Infuse 1 oz. Hops freshly broken with 20 fl. oz. boiling Distilled Water, in a covered vessel for 15 minutes; strain.

Tinctura Lupuli, *B. P.* Tincture of Hops.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 5).

Preparation: Hops 4 oz., Alcohol (60 p.c.), 20 fl. oz.; prepared by the maceration process.

Medicinal properties: **Tonic, Aromatic, Sedative**, and slightly soporific. It is used as a bitter tonic and stomachic. It is one of the constituents of bitter beer. A Hop pillow is sometimes used.

Lupulinum, B. P. Lupulin.

Glands obtained from the strobiles of *Humulus Lupulus*.

Dose : 2 to 5 grains.

Characters : Granular brownish-yellow powder consisting of minute glands ; odour strong, hoplike ; taste bitter aromatic.

Medicinal properties : **Aromatic, Tonic, Sedative.** Useful in atonic dyspepsia, and as a sedative in genito-urinary conditions.

Lupulin contains a volatile oil, a resin, and a bitter principle.

FICUS, B. P. Figs.

The dried fleshy receptacles of *Ficus Carica*, Linn. Persia. Cultivated in India.

Characters : The fig consists of the enlarged hollow succulent receptacle, bearing very numerous achenes on its inner surface.

The **fresh fruit** is pear-shaped, with a scar at the base, and a small scaly orifice at the apex ; internally hollow, the inner surface is covered with numerous yellowish hard seeds.

The **dried fruit** as sold in the market is flattened, roundish, fleshy discs, brownish ; odour fruity ; taste sweet and mucilaginous.

Medicinal properties and uses : Internally **laxative, demulcent, nutritive.** Externally it is applied split open and heated as an **emollient** poultice in suppurations,—e.g., gumboils, &c.

It contains about 70 p.c. grape-sugar, also some gum and fatty matter.

Dried figs (*Anjir*, Hind.) are to be obtained in most Indian bazaars.

BANYAN TREE. *Ficus bengalensis*, Linn. Grown all over India (*Bar*, Hind.).

Medicinal properties : The bark contains Tannin and is used as an **astringent tonic.**

PEEPUL TREE. *Ficus religiosa*, Linn. Indigenous to and cultivated throughout Northern and Central India.

Medicinal properties : The ripe fruit is nutritive, antiscorbutic, laxative. The bark contains tannin and is astringent.

UPAS TREE. *Antiaris toxicaria*, Leschen. A large tree found in Ceylon, Burma, &c. The gum-resin which exudes from incisions in its trunk has actions somewhat similar to those of Strychnine. It is used as an arrow poison.

It is likely that further investigation may reveal valuable medicinal properties.

FICUS ELASTICA, Roxb., the Assam Rubber tree indigenous to Assam and Burma. It is one of the sources of the india-rubber of commerce.

HAMAMELIDEÆ.

HAMAMELIDIS CORTEX, B. P. Hamamelis Bark. *Synonym*, Witch-Hazel bark.

The dried bark of *Hamamelis virginiana*, Linn.

Tinctura Hamamelidis, B. P. Tincture of Hamamelis.

Dose : $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 10).

Preparation : Moisten 2 oz. Hamamelis Bark in No. 20 powder with 1 fl. oz. Alcohol (45 p.c.) ; complete the percolation process, so that the resulting Tincture measure 1 pint.

Hamamelidis Folia, B. P. Hamamelis Leaves. *Synonym*, Witch-Hazel Leaves.

The leaves fresh and dried of *Hamamelis virginiana*, Linn.

Extractum Hamamelidis Liquidum, B. P. Liquid Extract of Hamamelis.

Dose : 5 to 15 mins.

A soft Alcoholic extract containing the active principle of an equal quantity of Witch-Hazel Leaves.

Liquor Hamamelidis, B. P. Solution of Hamamelis.

A distilled preparation.

Preparation : Macerate 50 oz. fresh Hamamelis Leaves, 10 fl. oz. Alcohol (90 p.c.), and 100 fl. oz. Water, in a still for 24 hours ; distil one-half.

Unguentum Hamamelidis, B. P. Hamamelis Ointment.
(Strength 10 p.c.).

Preparation : Mix $\frac{1}{4}$ fl. oz. Liquid Extract of Hamamelis and $2\frac{1}{4}$ oz. Hydrous Wool Fat.

Action and uses : **Hæmostatic**, both local and remote. Used locally for bleeding piles. Internally in hæmoptysis, memorrhagia, &c., and as an **analgæsic** in dysmenorrhœa.

Witch-Hazel contains in addition to Tannic Acid, an active principle, probably an essential oil, the chemistry of which is not known.

Hazeline (non-official) is the distilled extract from weak spirit and the leaves and twigs.

STYRAX PRÆPARATUS, B. P. Prepared Storax.

A purified Balsam obtained from the trunk of *Liquidambar orientalis*, Miller. Habitat, Asia Minor.

Sold in Indian Bazaars (*Silâras*, Hind.), it is used by the Hindus for perfuming medicinal oils.

Characters : Semi-transparent brownish-yellow, semi-liquid balsam ; odour strong, agreeable ; taste balsamic.

Medicinal properties : **Stimulating, Expectorant.** Used also for gonorrhœa and leucorrhœa.

It may be given in doses of 10 to 20 grains twice daily, gradually increasing.

An Ointment (1 of Storax in 4 of Prepared lard) is used for scabies and phthiriasis.

Storax in actions and uses resembles Balsam of Peru. It contains Cinnamic Acid, a volatile oil and various resins.

Cinnamic Acid when oxidised (which may be done by boiling with a solution of Potassium Bichromate and Sulphuric Acid) evolves an odour of Essential Oil of Bitter Almonds.

CUPULIFERÆ.

GALLA, B. P. Galls.

Excrescences on *Quercus infectoria*, resulting from the puncture and deposit of an egg or eggs of an insect *Cynips Gallæ tinctoriæ*.

Characters : Hard, heavy, subglobular, from $\frac{1}{2}$ " to $\frac{3}{4}$ " or more in diameter, tuberculated, smooth ; bluish-green externally, yellowish-white internally, with a small central cavity ; no odour, taste intensely astringent.

Unguentum Gallæ, B. P. Gall Ointment.

Preparation : Take 1 oz. Galls in fine powder ; 4 oz. Benzoylated Lard ; mix by trituration.

Unguentum Gallæ cum Opio, B. P. Gall and Opium Ointment.

(Strength of Opium $7\frac{1}{2}$ p.c.).

Preparation : Take 75 grains Opium in very fine powder ; 925 grains Gall ointment ; mix by trituration.

Medicinal properties : **Astringent.** Both the ointments are used as local applications in hæmorrhoids.

Dose : Of powdered Galls 10 to 20 grns.

From powdered Galls an infusion may be made ; also a **decoction** (boil $1\frac{1}{2}$ oz. bruised Galls in 20 oz. water for 10 minutes and strain ; dose 1-2 oz.). This may be used as an astringent wash, gargle, enema, or injection. It may also be given internally as an astringent. A useful powder for obstinate diarrhœa may be made by mixing 15 grns. Galls, $\frac{1}{2}$ grn. Opium, and 5 grns. Cinnamon all powdered, and given in honey.

Galls contain about 60 p. c. Tannin, and 3 p. c. Gallic Acid ; to these principles the action of the drug is due.

Galls (*Mui phul*, Hind.). May be purchased in Indian bazaars.

They are imported from Persia. The best quality are those collected before the mature insect has escaped, and are known as black or blue galls. The white variety collected after the insect has escaped, is perforated on one side, and inferior in quality.

ACIDUM TANNICUM, B. P. Tannic Acid. *Synonym*, Tannin. $C_{14}H_{10}O_9, 2H_2O$. May be extracted by water-saturated Ether from Galls which have been subjected to a special fermentation.

Dose: 2 to 5 grains.

Characters: Light brownish powder consisting of thin glistening scales; odour characteristic; taste strongly astringent; reaction acid; with ferric salts it changes to a bluish-black colour which does not disappear on heating, but clears on the addition of a mineral acid; is readily soluble in water, or alcohol (90 p.c.).

Incompatibles: Its aqueous solution precipitates solutions of isinglass, albumen, alkaloids and tartarated antimony. It is precipitated from its aqueous solution and loses its astringency in presence of many mineral salts (e.g., lead, silver), also mineral acids.

Glycerinum Acidi Tannici, B. P. Glycerin of Tannic Acid.

Preparation: Mix 1 oz. Tannic Acid with Glycerin sufficient to produce 5 fl. oz.; triturate until dissolved.

The application of heat darkens this preparation.

Suppositoria Acidi Tannici, B. P. Tannic Acid Suppository. Each suppository contains 3 grains Tannic Acid.

Prepare as described under Preparation of Suppositories *q.v.*

Useful in hæmorrhoids.

Trochiscus Acidi Tannici, B. P. Tannic Acid Lozenge.

Each contains $\frac{1}{2}$ grain Tannic Acid. Made with Fruit Basis. Used to lessen irritation of the throat.

~ *Dose*: 1 to 6 lozenges.

Medicinal properties: A local and intestinal styptic and astringent.

It is used as a spray for relaxed throat, 1 p.c. Tannin in Rose-water; as an injection of the same strength in gonorrhœa and leucorrhœa; as a nasal douche of $\frac{1}{2}$ p.c.; as an ointment of 10 p.c. in skin disease.

An astringent dentifrice is made by mixing 60 grs. Tannin, 1 oz. Chalk, and 30 grns. powdered Soap.

Internally, it is used in diarrhœa, but for this a less soluble form of Tannin, e.g., Kino, is preferred.

It is an antidote for alkaloidal poisons, but as all these poisons

a purgative. With Tartar Emetic, however, Tannin forms an insoluble compound and therefore is a good antidote.

Tannic Acid coagulates albumen, mucin, and gelatin, therefore is *styptic* and *astringent* if applied to wounded or secreting surfaces.

It has no effect on biliary secretion.

It is absorbed into the blood as Gallic Acid, and is excreted chiefly as such. Tannic Acid has no remote astringent action on secretions, on blood vessels, or on urinary excretion.

Natural Tannic Acid is a mixture of Digallic Acid (true Tannic Acid) and a glucoside of Digallic Acid. On exposure to air or acted on by dilute acids, it splits up into glucose and Gallic Acid.

Tannin is extensively used in tanning hides and converting them into leather.

ACIDUM GALLICUM, P. B. Gallic Acid.

A trihydroxybenzoic acid. $C_6H_2(OH)_3COOH, H_2O$; may be prepared by the action of diluted Sulphuric Acid on Tannic Acid.

Dose: 5 to 15 grains.

Characters: Needle-like crystals, colour pale-fawn or nearly white; odourless; taste, faintly acid. With the Persalts of Iron it gives a bluish-black precipitate which disappears on heating. Unlike Tannic Acid, it gives no precipitate with solutions of gelatin, albumen, isinglass, alkaloids, or tartarated antimony. Solubility 1 p.c. in cold water; much more soluble in hot water.

Incompatibles: With Spt. Æther. Nitrosi it gives off Nitrous fumes.

Medicinal properties: It is not a local astringent, and some authorities deny altogether its astringent action in any way. It is supposed to be a remote astringent and is used in hemorrhages, where the affected parts can be reached only through the circulation, *e.g.*, hemorrhage from the lungs or kidneys; to lessen the amount of albumen in the urine in albuminuria; in pyrosis, and in the night-sweats of phthisis, but in all these cases with questionable success.

In hæmoptysis it is given in 10 gr. doses every 2 hours.

Gallic Acid heated to $410^{\circ} F.$ becomes Pyrogallic Acid.

SALICINEÆ.

SALICINUM, B. P. Salicin.

A crystalline glucoside, $C_{13}H_{18}O_7$, obtained from the bark of various species of *Salix*, and of *Populus*. Obtained chiefly from America and Germany.

Dose: 5 to 20 grains.

Characters: Colourless shining trimetric tabular crystals, taste very bitter. Sulphuric acid colours it red; the crystals melt when heated, evolving salicylic aldehyde, recognisable by its odour of Meadow-sweet; a small quantity of salicin heated with a little potassium bichromate, a few drops of sulphuric acid and some water, yields Salicylic aldehyde. Solubility, 1 in 28 of cold water.

Medicinal properties: **Antipyretic, Tonic.** It has been almost entirely displaced by Salicylate of Soda.

Salicin has actions similar to Salicylic Acid of which it is one of the sources.

SALIX CAPREA, Linn. The **Sallow**, a species of willow cultivated in North-West of India. From the flowers is distilled an aromatic oil.

The bark is used as a **tonic** and **antirheumatic**. It contains salicin.

SCITAMINEÆ.

ZINGIBER, B. P. Ginger.

The scraped and dried rhizomes of *Zingiber officinale*, Roscoe.

Characters: Flattish, irregularly branched pieces; about 3" long; a depressed scar at the summit of each branch; externally pale-buff, somewhat striated, fibrous, fracture mealy, short fibrous odour agreeably aromatic; taste strong pungent.

It somewhat resembles Turmeric, but this is yellow.

Syrupus Zingiberis, B. P. Syrup of Ginger.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 40).

Preparation: To 1 fl. oz. strong Tincture of Ginger add Syrup sufficient to produce 20 fl. oz.

Tinctura Zingiberis, B. P. Tincture of Ginger.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 10).

Preparation: Moisten 2 oz. Ginger in No. 20 powder with 2 fl. oz. Alcohol (90 p.c.), complete the percolation process so that the resulting Tincture may measure one pint.

Tinctura Zingiberis Fortis. Strong Tincture of Ginger, known also as Essence of Ginger.

(Strength 1 in 2).

Prepared by the percolation process, with Alcohol (90 p.c.). From this the Syrup may be prepared.

The ordinary Tincture also may be prepared by diluting 1 part of strong Tincture with 4 parts Alcohol (90 p.c.).

Medicinal properties: **Stimulant, Carminative, Aromatic.**

Ginger acts, and is used in the same way as ordinary volatile oils. It is used largely as a condiment. Externally it is used as a local stimulant and rubefacient in headache, toothache and in the shortness of sight due to deficient contractile power of the iris.

Dose: Of powdered ginger 10 to 20 grns.

Ginger contains a volatile oil which gives the odour, and a resin which gives the taste. The oleo-resin is known as **Gingerine**.

Ginger (the root, fresh, *Adrakh*; dried, *Sonth*, Hind.), is cultivated extensively in India, and other tropical countries.

CARDAMOMI SEMINA, B. P. Cardamom Seeds.

The dried ripe seeds of *Elettaria Cardamomum*, Maton. The seeds should be kept in their pericarps and separated when required for use. Cultivated in Southern India. (*Chota elachi*, Hind.).

The pericarp weighs about 25 p.c. of the total weight of the fruit.

Characters: The fruits $\frac{2}{5}$ " to $\frac{4}{5}$ " long; ovoid or oblong, bluntly triangular in section, shortly beaked at the apex, colour pale buff, longitudinally striated.

The seeds dark reddish-brown, about $\frac{1}{8}$ " long and the same in breadth and thickness, irregularly angular, transversely wrinkled enclosed in a thin colourless membranous aril; odour and taste agreeably warm and aromatic.

Tinctura Cardamomi Composita, B. P. Compound Tincture of Cardamoms.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 80).

Preparation: $\frac{1}{4}$ oz. Cardamon Seeds, $\frac{1}{4}$ oz. Caraway Fruit, $\frac{1}{2}$ oz. Cinnamon Bark all bruised, 2 oz. Raisins of commerce freed from seeds, 55 grains Cochineal powdered, 1 pint Alcohol (60 p.c.). Prepare by the maceration process.

Medicinal properties: **Aromatic, stimulant, carminative.** Used in flatulence and as an adjunct to other medicines to lessen griping.

Dose: Of the powdered seeds, 5 to 20 grns.

Cardamoms act like ginger, but less powerfully. They contain a pale aromatic volatile oil on which their action depends, also a fixed oil.

EAU DE COLOGNE.

A perfume the secret of which is claimed by some 30 or 40 firms in Cologne, all having the name of Farina.

Take of Essential Oil of Neroli, Citron, Bergamot, Orange, and Rosemary, of each 12 drops; Malabar Cardamoms, 1 drn.; Rect. Spt. 1 galn.; dissolve, filter.

CEYLON CARDAMOMS. A variety cultivated near Kandy is much larger in size, but having the same medicinal properties as the Malabar variety.

AMOMUM SUBULATUM, Roxb. The Greater Cardamom (*Bari elachi*, Hind.). Indigenous on the mountainous parts of Northern India and Nepal. The fruit is ovoid, about 1" long.

Its medicinal properties are similar but inferior to those of the Malabar Cardamoms, and being cheaper it is much used as a substitute.

TURMERIC, B. P. *Appendix*. The dried rhizome of *Curcuma longa*, Linn. The Turmeric plant, indigenous and largely cultivated in India.

Characters: Tubers yellowish externally; or a deep yellow resinous powder; odour somewhat like ginger; taste aromatic. Its yellow colour is changed into a brownish-red by alkalis. It forms a brown compound with Boric Acid in presence of a mineral Acid.

B. P. Uses: It is used as a test for alkalis.

Turmeric paper is prepared by dipping unsized paper in the tincture and drying by exposure to the air.

Tincture of Turmeric is made by macerating 1 part bruised Turmeric in 6 of Alcohol (90 p.c.) for 7 days in a closed vessel, and then filtering.

Turmeric contains a yellow colouring matter which is not permanent, therefore its use as a dye in Britain has almost altogether ceased. It contains also a yellow essential oil which explains its use as a medicine, and as a condiment in curry powders.

The Turmeric plant (*Haldi*, Hind.), is indigenous to and extensively cultivated throughout India. It is largely used by the natives of this country as a condiment and cosmetic.

Medicinal properties: **Stimulant and Carminative**. Its actions resemble those of Ginger. The fumes of burning turmeric, inhaled through the nostrils, relieve nasal catarrh. A lotion (1 of bruised turmeric root in 20 of water) relieves the irritation of catarrhal conjunctivities. A paste of powdered turmeric and lime is used to relieve sprains and bruises.

WILD TURMERIC. (*Jangli-haldi*, Hind.).

The rhizomes of *Curcuma aromatica*, Salisb.; the Yellow Zedoary, common in many parts of India.

Characters: Cut segment or sections of an ovate or rounded tuber, marked externally with the remains of fibres; colour pale yellowish or brownish-grey; odour aromatic; taste pungent, bitter.

Medicinal properties: **Carminative Tonic**. It contains an oleo-resin.

CURCUMA ZEDOARIA, Roxb. The round Zedoary, a plant cultivated throughout India for its root, obtained in slightly curved pieces about 3" long and $\frac{1}{2}$ " in diameter. Greyish-white externally, grey internally, odour aromatic.

Its actions are similar to those of Ginger only somewhat camphoraceous.

CURCUMA AMADA, Roxb. Mango Ginger (*Ama-haldi*, Hind.). Its medicinal properties resemble those of Ginger.

The tubers are used as a condiment. The Infusion is used to give a flavour resembling Mango to confectionery.

CURCUMA ANGUSTIFOLIA, Roxb. (*Tikur*, Hind.).

From the tubers of this plant, East Indian Arrowroot is made. It is inferior in quality to Bermuda Arrowroot.

MARANTA. Arrowroot.

The starch obtained from the roots of *Maranta arundinacea*, Linn., the West Indian Arrowroot plant. The best quality is that from Bermuda.

Characters: A light white powder, without unpleasant odour or taste.

Medicinal properties: **Nutrient and Demulcent**. To prepare it add a little cold milk, making a thin paste; then add boiling milk, and a little sugar if desired.

The **PLANTAIN** or **Banana**. (*Kéla*, Hind.).

The fruit of *Musa sapientum*, Linn. A perennial herbaceous plant, cultivated throughout India.

The young tender leaves may be used as a cool surgical dressing, also as a substitute for oiled silk in water dressings. The older and greener leaves make an excellent eye-shade in ophthalmia.

The ripe fruit is extensively used as a food. It contains about 20 p.c. sugar; is antiscorbutic, and if fully ripe is slightly laxative.

The unripe fruit is somewhat astringent, and contains nearly as much starch as the potato, but is inferior as an article of diet. The flowers, and inner portion of the young stem are eaten as a vegetable.

AMARYLLIDÆ.

CRINI RADIX. The fresh root of *Crinum asiaticum*, var. *toxicarum*, Herb. *Habitat*, Humid localities throughout India.

Characters: Bulbous with a terminal stoloniferous fusiform portion issuing from the crown of the bulb; odour unpleasant narcotic; readily dried in a stove and reducible to powder.

Medicinal properties: in small doses **Emetic**, in larger doses **nauseant, expectorant, diaphoretic**. Its uses are analogous to those of Ipecacuanha, but inferior to it; a Succus and a Syrup are prepared.

AGAVE AMERICANA, Linn. The American Aloe (*Kakar pat*, *Murga*, Hind.).

Is naturalised in nearly every part of India.

Medicinal properties: **Diuretic, alterative**. Used in secondary syphilis. The large fleshy leaves cut into thin slices may be used as a poultice.

IRIDÆ.

CROCUS, B. P. Saffron.

The dried stigmas and tops of the styles of *Crocus sativus*, Linn. Imported from Spain, France and Italy.

Characters: Each entire portion of commercial saffron is 1" or more long, and consists of three orange-red stigmas, thickened and tubular above, jagged or notched at the upper extremities, and united below to the top of the yellow style.

Saffron is flexible and unctuous to the touch unless quite dry; odour peculiar, strongly aromatic; taste bitter, somewhat aromatic. Rubbed on the wet finger it leaves an intense yellow-orange stain.

Tinctura Croci, B. P. Tincture of Saffron.

Dose: 5 to 15 mins. (Strength 1 in 20).

Preparation: Take 1 oz. Saffron, Alcohol (60 p.c.). Prepare by the maceration process.

Actions and uses: Slightly **stimulant**: Used to **colour and flavour** other preparations.

One part Saffron gives a distinct yellow colour to 100,000 parts water.

Sulphuric Acid changes the colour of Saffron to indigo-blue which soon fades.

ORRIS ROOT (a corruption of Iris root) sold in the Calcutta bazaar, as *Bekh-banfsha*, the rhizome of several species of Iris. Natives of Southern Europe, Persia and Kashmir.

Orris root on drying acquires a fragrant smell of violets. It is

sweeten an offensive breath, or used as a fragrant addition to hair or tooth powders. A tincture of Iris root is sold as Essence of Violets.

Iridin. An oleo-resin obtained from *Iris versicolor*, Linn., the Blue Flag. It is dark brown in colour, bitter, nauseous, acrid.

Medicinal properties: **Cholagogue Cathartic.** Used in constipation and biliousness.

LILIACEÆ.

SCILLA, B. P. Squills.

The bulb of *Urginea Scilla*, Steinh., divested of its dry membranous outer scales, cut into slices and dried. Imported from the Mediterranean coast.

Dose: 1 to 3 grns.

Characters: Flattish slices, curved, frequently tapering towards both ends, yellow or slightly pink, 1" to 2" long; somewhat translucent; if dry, brittle, easily pulverisable, if moist, tough, and flexible, without odour; taste bitter and nauseous.

It somewhat resembles Tragacanth, but is not translucent.

Acetum Scillæ, B. P. Vinegar of Squills.

Dose: 10 to 30 mins. (Strength 1 in 8).

Preparation: Take $2\frac{1}{2}$ oz. bruised Squills, 20 fl. oz. Dilute Acetic Acid; exhaust the Squills by the maceration process as directed for Tinctures; make up the quantity to one pint.

Oxymel Scillæ, B. P. Oxymel of Squills.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Preparation: Digest $2\frac{1}{2}$ oz. bruised Squills in a mixture of $2\frac{1}{2}$ fl. oz. Acetic Acid and 8 fl. oz. Distilled Water; press strongly; filter; mix the product with about 27 fl. oz. of clarified Honey or sufficient to make the sp. gr. 1.320.

Pilula Scillæ Composita, B. P. Compound Squill Pill.

Dose: 4 to 8 grains.

Preparation: Take $1\frac{1}{4}$ oz. Squills, 1 oz. Ginger, 1 oz. Ammoniacum, 1 oz. Hard Soap, all in powder, 1 oz. Syrup of Glucose; mix to form a mass.

Useful in chronic bronchitis.

Syrupus Scillæ, B. P. Syrup of Squill.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Preparation: Dissolve 38 oz. Refined Sugar in 1 pint Vinegar of Squills. Boil the acid of gentle heat.

Tinctura Scillæ, R. P. Tincture of Squills.

Dose : 5 to 15 mins. (Strength 1 in 5).

Preparation : Take 4 oz. bruised Squills, 20 fl. oz. Alcohol (60 p.c.); prepare by the maceration process.

Given in mixtures with other expectorants. An excellent remedy for a bronchitic cough is 1 drm. of Tincture of Squills with $1\frac{1}{2}$ oz. water, in teaspoonful doses taken frequently.

Medicinal properties : A **Stimulating Expectorant** and **Diuretic**.

Squills acts very much like Digitalis on the heart and kidneys. It is also an expectorant, being specially useful in cases where the secretion is excessive, and difficult to expel. It is not so suited to cases where the secretion is viscid or deficient. In large doses it acts as a gastro-intestinal irritant. It should not be given in acute cases, nor where the digestion is enfeebled.

The active principle is a glucoside.

URGINEA INDICA, Kunth. Indian Squill (*Kandá, Jangli-piyaz*, Hind.).

The young tunicated bulbs only should be used, as they lose their medicinal properties as they get older.

Medicinal properties : **Stimulant, Expectorant, Diuretic**, resembling Squills.

SCILLA INDICA, Baker, Syn. *Ledebouria hyacinthina*, Roth. (*Suphaida-Khus*, Hind.).

A plant common in the North-Western Provinces. The scaly bulbs have been used in medicine as a substitute for Squills.

ALOE SOCOTRINA, B. P. Socotrine Aloes.

The juice that flows from the transversely cut leaves of *Aloe Perryi*, Baker, and probably other species of Aloes, evaporated to dryness. Imported principally by way of Bombay, and known in commerce as Socotrine and Zanzibar Aloes.

Dose : 2 to 5 grains.

Characters : **Socotrine Aloes**; usually more or less viscid and brownish-yellow; but forming, when dried, hard dark-brown masses which break with a dull waxy uneven fracture; odour strong but not disagreeable; taste nauseous, bitter.

Zanzibar Aloes; brown masses, fracture dull waxy, but nearly smooth and even; odour characteristic; taste nauseous, bitter.

Both varieties are opaque even in small splinters; under the microscope they exhibit numerous minute crystals embedded in a transparent mass, and impart to Nitric Acid a reddish or yellowish-brown colour; almost entirely soluble in alcohol (90 p.c.), diluted with half its volume of water; and about 50 p.c. should dissolve in water.

If powdered Socotrine Aloes be mixed with Sulphuric Acid and the vapour of Nitric Acid blown across the powder, no blue colouration is produced. Barbados Aloes so treated gives a slight bluish-green; Natal Aloes a bright blue.

Pilula Aloes Socotrinæ, B. P. Pill of Socotrine Aloes.

Dose : 4 to 8 grains.

Preparation : Take 2 oz. Socotrine Aloes, 1 oz. Hard Soap, both powdered, 1 fl. dr. Oil of Nutmeg, 1 oz. Confection of Roses; mix and make a pill.

Pilula Aloes et Asafetidæ, B. P. Pill of Aloes and Asafetida.

Dose : 4 to 8 grains.

Preparation : Take 1 oz. Socotrine Aloes, 1 oz. Asafetida, 1 oz. Hard Soap, all powdered, 1 oz. Confection of Roses; mix to form a mass.

Is Cathartic and Antispasmodic; useful in hysterical cases.

Pilula Aloes et Myrrhæ, B. P. Pill of Aloes and Myrrh.

Dose : 4 to 8 grains.

Preparation : Take 2 oz. Socotrine Aloes, 1 oz. Myrrh, both in powder, $1\frac{1}{2}$ oz. Syrup of Glucose; mix to form a mass.

Medicinal properties : Socotrine Aloes is a stomachic bitter and intestinal purgative. Its action depends in the Aloin (*q.v.*) present.

ALOES BARBADENSIS, B. P. Barbados Aloes.

The juice that flows from the transversely cut leaves of *Aloe vera*, Linn., *Aloe chinensis*, Bak., and probably other species, evaporated to dryness. Imported from the West Indies and known in commerce as Barbados and Curaçao Aloes.

Dose : 2 to 5 grains.

Characters : Hard masses varying in colour from a yellowish-brown to nearly black. Fracture either dull waxy, the small splinters being opaque and under the microscope exhibiting numerous minute crystals embedded in a transparent mass; or smooth and glassy, with the small splinters transparent.

Odour disagreeable; taste nauseous, bitter. The powder imparts a crimson colour to Nitric Acid; entirely soluble in Alcohol (90 p.c.), diluted with half its volume of water; at least 70 p.c. should be soluble in cold water.

Decoctum Aloes Compositum, B. P. Compound Decoction of Aloes; known also as Baume de Vie.

Dose : $\frac{1}{2}$ to 2 fl. oz.

Preparation : Reduce $\frac{1}{2}$ oz. Extract of Barbados Aloes and

Carbonate, and 2 oz. Extract of Liquorice, with 1 pint Distilled Water in a covered vessel for 5 minutes; add $\frac{1}{4}$ oz. Saffron; when the liquid is cool add 15 fl. oz. Compound Tincture of Cardamoms; set aside in a covered vessel for two hours; strain through flannel; pass through the strainer Distilled Water sufficient to make 50 fl. oz.

Extractum Aloes Barbadosensis, B. P. Extract of Barbados Aloes.

Dose: 1 to 4 grains.

Preparation: To 1 gallon boiling Distilled Water add 1 pound Barbados Aloes in small fragments; stir well until thoroughly mixed; set the mixture aside for 24 hours; decant; strain; evaporate to dryness at a temperature not exceeding 140° F.

Pilula Aloes, Barbadosensis, B. P. Pill of Barbados Aloes.

Dose : 4 to 8 grains.

Preparation : Take 2 oz. Barbados Aloes, 1 oz. Hard Soap, both powdered, 1 fl. drm. Oil of Caraway, 1 oz. Confection of Roses; mix and form a mass.

Pilula Aloes et Ferri, B. P. Pill of Aloes and Iron.

Dose : 4 to 8 grains.

Preparation: Take 2 oz. Barbados Aloes in powder, 3 oz. Compound Powder of Cinnamon, 1 oz. Exsiccated Ferrous Sulphate, 3 oz. Syrup of Glucose; mix and form a mass.

Useful for irregular menstruation in anæmic debilitated patients.

Tinctura Aloes, B. P. Tincture of Aloes.

Dose : $\frac{1}{2}$ to 1 fl. dram. for repeated administration ; for a single administration $1\frac{1}{2}$ to 2 fl. drms.

Preparation: Place $\frac{1}{2}$ oz. Extract of Barbados Aloes in a closed vessel with 16 fl. oz. Alcohol (45 p.c.); set aside for 48 hours, occasionally shaking until dissolved; add 3 fl. oz. Liquid Extract of Liquorice; filter; pass through the filter Alcohol (45 p.c.) sufficient to make 1 pint.

Medicinal properties: Of Aloes; **Purgative**, acting especially on the lower intestines. Barbados Aloes is rather more powerful as a purgative than the Socotrine variety, probably due to the greater proportion soluble in water, which is the more active part.

The action of the different kinds of Aloes is similar, and depends on the presence of Aloin. They also contain resinous substances and a trace of ethereal oil.

ALOINUM, B. P. Aloin.

Alcain is extracted from Dact. 1. Alcain is a

varieties of Aloes possess similar medicinal properties. The Aloin extracted from Barbados Aloes has the formula $C_{16}H_{16}O_7, 3H_2O$.

Dose : $\frac{1}{2}$ to 2 grains.

Characters : Usually in tufts of needle-like crystals, yellow, inodorous and having the taste of aloes.

Sparingly soluble in cold water; more soluble in alcohol (90 p.c.), freely soluble in hot liquids; rapidly altered in alkaline solutions.

Medicinal properties : Aloin in small doses acts as a **simple bitter**. In ordinary doses it is a **hepatic stimulant**, both increasing the secretion of bile and rendering it more watery; also **purgative**, acting chiefly on the large intestine and rectum. It is the slowest of all purgatives, not acting until 10 to 24 hours after administration, and is often accompanied by tenesmus, hæmorrhoids or hæmorrhage. It also increases the blood in the pelvic organs and so may aggravate uterine activity or even cause abortion. As it does not tend to produce subsequent constipation, it is largely used in chronic constipation, due to inactivity of the large intestine. It is often given as a dinner pill in the evening to act the following morning. As such it may be given regularly for years without bad effects. It is also given combined with myrrh in amenorrhœa, just before the time when menstruation is due. Also as an enema (10 grains Aloes, either variety, 15 grains Carbonate of Potassium, 10 oz. Mucilage of Starch).

It should not be used during menstruation or pregnancy nor where there is rectal irritation.

Aloin is excreted by the milk and so should be given with caution to nursing women.

CONVALLARIA MAJALIS, Linn., Lily of the Valley.

A Tincture (strength 1 in 5) is made from the flowers, leaves, stem, or root, all of which contain the active principles, by macerating the part selected in 1 pint Alcohol (90 p.c.) for 14 days, straining, pressing, and adding Alcohol (90 p.c.) up to 20 fl. oz.

Medicinal properties : **Cardiac Tonic, Diuretic**. Useful in mitral disease with dropsy. It acts like Digitalis but without its nauseating effects.

Dose : 30 to 60. mins.

MELANTHACEÆ.

VERATRINA, B. P. Veratrine.

An alkaloid or mixture of alkaloids prepared from *Cevadilla*, the dried ripe seeds of *Schoenocaulon officinale*, A. Gray.

Characters : Pale-grey amorphous, without odour but in the most minute quantity powerfully irritating the nostrils; taste bitter and intensely acid, insoluble

Unguentum Veratrinæ, B. P. Veratrine Ointment.

(Strength 2 p.c.).

Preparation: Rub together 10 grains Veratrine with 40 grains Oleic Acid; gently warm the mixture until dissolved; add 450 grains Lard: mix:

Used: To relieve non-inflammatory pains, but it should not be applied to mucous or wounded surfaces as the active principle may be absorbed producing poisonous effects.

Internally: It is a powerful cardiac depressant, but is not used for this purpose. Its actions resemble those of Aconite.

COLCHICI CORMUS, B. P. Colchicum Corm.

The fresh corm of *Colchicum autumnale*, Linn. Indigenous in Britain, collected in early summer; and the same stripped of its coats, sliced transversely and dried at a temperature not exceeding 150° F.

Dose: Of dried corm, 2 to 5 grains.

Characters: **Dried Corms**, slices $\frac{1}{10}$ " to $\frac{1}{8}$ " thick, somewhat kidney-shaped, white, yellowish at their circumference, breaking with a short fracture, no odour, taste bitter.

It somewhat resembles Tragacanth and Squills, but these have a different texture and are not kidney-shaped, besides Tragacanth is simply mucilaginous, Squill is nauseous and Colchicum corms are starchy.

Extractum Colchici, B. P. Extract of Colchicum.

Dose: $\frac{1}{4}$ to 1 grain.

The expressed juice of fresh Colchicum Corms bruised and evaporated to the consistence of a soft extract.

Vinum Colchici, B. P. Colchicum Wine.

Dose: 10 to 30 mins. (Strength 1 in 5).

Preparation: Take 4 oz. Colchicum Corm in No. 40 powder, 20 fl. oz. Sherry wine; macerate as directed for tinctures.

COLCHICI SEMINA, B. P. Colchicum Seeds.

The dried ripe seeds of *Colchicum autumnale*, Linn.

Characters: About $\frac{1}{10}$ " in diameter, nearly globular, slightly pointed at the hilum; reddish-brown; rough, hard and tough, without odour; taste bitter acrid.

It resembles black mustard but is somewhat larger.

Tinctura Colchici Seminum, B. P. Tincture of Colchicum Seeds.

Dose: 5 to 15 mins. (Strength 1 in 5).

Preparation : Moisten 4 oz. Colchicum Seeds in No. 30 powder with $2\frac{1}{2}$ fl. oz. of Alcohol (45 p.c.); complete the percolation process so that the resulting Tincture measure 1 pint.

The preparation from the seeds is supposed to be more certain in action and milder in operation than that from the corm.

Medicinal properties : **Cholagogue, Intestinal Stimulant, Diuretic, Diaphoretic, Cardiac Depressant.** Used to relieve attacks of acute gout.

It must be given in doses sufficient to produce its physiological action including an increase in the uric acid excreted.

The action of Colchicum in relieving gout is not understood. In medicinal doses it increases the secretion of the intestinal tract, kidneys and skin, also depresses the action of the heart. In large doses it is a powerful stimulant of both liver and intestines, rendering the bile more watery and increasing the secretion of biliary matter, thus acting as an emetic and purgative.

It contains a bitter alkaloid Colchicine which absorbed in quantity into the blood depresses the cerebrum and spinal cord, weakening the respiration and causing death by asphyxia.

SMILACEÆ.

SARSÆ RADIX, B. P. Sarsaparilla.

The dried root of *Smilax ornata*, Hook. f.; known as Jamaica Sarsaparilla. Obtained from Central America.

Characters : Long, nearly cylindrical, tough, flexible roots: grayish-brown or dark reddish-brown; folded together, and bound with a root of the same plant into bundles of about 18" long, and 4" to 5" in diameter. The Roots are usually $\frac{3}{16}$ " in thickness, deeply wrinkled longitudinally and provided with numerous rootlets; transverse section exhibits a reddish-brown cortex and yellowish-white wood; no odour, taste slightly bitter.

Extractum Sarsæ Liquidum, B. P. Liquid Extract of Sarsaparilla.

Dose : 2 to 4 fl. drms.

An Alcoholic Extract so prepared that 1 oz. of the Liquid Extract will contain the active principle of an equal quantity of the drug.

Liquor Sarsæ Compositus Concentratus, B. P. Concentrated Compound Solution of Sarsaparilla.

Dose : 2 to 8 fl. drms.

Preparation : Boil 2 oz. Sassafras Root, 2 oz. Guaiacum wood, both in shavings, 2 oz. dried Liquorice Root bruised, 1 oz. Mezereon Bark cut small, with Distilled Water until exhausted; to this add

and bruised, in three successive portions of 5 pints of the Distilled Water for one hour at 160° F.; rapidly concentrate the mixture until it measures when cold 16 fl. oz.; add 4½ fl. oz. Alcohol (90 p.c.); set aside for 14 days; filter. The product should measure 1 pint.

Medicinal properties: Sarsaparilla is said to be **Tonic** and **Alterative**, and is used in chronic diseases, *e.g.*, old standing cases of syphilis in debilitated subjects, often as a vehicle for Iodides or other drugs. Its actions are not understood: many disputing its having any beneficial action.

It contains a small proportion of volatile oil, and a bitter principle, but its activity depends upon a saponin-like body.

PALMACEÆ.

ARECA, B. P. Betelnut (*Supari*, Hind.).

The seeds of *Areca Catechu*, Linn., an elegant palm tree, extensively cultivated throughout India. Used as a masticatory, it is chewed with quicklime, aromatics, and the leaves of the betel pepper. The unripe nuts are laxative and carminative. The fresh nuts are intoxicating. A paste made of the powder of the dried nut is used as a dentifrice.

Medicinal properties: **Astringent**; anthelmintic for tapeworm.

Dose: As an astringent 15 to 30 grns., as an anthelmintic ½ to ¾ oz. For a large dog 60 grns. of powdered betelnut mixed with honey.

It contains tannic and gallic acids, and four alkaloids: arecoline, arecaine, arecaidine, and guvacine. The watery extract affords Betelnut Catechu.

The dried petioles may be used as splints for fractures.

PHŒNIX DACTYLIFERA, Linn. The edible Date (*Khurma*, *chuhara*, Hind.).

A tall palm tree cultivated in the Panjab. The fruit is used for food. The seeds roasted and ground are known as date coffee. The fruit is nutrient and in large doses laxative.

CALAMUS DRACO. Willd. (*Aprang*, Hind.).

One of the Rattan Palms. Its fruit yields a resin which is a blood-red pigment known as **dragon's blood** and is used as an astringent and for colouring. Burned as incense it yields a pleasing odour.

BORASSUS FLABELLIFER, Linn., the Palmyra or Fan Palm (*Tar*, Hind.) is found on dry soils throughout India.

The leaves are used for writing. It is one of the sources of Toddy.

TODDY, (*Sendi, Tari, Hind.*). The saccharine juice obtained by excision of the young flowering branch of various kind of Palms. There are several kinds of toddy throughout India, each named from the plant which produces it.

Toddy after undergoing vinous fermentation is converted into **Arrak**, an intoxicating drink. If of sufficient strength (sp. gr. 0.920), arrack may be used for the same purposes as Proof Spirit.

COCOS NUCLIFERA, Linn., the Cocoanut Palm (*Nariyel, Hind.*) is cultivated extensively along the sea coast portions of India.

The fruit yields a fixed oil, **Cocoanut oil** used as an emollient. illuminant and in the manufacture of soap. The fibrous bark of the fruit is the **coir fibre** of commerce. A kind of **Toddy** (*q.v.*) is made from the juice of the flowering spikes.

AROIDEÆ.

ACORUS CALAMUS, Linn. Sweet Flag (*Bash, Hind.*).

Characters: Pieces of various lengths, about $\frac{3}{4}$ " in thickness, flattened, spongy, with numerous sheath-like ringed appendages; odour aromatic, taste bitter, warm, acrid. It contains a volatile oil and a bitter substance.

An Infusion (made by pouring 10 oz. boiling water on 1 oz. powdered rhizome given in doses of 2 oz. twice or thrice daily, is useful as an **aromatic bitter stomachic** in the convalescence of fevers.

The odour of the root when fresh is credited with the power of driving away fleas and other insects from a room.

Scindapsus officinalis, Schott. A large climbing plant common throughout India.

The fruit sliced and dried (*Guypipul, Hind.*) is used by native practitioners as a **stimulant carminative**.

GRAMINEÆ.

AMYLUM, B. P. Starch.

The Starch procured from the grains of common wheat, *Triticum sativum*, Lindl. maize, *Zea Mays*; and rice, *Oryza sativa*, Linn.

Characters: Fine powder or irregular angular or columnar masses, readily reducible to powder; white, without odour; when lightly rubbed in a mortar with a little cold water the mixture is neither acid nor alkaline to test papers; boiled with water and cooled it gives a deep blue colour with solution of iodine; the blue disappears on boiling, but re-appears on cooling, provided the boiling has not been prolonged.

The following are the several varieties of starch present the

Wheat Starch; a mixture of large and small granules, the former lenticular in shape, and marked with faint concentric striæ surrounding a nearly central hilum.

Maize Starch; granules more uniform in size, frequently polygonal. Somewhat smaller than the granules of wheat starch, and having a distinct hilum, but no evident concentric striæ.

Rice Starch; granules exceedingly minute, nearly uniform in size, polygonal without evident hilum or striæ.

The starch should be free from granules other than those described.

Glycerinum Amyli, B. P. Glycerin of Starch.

Also known as Plasma.

Preparation: Mix together 1 oz. Starch, $6\frac{1}{2}$ fl. oz. Glycerin, $1\frac{1}{2}$ fl. oz. Distilled Water, heat together, stirring constantly until a translucent jelly is formed.

A soothing application for chilblains, etc.

Mucilage of Starch, B. P. Appendix. It should be recently prepared.

Preparation: Triturate 1 gramme (or 1 part) Starch with a small quantity of Distilled Water to form a smooth paste; add more Distilled Water gradually to produce 50 cubic centimetres or 50 parts of the mixture; boil for a few minutes, constantly stirring, cool.

Medicinal properties: Internally it is used as a food, and is slightly astringent. Externally a dusting powder for cutaneous eruptions, etc., to stiffen bandages for fractures, etc. Starch mucilage is used for enemas.

Voilet Powder (which is simply starch scented), is used to prevent chafing of the skin in infants.

***HORDEUM DECORTICATUM.** Pearl Barley.

The dried seeds of *Hordeum vulgare*, Linn., divested of its integument. Cultivated in Britain.

Characters: White, rounded, ovoid seeds, with a longitudinal fissure: taste and odour farinaceous.

Medicinal properties: **Nutritive** and **Demulcent**: Used in Catarrhs of throat and urinary tract.

Decoctum Hordei. Barley Water. Used as a demulcent drink.

Dose: 1 to 4 oz. frequently.

Preparation: Boil 1 part washed barley with 15 parts Distilled Water for 20 minutes in a covered vessel, and strain.

EXTRACTUM BYNESE. Malt Extract.

A thick syrupy brownish fluid, consisting largely of digested farinaceous food, but containing also a ferment (diastase) which has the power of converting other starches into a kind of sugar. As its action is lessened by the acid of the stomach, it is best given at least two hours after food, or it may be mixed with warm food before this is taken.

Medicinal properties: As a **nutritive** in wasting diseases, and a **tonic** in dyspepsia; also to emulsify cod oil. In large doses it is laxative.

Dose: A teaspoonful to a tablespoonful.

SACCHARUM PURIFICATUM, B. P. Refined Sugar. *Synonym* Sucrose.

A crystallised sugar, $C_{12}H_{22}O_{11}$, obtained from the juice of the sugar-cane. It is also obtained largely from Beet-root and from other plants.

Characters: Colourless, inodorous, separate crystals, readily and completely soluble in half their weight of water, forming a clear bright syrup; no odour; sweet taste; burns with a smoky flame, changing to a dark brown highly-flavored substance, called **Caramel**.

Test for absence of Glucose,—When syrup is heated to about 180° F. with solution of Potassio-Cupric Tartrate, or with solution of Copper Sulphate and excess of Potassium hydroxide, there should not be more than a trace of red or yellow precipitate.

Syrupus, B. P. Syrup.

Strength: 70 parts of Syrup contain 56 of Sugar.

Preparation: To 40 fl. oz. boiling Distilled Water add 5 lbs. Refined Sugar; heat until dissolved; add more boiling Distilled Water so that the product weigh $7\frac{1}{2}$ lbs. and has sp. g. of 1.330.

Syrupus Aromaticus, B. P. Aromatic Syrup.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Preparation: Mix 5 fl. oz. Tincture of Orange, 5 fl. oz. Cinnamon Water; shake the mixture with a little talc; filter; add 10 fl. oz. Syrup.

Medicinal properties: Sugar is **Antiseptic, Sweetening, Demulcent, Nutrient**. As Syrup, it is used in catarrhs; as a vehicle to mask the taste of nauseous remedies; to preserve foods, &c. It protects active ingredients from fermentation, and certain iron preparations from oxidisation.

Sugar is a rapid innocent stimulant useful to soldiers, bicyclists, &c. It was used as a ration by the German Army.

As an Antiseptic Sugar may be used in the following ways:—sprinkled on unhealthy ulcers: a solution of 1 part in 3 of water dropped into the eyes; or 1 in 8 of water as an injection in gonorrhœa.

A plaster composed of equal parts of sugar and yellow soap, is a common household application for boils.

Sugar is sold also as **Loaf Sugar**, the crystals in compact conical loaves: also as **Lump Sugar**, which is loaf sugar broken up.

Theriaca. Treacle. The uncrystallised residue of the refining of sugar.

Characters: Viscid, brownish, syrupy, very sweet, fermentable, not crystallising by rest, or spontaneous evaporation.

Medicinal properties: **Demulcent, nutrient, slightly laxative.** With Sulphur it is used as a domestic laxative. Used largely as an **excipient** in pill-making, its special advantage being its retentiveness of moisture, so ensuring the pills remaining moist.

GLUCOSE. Grape Sugar. *Synonym*, Dextrose, $C_6H_{12}O_6$. It is the sugar found in glycosuria.

Sucrose solutions exposed to light are slowly converted into glucose. Or by boiling sucrose with some dilute acid this change takes place rapidly.

Syrupus Glucosi, B. P. Syrup of Glucose.

Preparation: Mix by aid of gentle heat 1 oz. Liquid Glucose of Commerce, 2 oz. Syrup.

ORYZA. Rice.

The husked and cleaned seed of *Oryza sativa*, Linn. (*Chával*, Hind.). Unhusked rice is known as Paddy (*Dhán*, Hind.).

Medicinal uses: **Nutrient**; largely used in sick room dietary.

In an emergency rice may be used instead of linseed meal for poultices; the surface of the poultice being smeared with a bland oil so as to keep it moist and soft.

Rice contains about 80 p.c. carbo-hydrates, 7 of proteids, 1 of mineral matter. It is therefore a non-stimulating food, deficient in flesh-forming material.

Rice water, or Conjee, is made by boiling 1 oz. cleaned rice in 40 oz. water for 20 minutes, straining, and flavouring with sugar and a little lime juice. It is a pleasant demulcent drink.

Rice flour is a good dusting powder.

OLEUM ANDROPOGI. Lemon-grass Oil, or Oil of Verbena. The volatile oil distilled from various species of Andropogon. The oil from *A. Nardus*, Linn. (*Ganjni*, Hind.), is known as Oil of

Characters: Pale sherry colour; odour fragrant, lemon-like; taste pungent.

Medicinal properties: Are those of the aromatic oils. Internally **Carminative**. Externally mixed with a bland oil it is used as a stimulating liniment; in very chronic cases the undiluted oil may be used.

* *Adult dose*: 3 to 6 mins. in sugar.

ANDROPOGON MURICATUS, Retz. (*Khas-Khas*, Hind.).

A large grass growing in Southern India, Bengal and Burma. An aromatic oil is distilled from its root.

The long fibrous roots are used to make the scented door screens known as Khas-Khas Tatties.

ANDROPOGON SCHÖENANTHUS, Linn. The Geranium-grass. Indigenous to Central India. It yields an aromatic oil (*Rusa ka tel*, Hind.), which has the property of effectually disguising the odour of Iodoform.

BAMBUSA ARUNDINACEA. The Bamboo.

Extensively cultivated throughout India, and used very largely in ordinary life for building and domestic purposes.

Medicinal properties: The older drier stems make very efficient splints for fractures, &c.

CONIFERÆ.

TEREBINTHINA CANADENSIS, B. P. Canada Turpentine.
Synonym, Canada Balsam.

The oleo-resin obtained from *Abies balsamea*, Mill., the Balm of Gilead Fir.

Characters: Pale greenish-yellow, transparent, liquid; of the consistence of thin honey; odour peculiar, agreeably terebinthinate; taste slightly bitter, feebly acrid; drying very slowly on exposure to the air into a transparent varnish, and solidifying on being mixed with one-sixth of its weight of Magnesia, and a little water; soluble in Alcohol (90 p.c.) or Ether.

Medicinal properties: Same as Turpentine.

Dose: 20 to 30 grns. But not used internally.

THUS AMERICANUS, B. P. Frankincense.

The concrete oleo-resin which is scraped off the trunks of *Pinus palustris*, Mill., and *Pinus Tæda*, Linn.

Characters: When fresh a soft, pale yellow, opaque, tough solid with terebinthinate odour; but on keeping it becomes dry, brittle, translucent, darker in colour, and fainter in odour.

Medicinal properties: are similar to other oleo-resins. It is used externally as a stimulant.

OLEUM TEREBINTHINÆ, B. P. Oil of Turpentine.

The oil distilled from the oleo-resin (turpentine) obtained from *Pinus sylvestris*, Linn., and other species of *Pinus*; rectified if necessary.

Dose: 2 to 10 mins.; as an anthelmintic 3 to 4 fl. drms. combined with a purgative to prevent absorption.

A good emulsion may be made by rubbing 30 grns. powdered Acacia with 1 drm. Oil of Turpentine, then with 1 drm. water, then gradually adding 1 oz. water.

Characters: Limpid colourless; odour, strong, peculiar; taste, pungent bitter. Different kinds vary considerably in character. It dissolves in all proportions of Alcohol, or Chloroform; 1 in $6\frac{1}{2}$ of Alcohol (90 p.c.); 3 in 10 of Ether; 1 in 3 of Glacial Acetic Acid. With Resin it forms varnish.

Linimentum Terebinthinæ, B. P. Liniment of Turpentine.

Preparation: Mix together $1\frac{1}{2}$ oz. Soft Soap and 2 fl. oz. Distilled Water. Dissolve 1 oz. Camphor in 13 fl. oz. Oil of Turpentine. Gradually add the latter solution to the former, triturating until the mixture becomes a thick paste; add Distilled Water sufficient to produce 1 pint.

Linimentum Terebinthinæ Aceticum, B. P. Liniment of Turpentine and Acetic Acid.

Preparation: Mix 4 fl. oz. Oil of Turpentine, 1 oz. Glacial Acetic Acid; and 4 fl. oz. Liniment of Camphor.

An acid stimulating liniment. If an Alkali (e.g., Lin. Ammon.) be added its stimulating action is destroyed.

Medicinal properties: Stimulant, Antiseptic, Anthelmintic, Hæmostatic, Diuretic. In large doses it is purgative. Used as a stimulating liniment, as an inhalation in septic and chronic respiratory conditions, as an enema for flatulence and constipation.

Confection of Turpentine. *Adult dose*: 60 to 120 grns. (Strength 1 in 4).

A diffusible stimulant useful in chronic bronchitis; may be given rubbed up in Peppermint water.

Preparation: Rub together 1 of Oil of Turpentine, with 1 of Liquorice Powder; and add 2 of Clarified Honey.

Enema of Turpentine.

Preparation: Mix 1 oz. Oil of Turpentine with 15 oz. Mucilage of Starch. For one enema.

Medicinal properties: Turpentine acts in much the same way as the volatile oils, the differences being chiefly its disagreeable taste.

Externally: It is **antiseptic** and **stimulant**; or in large doses, especially if heated, **irritant** or **vesicant**. Inhaled it is a stimulating antiseptic.

Internally, it is a powerful **carminative**, and **anthelmintic** to tapeworm. It is freely absorbed into the blood through the unbroken skin and mucous surfaces; there it acts as a sedative to the circulatory and nervous system. This explains its action as a **hæmostatic** and **antispasmodic**.

It is excreted by the skin, lungs, kidneys, intestinal tract and mammary gland. Small doses produce **diaphoresis** and **diuresis**, besides acting as a **stimulating antiseptic** to the respiratory and urinary system. Large doses may cause renal irritation or even suppression of urine.

Turpentine is a mixture of hydrocarbons; its formula is $C_{10}H_{16}$.

Exposed to the continuous action of air in presence of water, Turpentine develops a large quantity of hydrogen peroxide, and other oxygenated products, which form the basis of the **Sanitas** series of disinfectants; these have the advantages of being non-poisonous and of not staining linen.

OLEUM PINI, B. P. Oil of Pine.

The oil distilled from the fresh leaves of *Pinus Pumilio*, Hænke, the Mountain Pine.

Characters: Nearly colourless; odour pleasant, aromatic; taste pungent.

Medicinal properties: **Stimulant, Antispasmodic, Disinfectant.** Used chiefly as an inhalation in chronic laryngeal diseases, and externally as a **stimulating** liniment in rheumatic pains.

CHIAN TURPENTINE.

An oleo-resin obtained from *Pistacia Terebinthus*, Linn.

Characters: A soft solid with characteristic odour.

Medicinal properties: Recommended in the treatment of **Cancer**.

Adult dose: 5 to 10 grns.

Dr. Clay's Cancer Pill. Take of Chian Turpentine 3 grns. Sulphur 2 grns. Mix one Pill. Dose, one or more every 4 hours.

TEREBENUM, B. P. Terebene.

A mixture of dipentene and other hydrocarbons obtained by agitating oil of turpentine with successive quantities of sulphuric acid until it no longer rotates the plane of a ray of polarised light, and then distilling with steam.

Dose: 5 to 15 drops on sugar, or suspended in Mucilage, or used as a spray or inhalation.

Characters: A colourless liquid; odour agreeable; taste aromatic terebinthinate; does not rotate the plane of a ray of

Medicinal properties: **Stimulating, Antiseptic, Expectorant.** Used for the same purposes as Oil of Turpentine, but is more agreeable to take, and has less tendency to cause renal trouble.

PIX BURGUNDICA, B. P. Burgundy Pitch.

A resinous exudation from the stem of *Picea excelsa*, Link., the Spruce Fir, melted and strained. Imported from Germany.

Characters: Hard, brittle, yet gradually taking the form of the vessel in which it is kept, opaque, colour usually dull reddish-brown; fracture clean conchoidal; odour aromatic especially when heated; taste, aromatic, sweet; soluble in Glacial Acetic Acid or Alcohol (90 p.c.).

Emplastrum Picis, B. P. Pitch Plaster.

Preparation: Melt together 26 oz. Burgundy Pitch, 13 oz. Frankincense, $4\frac{1}{2}$ oz. Resin and $4\frac{1}{2}$ oz. Yellow Beeswax; add 2 oz. Olive Oil and 2 fl. oz. Distilled Water; evaporate with constant stirring to a proper consistence.

Medicinal properties: It is not used internally; the plaster is applied externally as a counterirritant in chronic rheumatism and chronic pulmonary affections.

Burgundy Pitch is composed principally of a resin, mixed with Oil of Turpentine.

RESINA, B. P. Resin or Rosin.

The residue left after the distillation of the oil of turpentine from the crude oleo-resin (Turpentine) of various species of Pines.

Characters: Translucent, brittle, light amber coloured, compact, brittle, pulverisable; fracture shining; with slight odour and taste of turpentine; readily fusible; burns with a dense yellow flame, and much smoke. Insoluble in water, readily soluble in Alcohol (90 p.c.), Ether, Oil of Turpentine, or hot Olive Oil.

Emplastrum Resinæ, B. P. Resin Plaster.

Synonym, Adhesive Plaster.

Preparation: Melt separately at as low a temperature as possible, 4 oz. Resin, 2 pounds Lead Plaster, 2 oz. Hard Soap; mix.

Used chiefly for strapping wounds and ulcers.

Unguentum Resinæ, B. P. Resin Ointment.

Preparation: To 8 oz. powdered Resin, add 8 oz. Yellow Beeswax; melt; add 6 oz. Lard, and 8 oz. Olive Oil; strain; stir until cold.

Known also as Basilicon Ointment. It forms a stimulating dressing to chronic ulcers.

Medicinal properties: Never used internally. Used externally

PIX LIQUIDA, B. P. Tar or Wood-tar.

A bituminous liquid, obtained from the wood of *Pinus sylvestris*, Linn., the Scotch Pine, and other species of Pines, by destructive distillation. Known as Stockholm tar.

Characters: Dark-brown or black, semiliquid, odour peculiar, aromatic: water agitated with it acquires a pale-brown colour, sharp empyreumatic taste, acid reaction, and with test solution of ferric chloride assumes a red colour. Tar completely dissolves in ten times its volume of Alcohol (90 p.c.).

Unguentum Picis Liquidæ, B. P. Tar Ointment.

Preparation: Melt 2 oz. Yellow Beeswax at a low temperature; add 5 oz. Tar; stir until cold.

Medicinal properties: Of Tar, **Stimulant, antiseptic, expectorant, diuretic.** Used as an inhalation or as Tar Water; or given in doses of 20 to 60 minims in capsules, or in pills with Liquorice Powder.

Externally, the ointment or Tar Water as a wash, employed in the treatment of chronic parasitic skin affections.

Tar is a complex body, containing variable quantities of creasote, guaiacol, creosol, acetic acid and other substances.

Tar water is prepared by stirring 10 oz. Tar with $\frac{1}{2}$ gallon water, for 15 minutes, then decanting.

Dose: 10 to 20 oz. twice daily.

CREOSOTUM, B. P. Creosote.

A mixture of guaiacol, creosol, and other phenols, obtained in the distillation of wood-tar.

Incompatible: With Argentic Oxide undiluted, it is apt to form an explosive mixture.

Dose: 1 to 5 minims, may be given in water emulsified with Mucilage; or in pill made with Curd Soap.

The taste may be concealed by Spt. Juniper.

Characters: Colourless or yellowish, highly refractive liquid, with a strong empyreumatic odour and acrid taste; freely soluble in Alcohol (90 p.c.), ether, glycerin, chloroform, or glacial acetic acid, 1 part dissolves in 150 of cold water, more soluble in hot water.

Mistura Creosote, B. P. Creosote Mixture.

Dose: $\frac{1}{2}$ to 1 fl. oz. (Strength 1 minim in an oz.).

Preparation: Shake 16 minims Creosote with 14 fl. oz. Distilled Water; add 1 fl. oz. Syrup and 16 minims Spirit of Juniper; then add Distilled Water sufficient to make 16 fl. oz.

Unguentum Creosoti, B. P. Creosote Ointment.

Preparation: Melt together 4 oz. Hard Paraffin and 5 oz. Soft White Paraffin; add 1 oz. Creosote; stir until cold.

Used for mild cases of ringworm, and other dry skin diseases.

Medicinal properties: **Astringent, antiseptic, anæsthetic**; if undiluted **escharotic**. Used in tuberculosis, foetid bronchitis, gangrene of lungs, &c. A drop introduced into the decaying tooth relieves toothache.

Creosote Vapor. Preparation (Creosote 12 mins. mixed with 8 oz. water at 140° F., and the air which has passed through the solution inhaled) is useful in cases of septic discharges from the lungs, in phthisis, and in chronic congestion of the larynx.

The actions of Creosote are similar but inferior to those of Carbolic acid. Before Carbolic acid came into use, Creosote was largely used internally for the purposes to which that drug is now put.

Creosote is a complex product of variable composition and strength, consequently uncertain in action. It preserves animal substances from decay, and to it is due the preservative effect of smoking hams, &c.

PINUS LONGIFOLIA, Linn. The long-leaved Pine or Chir pine. (*Saral, chir, chil*, Hind.). Common in the Himalayas of North-Western India.

An oleo-resin (*Chir ka gond*, Hind.) is obtained from incisions in its bark, from which a variety of turpentine (Chir pine oil) is obtained, the residue being a resin.

Medicinal properties: Similar to those of Turpentine.

PINUS DEODARA, *Cedrus Libani*, var. *Deodara* (*Deodār*, Hind.).

Indigenous to Himalayas, and cultivated extensively throughout India. The wood yields an oleo-resin; and by destructive distillation a variety of tar is obtained.

Medicinal properties: Similar to those of Turpentine.

OLEUM JUNIPERI, B. P. Oil of Juniper.

The oil distilled from the full-grown, unripe, green fruit of *Juniperus communis*, Linn.

Dose: $\frac{1}{2}$ to 3 mins.

Characters: Colourless or greenish-yellow, with the characteristic odour of the fruit, bitterish taste, warm aromatic.

Spiritus Juniperi, B. P. Spirit of Juniper.

Dose: 20 to 60 mins. (Strength 1 in 20).

Preparation: To 1 fl. oz. Oil of Juniper add Alcohol (90 p.c.), sufficient to form a pint; if necessary to clear the mixture,

Medicinal properties: **Diuretic, stimulant, carminative.** Its chief action is **diuretic**, in this resembling Turpentine, only acting more powerfully. Used in debilitated dropsical cases, either alone or combined with other diuretics; or in the form of Hollands or Gin.

Juniper oil is a local **stimulant**; acting on the alimentary canal as do other aromatic oils. It is excreted by the kidneys giving to the urine the odour of violets. It is used to flavour Gin. It is contraindicated in acute renal disease.

OLEUM CADINUM, B. P. Oil of Cade. *Synonym*, Juniper Tar Oil.

An empyreumatic oily liquid obtained by the destructive distillation of the woody portions of several species of Juniper.

Characters: Dark reddish-brown or nearly black, more or less viscid oily liquid; odour empyreumatic, not unpleasant; taste, aromatic acrid bitter; soluble in ether or chloroform.

Medicinal properties: **Stimulant**: applied externally in chronic skin affections.

ORCHIDEÆ.

ORCHIS MASCULA, Linn. The Salep Orchid. (*Salep Misri*, Hind.).

As met with in commerce, it consists of dried tubers, hard horny, translucent, without odour, taste mucilaginous, slightly sweet, on boiling with 40 parts of water it forms a thick jelly.

It is used boiled with milk as a **nutritive** in alimentary affections and debilitated conditions.

Salep is also yielded by several other species of *Orchis*, also from several species of *Eulophia*. The Royal Salep (*Badshah Salab*, Hind.) is the product of *Allium Macleani*, Baker. (Nat. Ord. Liliaceæ).

FILICES.

FILIX MAS, B. P. Male Fern.

The rhizome of *Aspidium Filix-mas*, Swartz, collected late in autumn, divested of its roots, leaves, and dead portions, and carefully dried. Indigenous to Britain.

Extractum Filicis Liquidum, B. P. Liquid Extract of Male Fern.

An ethereal extract evaporated until an oily extract remains. Known also as Oil of Male Fern.

Dose: 45 to 90 mins. May be given in milk, or as an emulsion; it is best given on an empty stomach, one-third of the dose being taken at intervals of half an hour, and followed by a dose of Castor Oil to expel the worm.

Characters: A dark green syrupy substance; odour disagreeable, taste nauseous, bitter, astringent. It should not be kept longer than one year.

Medicinal properties: Vermicide to tapeworm.

It contains a dark green oil depositing Filicic Acid, which is supposed to be the active ingredient.

ADIANTUM, the Maiden Hair Fern (*Hansraj*, Hind.).

Indigenous to India. The dried fronds are sold in the Panjab bazaars.

Medicinal properties: Bitter Expectorant, in large doses Emetic.

LICHENES.

LITMUS, B. P. *Appendix*.

A blue pigment prepared from various species of *Roccella*, DC. It is used in testing.

Solution of Litmus. Digest 20 grammes powdered Litmus with 80 c.c. Alcohol (90 p.c.) for 1 hour; pour away the clear liquid; repeat this operation with 60 c.c. of Alcohol (90 p.c.), and a third time with a like quantity of Alcohol. Digest the washed Litmus in 200 c.c. Distilled Water: filter.

Blue Litmus Paper. Impregnate unglazed white paper with Litmus solution.

Red Litmus paper. Impregnate unglazed white paper with Litmus solution which has been reddened by the addition of a very minute quantity of Sulphuric Acid.

FUNGI.

ERGOTA, B. P. Ergot.

The sclerotium of *Claviceps purpurea*, Tulasne, originating in the ovary of *Secale cereale*, Linn., the common rye. That obtained from Spain is considered best.

Dose: 20 to 60 grains; infused in boiling water.

Characters: Somewhat triangular in cross section, tapering towards the ends; length from $\frac{1}{8}$ " to $1\frac{1}{2}$ " generally curved; longitudinally furrowed on each side, but more especially on that which is concave; externally very dark violet-black; internally whitish or pinkish-white; fracture short; odour, peculiar, disagreeable, increased on the addition of Liquor Potassæ; taste mawkish, rancid. It should be free from mustiness. It yields its active principle to either Water or Alcohol.

An Alcoholic Extract evaporated to the consistence of a soft extract.

Extractum Ergotæ Liquidum, B. P. Liquid Extract of Ergot.

Dose: 10 to 30 minims.

An Aqueous Extract with Alcohol (90 p.c.) added; of a strength that a given quantity of the Extract contains the active principle of a like quantity of the drug.

Infusum Ergotæ, B. P. Infusion of Ergot.

Dose: 1 to 2 fl. oz. (Strength 1 in 20). It should be freshly made as required.

Preparation: Infuse 1 oz. Ergot freshly crushed with 1 pint boiling Distilled Water, in a covered vessel for 15 minutes; strain.

Injectio Ergotæ Hypodermica, B. P. Hypodermic Injection of Ergot. *Synonym*, Hypodermic Injection of Ergotin.

Dose: By subcutaneous injection 3 to 10 minims. It should be recently made.

Strength: 110 minims contain about 33 grains Extract of Ergot.

Preparation: Mix 3 grains Phenol with 220 minims Distilled Water; boil for a few minutes; cool; add 100 grains Extract of Ergot and recently boiled and cooled Distilled Water sufficient to produce 330 minims.

Tinctura Ergotæ Ammoniata, B. P. Ammoniated Tincture of Ergot.

Dose: $\frac{1}{2}$ to 1 fl. drm. (Strength 1 in 4).

Preparation: Mix 2 fl. oz. Solution of Ammonia, with 18 fl. oz. Alcohol (60 p.c.). Moisten 5 oz. Ergot in No. 20 powder, with 2 oz. of this mixture and percolate with the remainder; press the marc; mix the expressed juice with the percolate; add Alcohol (60 p.c.) sufficient to make 1 pint; set aside 24 hours; filter.

Ergotinine, an alkaloid separated from Ergot, insoluble in water, soluble in alcohol.

Dose: For hypodermic injection 5 to 10 mins. of a 1 in 1,000 solution of the alkaloid = $\frac{1}{200}$ to $\frac{1}{100}$ grn.

Medicinal properties of Ergot, Ecbotic, Remote Astringent.

It is liable to deteriorate by keeping or by exposure to damp.

The chemistry of Ergot is complicated and uncertain. Its special action on the uterus is said to depend on Cornutine (an alkaloid) and Sphacelinic Acid, and not on the alkaloid Ergotinine present in the drug. Any preparation of Ergot becomes inactive if kept for more than a few months. The best results are obtained

Ergot acts specially by causing contraction of the unstriated muscle throughout the body. It contracts the arterioles, hence is useful as a **hæmostatic** in internal hæmorrhages of all kinds. It produces tetanic contraction of the uterus, especially if this be pregnant.

Its action in parturition should be clearly understood. Ergot tends to produce continuous contraction of the uterus; hence if given before the birth, it tends to suffocate, and so to kill the child. It is stated that in about 30 per cent. of the cases in which Ergot is so used, the child is born dead. The time for using Ergot is after the birth, then in large doses it is most useful to expel the placenta and clots, and to ensure contraction of the womb.

Ergot as a poison. A single large dose acts as a gastro-intestinal irritant, with subsequent incoordination, anæsthesia and paralysis; death following from respiratory arrest.

Continued consumption of small dose of Ergot (as in the eating of bread made from diseased rye) produces **Ergotism**, of which there are two varieties (1) **gangrenous**, a dry gangrene attacking chiefly the extremities (this is known in Germany as *the creeping sickness*); and (2) **convulsive or anæsthetic**, characterised by violent spasmodic convulsions, with sometimes loss of sensation.

ALGÆ.

CEYLON MOSS.

The dried plant. *Gracilaria lichenoides*, Grev., and *G. confervoides*, Grev., found on the coasts of Ceylon and the islands of the Indian Archipelago.

It may be given as a decoction, made by boiling $\frac{1}{4}$ to $\frac{1}{2}$ oz. finely powdered Ceylon Moss in 2 pints of water or milk, adding a little Cinnamon or other aromatic, and sugar; straining. A little wine may be added.

Medicinal properties: **Demulcent, Nutritive.** A light and readily digestible article of diet for children and patients with alimentary troubles.

It contains a large quantity of Pectin or vegetable jelly.

GILLUR KA PUTTA, dried leaf-like masses. It is a seaweed common in Indian seas, the *Laminaria saccharina*, Lam. It is used as a remedy for bronchocele (steeped in cold water overnight and the infusion drunk in the morning on an empty stomach). Its efficacy depends on the Iodine it contains.

GELIDIUM CORNEUM, or Japanese Isinglass (*Chinia ghas*,

Is the source of Agar-Agar now used in bacteriology. It occurs in shrivelled semi-transparent membrane-like strips; combining with 100 times its weight of water, it forms a jelly which requires a considerable degree of heat for its liquefaction. It may be used as an article of invalid diet.

ANIMAL MATERIA MEDICA.

MOSCHUS, B. P. Musk (*Kasturi*, *Mushk*, Hind.).

The dried secretion from the preputial follicles of *Moschus moschiferus*, Linn., the Musk Deer, which is found wild in Central Asia. Musk is exported from China and India.

Dose: 5 to 10 grains. A pill may be made of 4 of Musk and 1 each of Acacia and Liquorice, all powdered.

Characters Irregular, reddish-black, somewhat unctuous grains; odour characteristic, penetrating persistent; taste bitter, aromatic; the grains are contained in an oval sac about 2" diam., nearly smooth on one side, covered on the outside with bristle-like grayish hairs concentrically arranged around its central orifice.

Medicinal properties: **Stimulant, Antispasmodic.** Used in hysteria, epilepsy, collapse, and asthenic respiratory conditions.

Musk owes its properties to an odoriferous substance not yet isolated, but which seems to act in the same way as volatile oils. It is more powerful than Castor, but very expensive, and therefore not much used in medicine.

Its odour is to a large extent neutralised by Camphor.

CASTOREUM. Castor. The dried preputial follicles of *Castor Fiber*, Linn., the Beaver. Obtained from Canada and Russia.

Medicinal properties: **Stimulant, Antispasmodic.** Its actions are similar to those of Myrrh.

ZIBETH, CIVET CAT. An unctuous odorous secretion from this animal is much used by native Indian practitioners of southern India (known as Kusturi) for the same purposes as Myrrh. An establishment was for many years maintained by the Government at Travancore for the rearing of these animals.

SEVUM PRÆPARATUM, B. P. *Prepared Suet.*

The internal fat of the abdomen of the sheep, *Ovis aries*, Linn., purified by melting and straining.

Characters: White, smooth, almost odourless; melting point between 112° and 120° F., commencing to resolidify at about 110° F., insoluble in cold Alcohol (90 p.c.), slightly soluble in Ether or boiling Alcohol (90 p.c.).

It is used in the preparation of ointments and plasters.

THYROIDEUM SICCUM, B. P. Dry Thyroid.

A powder prepared from the fresh and healthy thyroid gland of the sheep.

Dose: 3 to 10 grains.

Preparation: Remove the external fat and connective tissue from thyroid glands taken from sheep immediately after killing; cut the glands across, rejecting any which contain cysts, are hypertrophied or are otherwise abnormal; mince finely; dry at a temperature of 90° to 100° F.; powder the dried product; remove all fat by treatment with petroleum spirit; again dry the residue.

Liquor Thyroidei, B. P. Thyroid Solution.

A liquid prepared from the fresh and healthy thyroid gland of the sheep.

Dose: 5 to 15 mins. (Strength, 100 minims represent one entire thyroid gland).

Characters: A pinkish turbid liquid, entirely free from any odour of putrescence. It must be freshly prepared and kept in well-stoppered sterilised bottles.

Medicinal properties: **Alterative**. Used with success in myxodema, and other affections where the Thyroid gland of the patient is functionally inactive, in the treatment of obesity, and in certain chronic skin disease,—e.g., exfoliative dermatitis.

Thyroid secretion seems to act by increasing the oxidation of the tissues, much as muscular exercise does.

ADEPS LANÆ, B. P. Wool Fat.

Known also as Anhydrous Lanolin.

The purified Cholesterin-fat of sheep's wool.

Characters: A yellowish tenacious unctuous substance, almost inodorous; melting point from 104° to 112° F; sparingly soluble in Alcohol (90 p.c.), readily soluble in Ether or Chloroform; the solution in chloroform poured gently over the surface of Sulphuric Acid acquires a purple-red colour,

Adeps Lanæ Hydrosus, B. P. Hydrous Wool Fat. Known also as Lanolin.

Characters: Yellowish-white; free from rancid odour; on heating it separates into an upper oily and a lower aqueous layer.

Preparation: Place 7 oz. Wool Fat in a warm mortar; add 3 fl. oz. Distilled Water gradually, and with constant trituration.

Medicinal uses: It is used as a basis for ointments. Its advantages are that it is unirritating, that it is readily absorbed, and so carries through the skin drugs meant to act on the sub-

SAPO ANIMALIS, B. P. Curd Soap.

Soap made with Sodium hydroxide and a purified animal fat consisting principally of stearin; and containing about 30 p.c. water.

Characters: White or with a very light greyish tint; dry; nearly inodorous; becomes horny and pulverisable when kept in dry warm air; easily moulded when heated; soluble in Alcohol (90 p.c.), especially in warming; sparingly soluble in cold water, soluble in hot water; it does not impart a greasy strain to white unglazed paper.

Uses: To prepare plasters, pills, suppositories, &c.

LAC. Cow's Milk.

The fresh Milk of *Bos taurus*, Linn., the Cow.

Good unadulterated unskimmed milk should have a specific gravity of between 1.028 and 1.034, and on standing should yield 12 to 24 p.c. of cream. The addition of water lowers the specific gravity; the abstraction of cream, or addition of skimmed milk raises it.

Medicinal properties: Chiefly **Nutritive**. Used largely in fevers and dyspepsia. To facilitate absorption. It may be prepared with ferments (e.g., pepsin, pancreatin, &c.), allowed to stand for half an hour and boiled to stop the fermentation.

Cow's milk mixed with an equal quantity of water, or lime juice, and some sugar of milk added, is a good substitute for human milk. In the artificial feeding of infants special care must be taken that the milk is good and unfermented. Bottles, dishes, &c., should be scalded or allowed to lie for some time in an antiseptic solution (e.g., weak Condy's fluid). Unwholesome milk if given to infants may produce vomiting, diarrhoea with green stools, or may act as a nerve poison producing convulsions.

Milk is an emulsion consisting of minute transparent globules, floating in a clear colourless fluid. When milk is allowed to stand the larger globules rise to the surface forming a layer of cream.

Cream consists largely of fat (butter). Skimmed milk is a solution containing chiefly casein, sugar of milk, and salts.

KOUMISS is fermented Mare's milk as made in the steppes of Tartary. It is an easily digested, slightly stimulating nutrient, used in the later stages of phthisis and other exhausting diseases. An imitation of Koumiss is made in Britain by fermenting cow's milk, and adding Grape Sugar.

SACCHARUM LACTIS, B. P. Milk Sugar. *Synonym*, Lactose.

A crystallised sugar, $C_{12}H_{22}O_{11} \cdot H_2O$, obtained from the whey

Characters: Crystals, or crystalline masses, greyish-white, translucent, hard; without odour, faintly sweet, gritty when chewed. Solubility: 1 in 7 cold water, 1 in 1 boiling water.

Medicinal properties: **Nutrient**, specially useful in debility, phthisis, gastric irritability, and for sweetening the food of infants. It is harder, less soluble, and less sweet than Cane Sugar, and therefore is a better **excipient**, and **diluent** for powders that require trituration.

Adult dose: to 2 drms., or more in water.

FEL BOVINUM PURIFICATUM, B. P. Purified Ox Bile.

Dose: 5 to 15 grains.

Characters: Yellowish-green hygroscopic substance; taste partly sweet and partly bitter; soluble in Water or in Alcohol (90 p.c.). A 3 to 5 p.c. solution in Water with 1 drop of recently-made Syrup (strength 1 of Refined Sugar in 4 of water), and then Sulphuric Acid cautiously added, until the precipitate at first formed is redissolved, gradually acquires a cherry-red colour which changes in succession to carmine, purple, and violet.

Preparation: Evaporate fresh ox bile to $\frac{1}{4}$ of its bulk; shake with twice its volume of Alcohol (90 p.c.); set aside for the sediment (mucus) to settle; decant the clear portion and filter the remainder; distil off most of the Alcohol from the mixed liquid; evaporate to the consistence of a thick extract.

Medicinal properties: **Laxative, Alterative**; used as an adjunct to remedies in cases of deficiency of bile, jaundice, &c. To prevent its action on the stomach it is best given in keratine capsules.

KERATINE.

An ammonical solution of horn; insoluble in Hydrochloric Acid. Prepared by digesting horn shavings in an acidified pepsin solution, to remove albuminous matter, then dissolving the residue in ammonia solution.

Keratine is a gum-like liquid. Being insoluble in gastric juice, it is used for **coating pills** which are meant to pass undissolved through the stomach, and to dissolve in the intestine.

Keratine coated pills should not be given along with alkalis or weak acids (e.g., Acetic or Citric) as these substances might dissolve the coating in the stomach and so the drug act sooner than is intended.

PEPSINUM, B. P. Pepsin.

An enzyme obtained from the mucous lining of the fresh and healthy stomach of the pig, sheep or calf. Made by scraping the cleansed mucous membrane, drying, and pulverising the product.

Characters: A light yellowish-brown or white powder or pale yellow translucent grains or scales; odour faint, taste slightly saline; free from any trace of putrescence; liable to absorb moisture from the air; moderately soluble in water or in Alcohol (90 p.c.)

If 12.5 grammes of firm coagulated white of fresh egg powdered, 125 c.c. of a .2 p.c. aqueous solution of hydrogen chloride, and 0.005 gramme pepsin be digested together at 105° F. for 6 hours and shaken frequently, the coagulated white of egg dissolves, leaving only a few small flakes in an almost clear solution.

Glycerinum Pepsini, B. P. Glycerin of Pepsin.

Dose: 1 to 2 fl. drms. (Strength, 1 fl. drm. represents 5 grains pepsin).

Preparation: Mix 110 mins. Hydrochloric Acid, 12 fl. oz. Glycerin, and 6 fl. oz. Distilled Water; then add 800 grains Pepsin; after one week pour off the clear portion or filter; add Distilled Water sufficient to produce one pint.

Medicinal properties: Of Pepsin, **Digestive.** Used in cases where the gastric secretion is defective in quality or quantity. It may be given during or just after meals, in powders, or in pills. It is used also to peptonise food and nutrient enemata.

Pepsin is the ferment of the gastric juice. It furthers digestion by converting the less soluble proteids (albumins and fibrin) into more soluble forms (albumose and peptone). It acts only in acid solution; 1 part of Hydrochloric Acid in 500 being the most favourable proportion. When begun, peptic digestion will go on indefinitely provided the products are removed. Therefore a small dose of pepsin only is required. Pepsin has no action on farinaceous food or on fat.

Pepsinum Saccharatum. Mix 1 part Pepsin with 9 of Sugar of Milk.

LIQUOR PANCREATICUS, B. P. Pancreatic Solution.

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

Preparation: Take 5 oz. of the pancreas freed from fat and external membranes, and finely divided by trituration with washed sand, or powdered pumice stone, digest in a closed vessel with 20 fl. oz. Alcohol (20 p.c.), for 7 days; filter.

Test: If 2 c.c. of the solution together with 0.2 gramme of sodium bicarbonate and 20 c.c. of water be added to 80 c.c. of milk, and the mixture kept at 113° F. for one hour, coagulation

Pancreatic juice owes its efficacy to the presence of four distinct ferments, one acting on starch, another on proteids, a third emulsifying fats, and a fourth curdling milk. These act only in neutral or alkaline solutions. They are destroyed in solution by heating above 170° F.

As the process of pancreatic digestion when once begun, goes on indefinitely, only a small quantity of the ferment is needed.

Many preparations of Pancreatic juice are in the market, differing in strength and value. Instructions are given on the package how they should be used.

ADEPS, B. P. Lard.

The purified fat of the Hog, *Sus scrofa*, Linn.

Characters: A soft white fatty substance; melting at about 100° F., and at a somewhat higher temperature forming a clear liquid; no rancid odour; dissolves entirely in ether; neutral to litmus. If exposed to daylight, it is apt to become rancid, due to oxidisation, but this hardly at all occurs if kept in the dark.

Preparation: From the perfectly fresh fat of the abdomen of the hog, remove as much of the external membranes as possible; suspend the fat so that it shall be freely exposed to the air for some hours; cut into small pieces; reduce these to a uniform mass in which the membranous vesicles are completely broken by beating in a mortar or by some similar process; put the mass thus produced into a vessel surrounded by warm water, heat to a temperature not exceeding 135° F., until the fat has melted and separated from the membranous matter; strain.

Adeps Benzoatus, B. P. Benzoated Lard.

Preparation: Melt 1 pound Lard on a water-bath; add 210 grains Benzoin; continue the application of heat for two hours, frequently stirring; remove the residue of the Benzoin by straining; stir the Benzoated Lard until cold.

Adeps Induratus, P. B. Appendix.

Lard deprived of a portion of its oil by pressure.

Hardened Lard may be employed in hot countries when the prevailing high temperature renders the Brit. Pharm. Lard too soft for use in ointments.

Medicinal properties of Lard: **Emollient.** Used in the preparation of ointments, and spread upon poultices to prevent them getting dry or sticking to the surface of the body.

Benzoated Lard is used for the same purposes as ordinary lard, only it has less tendency to become rancid. As it is irritating it should not be used for eye ointments.

CETACEUM, B. P. Spermaceti.

inhabits the Pacific and Indian Oceans; separated from the oil by filtration and pressure, and afterwards purified.

Characters: Crystalline pearly white, glistening masses, translucent, slightly unctuous to the touch, with little odour or taste; insoluble in Water, nearly insoluble in cold Alcohol (90 p.c.), but soluble in Ether, Chloroform, boiling Alcohol, (90 p.c.) and in fixed and volatile oils; melting point about 118° F. It is reducible to powder by the aid of a little Alcohol (90 p.c.).

It somewhat resembles white wax, or hard paraffin, but these are not crystalline.

Unguentum Cetacei, B. P. Spermaceti Ointment.

Preparation: Melt together 20 oz. Spermaceti, 8 oz. white Beeswax, 72 oz. Almond Oil; add 2 oz. Benzoin in coarse powder; and, frequently stirring the mixture, continue the application of heat for 2 hours; remove from the source of heat; strain; stir the ointment constantly until cold.

The Benzoin makes this ointment somewhat irritating.

Unguentum Cetacei sine Benzoino. Melt together 5 parts Spermaceti, 2 of White Wax and 18 of Almond Oil. Stir till cold.

A cool dressing, useful for eye ointments, etc. It may be smeared on the feet before starting on a long walk, or applied on lint to broken blisters caused by walking.

Medicinal properties of Setaceum: **Emollient, Demulcent.** Used externally as an emollient to make ointments, etc. Spermaceti is nearly pure cetine.

ALBUMEN, B. P. Appendix.

The clear liquid, separated from the yolk of the egg of *Gallus Bankiva*, var. *domesticus*, Temminck.

Characters: A colourless glairy viscid fluid, inodorous, tasteless, coagulated by heat, unaffected by Acetic Acid.

Solution of Albumen, B. P. Appendix.

This must be recently prepared.

Preparation: One part Albumen with 4 of Distilled Water; mix by trituration in a mortar; filter through clean tow, first moistened with Distilled Water.

The strength of the solution may be adjusted to suit requirements.

Medicinal uses: Albumen is used as a chemical test: and as an Antidote in certain cases of poisoning, e.g., corrosive sublimate or sulphate of copper.

Eggs, both the whites and the yolks, are nutritive, and are given in debilitated conditions.

ISINGLASS, B. P. Appendix.

The swimming bladder or sound of various species of Sturgeon, *Acipenser*, Linn., prepared and cut into shreds.

It is known also as *Ichthyocolla*, or Fish glue.

Characters: Light, coriaceous, yellowish, transparent shreds, without odour or taste.

Medicinal properties: It is used as a test for Tannic Acid; for fining wines; for making court plaster; also internally as a Nutrient like gelatin.

Isinglass is a kind of gelatin. It differs from ordinary gelatin in being insoluble in cold water, but, like it, is soluble in boiling water.

OLEUM MORRHUÆ, B. P. Cod Liver Oil.

The oil extracted from the fresh liver of the Cod, *Gadus Morrhua*; by the application of a temperature not exceeding 180° F., and from which solid fat has been separated by filtration at about 23° F.

Adult dose: 1 to 4 drms. For a child of 2 years begin with 10 mins. increasing up to 30 mins. thrice daily. It may be given floated on orange juice, water, or a mixture of Tr. Aurantii, Ac. Nitric dil., and Syrup. Is often given in emulsion with Malt Extract.

It is best given $\frac{1}{2}$ to 2 hours after food; it then mixes with the partly digested food, and so is more readily retained. Or it may be given in a single dose at bedtime.

It may be made into an Emulsion, mixed with an equal quantity of Mucilage of Tragacanth or Acacia, and a few drops of a volatile oil. An alkali should not be used, as the gastric juice may neutralise this and, liberating the oil, produce dyspepsia.

Characters: Pale yellow, odour slightly fishy but not rancid, taste fishy; readily soluble in Ether or Chloroform; slightly soluble in Alcohol (90 p.c.), a drop of Sulphuric Acid added to a few drops of oil on a porcelain slab develops a violet colour; when Nitric Acid is carefully poured into some of the oil contained in a test tube a precipitate of coagulated albumen should form at the surface of contact of the two liquids.

1 oz. Cod Liver Oil at 140° F. can dissolve 4 grns. pure Quinine.

Medicinal properties: **Nutritive, Hæmatinic.** It seems specially to benefit nervous and growing tissue. It is used in chronic conditions where the nutrition is deficient.

The oil should be stopped if it impairs digestion, causes nausea, or diarrhoea. The quantity should be decreased if it is passed out undigested with the stools.

It may be rubbed into the skin of wasting children with benefit.

Cod Liver Oil contains in addition to fatty matter, traces of Iodides, and a substance allied to biliary acids.

FISH LIVER OIL (*Machhi ka tel*, Hind.). Made from the livers of *Squalus carcharis*, the White Shark; *Cybius commersonii*, the *Seir*, and other fish. It is extensively prepared in the sea-coast towns of India. As a remedy it equals Cod Liver Oil, but the odour and taste are more disagreeable.

TURTLE OIL prepared from tortoises in Madras, has a reputation as a cheap and efficient substitute for Cod Liver Oil.

MEL DEPURATUM, B. P. Clarified Honey.

Honey of commerce, melted in a water-bath, and strained while hot through flannel previously moistened with warm water.

Characters: A viscid translucent liquid, colour light yellowish or brownish-yellow; gradually becoming partially crystalline and opaque; odour characteristic; taste very sweet.

Medicinal properties: **Demulcent, Nutritive, Laxative**: used chiefly as a vehicle for other medicines, e.g., powders.

It consists mainly of various kinds of sugars.

OXYMEL, B. P. Oxymel.

Dose: 1 to 2 fl. drms.

A vehicle for expectorant medicines: also added to gargles.

Preparation: Mix 40 oz. clarified Honey liquefied, with 5 fl. oz. Acetic Acid and about 5 fl. oz. Distilled Water. Its specific gravity should be 1.320.

Cerome^l. A stimulating application to indolent ulcers. Is made by melting and mixing 4 of clarified honey with 1 of yellow wax, and straining.

Honey (*Madh*, Hind.) is a saccharine secretion obtained from various flowers, and deposited in the honeycomb by *Apis mellifica*, Linn., the Hive Bee.

Honey is obtainable in most parts of India, but is usually inferior in quality. It is sometimes prepared from the honeycombs of other varieties of Bees than the official Hive Bee. On rare occasions cases of poisoning by noxious varieties of Honey have been reported.

CERA FLAVA, B. P. Yellow Beeswax.

Prepared from the honeycomb of the Hive Bee, *Apis mellifica*.

Characters: Firm; fracture granular; yellowish, odour agreeable honey-like; not unctuous to the touch; readily and entirely soluble in hot Oil of Turpentine; should not yield more than 3 p.c. to cold Alcohol (90 p.c.), nor more than 50 p.c. to cold Ether, and nothing to Water, or boiling solution of Sodium Hydroxide.

Used as an ingredient in plasters and ointments. Not used internally.

Internally it has no action, and passes out unchanged with the faeces.

CERA ALBA, B. P. White Beeswax.

Yellow wax which has been bleached by exposure to light, air and moisture.

Characters: Hard, nearly white, translucent.

Medicinal uses are the same as Yellow Beeswax, but as white wax has a greater tendency to become rancid the yellow variety is better for ointments.

Cold Cream. Melt together by means of a water-bath, 1 of White Wax, 1 of Spermaceti, 8 of Oil of Almonds, add Otto of Roses sufficient to flavour it; and strain through muslin into 11 of Rose water; stir together while gently warming, until the cream is of proper consistency.

Wax (*Mom*, Hind.) of good quality is obtainable in Indian bazaars.

COCOCUS, B. P. Cochineal.

The dried fecundated female insect *Ooccus Cacti*, Linn., reared on *Nopalea coccinellifera*, or other species of *Nopalea* (*Oacti*). Imported chiefly from Mexico.

Characters: About $\frac{1}{8}$ " long, somewhat oval; flat or concave beneath; convex above; transversely wrinkled, purplish-black or purplish-grey, easily reduced to powder which is dark-red or puce coloured; odour faint; taste slightly bitter.

When killed by dry heat, the insects are ashy-grey with silvery surface; when killed by immersion in boiling water they have a reddish appearance.

The powder somewhat resembles Kino, but is not astringent.

Tinctura Cocci, B. P. Tincture of Cochineal.

Dose: 5 to 15 mins. (Strength 1 in 10).

Preparation: Cochineal 2 oz., Alcohol (45 p.c.) 1 pint; prepare by the maceration process.

Medicinal uses: Only as a colouring agent to give an attractive colour to liquid preparations.

Cochineal has little medicinal value. It is used in dyeing; also to prepare Carmine, which is used as a staining agent, and to colour powders and ointments. It contains a red colouring matter, soluble in Water and Alcohol (90 p.c.).

The cultivation of the Cochineal insect has been successfully introduced into Rajputana.

LAC (*Lakh*, Hind.) a coloured resinous substance produced by

principally of the fig variety. The lac dye of commerce (soluble in water) is a product of the bodies of the insects. Shell lac (a resinous body insoluble in water) is prepared by melting and clarifying crude lac.

CANTHARIS, B. P. Cantharides.

The dried beetle *Cantharis vesicatoria*, Latr. Collected in Central and Southern Europe.

Characters : From $\frac{3}{4}$ " to 1" long and $\frac{1}{4}$ " broad, with two long elytra or wing sheaths of a shining green, or coppery-green colour, under which are two thin brownish transparent membranous wings; odour strong, disagreeable.

When powdered it is brownish-grey, and contains minute green portions of the wings.

The essential portion is Cantharidin, a tasteless inodorous substance.

The powder should be kept dry in closely corked bottles, as it spoils if at all moist. A piece of camphor prevents mites.

Acetum Cantharidis, B. P. Vinegar of Cantharides.

(Strength 1 in 10.)

Preparation : Macerate 2 oz. bruised Cantharides, in 18 fl. oz. of a mixture of equal quantities of glacial Acetic Acid and Distilled Water, for 24 hours; transfer to a percolator; when the liquid ceases to pass, pour sufficient of the menstruum in successive portions over the contents of the percolator to produce one pint.

Liquor Epispasticus, B. P. Blistering Liquid.

(Strength 1 in 2.)

Preparation : Mix 10 oz. Cantharides in No. 20 powder; with 5 fl. oz. of Acetic Ether; pack in a percolator; at the expiry of 24 hours pour Acetic Ether over the contents of the percolator; allow the solution to pass slowly through until one pint is obtained.

It should be kept in a stoppered bottle.

If painted on the skin two or three times it should vesicate in about half an hour.

Collodium Vesicans, B. P. Blistering Collodion.

Preparation : To 20 fl. oz. Blistering Fluid add $\frac{1}{2}$ oz. Pyroxylin in a stoppered bottle; shake them together until the Pyroxylin is dissolved.

Emplastrum Calefaciens, B. P. Warming Plaster.

(Strength about 1 in 25.)

Preparation : Infuse 4 oz. Cantharides in coarse powder in 20 fl. oz. boiling Distilled Water, for 6 hours; squeeze strongly through calico; evaporate on a water-bath until reduced to

one-third ; add 4 oz. Yellow Beeswax, 4 oz. Resin, $3\frac{1}{4}$ pounds Resin Plaster, 2 pounds Soap Plaster ; melt on a water-bath ; stir until the ingredients are thoroughly mixed.

Emplastrum Cantharidis, B. P. Cantharides Plaster.

(Strength about 1 in 3.)

Preparation : Melt 2 oz. Resin ; add $\frac{1}{2}$ oz. Soap Plaster and afterwards 2 oz. Yellow Beeswax and 2 oz. Lard ; sprinkle $3\frac{1}{2}$ oz. powdered Cantharides over the melted mixture ; stir continuously while the product is cooling.

May be applied at night and removed in the morning, or, after about eight hours, and the part dressed with Boracic Ointment. Vesication will be produced more rapidly by applying an ordinary poultice after the blister.

To prevent renal irritation powdered Camphor may be sprinkled over the plaster.

Tinctura Cantharidis, B. P. Tincture of Cantharides.

Dose : 5 to 15 minims ; if frequently repeated 2 to 5 mins. (Strength 1 in 80).

Internally in small doses it is used as a diuretic in the suppression of urine following cholera, but it must be used with caution on account of the risk of strangury.

One drop Tr. Canthar. thrice daily will often relieve chordee.

Preparation : Take $\frac{1}{4}$ oz. Cantharides in No. 40 powder, 1 pint Alcohol (90 p.c.). Prepare by the maceration process.

Unguentum Cantharidis, B. P. Cantharides Ointment.

(Strength 1 in 10).

Preparation : Melt 10 oz. Benzoated Lard, add 1 oz. bruised Cantharides : digest at 120° F. for 12 hours ; strain through calico and press the residue gently ; stir until cold.

Medicinal properties of Cantharides : Externally **rubefacient**, **irritant** or **vesicant** depending on the strength of the application. Internally it is a powerful **diuretic** and as such must be used with caution ; it is also an **alterative** in chronic nervous affections.

The active principle of Cantharides is Cantharidin, a substance without either taste or odour.

Externally Cantharides produces congestion, irritation, and vesication ; if its action be prolonged the vesicles coalesce into one large bleb filled with serum ; if left on still longer, suppuration, ulceration and even sloughing may occur. The Emplastrum and Liquor Epispasticus are used externally as irritants, or by prolonged application as vesicants in deep seated inflammations.

chronic inflammations, etc. In acute conditions a blister should be put not directly over, but a little distance from the affected part, so as to draw the blood away from the part. In chronic conditions it should be placed more over the part so as to increase the blood-supply and so improve nutrition. Its actions last longer and are less irritating to the patient than either Ammoniacal or Acetic Acid embrocations.

Internally, in minute doses it is a stimulant, in ordinary doses a gastro-intestinal irritant. Absorbed into the blood it combines with the albumen, forming an inert compound. But on being exerted it is again set free in the kidneys and so acts as an irritant to the urinary system.

Large doses produce spasm of glottis, hemorrhagic vomiting, and diarrhoea with severe abdominal pains. When excreted it causes pain in the loins, a burning sensation in the bladder and urethra, desire to micturate, but difficulty in doing so, or even suppression of urine, increase of sexual appetite, especially in females, and inflammation of the genital parts. Very large doses produce insensibility, paralysis of respiration, and death with asphyxial convulsions.

Treatment of poisoning by Cantharides: Evacuate the stomach; give mucilaginous drinks to lessen gastro-intestinal irritation, but avoid fats and oils, as these facilitate the absorption of the Cantharidin. For strangury use Opium and hip baths.

Cantharides is the basis of most of the applications used to increase the growth of the hair.

Linimentum Crinale; Cantharidin 1 grn., Acetic Ether 6 drms., Alcohol (90 p.c.), 3 oz.; Castor Oil 1 oz. and Lavender Oil 15 mins. A stimulating application to the scalp when the hair is falling out. For delicate skins it should be diluted with equal parts or more of Rectified Spirit. It may be applied twice daily after thoroughly washing the part.

THE TELINI FLY, *Mylabris cichorii*, Fabr. (Zirangi, Hind.).

Allied species are common throughout India. They contain the same active principle as Cantharides and may be used for vesication. The difficulty of preparation and uncertainty of strength however render them undesirable.

HIRUDO, B. P. Leeches.

Characters: Body soft, smooth, 2" or more in length, tapering to each extremity, plano-convex, marked with from 90 to 100 fine annulations, back olive-green, with 6 rusty red longitudinal stripes; the anterior end is terminated by a small sucker surrounded by tri-radiate jaws, the posterior end by a large sucker. Two varieties are official.

2. *Sanguisuga officinalis*, Savigny. The green Leech. This has its ventral surface olive green, not spotted.

In India there are at least six varieties of leeches suitable for use medicinally. (*Jok, Jonk*, Hind.). They are procurable in the neighbourhood of tanks and in swampy places, especially during the rains.

Medicinal uses: Depletive and counterirritant. Used to abstract blood from congested parts, and in cases of internal inflammation, also in cardiac distension.

An average number of leeches to apply is one for every two years of the patient's age up to adult life.

Leeches abstract about four times their own weight of blood; an average sized leech will remove directly and by subsequent hæmorrhage about $\frac{1}{2}$ oz. blood.

A substance is excreted from the pharynx of the leech, which antagonises the clotting of blood; hence sometimes the bleeding is very obstinate. To stop this if ordinary pressure fail, apply a Nitrate of Silver point over the wound, or Perchloride of Iron, or other styptic.

Leeches should not be applied over a prominent vein, nor to a position where the skin is lax (*e.g.*, the *eyelid, mamma, scrotum*, or *penis*), as wounds in such situations are specially liable to inflame. It is safest to apply them where a bone is near the surface, so that pressure can be applied if necessary. The best time to apply leeches is in the morning; in this way the bleeding can be controlled and dangerous hæmorrhage, while the patient is asleep, be avoided.

To make a leech bite, thoroughly cleanse the part, smear it over with cream, or sugared milk, or scratch the skin so that a little blood oozes out.

To make a leech bite on a particular spot, cut a small hole in a piece of paper; lay this over the spot, and apply the leech as mentioned in last paragraph.

To remove a leech from the skin or a body cavity; apply a solution of common salt or vinegar, or touch it with a piece of onion.

To promote hæmorrhage from a leech-bite, apply hot fomentations, or a warm moist poultice.

INORGANIC MATERIA MEDICA.

NON-METALS.

The Non-Metals used in Medicine are **Oxygen, Sulphur, Carbon, Nitrogen**, and the members of the Halogen Group, *viz.*, **Chlorine, Bromine, Iodine** (**Phosphorus** see *Metalloids*).

OXYGEN, O. *Atomic weight 16.*

A colourless gas, without smell or taste, rather heavier than common air; forms about one-fifth of the atmosphere; supports combustion and life; slightly soluble in water. It is capable of uniting with nearly every known element, forming **Oxides**. The only substances with which it does not directly combine are the halogens, and the noble metals gold and platinum; the oxides of Silver and Mercury are feeble combinations. The union of oxygen with another substance is termed **oxidisation**. This may proceed so gradually as to be hardly noticeable (as in the rusting of metals, the decay of wood, or the drying of oils in paint), or so energetically that the heat evolved renders the particles luminous (as in combustions). The removal of oxygen from a substance is termed **reduction**.

Oxygen may occur in either of three forms:—

- (1) **Atomic or Nascent Oxygen.** The atoms are separate and very active.
- (2) **Molecular Oxygen.** Two atoms having united form the oxygen molecule O_2 .
- (3) **Ozone.** A very powerful and condensed form of Oxygen, supposed to be one molecule, with one atom loosely attached, O_3 . The sulphury smell in the atmosphere after a thunderstorm is due to ozone.

Oxygen may be made by heating Pot. Chlorate with Mang. Perox.

Medicinal uses: It has been used as a **Stimulant** to foul ulcers, in obstructive respiratory diseases, *e.g.*, asthma, or in other conditions where oxidisation is deficient.

CARBO LIGNI, B.P. Wood Charcoal.

The carbonaceous residue of wood charred by exposure to a red heat without access of air. May be given in powder, biscuit, or capsule. The most palatable way is mixed with chocolate.

Characters : A black powder, without odour or taste, free from gritty matter; when burned at a high temperature it should not leave more than $7\frac{1}{2}$ p.c. of ash; insoluble in all re-agents.

Before being pulverised it occurs as black brittle porous masses, very light, often retaining the shape, and texture of the wood from which it has been made. If burned in air or oxygen it forms carbonic acid.

Medicinal properties : Deodoriser, Disinfectant, Antiseptic, Absorbent.

It is used in respirators and sewer traps to protect from poisonous gases; as a poultice to foetid ulcers and gangrene. It is not good as a dentifrice, as it scratches the teeth.

Internally it is used in flatulence and acidity of the stomach and intestinal tract, also in diarrhoea, dysentery and typhoid fever. It acts as an intestinal antiseptic and stimulant, the particles acting as mechanical irritants, and thus in large doses may even be purgative.

Dry charcoal has the power of condensing oxygen within its pores which then becomes a powerful oxidiser, rapidly destroying organic substances. When thoroughly wetted it loses this power.

Charcoal Poultice. Soak 2 oz. bread crumb in 10 oz. boiling water for ten minutes near a fire; add $1\frac{1}{2}$ oz. linseed meal or rice flour, stirring the ingredients so that a poultice is formed; add $\frac{1}{4}$ oz. wood charcoal; mix; and sprinkle a like quantity of dry charcoal on the surface of the poultice.

Carbo Animalis Purificatus. Purified Animal Charcoal.

A black powder, without taste or smell, insoluble in all re-agents. It is prepared by dissolving the inorganic matter out of bone black by means of Hydrochloric acid.

It sinks in water so differing from wood charcoal.

Uses and actions : Used in teaspoonful doses given frequently as an antidote for alkaloid poisoning (e.g., Morphine, Aconitine, etc.), but it must be followed by an emetic and purgative, as if left in the stomach the alkaloid will re-dissolve and continue its poisonous effect; also for decolorising in various pharmaceutical processes.

It has the power of precipitating colouring matter and alkaloids from solutions.

Carbonic Acid or Carbonic Anhydride, CO_2 , is the gas which bubbles up from aerated waters and effervescing wines. It may be prepared by acting on a carbonate by a dilute acid.

bulk of water: it is the weakest of all the acids, any other acid being able to displace it from its combinations, the Carbonic Acid escaping by effervescing.

It can be easily detected by its turning lime water a whitish colour which again disappears on adding it in excess.

Medicinal properties: Externally it has a slight stimulating action on the skin.

It stimulates the mucous membrane. In the mouth it increases the flow of saliva, hence aërated waters quench the thirst better than pure water. In the stomach and intestinal canal it produces hyperæmia, and hence increases digestion and absorption of food.

It is used largely as aërated waters and effervescing wines.

United with alkalis it forms Carbonates and Bicarbonates. Test for **Carbonates** and **Bicarbonates**:—

1. Dilute Acids cause an effervescence of Carbonic Anhydride.
2. With solutions of Mercuric Chloride, soluble carbonates give a brownish-red precipitate; bicarbonates give a whitish precipitate.
3. With cold solution of Magnesium Sulphate soluble carbonates give a whitish precipitate; bicarbonates do not.

The carbonates of the alkalis are soluble in water, those of the alkaline earths, and of iron are only sparingly soluble, but dissolve readily in water aërated by carbonic acid; forming bicarbonates.

CARBONIS BISULPHIDUM, B.P. Carbon Bisulphide.

Synonym. Carbon Disulphide, CS_2 may be prepared by combining carbon and sulphur at a high temperature; condensing and purifying.

Characters: A clear colourless highly refractive liquid, odour characteristic, not fetid; sp. gr. 1.268; boiling point $115^{\circ} F.$; very slightly soluble in water, soluble in alcohol, ether, chloroform, and the fixed and volatile oils; it rapidly evaporates at ordinary temperatures; highly inflammable, burning with a blue flame forming carbonic and sulphuric anhydrides.

Test for absence of Sulphurous Acid: It should not affect the colour of blue litmus paper moistened with water.

Test for absence of Sulphur: Evaporated spontaneously in a glass vessel it should leave no residue.

Test for absence of Hydrogen Sulphide, shaken with solution of Lead Acetate the latter should not be blackened.

Used as a solvent for Sulphur, Phosphorus, Caoutchouc, &c.

SULPHUR, S. *Atomic weight 32.*

Occurs native in volcanic regions, also as the Sulphides of Iron and Lead. It readily volatilises; if the vapour is received into a cool chamber, it condenses as a fine powder known as **Flowers of Sulphur**; if received into a chamber at a temperature of about 240° F. it condenses in liquid form, and run into moulds, forms **Roll Sulphur**.

Sulphur (*Gundhuk*, Hind.) occurs naturally in some parts of India, but is impure and little used in medicine.

SULPHUR PRÆCIPITATUM, B.P. Precipitated Sulphur.

Synonym: Milk of Sulphur.

Sulphur precipitated by Hydrochloric Acid from a solution of calcium sulphides and thiosulphate, which has been made by boiling together sulphur and lime in water.

Dose: 20 to 60 grains.

Characters: A greyish-yellow soft powder, free from grittiness and from the smell of hydrogen sulphide. Under the microscope it is seen to consist of opaque globules without any admixture of crystalline matter, it responds to the chemical tests under Sulphur Sublimatum.

TROCHISCUS SULPHURIS, B.P. Sulphur Lozenge.

Each contains 5 grains precipitated Sulphur, with 1 grn. Acid Potassium Tartrate, and flavoured with Tincture of Orange.

Medicinal properties: Of Precipitated Sulphur, those of Sublimed Sulphur, only more powerful.

SULPHUR SUBLIMATUM, B.P. Sublimed Sulphur.

Synonym, Flowers of Sulphur, may be prepared more or less directly from native sulphur or sulphides.

Dose: 20 to 60 grains; may be given in treacle or milk.

Characters: A slightly gritty powder, colour bright greenish-yellow; without odour or taste until heated. Under the microscope it is seen to consist of almost opaque irregular particles without any admixture of crystalline matter; burns with a blue flame forming sulphurous anhydride; is entirely volatilised by heat. It sometimes has a slight odour of Sulphurous Acid, and a faintly acid taste and reaction; insoluble in Water or Rect. Spt., but soluble, when heated, in Oils or Turpentine.

Test for absence of Sulphurous Acid. It should not have any action upon litmus.

Test for absence of Arsenious Sulphide. Solution of Ammonia agitated with it and filtered does not on evaporation leave any residue.

CONFECTIO SULPHURIS, B.P. Confection of Sulphur.

Preparation: Mix 4 oz. Sublimed Sulphur, 1 oz. powdered Acid Potassium Tartrate, 18 grains powdered Tragacanth, 2 fl. oz. Syrup, $\frac{1}{2}$ fl. oz. Tincture of Orange, and $1\frac{1}{2}$ fl. oz. Glycerin; rub well together.

Used as a **Laxative** in hæmorrhoids.

UNGUENTUM SULPHURIS, B.P. Sulphur Ointment.

Preparation: Mix 1 oz. Sublimed Sulphur finely sifted, 9 oz. Benzoated Lard. A little Oil of Lemon may be added to disguise the odour.

Medicinal properties: **Antiparasitic, Stimulant.** Used in parasitic skin diseases especially scabies, and as an insufflation to the throat in diphtheria.

Internally, a mild laxative, useful in cases where drastic purgatives are inadmissible, e.g., pregnancy, hæmorrhoids, &c., and as an **Alterative** in rheumatism, gout, and chronic bronchitis.

In the intestinal canal it acts chiefly as a mechanical irritant, but a small portion is transformed into Hydrogen Sulphide, which increases peristalsis, so that the motions become looser, and often colicky pains occur. The sulphide is excreted by the skin and breath, giving these the smell of rotten eggs, and blackening any silver ornaments. Burnt in free air it becomes Sulphurous Acid which is a disinfectant.

Actions. In contact with living substances Sulphur enters into combination, becoming Sulphurous Acid, and Hydrogen Sulphide, both of which are very poisonous to low organisms, hence its use as a dressing for vines, and in skin diseases.

Chelsea Pensioner.

Adult dose: A teaspoonful every alternate evening as an **alterative** in rheumatism; or in the morning as an **aperient**.

Preparation: Mix Sulph. Subl. and Pulv. Sinap. each 4 parts, Pulv. Guaiac. 2 parts, Pulv. Rhei, and Pot. Nitr., each 1 part, keep in powder; when required for use, add honey or treacle sufficient to make an electuary.

A slight modification of a classical prescription, for the right to publish which £400 was once paid.

SULPHURIS IODIDUM, B.P. Sulphur Iodide.

A very loose combination of Iodine (80 p.c. by weight) and Sulphur (20 p.c.).

Characters: Greyish-black, crystalline solid with a radiate appearance; smelling strongly of Iodine; on being boiled with water, Iodine is given off, and Sulphur remains. Soluble in 60 parts glycerin; insoluble in cold water.

UNGUENTUM SULPHURIS IODIDI, B.P. Sulphur Iodide

Preparation : Triturate 20 grains Sulphur Iodide, and 20 grains Glycerin, in a slightly warmed mortar, until a smooth paste results ; gradually add 460 grains Benzoated Lard ; stir until cold.

Medicinal properties : **Antiparasitic.** Used in chronic skin diseases. Never used internally.

NITROGEN, N. *Atomic weight 14.*

A colourless, odourless, tasteless gas ; very inactive, it does not readily combine with other elements.

Atmospheric air consists of about 1 of oxygen, 4 of nitrogen, with a varying amount of water vapour, and small quantities of carbonic acid, ammonia, dust, &c.

The compounds of Nitrogen are very important, and are present in one form or other in every kind of life. With hydrogen it forms **Ammonia** (NH_3). With Oxygen it forms a number of different compounds, the chief of which are **Nitric Acid** HNO_3 , **Nitrous Acid** HNO_2 , and **Nitrous Oxide** N_2O .

Nitrous Oxide, Laughing Gas.

A colourless gas, with a sweetish odour and taste.

Made by heating Ammonium Nitrate to 400°F. , and purifying.

Use : As an **anæsthetic** for operations which can be completed within about one minute, *e.g.*, tooth extraction.

It induces intense venosity of the blood, and therefore is unsuitable for lengthy operations. It should not be given to patients who have atheromatous vessels, or Bright's disease, as the great rise of arterial pressure is liable to cause cerebral hemorrhage.

Dose : About $3\frac{1}{2}$ gallons of gas are required for each inhalation.

Haloid Group. (Haloid means derived from the sea).

Arranged according to their activity and inversely in order of the activity of their salts ; the haloid elements used in medicine are (1) **Chlorine** (obtained from sea salt), (2) **Bromine** (from sea water), and (3) **Iodine** (from sea weeds).

Their activity depends on their affinity for metals and bases. They all readily unite with Hydrogen, thus when in contact with moist substances, they liberate nascent oxygen, which oxidises and so is able to destroy many alkaloids and organic bodies. Their salts rank next to Nitrates in diffusibility.

They are all prepared by expelling them from their compounds with the alkaline metals, by means of Sulphuric acid and Manganese dioxide.

Chlorine. (Cl. *Atomic weight 35.5*). A greenish-yellow gas, with a suffocating odour. Chlorine gas is a powerful disinfectant.

Combined with bases it forms chlorides. These are stable salts

The official Chlorides are those of Ammonium, Calcium, Sodium and Zinc.

The official Hydrochlorides are those of Apomorphine, Cocaine, Morphine and Quinine.

Tests for Chlorides or Hydrochlorides—

1. Silver Nitrate gives, with solution of chlorides, a curdy white precipitate of silver chloride, insoluble in Nitric Acid, readily soluble in Ammonia.

2. Heated with Manganese Peroxide and Sulphuric Acid, solution of chlorides gives chlorine which can be recognised by (a) its colour, (b) its odour, and (c) by its giving a brown colouration (free iodine) to a solution of Potassium Iodide; the brown portion if added to mucilage of starch giving a blue colour.

Bromine, (Br. Atomic weight 80). A dark brownish-red liquid very volatile, with a strong disagreeable odour.

Its solution renders cold starch yellow. Its fetid disagreeable smell prevents its being used medicinally. Combined with bases it forms **Bromides** in which the bromide action predominates, the base being secondary.

The official Bromides are those of Potassium, Sodium and Ammonium. The official Hydrobromides are those of Homatropine and Hyoscine.

Tests for Bromides or Hydrobromides—

1. Silver Nitrate with solution of bromides, gives a curdy very pale-yellow precipitate of silver bromide, insoluble in Nitric Acid, somewhat soluble in strong Ammonia, almost insoluble in weak Ammonia.

2. Solutions of chlorine with solutions of bromides liberates bromine, recognisable by its colour and odour, soluble in 2 or 3 drops of carbon disulphide or of chloroform and forming a reddish-solution.

3. Black oxide of Manganese and Sulphuric Acid, with solutions of bromides, liberate bromine, recognisable by its colour, odour and action on Potassium Iodide.

IODUM, B.P. Iodine. I. Atomic weight 127.

A solid non-metallic element, obtained from the ashes of seaweeds and from native iodides and iodates.

Characters: Rhombic prisms or octahedrons of the trimetric system; colour bluish-black with metallic lustre; odour peculiar, disagreeable; on gently heating it yields a violet-coloured vapour; freely soluble in Alcohol (90 p.c.), Ether, Chloroform, or solution of Potassium Iodide; soluble 1 part in 5000 of water: its aqueous solution gives a deep blue colour with mucilage of starch.

Exposed to the air it slowly volatilises. It stains the skin

sulphite. On adding chlorine water to an iodide, this is decomposed yielding a chloride and a solution of Iodine.

Test for absence of Iodine cyanide. It sublimes without residue, the first portion that comes over does not include any slender colourless prisms emitting a pungent odour.

Test for absence of moisture. A solution in chloroform should be perfectly clear.

Iodine forms Iodides with bases. The official iodides are those of Arsenic, Lead, Mercury, Potassium, Sodium and Sulphur.

Test for Iodides—

1. Silver Nitrate with solution of an Iodide gives a curdy pale-yellow precipitate of Silver Iodide, insoluble in Nitric Acid and almost insoluble in Ammonia (Ammonia with Silver Iodide forms a whitish, insoluble compound).

2. Mercuric chloride with solutions of Iodides gives a precipitate of Mercuric Iodide, yellow at first but rapidly becoming scarlet; this dissolves readily in excess of potassium iodide and in excess of mercuric chloride.

3. Lead Acetate with solutions of Iodides gives a yellow precipitate of lead iodide; soluble in Nitric Acid, soluble also on boiling; on cooling the lead iodide separates as golden crystalline scales.

4. A small quantity of solution of chlorine or bromine, or a solution of Sodium Nitrite and dilute hydrochloric acid, added to a solution of an iodide, liberates iodine which can be recognised by its giving a blue colour to solution of starch.

If a solution containing free Iodine be shaken with carbon bisulphide, the iodine is dissolved in the carbon bisulphide, imparting to it a violet colour.

LIQUOR IODI FORTIS, B.P. Strong Solution of Iodine. Linctament of Iodine, Brit. Pharm. 1885.

Strength: $11\frac{2}{3}$ p.c. Iodine, 7 p.c. Potassium Iodide.

Preparation: Dissolve $\frac{3}{4}$ oz. Potassium Iodide and $1\frac{1}{4}$ oz. Iodine in $1\frac{1}{4}$ fl. oz. Distilled Water in a bottle; add 9 fl. oz. Alcohol (90 p.c.); shake.

TINCTURA IODI, B.P. Tincture of Iodine.

Dose: 2 to 5. (Strength $2\frac{1}{2}$ grains each of Iodine and Potassium Iodide in 110 mins.).

Preparation: Place $\frac{1}{2}$ oz. each of Iodine and Potassium Iodide with $\frac{1}{2}$ oz. Distilled Water in a bottle; dissolve; add Alcohol (90 p.c.) sufficient to produce 1 pint.

UNGUENTUM IODI, B.P. Iodine Ointment.

Strength: 4 p.c. each of Iodine and of Potassium Iodide.

Preparation: Triturate 20 grains each of Iodine and of Potassium Iodide with 60 grains Glycerin in a glass or porcelain mortar; add 400 grains Lard, gradually mix.

Medicinal properties: Iodine is a powerful **Antiseptic, Absorbent and Parasiticide**. Applied to the skin it is **rubefacient or vesicant**, depending on the strength of the application.

Uses: The strong liquor (or for delicate patients the Tincture) is painted on the skin to cause **absorption of thickenings** around joints, enlarged strumous glands or goitre, and of fluid in serous cavities, *e.g.*, pleurisy or ascitis; also over the lungs to remove slight consolidation or to relieve pleurisy; for this it should be painted on every two or three days, and strong enough to have always one part a little tender. Painted over the affected part it is a **parasiticide** (*e.g.*, in tinea); also by acting as a **local irritant** it may remove muscular pains.

A few drops of Tincture Iodine in a solution of Sod. Chloride is used as a nasal wash in ozæna. The vapour of Iodine (Tr. Iod. 1 drm. mixed in 1 oz. water, gently heated and the vapour inhaled) is used in chronic bronchitis and phthisis.

Internally, it is **Antemetic, Gastric Stimulant and Eliminant**. It is used in the same way as Pot. Iod., but is more irritating to the intestinal mucous membrane. In small doses it is used as an antemetic (mins. 2 to 5 of the Tr. Iod.).

Absorbed into the blood it **diminishes the size** of enlarged glands, and the thickening of chronic inflammation. It forms soluble iodides with lead and mercury, so hastening their elimination. Iodine is excreted by the urine, by the secretions of the mucous membranes and by the milk.

Small doses long continued may produce a condition known as **Iodism**, the symptoms of which are similar to those of ordinary catarrh. This may be prevented by either discontinuing the drug, or doubling the dose. As Iodine is excreted by the tears, severe conjunctivitis may follow the application of Calomel to the eyes of those who are taking Iodides internally. It is also eliminated by the skin, so that tubercular-like or acne skin affections may result. This may be prevented by perfect cleanliness and daily baths, or may be lessened by the simultaneous use of arsenic.

Very large doses are **poisonous**, the patient becoming collapsed; this gradually passes off, but some days after sudden death may occur.

The Edinburgh Tincture of Iodine (strength 30 grains Iodine in 1 oz. Alcohol, 90 p.c.) is used for injecting into serous sacs from which the fluid has been evacuated (*e.g.*, in hydrocele), to promote adhesive inflammation, and so prevent the fluid re-accumulating.

Morton's Fluid. Dissolve Iodine 10 grains, Pot. Iod. 30 grns.

Ethereal Tincture of Iodine. (Strength 30 grains Iodine in 1 oz. Pure Ether) for use externally where rapid action of Iodine is required.

METALLOID GROUP.

The medicinal actions are—

(1) In small doses they stimulate the growth of bone, and connective tissue.

(2) In large doses they tend to split up the tissues into fatty substances, which are not liable to oxidation.

Include **Phosphorus**, (a non-metal) and **Arsenic**, **Antimony** and **Bismuth** (metals). These have so many common chemical affinities and medicinal actions that they are included in one group.

PHOSPHORUS, B.P. Phosphorus. *P. Atomic weight 31.*

A solid non-metallic element obtained from calcium phosphate made from bones.

Dose: $\frac{1}{100}$ to $\frac{2}{10}$ grain.

Characters: A semi-solid wax-like solid which when exposed to air emits white vapour, and is luminous in the dark.

Sp. gr. 1.77, melts at 100° F., a little above which it ignites in the air, burning with a luminous flame and producing dense white fumes.

Solubility: 1 in 80 of Olive Oil, 1 in 80 of Ether, 1 in 350 of absolute Alcohol, 1 in 25 of Chloroform, 2 in 1 Carbon bisulphide.

It is usually sold as pale cinnamon coloured rods, about $\frac{1}{4}$ " to $\frac{1}{2}$ " in diameter. As it readily ignites, it should be handled with caution, and cut only under water.

OLEUM PHOSPHORATUM, B.P. Phosphorated Oil.

A 1 p.c. solution of Phosphorus in Almond Oil dissolved by heat, in a special manner.

Dose: 1 to 5 mins.

Characters: A clear straw-coloured liquid, Phosphorescent in the dark.

PILULA PHOSPHORI, B.P. Phosphorus Pill.

Dose: 1 to 2 grains.

Strength: 2 p.c. Phosphorus.

Preparation, intricate: the pills are to be varnished before being dispensed.

Medicinal properties: Phosphorus is a powerful general **Stimulant** and **Nervine Tonic**. Being dangerous it is rarely used pure

forms of loosely combined Phosphorus, and being less dangerous are preferred. They are probably converted into Phosphates in the stomach and act as such.

Phosphorus as a Poison. *Fatal dose* $\frac{1}{2}$ grn. and upwards for adults, $\frac{1}{12}$ grn. for children. Match heads contain on an average about $\frac{1}{100}$ grn. in each.

Symptoms : Nausea, urgent bilious vomiting, with garlicky taste in mouth; diarrhoea, with severe tormina. Later, jaundice may occur, or convulsions come on. The onset of symptoms is often deferred for some hours, but the illness is rapid when it has commenced.

The *fatal period* is seldom early, usually from 4 hours to 3 days or more.

Treatment : If seen early, give **emetics**, Sulphate of Copper is best, being also an antidote; later give **laxatives**, Oil of Turpentine, Magnesia. As Phosphorus dissolves in fats or oils and thus is more readily absorbed into the system these should not be administered.

Prolonged exposure to Phosphorus fumes (e.g., in match factories) produces necrosis of the jaw-bone, especially if teeth be decayed, or recently extracted. This may be prevented by good ventilation and exposure to fumes of Oil of Turpentine.

Arsenium. *As.* Atomic weight 75. A brilliant bluish-grey metal quickly tarnishing on exposure. It is found extensively combined with other metals. Its oxide also is a natural product.

ACIDUM ARSENIOSUM, B.P. Arsenious Anhydride; Arsenic; White Arsenic; As_2O_3 . Obtained by roasting certain arsenical ores.

Is an Anhydride not a true Acid.

Dose : $\frac{1}{60}$ to $\frac{1}{15}$ grain in solution, or mixed with the Sugar of Milk in a pill.

Characters : Occurs on a heavy white powder or in masses which usually present a stratified appearance caused by the presence in separate layers of the crystalline and opaque and of the amorphous and vitreous allotropic modifications of Arsenious Anhydride; soluble 1 in 100 of cold water, 1 in 10 of boiling water, 1 in 5 of glycerin, moderately soluble in solutions of alkaline hydroxides and carbonates, in hydrochloric acid, and in mixtures of that acid and water; sprinkled on ignited charcoal it emits an odour like garlic, it sublimes at 400° F.; heated slowly in a test tube it yields a sublimate of minute brilliant transparent octahedral crystals.

The latter reaction is perhaps the best test for Arsenic.

Its aqueous solution is odourless, tasteless and faintly acid to

Test for absence of Arsenious sulphide.

It should dissolve completely in solution of Ammonia, and the resulting liquid when diluted with an equal volume of water and acidulated with hydrochloric acid should not have a yellow colour.

Tests for Arsenious solutions (arsenites).

Hydrogen Sulphide colours the solutions yellow, on adding Hydrochloric Acid a yellow precipitate of Arsenious sulphide is formed. This dissolves on adding potassium hydroxide.

With Silver ammonio-nitrate solution, the aqueous solution of arsenious anhydride or an arsenite gives a canary-yellow precipitate, readily dissolved by ammonia solution or by Nitric acid.

With arsenates the same reagent gives a reddish chocolate precipitate.

LIQUOR ARSENICALIS, B.P. Arsenical Solution.

Synonyms: Liquor Potassæ Arsenitis, Fowler's Solution.

Dose: 2 to 8 mins. (Strength 110 mins. contain 1 grain Arsenious Anhydride).

Characters: A reddish alkaline liquid with odour of lavender.

Preparation: Heat $87\frac{1}{2}$ grains each of Arsenious Anhydride and Potassium Carbonate with 10 oz. Distilled Water in a one pint flask until a clear solution is obtained; cool; add 5 fl. drachms of compound Tincture of Lavender, and Distilled Water sufficient to produce 1 pint.

If given with acid preparations of Iron, the free Potassium Carbonate tends to precipitate Peroxide of Iron, which is stated as an antidote for arsenic. Therefore Liquor Arsenicalis is said to be incompatible with such preparations as Liquor Ferric Perchloride. But this occurs only in neutral solutions, and so in ordinary medicinal doses these drugs are not incompatible.

LIQUOR ARSENICI HYDROCHLORICUS, B.P. Hydrochloric Solution of Arsenic.

Dose: 2 to 8 mins. (Strength 110 mins. contain 1 grain Arsenious Anhydride).

Characters: A colourless liquid with acid reaction.

Preparation: Heat $87\frac{1}{2}$ grains powdered Arsenious Anhydride and 2 fl. drms. Hydrochloric Acid with 10 fl. oz. Distilled Water in a one pint flask until a clear solution is obtained; cool; add Distilled Water sufficient to produce 1 pint.

Introduced so as to be compatible with acid iron preparations.

Medicinal properties: Externally arsenic is a powerful **Caustic**.

It forms the basis of most of the secret cures for cancer.

If absorbed it produces all the constitutional effects of arsenical poisoning, but absorption may be prevented by applying it in a

Internally in small doses; mins. $\frac{1}{2}$ to 1 of *Liquor Arsenicalis* given **before** food; **gastric, sedative, anodyne, astringent.**

Used: To increase the appetite, check gastralgia, heartburn, vomiting, the regurgitation of food without nausea, and the diarrhoea which comes on immediately after the ingestion of food.

Doses: In large doses given **after** food (mins. 6 to 8 of *Liq. Arsenic.*), **antiperiodic, nerve tonic, alterative.**

Used: In the more chronic forms of malarious fevers, and in all masked forms of malaria, in chronic nervous diseases commencing phthisis, chronic bronchitis with copious expectoration, catarrh without fever, pernicious anaemia, and in all chronic skin diseases. Its stimulating effect renders it unsuited for acute conditions; symptoms of an over dose of arsenic are conjunctivitis and gastric irritation.

Absorbed into the blood, arsenic modifies tissue change. Minute doses increase the rapidity of the pulse. Large doses, long continued, produce fatty degeneration of the liver and other organs.

When taken by the stomach for a long time a tolerance is established. Many of the natives of Styria take without bad effects doses of arsenic several times more than is sufficient to kill ordinary persons.

Arsenic as a poison. Still larger doses act as a poison, producing gastro-intestinal irritation, colicky pains and diarrhoea, with faeces sometimes tinged with blood.

A single large dose may produce symptoms very like those of Asiatic Cholera, or, if the nervous system be chiefly affected, like those of the coma of opium poisoning.

Treatment: Of Arsenical poisoning: Emetics, stomach pump.

The value of so-called antidotes (e.g., moist peroxide of iron, calcined magnesia in large quantities, dialysed iron followed by common salt to ensure precipitation of the iron) is doubtful, the most they can do is to render the arsenic less soluble and so allow more time for its removal by emesis or purgation.

After absorption into the blood nothing can be done except treat symptoms; intestinal irritation by mucilaginous drinks, olive or carron oil; prostration by stimulants, warmth (hot blankets, bottles, &c.).

Chronic poisoning by arsenic may occur from the inhalation into the lungs of very minute quantities of arsenical dust from dresses, wall-paper, and other materials containing arsenic, or from continued over-doses of the drug. The symptoms are at first, increased appetite, then the symptoms of gastro-enteritis and coryza, a short dry cough, and a silvery appearance of the tongue.

ARSENII IODIDUM, *B.P.* Arsenious Iodide, As I_3 , may be

Characters: Small orange-coloured crystals or crystalline masses, soluble in water and in alcohol (90 p.c.); heated in a test tube it entirely volatilises, violet vapours of Iodine being set free.

Tests: Its aqueous solution gives the reactions of arsenium and iodides, and when freshly prepared is neutral to litmus, afterwards it becomes acid. Used to make Donovan's solution.

LIQUOR ARSENI ET HYDRARGYRI IODIDI, B.P. Solution of Arsenious and Mercuric Iodides. Known also as Donovan's solution.

Dose: 5 to 20 mins. diluted.

Strength: 110 mins. contains 1 grain each of Arsenious Iodide and of Mercuric Iodide.

Characters: A clear pale yellow liquid with a metallic taste. It gives the reactions of mercuric salts, arsenium and iodides.

Preparation: Triturate $87\frac{1}{2}$ grains each of Arsenious Iodide and of Mercuric Iodide with 3 or 4 fl. oz. of Distilled Water until nearly dissolved; filter; wash the undissolved portion on the filter with Distilled Water sufficient to make 20 oz.

Medicinal properties: **Alterative:** Given in syphilitic skin diseases.

It combines the actions of arsenic and of Iodides.

Antimony. Sb. Atomic weight 120. A silvery white brittle crystalline metal found generally as the Sulphide (the Stibium of the ancients). It is extensively employed in the manufacture of type metal and the alloy known as Britannia metal. It is noted for the great number and variety of its combinations, so much so that Basil Valentine said of it: "The shortness of life makes it impossible for one man thoroughly to learn antimony."

Tests of Antimony are—

1. Hydrogen Sulphide with slightly acidulated solutions of antimony salts gives an orange precipitate of antimonious sulphide, soluble in solution of potassium hydroxide.

2. Copper foil precipitates antimony from solutions and the antimony may be volatilised by heat; the metal on being heated condenses as a white amorphous sublimate of oxides of antimony.

ANTIMONII OXIDUM, B.P. Antimonious Oxide.

Sb_2O_3 may be prepared by pouring solution of antimonious chloride into water and decomposing the precipitated antimony oxychloride with sodium carbonate.

Dose: 1 to 2 grains.

Characters: A greyish-white powder, fusible at a low red heat, insoluble in water, readily soluble in hydrochloric acid.

Medicinal properties: **Diaphoretic** in small doses, **emetic** in

PULVIS ANTIMONIALIS, B.P. Antimonial Powder.

Dose: 3 to 6 grains.

Preparation: Mix together 1 oz. Antimonious Oxide, with 2 oz Calcium Phosphate.

Medicinal properties: **Diaphoretic** and **Cardiac Depressant** in the asthenic stage of fevers.

This is the Pharmacopoeial equivalent of James' Fever Powder, *i.e.*, **Pulvis Jacobi Verus**.

ANTIMONIUM NIGRUM PURIFICATUM, B.P. Antimonious Sulphide.

Native Antimonious Sulphide, Sb_2S_3 , from which siliceous matter has been removed by fusion, reduced to fine powder, and, if any salt of arsenium be present, purified by digesting with half its weight of solution of ammonia for several days, washing and drying.

Characters: Greyish-black crystalline powder, decomposed on boiling with hydrochloric acid, hydrogen sulphide escaping, and an almost clear solution remaining. It should give the tests for antimony, and hardly at all those of arsenium.

Used to prepare Sulphurated Antimony. In India an impure Black Antimony (*Surmah-ka-patthar*, Hind.), found in the Panjab, is used by women to darken their eyelids, so improving their personal appearance; also as a tonic for horses.

ANTIMONIUM SULPHURATUM, B.P. Sulphurated Antimony.

A mixture containing Antimony Oxide, Sulphides and Sulphur, prepared from Antimonious Sulphide.

Dose: 1 to 2 grains.

Characters: A dull red powder; odour none; taste slight; insoluble in water, readily soluble by solution of Sodium hydroxide, also by hot hydrochloric acid with evolution of hydrogen sulphide and separation of sulphur. It should not give more than the faintest reactions for arsenium.

Medicinal properties: An **Alterative Tonic** used in skin diseases and chronic rheumatism, but owing to its slight solubility, its action is somewhat uncertain. It is prescribed with Calomel and Guaiacum as *Plummer's pill* for Secondary Syphilis and cutaneous eruptions; or with Henbane or Hemlock for **Chronic Rheumatism**.

It acts as a Sulphide.

ANTIMONIUM TARTARATUM, B.P. Tartarated Antimony.

Synonyms: Potassio Tartrate of Antimony; Tartar Emetic.

Preparation: Prepared by setting aside a mixture of Antimonious oxide and acid potassium tartrate made into a paste with a little water until they combine, then purifying by crystallisation.

Dose: As a diaphoretic $\frac{1}{2}$ to $\frac{1}{4}$ grain: as an emetic 1 to 2

Incompatibles: Tartar Emetic is precipitated by **Alkalis** and their **Carbonates**, **Tannic Acid**, and drugs containing it.

Characters: Colourless transparent crystals, with triangular facets; taste sweet, metallic; solubility 1 in 17 of cold water, 1 in 3 of boiling water, moderately soluble in weak alcoholic liquids, insoluble in Alcohol (90 p.c.); precipitated from its solutions by tannic acid, alkalis or alkaline carbonates, but not by gallic acid.

It gives the reactions of antimony, of potassium, and of tartrates.
Test for absence of acid potassium tartrate. It should not effervesce with solution of Sodium Bicarbonate.

VINUM ANTIMONIALE, B.P. Antimonial Wine.

Dose: 10 to 30 mins.; as an Emetic 2 to 4 fl. drms.

Strength: 2 grns. Tartarated Antimony to 1 fl. oz.

Preparation: Dissolve 40 grains Tartarated Antimony in 1 fl. oz. Distilled Water; mix with this sufficient sherry to form 1 pint.

Medicinal properties: Tartar Emetic in small continued doses acts as **diaphoretic**, **cardiac depressant** and **antipyretic**. As an **expectorant** it makes the mucus more fluid.

Used as a diaphoretic and cardiac depressant in the asthenic stage of pneumonia, acute bronchitis and inflammations.

Large doses are Emetic: used as such in croup and diphtheria.

Tartar Emetic as a poison.

Large doses as a rule act as an Emetic and thus form an antidote. If retained it produces gastro enteritis, cardiac and muscular weakness, convulsions, and death.

Lethal dose: 40 grains. Small doses may fatally depress, in exhausted subjects.

Treatment. Encourage vomiting and give any fluid containing Tannin, e.g., strong tea, Tr. Cinchona, Galls, etc. Treat collapse by stimulants and warmth.

Applied externally it is a Vesicant producing smallpox-like pustules, which are followed by pitting. The ointment (1 Tartar Emetic, 4 Simple Ointment) used as a counterirritant especially in Tubercular Meningitis, but its use has been given up.

BISMUTHUM, Bismuth, Bi. Atomic weight 209. A brittle metal of crystalline texture. It repels the magnet more than any other metal, and when exposed to great pressure its density decreases.

Fusible metals consists of 2 of bismuth and 1 each of tin and lead; melts at 200° F.

Tests:—

1. Hydrogen Sulphide added to an acid solution of bismuth salt gives a brownish-black precipitate of Bismuth Sulphide; insoluble in alkaline sulphides or cold dilute acids, but decomposed and dissolved in boiling Nitric acid.

2. Solutions of potassium hydroxide, sodium hydroxide or ammonia, except in the presence of citrates, give a white precipitate of Bismuth hydrate, insoluble in excess of the reagent.

BISMUTHI CARBONAS, B.P. Bismuth Oxycarbonate.

$(\text{Bi}_2\text{O}_2\text{CO}_3)_2, \text{H}_2\text{O}$. May be prepared by the interaction of bismuth nitrate and ammonium carbonate.

Dose : 5 to 20 grains.

Characters : A whitish powder; insoluble in water; soluble in nitric acid, diluted with half its bulk of water, giving the reactions of bismuth and carbonates.

Medicinal properties : Similar to Bismuth Subnitrate (*q.v.*).

BISMUTHI OXIDUM, B.P. Bismuth Oxide.

Bi_2O_3 . May be prepared by boiling bismuth oxynitrate with solution of sodium hydroxide.

Dose : 5 to 20 grains.

Characters : A slightly brownish-yellow powder, giving the tests of bismuth.

LIQUOR BISMUTHI ET AMMONII CITRATIS, B.P. Solution of Bismuth and Ammonium Citrate.

Synonym : Liquor Bismuthi.

Dose : $\frac{1}{2}$ to 1 fl. drm.

Strength : 1 fl. drm. equals 3 grains Bismuth Oxide.

Characters : A colourless solution, taste slightly metallic. Sp. gr. 1.070; slightly alkaline; freely miscible with water; heated with alkalis it evolves ammonia and yields a white precipitate.

Medicinal properties : **Antacid, Gastric Sedative.** It is more easy to take and more rapid in action than the insoluble Bismuth preparation. Taken into the stomach it is changed into the insoluble oxychloride which acts as the subnitrate. Large doses are irritant, producing gastro-enteritis, and if absorbed or if injected into the circulation, it is poisonous, leading to fatty degeneration of the liver, as does arsenic or antimony.

BISMUTHI SALICYLAS, B.P. Bismuth Salicylate or Oxysalicylate.

May be prepared by the interaction of bismuth nitrate and sodium salicylate.

Dose : 5 to 20 grains.

Characters : A white or nearly white amorphous powder, insoluble in water; gives the reactions of bismuth and salicylates.

Medicinal properties : **Sedative** to mucous membranes. Used in gastro-enteric affections especially of children.

BISMUTHI SUBNITRAS, B.P. Bismuth Oxynitrate

Dose : 5 to 20 grains suspended with Tragacanth. Mucil. Acaciæ is not good as a suspender of Bismuth, as the powder settles in a hard mass at the bottom of the bottle.

As it tends to part with its nitric acid, Bismuth Subnitrate is not suitable for mixtures, especially those containing Carbonates or Bicarbonates. The Carbonic Acid slowly but steadily evolved may break the bottle. For alkaline mixtures Bismuth Carbonate should be used.

Characters : A heavy white inodorous powder consisting of minute crystalline scales, with only a slight action on litmus; gives the tests for bismuth and a nitrate.

Medicinal properties : A very soothing and slightly astringent **sedative** to mucous membranes, acting like minute doses of arsenic.

Uses : In stomach diseases (*e.g.*, pyrosis, vomiting and irritative dyspepsia), also in diarrhoea. As an injection for Gonorrhœa 60 grs. suspended by Tragacanth. in 1 oz. water.

Bismuth preparations render the fæces black, and their prolonged use gives to the breath a peculiar garlicky odour known as Bismuth breath.

Ferrier's Snuff. Mix Bismuth Subnitrate 3 drms., Morphine Hydrochloride 1 grn., powdered Gum Acacia 1 drm.

A speedy remedy for a recent cold in the head; should be used frequently; a pinch being taken each time the nostrils are cleared. The quantity stated above is sufficient for 24 hours.

METALS.

The Metals used in medicine may be classified as follows:—

Light Metals.

1. Hydrogen.
2. Metals of the **Alkalis**, *e.g.*, [Ammonium], Potassium, Sodium, Lithium.
3. Metals of the **Alkaline Earths**, *e.g.*, Calcium, Magnesium.
4. Metals of the **True Earths**, *e.g.*, Aluminium, Cerium.

Heavy Metals.

1. Metals whose oxides form powerful bases, *e.g.*, Iron, Manganese, Chromium, Zinc, Lead, Copper.
2. Metals whose oxides are reducible by heat, *e.g.*, Mercury, Silver.

Heavy Metals. General action of.

Their salts form sparingly soluble compounds with albumen, hence the white of egg is an **antidote** for poisoning by heavy metals.

They unite with the albumen of the tissues, hence are **astringents**; also irritants or caustics depending on the strength of the

They are absorbed into the blood as albuminates or peptonates.

Injected below the skin, or absorbed in large quantity, they are powerful poisons of muscles, nerves, nerve centres, and glands. Iron being a necessary constituent of the blood is an exception.

They are excreted by the bile, and by the intestinal mucous membrane, producing vomiting and diarrhoea; but, like the bile, tend to be reabsorbed in the lower intestine, hence purgatives are good adjuncts in the treatment of chronic metallic poisoning. They are also excreted by the kidneys producing albuminuria.

HYDROGEN. H. *Atomic weight 1.*

A colourless gas, without smell or taste. It is very light, being only $\frac{1}{15}$ the weight of air. It burns in Oxygen with an intensely hot pale blue flame; two volumes of hydrogen uniting with one of Oxygen to form water, H_2O . In chemical combination it acts like a metal. The true acids are Hydrogen salts. Water, H_2O , is Hydrogen oxide.

Hydrogen Sulphide, B.P. Appendix.

Synonym: Sulphuretted Hydrogen.

A gas prepared by the action of hydrochloric acid on ferrous sulphide. It will be sufficiently pure after passing through two wash bottles each containing water. A fresh solution of the gas in water may also be employed.

Hydrogen Sulphide. H_2S is a colourless transparent gas, with a very unpleasant smell of rotten eggs. It acts upon many of the metallic salts producing a free acid and a sulphide of the metal, and thus is useful as a test.

It burns in air with a blue flame, producing water, and sulphurous acid gas. It is a poison to all forms of animal and vegetable life.

AQUA DESTILLATA, B.P. Distilled Water.

Prepared by distillation of good natural potable water.

In distilling, the first twentieth that comes over is rejected as it may contain ammonia or other volatile substances, and the process is stopped when four-fifths of the whole has been distilled, so excluding non-volatile substances, *e.g.*, salts.

Characters: Colourless, odourless, tasteless; it should not affect litmus paper; it should yield no reaction with the tests for the various metals,—chlorides, nitrates, nitrites or sulphates.

Test for dissolved solids. 25 c.c. evaporated in a platinum capsule should leave at most a scarcely visible residue.

Test for more than a trace of organic matter. The liquid obtained on boiling 100 c.c. for 3 minutes with 1 c.c. of dilute

Test for absence of ammonia; 100 c.c. should not afford a yellow tint when mixed with Nessler's reagent and observed in a glass tube of 1" diam.

Medicinal uses: Diluent, used in the preparation of drugs.

AQUA. Water, H_2O .

At ordinary temperatures this is a clear transparent liquid approximating more or less to the characters and reactions of Distilled Water. As is the case with all other elements, it occurs as a solid, a liquid, or a gas, under different conditions. At sea level it becomes solid at a temperature of 32° F. or 0° C., it is at its maximum density at about 39° F. (4° C.) and becomes an invisible vapour at 212° F. (100° C.).

Water is used in the Metric system as a means of connecting measures of weight with those of magnitude, a litre of water at 4° C. weighing a kilogramme, and occupying the bulk of a cubic decimetre. Similarly a gallon is the space occupied by 10 pounds by weight of water.

The water used for making medicinal preparation should be the purest obtainable; distilled, if possible. The best method of purifying water for ordinary use is to filter it, and then boil it, exposing it afterwards to the air in thoroughly clean vessels, so as to remove the mawkish taste. Natives of India purify water by rubbing the inside of the vessel with **Nermali** or **Clearing nut** (the seed of *Strychnos potatorum*, Linn.).

The amount of **hardness** of a water signifies the proportion of carbonates and sulphates of Lime or Magnesia it contains. Boiling precipitates the carbonates but not the sulphates. Hence that due to the presence of carbonates is termed **temporary hardness**, and that due to sulphates is termed **permanent hardness**.

Clark's Soap Test for ascertaining the degree of hardness of water:—Dissolve 1 oz. white curd soap in 1 gallon Proof Spirit. Add this gradually to a measured quantity of the water to be tested; note how much is required to be added before frothing begins. Compare this with standard solutions. Tables for this calculation have been compiled.

Testing an unboiled sample of water gives the **total hardness**; a boiled sample the **permanent hardness**; the difference between the two the **temporary hardness**.

Clark's process for softening water. A solution of lime is made by agitating soft water with quicklime, and allowing the sediment to settle. A carefully calculated proportion of this lime water is run into a tank containing the water to be softened; the milky sediment of calcium carbonate is allowed to settle, and the clear water thus softened is run off for use. By this process three-fourths of the hardness of the Thames' water (which

Medicinal properties and uses : Externally.—Water is used as cold, warm, hot, or vapour baths, also by sponging, douching, fomenting, for the following purpose ; **cleanliness, applying heat or cold directly to body, cooling the body by its evaporation, modifying the circulation** so as to relieve congestions (e.g., hot fomentation in pneumonia, cold to the spine in congestive sunstroke, or hot baths in infantile convulsions). The vapour inhaled, makes the expectoration more *fluid*, and so it is used as an **expectorant** in the dry stage of bronchitis.

Taken internally, warm water is an **emetic**. Water, as hot as can be drunk, in doses of about 10 ounces, is a **gastric sedative**.

It is used as a **cooling drink** in fevers. Except for cases of dropsy water is one of the best of **diuretics** and **diaphoretics**. If in sufficient quantity it is a good **lithontriptic**. A douche of hot water (120° F.) is a **styptic**, it is the best means of stopping post-partum hæmorrhage.

After absorption it relieves thirst. If taken in moderation it improves the digestion and absorption of food, also increases tissue change, and so tends to bring the body into a healthy condition, increasing or diminishing the fat as may be beneficial. If taken in great excess water may kill, by destroying the red corpuscles of the blood. It is excreted by the lungs, skin and kidneys, and so **assists the elimination of waste products**.

LIQUOR HYDROGENII PEROXIDI, B.P. Solution of Hydrogen Peroxide.

An aqueous solution of hydrogen peroxide, H_2O_2 ; prepared by the interaction of water, barium peroxide, and a dilute mineral acid at a temperature below 50° F.

Dose : $\frac{1}{2}$ to 2 fl. drm.

Characters : A colourless, odourless liquid ; taste slightly acid ; it renders the saliva frothy ; on heating, it decomposes into water and oxygen ; evaporated to dryness on a water-bath not more than $\frac{1}{2}$ p.c. solid residue should remain.

Medicinal properties : **Oxidising, Stimulant, Antiseptic.** Used as an escharotic or stimulant to foul ulcers : a gargle in diphtheritic throat.

It has been recommended as a gastric tonic or stimulant in dyspepsia, &c., but its value as an internal remedy is very doubtful.

Hydrogen Peroxide.

May be regarded as a molecule of water, with an atom of oxygen loosely attached ($H_2O.O$) the atom acting as nascent oxygen. In its purest form it is very unstable. That sold in shops contains about 10 volumes of available oxygen, and at this

most powerful **oxidising agents** known, and is used for bleaching delicate substances which would be injured by Chlorine. This action explains its use as a hair dye.

Ozonic Ether is a solution of Hydrogen Peroxide in Ether. It is used as a test for blood, the hæmoglobin acting as a carrier, and so enabling the free oxygen to unite with, and thus give a bluish tinge to the Tr. Guaiaci.

ACIDS.

Acids are substances which (1) combine with alkalis to form salts, (2) redden blue litmus, (3) turn brown turmeric paper yellow, and (4) as a rule have a sour taste.

CLASSIFICATION OF ACIDS BASED ON THEIR CHIEF ACTIONS.

(A) *Ordinary acids*—

Caustic—(*Inorganic*) Sulphuric, Hydrochloric, Nitric (*Organic*) Acetic.

Caustic Acids destroy animal tissue or, taken internally, are corrosive poisons, due to their coagulating albumen, their affinity for bases (forming salts) and for water.

Refrigerant—Dilute solutions of the caustic acids (*Inorganic*) Dilute Phosphoric Acid (*Organic*) Tartaric and Citric.

Diluted acids applied externally cool the skin in fevers. Internally the dilute or weaker acids increase the alkaline and diminish the acid secretions, and thus are sialagogue and refrigerant.

Uses of Ordinary Acids: Externally.—Nitric Acid is used to destroy piles, poisoned wounds, and spreading unhealthy sores. Glacial Acetic Acid is employed to destroy corns and warts. Dilute Acetic Acid is applied locally as a lotion to relieve headache, allay itching, and to check perspiration. Dilute Nitrohydrochloric Acid is used as a lotion or footbath in jaundice and biliousness.

Internally.—The refrigerant acids either alone or combined with alkaline carbonates are used to diminish thirst in fever. Dilute Hydrochloric Acid is given after meals to aid digestion in the dyspepsia of debilitated subjects, and before meals to check sour eructations. Dilute Nitric Acid and Nitrohydrochloric Acid are used for their action on the liver. Aromatic Sulphuric Acid is said to check diarrhoea and to act as a remote astringent but this is doubted. Phosphoric Acid is used as an alterative tonic, as it stimulates the healthy growth of bone and the red corpuscles of the blood. It is used also to prevent the formation of phosphatic calculi.

Even in poisonous doses, acids never succeed in making the blood have an acid reaction, but they reduce its alkalinity, so diminishing tissue change and slowing the pulsations. In this way they act as antipyretics and sedatives.

Ordinary doses of Citric, Tartaric, or Acetic Acid are converted into carbonates in the blood, and as such are excreted by the

ungs. Nitric Acid in some cases may be excreted as ammonia, and so even act as a remote antacid. Other acids are excreted with the urine and milk.

Care must be exercised in giving acids to nursing mothers, as the excessive acidity of the milk may produce griping or diarrhoea in the child.

(B) Acids with special actions—

Sedative.—(*Inorganic*) Dilute Hydrobromic Acid and Dilute Hydrocyanic Acid.

Astringent.—(*Organic*) Tannic Acid, Gallic Acid.

Antiseptic.—(*Inorganic*) Boric Acid, (*Organic*) Benzoic Acid, Carbolic Acid.

Antiparasitic.—(*Organic*) Chrysophanic Acid.

Preliminary test for Acid Radicles.

To a few drops of undiluted Sulphuric Acid in a test tube, add a few crystals of the substance to be tested; and if necessary apply heat.

Escape of colourless inodorous gas with effervescence—

			indicates a Carbonate.
"	"	brown fumes	... " " Nitrite.
"	"	reddish fumes	... " " Bromide.
"	"	violet fumes	... " " Iodide.
Odour of burning Sulphur	...		" " Sulphite.
"	"	" " with a yellow precipitate	" " Hyposulphite.
"	"	Chlorine gas	... " " Chloride or Hypochlorite.
"	"	Vinegar	... " " Acetate.
"	"	Bitter almonds	... " " Cyanide.
"	"	Rotten eggs	... " " Sulphide.

ACIDUM TARTARICUM, B.P. Tartaric Acid or dextro-rotatory hydrogen tartrate, $C_4H_6O_6$, prepared from Acid Tartrate of Potassium.

Dose : 5 to 20 grains.

Characters : Colourless monoclinic prisms; taste strongly acid; readily soluble in less than its own weight of water, or in less than 3 times its weight of alcohol (90 p.c.) 100 grains neutralise 133 grains Potassium Bicarbonate; it is distinguished from all other acids by giving with strong solutions of Potassium Acetate a crystalline precipitate of bitartrate, neutralised with an alkali it gives the reactions characteristic of a Tartrate.

- Medicinal properties:* Refrigerant, antacid.

ACIDUM CITRICUM, B.P. $\text{H}_8\text{C}_6\text{O}_7, \text{H}_2\text{O}$. Citric Acid.

Dose: 5 to 20 grains; may be given in a wine glass of water.

1. It becomes charred when heated.

- Medicinal properties:* **Refrigerant, Antiscorbutic.** It allays thirst in fevers, either alone or with alkaline carbonates. Used in scurvy, in the form of lime juice.

20 „ „ Sodium.

12 $\frac{3}{4}$ „ Carbonate of Ammonium.

ACIDUM BORICUM, B.P. Boric Acid.

Dose : 5 to 15 grains.

Characters : Colourless, pearly, lamellar crystals or irregular

Solubility : 1 in 30 cold water, 1 in 3 boiling water, 1 in 4 glycerin; 1 in 30 alcohol.

Reactions : It changes the colour of litmus to wine-red in the cold, a hot saturated solution giving a bright red colour.

Turmeric paper even when slightly acidulated with hydrochloric acid if moistened with boric solution becomes brownish-red on drying, on adding Liq. Potassæ, the colour changes to greenish-black. A solution in alcohol burns with a flame tinged with green, especially if Sulphuric Acid be added.

UNGVENTUM ACIDI BORICI, B.P. Boric Acid Ointment.

Strength : 10 p.c.

Preparation : Mix 1 oz. Boric Acid finely powdered and carefully sifted in 9 oz. white Paraffin Ointment.

BORAX, B.P. Borax.

Synonym : Biborate of Sodium.

This salt, Sodium pyroborate, $\text{Na}_2\text{B}_4\text{O}_7, 10 \text{H}_2\text{O}$, occurs native. It is also made artificially by neutralising native boric acid with sodium carbonate, or by boiling native calcium borate with solution of sodium carbonate.

Dose : 5 to 20 grains.

Characters : Transparent, colourless, crystals, sometimes slightly effloresced, reaction weakly alkaline; insoluble in alcohol (90 p.c.) solubility 1 in 25 of cold water, 2 in 1 of boiling water, 1 in 1 (by weight) of glycerin, it has the reactions of Sodium and Boric Acid.

GLYCERINUM BORACIS, B.P. Glycerin of Borax.

Preparation : Triturate 1 oz. Borax with 6 fl. oz. Glycerin until it is dissolved.

GLYCERINUM ACIDI BORICI, B.P. Glycerin of Boric Acid.

Strength 30 p.c. by weight of Boric Acid dissolved in Glycerin at a temperature under 302°F .

Medicinal properties : A mild **Antiseptic**.

Internally.—Used as an antiseptic in diseases of the alimentary tract and in cystitis; as a mouthwash (grains 10 to 15 in 1 ounce water); as a paint for the throat (20 per cent. in glycerin); as a pessary (grains 10 in gelatin mass or Oil of Theobroma); as an eyewash, (grains 2 to 8 in 1 ounce water). Also in surgery as ointment, lotion, or lint for healing surfaces. A good dusting powder for infants, and foetid perspiration is made by mixing together Boric Acid and starch.

MEL BORACIS, B.P. Borax Honey.

Preparation: Mix together 1 oz. Borax finely powdered, $\frac{1}{2}$ oz. Glycerin and 8 oz. clarified honey.

Applied locally in aphthæ, &c.

Medicinal properties: A mild antiseptic in action, it is similar to Boric Acid but less powerful and having the advantages of being more soluble and rather more of a sedative to mucous surfaces.

Boro glyceride is made by heating 92 parts Glycerin with 62 parts of Boric Acid. A $2\frac{1}{2}$ per cent. solution of this is a powerful antiseptic.

(*Sohágá, Tinkal, Hind.*). A more or less impure Borax, mixed with common salt, may be purchased in Indian bāzārs. Borax is largely imported from Nepal and Tibet.

ACIDUM ACETICUM, B.P. Acetic Acid.

A product of the destructive distillation of wood and of the oxidation of ethylic alcohol. 100 parts should contain 33 p.c. by weight of hydrogen acetate, $\text{CH}_3 \cdot \text{COOH}$, dissolved in water.

Characters: A clear colourless liquid, odour pungent; taste sour; reaction acid; when neutralised with an alkali gives the reactions of acetates.

Medicinal properties: Externally, **Caustic and Vesicant**.

Used as a **caustic** to warts and corns, and as a **vesicant** in kidney disease in cases where cantharides is contraindicated. The vapour lessens drowsiness, also tends to avert syncope, as well as to arouse a patient from it.

Undiluted Acetic Acid is not used internally.

ACIDUM ACETICUM DILUTUM, B.P. Dilute Acetic Acid.

Preparation: Dilute $2\frac{1}{2}$ fl. oz. Acetic Acid with water sufficient to make 1 pint.

Dose: $\frac{1}{2}$ to 2 fl. drms.

Strength: 4.27 p.c. by weight of Hydrogen Acetate.

Medicinal properties: Dilute Acetic Acid is **Refrigerant, Astringent**.

Used (1 part dilute acid in 10 of water) as a cooling lotion applied to the skin in headache, or on lint to sprains and bruises, also sponged over the skin to check profuse perspiration in fevers. As an astringent gargle ($1\frac{1}{2}$ drms. dilute acid to 1 oz. water.). As a styptic in epistaxis, or bleeding after leech bite, or tooth extraction.

Internally: the dilute acid is used to allay thirst; to reduce the sweating of hectic fever; as an antidote for alkali or carbolic acid poisoning, and as a pick-me-up ($\frac{1}{2}$ oz. in a tumbler of water) in alcoholic or narcotic cerebral congestion.

It may be used as a substitute for vinegar.

ACIDUM ACETICUM GLACIALE, B.P. Glacial Acetic Acid.

Contains 99 p.c. by weight of Hydrogen Acetate.

Characters: At ordinary temperatures it is a clear colourless liquid with a very pungent odour: it crystallises when sufficiently cooled and remains crystalline until the temperature rise to 60° F.; neutralised it gives the reaction of acetates. It dissolves camphor, gum, resins, turpentine and volatile oils.

It is used only externally as an escharotic for corns and warts, and to make aromatic vinegar.

ACETUM. Vinegar.

A brown acid liquid with a sour taste and odour. Made from grain by acetous fermentation.

Action and Uses.—Are the same as those of dilute Acetic Acid (q.v.).

Dose: 1 to 2 fl. drms.

Country Vinegar (*Sirka*, Hind.) is made all over India from the saccharine juice of various plants.

ACIDUM HYDROCHLORICUM, B.P. Hydrochloric Acid.

A liquid containing 31.79 p.c. by weight of hydrogen chloride, HCl, in water; obtained by dissolving in water the gas produced by the interaction of sulphuric acid and sodium chloride.

Characters: A colourless strongly acid liquid, emitting white pungent fumes; when neutralised it yields the reactions characteristic of chlorides.

Test for absence of free chlorine. Dilute the acid with much water, add solution of potassium iodide; no blue colour is produced on adding mucilage of starch.

ACIDUM HYDROCHLORICUM DILUTUM, B.P. Dilute Hydrochloric Acid.

Contains 10.58 p.c. by weight of hydrogen chloride, HCl.

Dose: 5 to 20 minims; may be given with aromatic or bitter infusions.

Preparation: To 6 fl. oz. Hydrochloric Acid, add distilled water sufficient to make 20 oz.

Gaseous Hydrochloric Acid, B.P. Appendix, is the dry gas, HCl, prepared by the interaction of Sulphuric Acid and common salt.

Medicinal properties: Are those of the ordinary inorganic acids generally.

The strong acid externally is a **Caustic** but is rarely so used.

Dilute Hydrochloric Acid is a **Refrigerant Tonic**, used to **quench thirst** in fever. Being the acid of digestion, it is given in cases of **dyspepsia** due to deficiency of acid in the stomach; it is best given after meals.

In phosphatic urine it diminishes the deposit.

Acidum Hydrochloricum is known also as **Spirit of Salt** or **Muriatic Acid**.

Incompatibles: With Silver, Lead Salts, Tartar Emetic, or Ammonia, less soluble compounds are formed, but these become soluble on advancing further along the alimentary canal.

ACIDUM HYDROBROMICUM DILUTUM, B.P. Diluted Hydrobromic Acid.

An aqueous solution containing 10 p.c. by weight of hydrogen bromide, HBr; may be obtained by the distillation of potassium bromide with concentrated phosphoric acid.

Dose: 15 to 60 mins. May be given in Syrup.

Characters: A clear colourless liquid, without odour, taste and reaction strongly acid; may be completely volatilised by heat; when neutralised it gives the reaction of bromides.

Medicinal properties: It is a nervous sedative. As it does not produce the feeling of depression which follows the use of Bromide of Potassium, it is preferred when large doses or continued use is indicated. It quiets palpitation, nervousness, etc., relieves headache or singing in the ears; is an **antidote** for the toxic symptoms of tea, coffee and quinine; and is given with quinine for nervous exhaustion. 1 fl. drm. contains the same quantity of Bromine as $8\frac{2}{3}$ grains Bromide of Potassium.

ACIDUM HYDROCYANICUM DILUTUM, B.P. Diluted Hydrocyanic Acid. Known also as **Prussic Acid**.

An aqueous solution containing 2 p.c. hydrogen cyanide, HCN. May be prepared by the interaction of diluted sulphuric acid, and potassium ferrocyanide. As this is very dangerous, it should not be attempted without special precautions.

Dose: 2 to 6 minims. Being a powerful poison it should never be prescribed alone.

Characters: A colourless liquid with peculiar odour, somewhat resembling peach blossom, or oil of bitter almonds. When inhaled it produces a peculiar ethereal bitter sedative sensation in the back of the mouth. Being volatile it only transiently reddens litmus paper; when neutralised it gives the reactions of cyanides.

Dilute Hydrocyanic Acid should be stored in a dark place, in small stoppered bottles of amber coloured glass, the stoppers being tied over with impervious tissue and the bottles inverted.

when unbroken. **Internally** to relieve vomiting or gastric irritability, also functional palpitation due to dyspepsia; also to relieve coughs. Its vapour (10 to 15 minims in water 60 minims. Mix in a suitable vessel and inhale the vapour), is used to lessen irritability of the respiratory passages.

In small doses applied to the skin or mucous membrane, it is rapidly absorbed and paralyses the sensory nerves, so numbing the part and diminishing the sense of touch.

Scheele's Hydrocyanic Acid contains 4 p.c. of hydrogen cyanide; its only practical use is to destroy dogs and cats.

Incompatibles: Salts of Silver, Copper and Iron, Red Oxide of Mercury and Sulphides.

Prussic Acid as a poison: It is one of the most rapid poisons known. One-drop of the pure acid injected into the eye, nose, or mouth of a small animal causes it to fall down dead as if struck by lightning. This dose is sufficient to kill even a large animal.

Lethal dose: In man 45 mins. B.P. Hydrocyanic Acid.

The *symptoms* begin in a few seconds or minutes after the poison is taken, coma comes on almost immediately; with face gorged, eyes staring, pupil dilated and insensible to light; foaming at mouth; muscles relaxed, respiration slow, interrupted or stertorous; pulse almost imperceptible, skin cold clammy; if the dose is just sufficient to kill there will be convulsions. Death usually occurs in 15 to 20 minutes, or rarely longer than an hour.

Treatment: Fresh air; cold affusion to head and spine, diffusible stimulants, artificial respiration. The so-called antidotes are of little avail, the poison is absorbed into the blood so rapidly.

ACIDUM LACTICUM, B.P. Lactic Acid.

A liquid containing 75 p.c. hydrogen lactate, $\text{HC}_3\text{H}_5\text{O}_3$; may be produced by the fermentation of lactose or sugar of milk.

Characters: A colourless, syrupy, hygroscopic liquid, without odour; taste very sour, reaction acid; miscible in all proportions with water, alcohol (90 p.c.) or ether. Sp. gr., 1.21.

Medicinal properties: Undiluted a solvent for false membranes; diluted in doses of 5 to 20 mins. with 6 or 7 times its volume of water, a Tonic and refrigerant.

SYRUPUS CALCII LACTOPHOSPHATIS, B.P. Syrup of Calcium Lactophosphate.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Preparation: Dilute $2\frac{1}{2}$ fl. oz. Lactic Acid with 10 fl. oz. Distilled Water, to this add gradually $2\frac{1}{2}$ fl. oz. precipitated Calcium Carbonate, dissolve; add 4 fl. oz. 262 mins. Concentrated Phosphoric Acid and triturate until the precipitate which at first forms is dissolved; dilute with a little Distilled Water; add $2\frac{1}{4}$ fl. oz.

oz. Refined Sugar in the mixture without the aid of heat; strain; add Distilled Water sufficient to make 5 pints.

Medicinal properties: **Tonic**, specially useful in **phthisis**.

It has the action of phosphates, and the lime present favours the calcareous degeneration of tubercular tissue.

ACIDUM NITRICUM, B.P. Nitric Acid.

A liquid containing 70 p.c. by weight of hydrogen nitrate, HNO_3 , dissolved in water, prepared by the interaction of sulphuric acid and potassium or sodium nitrate.

Characters: A colourless heavy liquid, sp. gr., 1.42; very acid, giving off brownish acrid suffocating fumes, which, if inhaled, may produce a spasm of the glottis so prolonged as to cause death within a few minutes by suffocation, or some hours later an intense bronchitis may result. Should strong Nitric Acid be spilled in a room no one should be allowed to enter until it has been thoroughly ventilated.

Nitric Acid stains the skin yellow.

When neutralised it gives the reaction characteristic of a Nitrate.

ACIDUM NITRICUM DILUTUM, B.P. Diluted Nitric Acid.

A clear liquid very acid. Sp. gr., 1.101. It contains 17.44 p.c. by weight of hydrogen nitrate.

Dose: 5 to 20 mins., prescribed with bitter infusions or Tr. Aurant.

Preparation: Mix 3 fl. oz. 7 fl. drms. Nitric Acid with water sufficient to make one pint.

Medicinal properties: **Refrigerant, Tonic, Antiseptic.** Dilute Nitric Acid has the same action as other dilute inorganic acids. It is used to **quench thirst** in febrile condition, in dyspepsia, and as a **cholagogue** in biliousness. After absorption into the blood it **diminishes the secretion** from the lungs in bronchitis and in **phthisis**. It is useful also in **syphilis**, in debilitated subjects. Much diluted it has been injected into the bladder to dissolve phosphatic calculi.

Fuming Nitric Acid, B.P. Appendix.

Nitric Acid of Sp. gr., 1.5. Used in chemical testing.

Medicinal properties: The undiluted acid is a powerful **caustic**, but by coagulating the albumen it forms a barrier to its further destructive action. Internally it is a corrosive poison. It is used externally to destroy unhealthy tissue (e.g., **chancres**) or the virus of poisonous bites, or unhealthy ulceration.

ACIDUM NITRO-HYDROCHLORICUM DILUTUM, B.P.

Diluted Nitro-Hydrochloric Acid.

An aqueous solution of free Chlorine, Hydrochloric, Nitric, and

Dose : 5 to 20 mins. diluted ; may be given with bitters.

Characters : A colourless liquid with a pungent acid odour and taste ; sp. gr., 1.07.

Preparation : Mix 3 fl. oz. Nitric Acid, 4 fl. oz. Hydrochloric Acid, and 25 fl. oz. Distilled Water. Keep the mixture in a stoppered bottle for 14 days before using.

Medicinal properties : **Tonic, Stomachic, Alterative.**

Uses : Internally in **dyspepsia, biliousness, jaundice, oxaluria and eructations** with rotten-egg odour ; it removes the **headaches** due to these conditions.

Externally : It is used as a *bath* for hepatic obstruction. To prepare this add 8 oz. acid to a gallon of water at 96° F. In this soak a strip of flannel about 7 feet long and 12 inches wide, wring it out, so that it remains only damp. Apply this round the abdomen and cover with a piece of oiled silk, to avoid damping the clothes. This should be worn constantly, renewing it morning and evening.

The actions of diluted Nitro-Hydrochloric Acid are those of the dilute inorganic acids. It is a **hepatic stimulant** of considerable power.

Aqua Regia. A mixture of 1 measure of Nitric Acid with 3 measures of Hydrochloric Acid.

It is used for dissolving gold, platinum, etc.

ACIDUM PHOSPHORICUM CONCENTRATUM, B.P. Concentrated Phosphoric Acid.

A liquid containing 66.3 p.c. of hydrogen orthophosphate dissolved in water ; may be prepared by treating with water and Nitric Acid the residue left after burning phosphorus in air.

Characters : A colourless and odourless syrupy liquid with an acid taste and reaction, sp. gr., 1.5 ; evaporated it leaves a residue which melts at a low red heat ; and when cold forms a glass-like mass ; when neutralised it gives the reactions of phosphates. It does not coagulate albumen.

It is not used externally, internally the Diluted Acid is used.

ACIDUM PHOSPHORICUM DILUTUM, B.P. Diluted Phosphoric Acid.

A liquid containing 13.8 p.c. by weight of hydrogen orthophosphate dissolved in water.

Dose : 5 to 20 mins. largely diluted. May be given with some bitter or aromatic tincture, or syrup, or with the syrup of the Phosphate of Iron.

Characters : A colourless liquid, sp. gr., 1.08.

Preparation : Mix 3 fl. oz. Concentrated Phosphoric Acid with

Medicinal properties: **Tonic, Refrigerant.** Its actions are similar to those of other dilute inorganic acids. It is used internally to **allay thirst**. As it has less tendency than other mineral acids to derange the digestion, it is preferred in cases where acid has to be continued for a length of time.

After absorption it has the same action as phosphates (e.g., in scrofula, etc.). It is a remote **antalkali**.

Incompatibles: With the alkaline earths it forms almost insoluble compounds.

ACIDUM SULPHURICUM, B.P. Sulphuric Acid; known also as Oil of Vitriol.

An Acid produced by the combustion of sulphur or pyrites, and the oxidation and hydration of the resulting sulphurous anhydride by means of nitrous and aqueous vapour. It should contain 98 p.c. by weight of hydrogen sulphate, H_2SO_4 .

Characters: A colourless corrosive intensely acid liquid of oily consistence without smell, sp. gr., 1.843. It discolours most organic substances, black cloth is stained reddish; it has a great affinity for water; when mixed with it, much heat is evolved; to prevent accident the acid should be slowly poured into the water. When neutralised it gives the reactions of sulphates.

Medicinal properties: Is a powerful **caustic**, and is used as such mixed with charcoal. If swallowed undiluted it is a corrosive poison.

ACIDUM SULPHURICUM AROMATICUM, B.P. Aromatic Sulphuric Acid.

Synonym: Elixir of Vitriol.

Dose: 5 to 20 mins.

Preparation: Pour gradually 3 fl. oz. Sulphuric Acid into 29½ fl. oz. Alcohol (90 p.c.); add ½ fl. oz. Spirit of Cinnamon and 10 fl. oz. Tincture of Ginger.

ACIDUM SULPHURICUM DILUTUM, B.P. Dilute Sulphuric Acid.

Dose: 5 to 20 mins. diluted.

Preparation: Pour very gradually 1 fl. oz. and 5½ fl. drams. Sulphuric Acid into 10 fl. oz. Distilled Water; stir and cool the mixture; add Distilled Water sufficient to make one pint.

Medicinal properties: Diluted Sulphuric Acid is **Tonic, Refrigerant, Astringent**; used internally to **check thirst**; to **prevent absorption of lead** in paint trades, &c., as an **astringent** in diarrhoea, hemorrhage, night sweat and mucous discharges. As the microbe of cholera proliferates only in alkaline fluids, dilute Sulphuric Acid with Quinine is given as a **cholera preventive**.

Its actions are those of diluted inorganic acids.

ACIDUM SULPHUROSUM, B.P. Sulphurous Acid.

An aqueous solution containing 5 p.c. by weight Sulphurous Anhydride, SO_2 , corresponding to 6.4 p.c. of hydrogen sulphite, H_2SO_3 .

Sulphurous anhydride may be prepared by burning sulphur in air or oxygen, or by boiling sulphuric acid with carbon, mercury, or copper.

Dose: 5 to 1 fl. drm.

Characters: A colourless liquid, with a pungent sulphurous odour; sp. gr., 1.025; when neutralised it gives the reactions characteristic of sulphites.

Medicinal properties: **Disinfectant, Antiseptic.** Used as a spray (1 in 2 of water) in ulcerated sore throat; as an inhalation (1 fl. drm. in 20 oz. water).

It has been given internally to prevent flatulence due to fermentation.

Action: Is a powerful deoxidising agent, and therefore **disinfectant**; **antiseptic** and destructive to vegetable life.

ALKALIS, ALKALINE EARTHS AND ALKALOIDS.—

Alkalis.—Are inorganic substances which have the power of (1) uniting with acids to form salts; (2) changing yellow turmeric to brown; and (3) restoring the blue colour to litmus which has been reddened by an acid; and (4) their carbonates and phosphates are soluble in water.

The Alkalis may be considered as of two groups—

1. *Volatile.*—Ammonia (being volatile) differs considerably in its action from the fixed Alkalis. (See Ammonia, page 235).

2. *Non-volatile or fixed.*—Potassium, Sodium and Lithium.

General properties of the fixed Alkalis. (1) They are powerfully **antacid**, (2) their oxides are very **alkaline** in reaction, (3) with water they form hydrates. Concentrated they are **caustic**, due to their dissolving gelatin and albumen, saponifying fats, and to their affinity for acids and water. If swallowed undiluted they are **corrosive poisons**.

Diluted applied externally they soften and **soothe** the tissues and so are opposed to astringents. Internally, in large doses, they cause serum to pass from the blood into the alimentary canal, therefore are **purgative**. After absorption they **increase the alkalinity of the blood** and body generally, so favoring oxidation and tissue change; therefore are given in gout and rheumatism. Prolonged administration may produce emaciation. They are excreted by the kidneys. Potassium and Lithium are **diuretic**; they tend to **dissolve acid calculi**.

The **Alkaline Earths** (Lime, Magnesia, Barium), resemble Alkalis in their reaction, but act more feebly. Their carbonates are

The **Alkaloids** are organic substances which resemble Alkalies in forming salts with acids. Those which are official are—

Alkaloids derived from Opium, *e.g.*, Morphine, Codeine, Apomorphine.

Aconitine.

Atropine, Hyoscyamine, Hyoscine, Homatropine.

Caffeine or Theine.

Cocaine.

Physostigmine or Eserine.

Pilocarpine.

Quinine.

Strychnine.

Veratrine.

Ammonium, NH_4 . A compound radical which acts in nearly every way as an element. It is said to have been isolated as a dark blue liquid with a metallic lustre; but is able to exist in an uncombined state only at a low temperature and high pressure.

In early times Sal Ammoniac was obtained from the combustion of camel's dung. This process was carried on to a considerable extent in the neighbourhood of the temple of Jupiter Ammon in Egypt, hence the name Ammonia.

The compound NH_4HO (corresponding to KHO), is not known to exist separately; possibly some of the Ammonia in Ammoniacal Solutions may exist in this form.

Ammonia, NH_3 . A colourless transparent gas, with pungent peculiar odour, and strongly alkaline reaction; sp. gr., 0.59; may be condensed by cold or pressure to a colourless liquid. Over 600 volumes may be dissolved in 1 volume of water at ordinary temperatures. Solutions of Ammonia have a specific gravity less than that of water; they give up all the Ammonia on being boiled.

AMMONIA is obtained principally from the destructive distillation of coal, also from the decomposition of organic matters.

Medicinal properties: All the ammoniacal salts used in medicine are volatile. Its effect is transient, and, therefore, the interval between the doses should be comparatively short. The general effect of Ammonia and its preparation on the body is **stimulant** in small doses. It is excreted by the mucous membranes of the respiratory tract rendering the expectoration more fluid and easily discharged. It does not render the urine more alkaline, and so is not a remote ant-acid. It is poisonous in large doses, paralysing the spinal cord, motor nerves and muscles. The special action depends largely on the acid with which it is combined.

LIQUOR AMMONIÆ FORTIS, B.P. Strong Solution of Ammonia.

Chloride with slaked lime; and passing the resulting Ammonia gas into Distilled Water.

Characters: A colourless liquid, odour very pungent and characteristic; strongly alkaline; Sp. gr., 0.891 may be used *externally* as a **rubefacient**, **counterirritant** or **vesicant**, depending on strength and length of application.

LIQUOR AMMONIÆ, B.P. Solution of Ammonia.

An aqueous solution containing 10 p.c. by weight of Ammonia, NH_3 . Sp. gr. 0.959 obtained by mixing 1 part of Strong Solution of Ammonia with 2 parts of water.

Medicinal properties: *Externally*, Ammonia relieves the stings of insects and the bites of the less poisonous snakes.

Inhaled, the gas is a powerful **stimulant** used in nervous headache, fainting or shock, but it must not be applied for long, as it may bring on bronchitis.

Internally, it is given diluted in syncope and as an **antispasmodic** in flatulence and colic.

For internal administration it is better given in the form of aromatic spirit of ammonia.

LINIMENTUM AMMONIÆ, B.P. Liniment of Ammonia.

Strength: 1 in 4.

Preparation: Shake together 1 fl. oz. Solution of Ammonia, 1 fl. oz. Almond Oil, 2 fl. oz. Olive Oil.

It should be made fresh when required as it deteriorates, becoming saponified by keeping. Cotton seed oil makes a satisfactory and permanent emulsion.

Medicinal properties: **Counterirritant**, used *externally* in rheumatic pains, stiffened joints, and bronchitis.

SPIRITUS AMMONIÆ AROMATICUS, B.P. Aromatic Spirit of Ammonia.

Synonyms: Spiritus Ammoniae Compositus, Spirit of Sal Volatile.

Preparation: Distil Oil of Nutmeg, Oil of Lemon, Alcohol (90 p.c.) and water; dissolve Ammonium Carbonate in a portion of the distillate; add strong solution of Ammonia; mix and filter.

Dose: 20 to 40 mins. for repeated administration, for a single dose 60 to 90 mins.

Characters: A transparent liquid, with pungent ammoniacal odour or flavour; liable to darken slightly on keeping: Sp. gr., 0.890; on adding water it becomes milky.

Medicinal properties: **Stimulant**, **Carminative**, **Antispasmodic**. Used to relieve feeling of faintness or depression. For nervous headache it is more effective if combined with Ammonium

Its actions are the same as Ammonium Carbonate.

SPIRITUS AMMONIÆ FETIDUS, B.P. Fetid Spirit of Ammonia.

Dose : 20 to 40 for repeated administration, for a single dose 60 to 90 mins.

Strength : 10 p.c. Strong Liquor Ammonia and $7\frac{1}{2}$ p.c. Asafetida in Alcohol (90 p.c.).

Medicinal properties : A Stimulating Antispasmodic.

LIQUOR AMMONII ACETATIS, B.P. Solution of Ammonium Acetate. Known also as **Mindererus, Spirit.**

It should be stored in green (i.e., lead free) bottles.

Dose : 2 to 6 fl. drms.

Preparation : Dissolve 1 oz. Ammonium Carbonate in 10 fl. oz. Distilled Water, add Acetic Acid sufficient to neutralise ; then add Distilled Water sufficient to make one pint.

Medicinal properties : Stimulating, Refrigerant, Diaphoretic, Diuretic.

Used as an eyewash and as a lotion to inflamed parts. Given internally, combined with Spt. Eth. Nitrosi ; in influenza, cattarrhs, and feverish conditions ; also in dysmenorrhœa.

It acts as a diaphoretic if the body be kept warm ; as a diuretic if it be kept cool.

AMMONII BENZOAS, B.P. Ammonium Benzoate.

Obtained by neutralising Benzoic Acid with Solution of Ammonia.

Dose : 5 to 15 grains.

Characters : Colourless lamellar crystals with odour of Benzoin, permanent in air, with a saline bitter and afterwards slightly acrid taste, and neutral re-action. When heated it sublimes without residue. When Sulphuric Acid is added Benzoic Acid is deposited ; solubility 1 in 6 of cold water, 1 in 30 Alcohol (90 p.c.). It gives the reactions of Ammonium and of Benzoic Acid.

Medicinal properties : A Stimulating Diuretic used to render the urine acid where there is a tendency to phosphatic deposits.

Its action are those of Ammonium and Benzoic Acid. It is a hepatic, but not an intestinal stimulant.

Being more soluble than Benzoic Acid it acts more quickly.

The Ammonia facilitates the excretion of Uric Acid, thus acting as a remote antalkali.

Incompatibles : Alkalis drive off the Ammonia, Ferric Salts produce a bulky reddish-yellow precipitate.

AMMONII BROMIDUM, B.P. Ammonium Bromide ; obtained by neutralising Hydrobromic Acid with Solution of Ammonia.

Characters: Small colourless crystals, taste pungent saline; on exposure to the air they become yellowish, due to decomposition; its solutions give the reactions of Ammonia and Bromides; soluble in water, less so in alcohol (90 p.c.); may be sublimed unchanged by the application of heat.

Medicinal properties: **Nervine Sedative**. Used in hysteria, in nervous sleeplessness without pain or organic disease, headache, neuralgic pains, the itching of prurigo, in whooping coughs and other laryngeal irritation.

Ammonium Bromide has the same action and uses as Potassium Bromide, only is not depressing. A mixture of two of Pot. Brom., two of Sod. Brom., and one of Amm. Brom. gives better results than any one of these salts alone.

AMMONII CARBONAS, B.P. Ammonium Carbonate.

A variable mixture of Ammonium Hydrogen Carbonate, NH_4HCO_3 , and Ammonium Carbonate, $\text{NH}_4\text{NH}_2\text{CO}_3$, produced on heating Ammonium Sulphate or Chloride with Calcium Carbonate.

Dose: 3 to 10 grs. as a stimulant or expectorant.

Characters: Translucent crystalline masses; odour ammoniacal; reaction alkaline; solubility 1 in 4 of cold water. When heated it volatilises completely; is readily dissolved by all acids with effervescence. 15 grains is able to neutralise 17 grains Citric Acid or $18\frac{1}{2}$ grains Tartaric Acid. Gives the reactions of an ammoniacal salt and a carbonate, exposed to the air it becomes covered with a white efflorescence which should be only superficial, this should be scraped off before the salt is used for dispensing purposes.

Medicinal properties: **Stimulant, Expectorant, Antacid, Sudorific**. In doses of 30 grains it is used as a stimulating emetic in debilitated patients, in bronchitis with thick viscid mucus.

Used as an inhalation as smelling-salts or given internally for similar purposes to Liq. Ammonia. It increases the gastric and intestinal juices, and, therefore, is given as a tonic for dyspepsia, flatulence and colic. It is a respiratory stimulant. Combined with Ipecacuan it is given in chronic bronchitis, broncho-pneumonia, and asthma associated with heart disease; is used in measles and scarlet fever in 3 to 5 grain doses every 1, 2 or 3 hours; is given with Pot. Iod. to prevent Iodism.

The following prescription: Amm. Carb., 5 to 10 grains; Tr. Capsici, 10 mins., and any bitter infusion 1 oz., is useful to relieve a feeling of sinking and depression in the stomach, also to relieve the craving for alcohol in drunkards.

The name **Sal Volatile** properly belongs to Ammonium Carbonate. Aromatic Spirit of Ammonia is Spirit of Sal Volatile.

AMMONII CHLORIDUM, B.P. Ammonium Chloride.

NH_4Cl ; obtained by neutralising crude Solution of Ammonia

Dose: 5 to 20 grains. To disguise its taste Liquorice may be added.

Characters: Colourless crystals, inodorous. On heating it volatilises without decomposition.

Solubility, 1 in 3 cold water, 1 in 60 alcohol (90 p.c.). It gives the reactions of Ammonium salts and of Chlorides.

Medicinal properties: Stimulating Expectorant, Cholagogue, Diaphoretic, Diuretic, Alterative.

As cold is produced by its solution in water, Ammonium Chloride is used locally as a cooling lotion in headache, apoplexy and acute head conditions; also in sprains, bruises, local inflammation, etc., to allay the itching of prurigo and to remove glandular enlargements. It stimulates the gastric mucous membrane, and therefore is used in the gastric catarrh which occurs in persons not much debilitated. It has no stimulant action directly on the liver, but acts powerfully on the intestines, so relieving hepatic congestion and the dropsy due to hepatic disease. It is given internally also by inhalation, or in lozenges (2-5 gr.), in bronchial catarrh without fever, where the bronchial secretion is scanty and difficult to bring up; not when it is profuse. As an alterative it is given in rheumatic pains, neuralgia and neuralgic headaches in 20 gr. doses, thrice daily or oftener; it should relieve after four or five doses, if not it is useless continuing it.

Sal Ammoniac gr. 10, Spirit Chlorof. 10 mins., syrup 30 mins., in 3 oz. water, frequently sipped, allays distressing fits of coughing in bronchitis.

A convenient method of inhaling it for chronic bronchitis, is to heat a small quantity of the salt in any convenient vessel over a spirit lamp, and inhale the fumes.

Sal Ammoniac in a very impure form is obtainable in most Indian bazaars (*Nousádar*, Hind.). To fit it for medical use, dissolve it in boiling water; strain through calico; expose the clear portion in an open vessel to crystallise.

LIQUOR AMMONII CITRATIS, B.P. Solution of Ammonium Citrate; obtained by dissolving $2\frac{1}{2}$ oz. Citric Acid in about $12\frac{1}{2}$ oz. Distilled Water, neutralising with Ammonium Carbonate, and adding Distilled Water to produce one pint. It should be preserved in green (*i.e.*, lead free) glass bottles.

Dose: 2 to 6 drms.

Medicinal properties and Uses: Are the same as Liquor Ammonii Acetatis, only more agreeable.

AMMONII NITRAS. Ammonium Nitrate.

White, deliquescent, irregular crystals, taste bitter acid. Soluble in water. Made by neutralising Amm. Carb. with Nitric

Ammonium Picrate.

Pale yellow, needle-like crystals, taste bitter. Slightly soluble in water. It should be kept in liquid form, as if dry it is powerfully explosive.

Used for malarious fever, especially the chronic varieties.

Dose : $\frac{1}{2}$ grn. four or five times daily.

Ammonium Oxalate, B.P. Appendix.

Colourless crystals, prepared by neutralising Oxalic Acid with Solution of Ammonia. Used in chemical testing.

Ammonium Molybdate, B.P. Appendix.

A nearly white crystalline salt, $(\text{NH}_4)_2 \text{MoO}_4$.

Ammonium Thiocyanate, B.P. Appendix.

A crystalline salt, $\text{NH}_4 \text{SCN}$.

AMMONII PHOSPHAS, B.P. Ammonium Phosphate; obtained by neutralising Phosphoric Acid with solution of Ammonia.

Dose : 5 to 20 grains.

Characters : Transparent, colourless prisms; solubility 1 in 4 of cold water, insoluble in alcohol (90 p.c.). It gives the reactions of ammoniacal salts and of phosphates.

Medicinal properties : **Cholagogue, Alterative.** Given in gout and rheumatism. It is a powerful hepatic, but not an intestinal stimulant. It facilitates the removal of Uric acid from the system.

Potassium. K. *Atomic weight 39.*

The letter K (the first letter of the word *Kali* the Arabic for Potash; hence *Alkali*) has been chosen as the symbol for Potassium.

Characters : A soft metal, cutting like wax; of a silvery-white colour, but tarnishing immediately on being cut; it has a great affinity for oxygen; when thrown upon water it combines with the oxygen of the water, evolving heat sufficient to set the liberated hydrogen on fire, a solution of potash being the result.

Medicinal actions : The prolonged use of even small doses of Potassium Salts is apt to cause depression; larger doses continued for some time, diminish the force of the circulation, and the contractile power of both voluntary and involuntary muscles.

Potassium Salts are more readily absorbed and excreted than Sodium salts.

Reactions : 1. Potassium compounds, moistened with Hydrochloric Acid, give a violet coloration when introduced on platinum wire into the flame of a spirit lamp; seen through blue glass the flame appears red.

2. If Tartaric Acid be added to a solution of a salt of Potassium combined with an Organic Acid, crystalline Cream of Tartar is formed. In the case of salts of Potassium combined with

3. With Perchloride of Platinum a moderately strong solution of Potassium chloride gives a yellow crystalline precipitate, in the case of other preparations of potassium a little Hydrochloric Acid must be added to produce this reaction.

The preparations of Potassium are derived from wood-ashes, natural nitrates, or from the fermentation of wines.

POTASSA CAUSTICA, B.P. Potassium Hydroxide.

Synonym: Caustic Potash, Potassium Hydrate, KOH, with not more than 10 p.c. of combined water and impurities: prepared by the interaction of potassium carbonate and calcium hydrate. It should be preserved in green-glass bottles, with air-tight stoppers.

Characters: Hard white pencils or cakes, very deliquescent, powerfully alkaline, and corrosive; sp. gr., 1.058. It gives the reactions of potassium; solubility, 2 in 1 of water, 1 in 2 of alcohol (90 p.c.).

Used only externally as a Caustic for tumours, &c.

LIQUOR POTASSÆ, B.P. Solution of Potash.

An aqueous solution containing 6.2 grains of potassium hydroxide in 110 mins.

Dose: 10 to 30 mins. freely diluted. May be given in milk.

Characters: A colourless liquid, odourless, tasteless, and reaction alkaline. It has a soapy feeling when rubbed between the fingers.

For dispensary purposes it may be prepared by dissolving 1 part Caustic Potash in 14 of water, and adjusting the gravity.

Medicinal properties: A powerful solvent of organic matter therefore used *externally* as caustic in bites of venomous animals, also diluted to 1 to 6 with water to soften ingrowing toe-nails; still more diluted as a wash in chronic skin diseases.

Internally: It is gastric sedative and a direct antacid. In irritative dyspepsia it has a sedative action on the stomach, and so is preferred to Pot. Bicarb.

After absorption it acts as an alterative, and as such is used in inflammations of serous membranes, e.g., pleurisy, pericarditis. It increases and liquefies the bronchial secretion, and therefore is used as an expectorant in bronchitis with thick viscid mucus. Is given in scaly skin diseases associated with gastric acidity; in both acute and chronic rheumatism; and to cause absorption of fat in stout persons, but if taken to excess it may destroy the general health. It is very rapidly excreted acting as a remote antacid.

Incompatibles: Belladonna, Henbane and Stramonium are destroyed by Caustic Potash; from ammoniacal preparations the ammonia is volatilised; with acids, acid salts, and metallic salts, combinations of potassium are formed.

POTASSA SULPHURATA, B.P. Sulphurated Potash.

Synonym: Liver of Sulphur.

A Mixture of salts of Potassium, the chief of which are Potassium Sulphides; obtained by fusing together 2 of Potassium Carbonate and 1 of Sublimed Sulphur, breaking into fragments and immediately enclosing in a green glass-stoppered bottle.

Characters: Solid greenish fragments, liver-brown when recently broken, alkaline, taste acrid; readily forming with water a yellow solution which has the odour of Hydrogen Sulphide; about 50 p.c. is soluble in alcohol (90 p.c.).

Medicinal properties: **Solvent, Antiparasitic.** Used *externally* in chronic skin diseases and scabies as an ointment (1 of Sulphurated Potash in 15 of mixed hard and soft Paraffin), in a bath (4 oz. dissolved in 30-gallons water); a hot bath of Sulphurated Potash relieves the itching of jaundice.

It is not used *internally*.

POTASSII ACETAS, B.P. Potassium Acetate.

Prepared by fusing the result of the interaction of Acetic Acid and Potassium Carbonate.

Dose: 10 to 60 grains. May be given in simple solution or with a little sugar.

Characters: Either in white foliaceous, satiny masses, or in granular particles; very deliquescent, alkaline; taste agreeably acid; solubility, 2 in 1 of water, 1 in 2 of alcohol (90 p.c.).

It gives the reactions of potassium and of acetates.

Medicinal properties: It is one of the most powerful of **diuretics**. Used in dropsies; as a remote **antacid** in gout; and as an **alterative** in acute rheumatism, skin disease and enlarged glands. In large doses concentrated it is a **purgative**.

POTASSII BICARBONAS, B.P. Potassium Bicarbonate.

Synonym: Potassium Hydrogen Carbonate, KHCO_3 . May be prepared by saturating a strong aqueous solution of potassium carbonate with carbonic anhydride.

Dose: 5 to 30 grains.

Characters: Colourless, monoclinic prisms; not deliquescent, not corrosive; taste saline and slightly alkaline; solubility, 1 in 4 of cold water, almost insoluble in alcohol (90 p.c.). It gives the reactions of Potassium and of Bicarbonate.

Medicinal properties: **Antacid, Antilithic.** In acute rheumatism 30 to 40 grns. every 4 hours, freely diluted. May be given in aerated water, or in a bitter infusion. It renders the blood and urine strongly alkaline and therefore is **alterative**. Used *externally* to relieve itching; *internally*, in dyspepsia, rheumatism, gout, and the scalding due to the presence of uric acid in the urine.

20 parts by weight of Potassium Bicarbonate to 1 part of ...

POTASSII BICHROMAS, B.P. Potassium Bichromate.

Synonym: Potassium Dichromate, Red Chromate of Potassium, K_2CrO_4 , CrO_3 , obtained by roasting chrome iron-stone with lime in presence of air; treating the resulting chromate with a potassium salt; and subsequently with an acid.

Dose: $\frac{1}{10}$ to $\frac{1}{5}$ grain.

Characters: Large orange-red transparent triclinic crystals; solubility, 1 in 10 of water; fuses below redness, at a higher temperature is decomposed, yielding green chromium oxide and yellow potassium chromate, which may be separated by dissolving the latter in water.

Medicinal properties: Nerve tonic. Its actions resemble those of silver salts, over which it has the advantage of not causing discoloration of the skin. In large doses, a powerful irritant poison. It is largely used in the arts.

POTASSII BROMIDUM, B.P. Potassium Bromide. KBr.

Obtained by adding a slight excess of bromine to a strong solution of potassium hydroxide; evaporating the solution of potassium bromide and bromate to dryness; decomposing the bromate by fusing the mixture with charcoal; and purifying by crystallisation.

Adult dose: 5 to 30 grs., half the quantity being repeated every hour until the effect is attained.

Characters: Colourless cubical crystals, no odour; taste pungent, saline. Solubility 1 in 2 of cold water; 1 in 200 of alcohol (90 p.c.).

It gives the reactions of potassium and of bromides.

Medicinal properties: **Hypnotic, Sedative, Antispasmodic.**

Applied locally it produces anæsthesia of the larynx.

Internally it is used as a **hypnotic** in the sleeplessness due to mental excitement or worry, its action being increased by cold applications to the head, and warmth to the feet, also in the sleeplessness of delirium tremens or mania, when opium, belladonna or hyoscyamus fail to act, or when they cause sickness. As a **sedative**, in excitability or irritability of temper, in the delusions of pregnant women, in the night screaming and nightmare of children, in the sickness of pregnancy, in sea sickness, and in menorrhagia. As an **antispasmodic**, in convulsive nervous affections, e.g., whooping cough, laryngismus stridulus, spasmodic asthma. It is very beneficial in epilepsy, allaying the convulsions, but as it does not remove the cause, it is not curative. As an **anaphrodisiac**, used in priapism and nymphomania.

Any of the bromides may be given even in largish doses without hesitation, as their effect is only transient. In very large doses, or given for a considerable time, they sometimes induce a condition known as **Bromism**, which is characterised by diminished reflex

action, drowsiness, impaired memory and speech, muscular weakness and unsteady gait.

Incompatibles: Spiritus Ætheris Nitrosi or other oxidising substance is liable to liberate the Bromine.

POTASSII CARBONAS, B.P. Potassium Carbonate.

Synonym: Salt of Tartar. K_2CO_3 , associated with 1 or 2 molecules of water. May be obtained from the ashes of wood, or by the interaction of crude potassium sulphate and crude calcium carbonate and carbon.

Dose: 5 to 20 grains.

Characters: White crystalline powder; taste alkaline caustic; very deliquescent; solubility, 1 in 1 of water, insoluble in alcohol (90 p.c.). It gives the reactions of potassium and of carbonates.

Medicinal properties: Antacid, alterative. Its actions are similar to the Bicarbonate, only more irritating. It is rarely used internally.

POTASSII CHLORAS, B.P. Potassium Chlorate.

$KClO_3$; obtained by passing chlorine into water holding lime or magnesia in suspension; treating the clarified liquid with potassium chloride; and subsequently crystallising the potassium chlorate.

Dose: 5 to 15 grains.

Characters: Colourless monoclinic crystalline plates, no smell; taste, cool saline; solubility, 1 in 16 cold water, 1 in 8 boiling water; when heated it fuses, giving off oxygen and leaving a white residue which, dissolved in water, gives the reaction of potassium and of chlorides. Moistened with hydrochloric acid it evolves a yellow gas consisting of a mixture of chlorine and chloric oxide. Only one or two crystals of the chlorate should be used for this experiment, as the mixture of gases even in small quantities may give rise to violent and dangerous explosions.

Is distinguished from Chlorides by giving no precipitate with Argentic Nitrate.

Trochiscus Potassii Chloratis, B.P. Potassium Chlorate Lozenge.

Each contains 3 grains made up with Rose basis.

Medicinal properties: Potassium Chlorate is Stimulant, Diuretic, Antabortive. Being excreted unchanged in the urine, its actions differ from those of other Potassium salts.

Used chiefly as a local application to the mouth, as a lotion or gargle (1 part in 20-40 of water) in spongy, irritable, or ulcerated gums, or in diphtheria, aphthæ, or cancrum oris. A solution of 1 part in 60 is used as an injection in catarrh of the bladder.

Externally and locally it is used in croup, diphtheria, and spasm.

more easily expectorated; as a diuretic in dropsy; and in 20 grain doses thrice daily to prevent abortion in cases where this has previously occurred through fatty degeneration of the placenta.

In small doses it first depresses then raises the blood pressure accelerating the pulse.

In large doses it is a poison, especially to children. It acts by destroying the hæmoglobin, producing jaundice; *Lethal dose*, 7 drams, have caused convulsion and death in an adult.

Incompatibles: It is liable to explode if rubbed in a mortar with Sulphur or a Sulphide, or if dispensed with Tannic acid, as a powder. Mixed with Sulphur and Charcoal it forms an explosive compound like gunpowder.

A mixture of Pot. Chloras, Tr. Ferri Perchlor. and Glycerin has been known to explode on being heated.

POTASSII CITRAS, B.P. Potassium Citrate.

Prepared by the interaction of Citric Acid and potassium carbonate.

Dose: 10 to 40 grains.

Characters: A white powder; taste saline, pleasant, slightly acid; deliquescent; very soluble in water.

Medicinal properties: Antiscorbutic, Diuretic, Antacid, Alterative. Is less liable to purge than other Potassium salts. Given in gott, rheumatism, scorbutus, &c.

Potassium Chromate, B.P. Appendix. K_2CrO_4 . The pure neutral yellow crystals of commerce. Used in chemical testing.

Potassium Cyanide, B.P. Appendix. The commercial salt containing at least 90 p.c. of Potassium Cyanide, KCN. Used in chemical testing; may be used to remove the black stains on the skin caused by argentic nitrate. It is intensely poisonous.

Potassium Ferricyanide, B.P. Appendix. The red crystalline salt, $K_3FeC_6N_{12}$. Its aqueous solutions give no precipitate or blue coloration with a dilute solution of a pure ferric salt. Used in chemical testing.

Potassium Ferrocyanide, B.P. Appendix. The yellow crystalline salt, $K_4FeC_6N_6 \cdot 3H_2O$. Prepared by fusing together potassium carbonate, nitrogenous organic matter and iron. Used in chemical testing.

Potassium Hydrogen Sulphite, B.P. Appendix.

Synonym: Acid Potassium Sulphite.

The commercial salt. $KHSO_3$. Used in chemical testing

POTASSII IODIDUM, B.P. Potassium Iodide, KI; may be prepared in the same manner as Potassium Bromide, iodine taking the place of bromine.

Dose: 5 to 20 grains. The dose may be increased to 100 or 200 grains in 24 hours.

Characters: Colourless, generally opaque, cubic crystals; taste saline, reaction feebly alkaline; solubility, 1 in less than 1 of cold water, 1 in 12 of alcohol (90 p.c.). It gives the reactions of potassium and iodides.

Linimentum Potassii Iodidi cum Sapone, B.P. Liniment of Potassium Iodide with soap.

Preparation: Mix 2 oz. Curd Soap recently prepared and reduced to fine shreds, with 10 fl. oz. Distilled Water and 1 fl. oz. Glycerin in a porcelain dish on a water-bath; when dissolved pour the liquid into a mortar in which the Potassium Iodide has previously been powdered; mix briskly by trituration; continue the trituration until cold; set aside for an hour; then rub well 1 fl. drm. Oil of Lemon into the cream-like product.

It does not irritate or stain the skin. It gives relief to inflamed and rheumatic joints when applied by means of flannel or lint, especially if an equal quantity of Opium liniment be added.

Unguentum Potassii Iodidi, B.P. Potassium Iodide Ointment.

Preparation: Dissolve 50 grains Potassium Iodide and 3 grains Potassium Carbonate in 47 grains Distilled Water; mix the solution gradually with 400 grains Benzoated Lard in a slightly warmed mortar.

Useful in chronic joint disease. If made with Lanolin it is more easily absorbed, and gives greater relief.

Medicinal properties: Of Potassium Iodide are those of Iodine. It is less irritating than free Iodine, and so can be given in larger doses. It has no local action, but after absorption into the blood, is broken up and free Iodine liberated.

Uses: *Externally* as a liniment or ointment, in inflamed and rheumatic joints, and in chronic joint disease.

Internally as an **eliminant** of chronic metallic poisoning, *e.g.*, Mercury and Lead; as an **alterative** in syphilis, especially in the tertiary stage; it is more effective if preceded by a course of Mercury; in chronic rheumatism, especially if the pain be worst at night; in syphilitic and scrofulous skin diseases; in scrofula and enlargement of lymphatic glands; in all cases of hypertrophied organs due to deficient absorption; to aid the absorption of pneumonia consolidation; and in congestive bronchitis with deficient secretion.

In aneurism it should be given in large doses (30 grns. dose t.i.d.). It relieves the pain by diminishing the sensibility of the spinal cord, but its chief action in this disease is due to its weakening the circulation, and beneficially affecting the vessel walls which are usually syphilitic.

POTASSII NITRAS, B.P. Potassium Nitrate.

Synonyms: Nitre, Saltpetre. KNO_3 ; may be obtained by purifying crude nitre, or by the interaction of sodium nitrate and potassium chloride. Nitre is sold in Indian bazaars under the name of *shora*.

Dose: 5 to 20 grains.

Characters: White crystalline masses, on fragments of striated six-sided rhombic prisms; taste peculiar cool saline; solubility 1 in 4 of cold water, 2 in 1 of boiling water; if thrown on a fire it deflagrates; it gives the reactions of potassium and a nitrate.

Medicinal properties: **Refrigerant, Diuretic, Sedative.**

The smoke produced by the burning of unsized paper which has been saturated in a 20% solution of Pot. Nitrate and dried, is useful as an inhalation in asthma. Volatile antiseptics, e.g., aromatic oils or resins, are sometimes added.

Used as a gargle for sore throat. A ball of nitre allowed to melt slowly in the mouth is a good remedy for relaxed throat. A drink of Pot. Nitrat., gr. 5, Pot. Bicarb., 20 grns., dissolved in a small tumbler of cold water, and Citric Acid 15 grns. added, is a pleasant cooling draught and lessens febrile excitement. It is used as a diuretic in dropsy and gonorrhœa.

In large doses it is a poison, producing death by gastro-enteritis, and cardiac depression.

Sal Prunella is Nitre fused and moulded into small balls.

POTASSII PERMANGANAS, B.P. Potassium Permanganate.

$\text{K}_2\text{Mn}_2\text{O}_8$; may be obtained by the interaction of potassium chlorate, potassium hydroxide, and manganese dioxide.

Dose: 1 to 3 grains; pills may be made with a mixture of 2 of hard paraffin and 3 of vaselin.

Characters: Dark purple slender prismatic iridescent crystals; no odour, taste sweet astringent; solubility, 1 in 20 of cold water; without action on litmus; one small crystal suffices to colour 1 oz. water a rich purple.

The crystals heated to redness decrepitate, evolve oxygen, and leave a black residue from which water extracts potassium hydroxide.

Potassium Permanganate stains the skin brown, which may be removed by a solution containing 44 grns. Granulated Sulphate of Iron, acidulated with 2 drms. of dilute Sulphuric Acid.

Liquor Potassii Permanganatis, B.P. Solution of Potassium Permanganate.

Dose: 2 to 4 drms. (Strength, 110 mins. contains 1 grain).

Preparation: Dissolve $87\frac{1}{2}$ grains Potassium Permanganate in

As this decomposes when in contact with organic matter, it should not be put in bottles with corks.

Diluted with 40 to 80 parts of water is the proper strength for use as a gargle or lotion.

Condy's Fluid is a solution of 2 grns. to 1 oz.

Stronger solutions also are used, *e.g.*, 5 p.c.

Medicinal properties: Potassium Permanganate is a powerful disinfectant, completely destroying organic matter. It is used to disinfect stools in typhoid fever, to purify the hands after contact with contagious matter; to cleanse foul smelling ulcers or wounds. It is injected into abscess cavities after evacuation of pus; as a nasal wash in ozœna, and as a gargle or lotion in ulcerative stomatitis or diphtheria.

It is said to be useful in amenorrhea, 2 or 3 grns. being given three or four times daily for some days before the period.

Incompatibles: It readily gives up its oxygen to organic bodies and is decomposed, becoming a yellowish brown $\parallel$ (= Potassium Manganate or Manganese oxide).

It decomposes **Morphine** and therefore is an efficient antidote for **Opium** poisoning.

It so readily gives up its oxygen that, if mixed with easily oxidisable substances (*e.g.*, Sugar, Syrup, Glycerin), it may explode.

POTASSII SULPHAS, B.P. Potassium Sulphas, K_2SO_4 ; may be obtained by purifying the crude salt, or by the interaction of Sulphuric Acid and potassium chloride or certain other potassium salts.

Dose: 10 to 40 grains.

Characters: Colourless hard rhombic prisms, terminated by six sided pyramids; decrepitates strongly when heated; solubility, 1 in 10 of cold water, 1 in 4 of boiling water; insoluble in alcohol (90 p.c.); it gives the reactions of potassium and of sulphates.

Medicinal properties: A mild **Cathartic**. Used in jaundice and in gastric affections. It is an intestinal stimulant, its action on the liver is not uniform.

In pharmacy it is added to tenacious vegetable materials to facilitate their pulverisation.

POTASSII TARTRAS, B.P. Potassium Tartrate, Normal Potassium Tartrate; obtained by neutralising Acid Potassium Tartrate with Potassium Carbonate.

Dose: 30 to 240 grains.

Characters: Small colourless 4 or 6 sided prisms; solubility, 1 in 1 of water; it gives the reaction of potassium and of tartrates.

POTASSII TARTRAS ACIDUS, B.P. Acid Potassium Tartrate.

Synonym: Bitartrate of Potassium.

Purified Cream of Tartar. $\text{KHC}_4\text{H}_4\text{O}_6$; obtained from the crude cream of tartar deposited during the fermentation of grape juice; and from the lees of wine.

B.P. Dose: 20 to 60 grains.

Characters: A gritty white powder, or fragments of cakes crystallised on one side; taste, pleasantly acid; solubility, 1 in 200 cold water; insoluble in alcohol (90 p.c.).

It gives the reactions of Potassium, and its insolubility in water distinguishes it from other medicinal Potassium salts.

Medicinal properties: Refrigerant, Diuretic. Used in making cooling drinks for febrile conditions.

In small doses it is absorbed, acting as a diuretic, in the same way as the Acetate.

In larger doses it retains fluids in the intestine, and so if evacuated with sufficient rapidity, produces watery stools. As such, it is used as a laxative in doses of 60 to 120 grains in dysentery, piles, and prolapsus ani, and as a purgative, dose $\frac{1}{2}$ to 1 oz. in cardiac and renal dropsies, and in Bright's disease.

Potus Imperialis or **Imperial Draught** is made by dissolving 60 to 90 grns. of Cream of Tartar, some Sugar, and the fresh peel of half a lemon in 1 pint boiling water and infusing.

SODIUM, B.P. Na. Atomic weight 22.88.

A soft metal, with a bright metallic surface when freshly cut, but rapidly tarnishing (=oxidising) on exposure to air. It has a strong affinity for oxygen. Thrown on cold water it instantly fuses into a globule, rolling over the surface of the water without combustion, forming Sodium Hydrate and liberating Hydrogen. If the water be hot, the hydrogen bursts into flame, burning with the characteristic yellow flame of Sodium. It also violently attacks alcohol (90 p.c.) with the evolution of hydrogen, little or no insoluble matter remaining. Like Potassium, it must be preserved under Mineral Naphtha (a substance which contains no oxygen) in well stoppered bottles.

The Reactions of Sodium salts are:—

1. They are not precipitated by ordinary reagents.
2. They give an intensely yellow colour to flame. This flame observed through a piece of blue glass should not appear more than transiently red. If the red thus seen be at all distinct, it indicates the presence of Potassium.

Sodium salts as compared with the salts of Potassium:—

1. Are less irritating to the gastro-intestinal canal.
2. They diffuse less rapidly, and so are neither absorbed nor

3. They are not so depressant to heart, muscle, or nerve.

4. They are of little use as diuretics, or lithontriptics. Sodium Urate is sometimes stored up as nodules under the skin, and these form the chalk stones of gouty patients.

Liquor Sodii Ethylatis, B.P. Solution of Sodium Ethylate.

A solution of Sodium in absolute alcohol. It must be recently prepared: special precautions are required to prevent accidents.

Characters: A colourless syrupy liquid, becoming brown on keeping.

Medicinal properties: A powerful **Caustic**. It is expensive, difficult to prepare, unstable and unsuited for use in the hot climates.

It probably acts only as a solution of caustic soda in alcohol.

Incompatible: With chloroform it forms an explosive mixture.

Sodium Hydroxide, B.P. Appendix. Sodium Hydrate or Caustic Soda, occurs as hard greyish-white rods or cakes, deliquescent, very alkaline and corrosive.

Purified Sodium Hydrate may be obtained by dissolving Caustic soda in ethylic alcohol, filtering the solution, evaporating it to dryness in a silver dish, occasionally adding Distilled Water during the evaporation. The residue should give no reaction with tests for phosphates or sulphates, and not more than the slightest trace of the tests of carbonates. It is not quite free from alumina.

Pure Sodium Hydroxide may be prepared by the interaction of pure barium hydroxide and sodium sulphate, or by the interaction of pure sodium and water. It is required only in testing for small quantities of aluminium.

SODA TARTARATA, B.P. Sodium Potassium Tartrate.

Synonyms: Tartarated Soda, Tartrate of Potassium and Sodium; Rochelle Salt; prepared by neutralising Acid Potassium Tartrate with Sodium Carbonate.

Dose: 120 to 240 grains.

Characters: Trimetric prisms with hemihedral facets; taste saline; entirely soluble in cold water; it gives the reactions of potassium, of sodium and of tartrates; a strong solution gives a crystalline precipitate with a small quantity of Acetic Acid.

Medicinal properties: **Purgative, Remote Antacid.** In the intestinal canal it retains the fluid, and quickens peristalsis. In small doses it is absorbed, and in the blood acts as the Carbonates of Potassium and of Sodium.

PULVIS SODÆ TARTARATÆ EFFERVESCENS, B.P.

Effervescent Tartarated Soda Powder; commonly known as Seidlitz Powder.

Preparation: Mix 2 drms. Tartarated Soda and 40 grns Sod

Take 38 grns. Tartaric Acid in dry powder, wrap in white paper. This forms powder No. 2.

When required, dissolve the alkaline powder (No. 1) in about 40 oz. cold or lukewarm water; then add the acid powder (No. 2), the solution being drunk during effervescence.

Medicinal properties: A cooling pleasant laxative.

Liquor Sodæ Chlorinatæ, B.P. Solution of Chlorinated Soda. It should be preserved in stoppered bottles in a cool and dark place.

Dose: 10 to 20 mins. Strength about $2\frac{1}{2}$ p.c. of available chlorine.

Characters: A colourless alkaline liquid; with faint odour of chlorine; taste astringent; on adding hydrochloric acid it gives off chlorine; it decolorises solution of indigo sulphate.

Preparation: Dissolve 24 oz. Sodium Carbonate in 40 fl. oz. Distilled Water; thoroughly triturate 16 oz. Chlorinated Lime with 120 fl. oz. Distilled Water; mix the two solutions; filter.

Medicinal properties: **Antiseptic**; useful in intestinal affections. Along with good feeding it has given very satisfactory results in Typhoid fever. Locally used as a wash, poultice, or on lint, in all affections attended with foetor; a 4 p.c. solution makes a good gargle.

Chlorine Poultice. Mix 2 of Linseed Meal, 1 of Liq. Sod. Chlorin. with 4 of boiling Water, stirring constantly.

Used to remove foetid slough and produce healing surfaces.

Sodium Acetate, B.P. Appendix. The pure commercial salt.

SODII ARSENAS, B.P. Sodium Arsenate.

Arseniate of Sodium (hydrous), Brit. Pharm. 1885. The anhydrous salt, di-sodium hydrogen arsenate, Na_2HAsO_4 , obtained by exposing to a temperature of 300°F . crystallised sodium arsenate, which may be prepared by treating with water the product of the fusion of arsenious anhydride with sodium nitrate and sodium carbonate.

Dose: $\frac{1}{40}$ to $\frac{1}{10}$ grain.

Characters: A white powder, soluble in 6 parts of water and yielding an alkaline solution; slightly soluble in cold or boiling alcohol (90 p.c.); it gives the reaction of sodium and of arsenates.

Liquor Sodii Arsenatis, B.P. Solution of Sodium Arsenate.

Dose: 2 to 8 mins. (Strength, 110 mins. contain 1 grain of Anhydrous Sodium Arsenate).

Preparation: Dissolve $17\frac{1}{2}$ grains Sodium Arsenate, recently rendered anhydrous, in Distilled Water sufficient to form 4 fl. oz.

Medicinal properties: Sodium Arsenate.

irritating effect on the stomach or conjunctivæ, and therefore is more suited for prolonged administration.

SODII BENZOAS, B.P. Benzoate of Soda.

May be obtained by neutralising benzoic acid with sodium carbonate.

Dose : 5 to 30 grains.

Characters : A white somewhat crystalline or amorphous powder, inodorous or with a faint benzoic odour; taste sweetish, saline unpleasant; reaction feeble alkaline. Soluble in water; solubility 1 in less than 2 of cold water, 1 in 24 of cold alcohol (90 p.c.).

Medicinal properties : **Antiseptic.** Used in rheumatism and gout. Is a powerful stimulant of the liver, but not of the intestines.

SODII BICARBONAS, B.P. Bicarbonate of Soda. NaHCO_3 .

May be obtained by exposing crystals of sodium carbonate to carbonic anhydride; or by the interaction of sodium chloride and ammonium bicarbonate.

Dose : 5 to 30 grains.

Characters : White powder, or small opaque monoclinic crystals, taste saline; solubility, 1 in 11 of cold water; insoluble in alcohol (90 p.c.). It gives the reactions of sodium and of bicarbonates.

20 parts Sod. Bicarb. can neutralise 16·7 parts of Citric Acid or 17·8 parts of Tartartic Acid.

Trochiscus Sodii Bicarbonatis, B.P. Sodium Bicarbonate

Lozenge. Each contains 3 grains made up with Rose basis.

Medicinal properties : **Antacid.**

Externally moistened with water it is a good application for the stings of noxious insects; used (in strength of 2 grns. to an oz.) as an **alkaline wash** in itching skin-diseases, and as a lotion in eczema.

Internally as a mouth wash, or introduced into the cavity of the tooth, it relieves toothache due to gastric acidity; combined with a bitter tonic and a carminative and taken 10-30 minutes before meals it **stimulates** the gastric secretion, and so is useful in atonic dyspepsia where the patient complains of weight or pain in the pit of the stomach, pain between the scapulæ and much flatulence without constipation; it relieves the frontal headache which is felt at the junction of the hairy scalp and the forehead. As an **antacid** in gastric acidity it is given after meals. A solution of grn. $\frac{1}{2}$ -1 in 1 oz. milk arrests the diarrhoea of infants due to acidity.

Sodium Bicarbonate in its actions resembles Potassium Bicarbonate, only that as an **alterative** and **remote diuretic** it is less

SODII BROMIDUM, B.P. Sodium Bromide. NaBr .

May be prepared in the same manner as Potassium Bromide, sodium hydroxide being used in place of potassium hydroxide.

• *Dose*: 5 to 30 grains.

Characters: Small white cubic crystals somewhat deliquescent, without odour; taste, saline; solubility 1 in less than 2 of water, 1 in 16 of alcohol (90 p.c.); it gives the reactions of Sodium and of Bromides.

Medicinal properties: **Sedative, Hypnotic.** Its actions are similar to those of Pot. Brom. only not so depressing, nor so irritating to the stomach.

Recommended as a remedy for sea-sickness, 60 grns. thrice daily, for 2 days, before embarking, gradually reducing the dose when on board.

Sajji. An impure Sodium Carbonate known as *Reh* is found as a white efflorescence in many parts of India. It is used in making country soap and by dhobies for washing clothes.

Barilla. A purer variety is obtained from the ashes of certain marine plants.

SODII CARBONAS, B.P. Sodium Carbonate, $\text{Na}_2\text{CO}_3, 10 \text{ H}_2\text{O}$.

May be obtained from sodium chloride, either by interaction with ammonium bicarbonate, and subsequent ignition; or by its conversion into sodium sulphate and the action of heat on a mixture of the sulphate with carbon and calcium carbonate.

Dose: 5 to 20 grains.

Characters: Transparent, colourless rhombic crystals, efflorescent; taste, harsh; reaction strongly alkaline, on heating it loses about $\frac{2}{3}$ of its weight; solubility, 1 in 2 of cold water, insoluble in alcohol (90 p.c.).

20 parts of Sodium Carbonate are neutralised by 9.8 parts of Citric Acid, or by 10.5 parts of Tartaric Acid.

Medicinal properties: **Antacid**, a dilute solution is used as an alkaline wash to the skin to relieve itching. As a bath 8-10 oz. Sod. Carb. in 60 gallons water. Used to remove scabs, and scaly incrustations in eczema.

Internally it may be used in acidity of the stomach in the same way as ordinary Sodium Salts, but its harsh taste interferes with its use in this way.

Sodium Carbonate is commonly known as Washing Soda. It is obtained from the ashes of sea-plants or the decomposition of common salt. Its chief use is in the preparation of other Sodium salts.

SODII CARBONAS EXSICCATUS, B.P. Exsiccated Sodium Carbonate.

carbonate until it loses nearly 63 p.c. of its weight, i.e., until all its water of crystallisation is driven off.

Used in making pills.

SODIUM CHLORIDUM, B.P. Sodium Chloride, NaCl , is common salt purified. Obtained from the ocean or from salt mines.

Characters: Small white crystalline grains, or transparent cubic crystals, free from moisture; no smell; taste purely saline; if pure, it is not deliquescent; solubility, 1 in less than 3 of water; it gives the reactions of sodium and of chloride.

Medicinal properties: **Antiseptic**, therefore used to preserve food

Used *Externally* in the form of bath (1lb salt in 4 gallons water), as a stimulant and tonic to the skin. A lotion of $\frac{1}{2}$ p.c. common salt in water is used to wash raw surfaces and septic cavities. *Locally* as a fomentation to sprains and bruises.

A strong solution of salt is used to dislodge Leeches from cavities.

Internally, in small doses (10 to 60 grains), **Stimulant, Tonic, Anthelmintic**. In large doses, $\frac{1}{4}$ to $\frac{1}{2}$ oz., **Purgative, Emetic**. In doses of 8 to 12 drms. in divided doses, during the intermission of Malarial Fever, it is an **Antiperiodic**.

A solution of $6\frac{1}{2}$ of common Salt in 1,000 of water does not destroy animal tissue, which pure water does. Strong solutions, however, are intensely irritating.

Salt is an important constituent of the human body; it is used largely as a **condiment** and a **food**.

Internally is a very feeble hepatic stimulant.

In large doses, if it does not cause vomiting, it is poisonous; 9 oz. has killed an adult.

Rock Salt. An impure variety of Sodium Chloride sold in Indian Bazaars. (*Senda-numak, Senda-lon*, Hind.). It is dull brownish-white externally; white crystalline internally; taste pure saline. It has purgative properties, but is too uncertain to be recommended.

SODII CITRO TARTRAS EFFERVESCENS, B.P. Effervescent Sodium Citro-tartrate.

Dose: 60 to 120 grains.

Medicinal properties: A pleasant saline purgative.

SODII HYPOPHOSPHIS, B.P. Sodium Hypophosphite, NaPH_2O_2 ; obtained by the interaction of sodium carbonate and calcium hypophosphite.

Characters: A white granular salt; deliquescent; taste, bitter, nauseous; solubility, 1 in 1 of water, 1 in 30 of alcohol (90 p.c.).

Tests: Hyphosphites with a solution of Nitrate of Silver give a black precipitate: with Mercuric Chloride a grey precipitate.

Medicinal properties: A Nervine Tonic.

SODII IODIDUM, B.P. Sodium Iodide, NaI.

May be prepared from Iodine and Sodium hydroxide by a process similar to that employed in making potassium bromide, the salt being crystallised at a temperature of not less than 68° F.

Dose: 5 to 20 grains.

Characters: A dry white crystalline deliquescent powder; taste, saline, somewhat bitter; solubility, 1 in less than 1 of water, 1 in 3 alcohol (90 p.c.); gives the reactions of sodium and of iodides.

Medicinal properties: **Alterative:** specially useful in the later stages of syphilis. It has much the same action as Potassium Iodide, but is less depressing.

SODII NITRIS, B.P. Sodium Nitrite, NaNO_2 , obtained by fusing sodium nitrate with metallic lead.

Dose: 1 to 2 grains.

Characters: A white crystalline powder, deliquescent; very soluble in water, the solution is neutral or slightly alkaline; it gives the reactions of sodium and of nitrites.

Medicinal properties: **Antispasmodic.** Acting powerfully on the arterial system. Its actions resemble those of the other medicinal nitrites. Used in Angina pectoris.

It has not the objectional features of Trinitrine; it does not act so quickly as Nitrite of Amyl; it has the advantage of being easily given in water.

SODII PHOSPHAS, B.P. Sodium Phosphate.

The di-sodium hydrogen phosphate, $\text{Na}_2\text{HPO}_4, 12 \text{ H}_2\text{O}$; may be obtained by the interaction of sodium carbonate, and the solution of acid calcium phosphate, produced on mixing bone ash and sulphuric acid.

Dose: 30 to 120 grains for repeated doses; for a single dose $\frac{1}{4}$ to $\frac{1}{2}$ oz.; may be given in gruel or weak broth.

Characters: Transparent, colourless, rhombic prisms, terminated by four converging planes, efflorescent; reaction alkaline; taste, pure saline; solubility, 1 in 6 of water, insoluble in alcohol (90 p.c.); on heating it dissolves in its own water of crystallisation. It gives the reactions of sodium and of phosphates.

SODII PHOSPHAS EFFERVESCENS, B.P. Effervescent Sodium Phosphate. Known also as Tasteless Aperient Salt.

Dose: 60 to 120 grns. for repeated doses: for a single dose

Medicinal properties: Sodium phosphate, in small doses, is **Diuretic, Remote Antacid**. In large doses, **Purgative**.

Microcosmic Salt, B.P. Appendix. The salt, $\text{NaNH}_4\text{HPO}_4 \cdot 4\text{H}_2\text{O}$, of commerce.

SODII SALICYLAS, B.P. Sodium Salicylate.

May be obtained by the interaction of salicylic acid and sodium carbonate or sodium hydroxide.

Dose: 10 to 30 grains.

Characters: Small colourless scales or in tabular crystals, with a pearly lustre; no odour; taste, sweetish, somewhat unpleasant; solubility, 1 in less than 1 of cold water, 1 in 6 of alcohol (90 p.c.), the solutions are acid or faintly neutral to litmus.

Medicinal properties: **Intestinal, Antiseptic, Antipyretic, Anodyne**. Used in doses of $\frac{1}{2}$ to $2\frac{1}{2}$ grns. every 15 or 30 minutes to cut short a headache; 10–30 grns. every 2 or 3 hours in rheumatic fever with Spt. Ammon. Arom. or some form of Alcohol to counteract cardiac depression; also in chronic rheumatic conditions, e.g., sciatica, rheumatic tonsillitis, headache, &c.

Sod. Salicyl. has the same actions as Ac. Salicyl., but is more soluble and less irritating. It has the power to destroy low organisms. It is a powerful stimulant of the liver, rendering the bile more watery, but only a very slight stimulant of the intestinal glands. It is the best **Antiseptic** for fermentative dyspepsia. Taken in excess, it may produce noises in the ears, deafness, giddiness, and headaches, but these are removed by Bromides or by Ergot.

If made from artificial Acid it is colourless: if from natural Acid is coloured slightly yellow. It rapidly turns brown when mixed with Alkalis.

SODII SULPHAS, B.P. Sodium Sulphate, $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$, known also as **Glauber's Salt**.

May be obtained by the interaction of sodium chloride and other sodium salts with sulphuric acid.

Dose: 30 to 120 grains for repeated doses; for a single dose $\frac{1}{4}$ to $\frac{1}{2}$ oz.

Characters: Transparent monoclinic prisms, effloresces on exposure to air; taste, bitter saline; soluble 2 in less than 1 of water at 80° F.; heated to boiling, this solution deposits crystals of the anhydrous salt; insoluble in alcohol (90 p.c.): heated in a porcelain crucible it loses 55.9 p.c. of water; it gives the reactions of sodium and of sulphates.

SODII SULPHAS EFFERVESCENS, B.P. Effervescent Sodium Sulphate.

Dose: 30 to 120 grains for repeated doses; for a single dose

Medicinal properties: **Laxative, refrigerant.** It is a moderately powerful hepatic stimulant and powerful intestinal stimulant. May be given as one dose of 60 grns. with 5 grns. powdered ginger in a small tumbler of warm water on rising.

Khari-nun or **Khari-namak**, (*Hind.*), an impure variety of Sodium Sulphate. Obtainable in Indian bazaars; is used as a purgative for horses and cattle, and for dressing hides.

SODII SULPHIS, B.P. Sodium Sulphite, $\text{Na}_2\text{SO}_3, 7 \text{ H}_2\text{O}$.

May be obtained by the interaction of sulphurous acid on sodium carbonate.

Dose: 5 to 20 grains.

Characters: Colourless, transparent, monoclinic prisms; efflorescent in dry air; no odour; taste, saline sulphurous; readily soluble in water; sparingly soluble in alcohol (90 p.c.); it gives the reactions of sodium and of sulphates.

Medicinal properties: **Antiseptic**, specially useful in gastric affections.

Sodium Hydrogen Sulphate, B.P. Appendix.

Synonym: Acid Sodium Sulphate. NaHSO_4 . The commercial salt.

SODII SULPHOCARBOLAS, B.P. Sodium Sulphocarbolate, or Sodium phenol-para-sulphonate.

May be obtained by dissolving phenol in excess of sulphuric acid and converting the phenolsulphonic acid so obtained into a sodium salt.

Dose: 5 to 15 grains; may be combined with bitters.

Characters: Colourless transparent rhombic prisms; odourless, or nearly so; taste cooling saline, slightly bitter; reaction neutral; solubility 1 in 6 of water; 1 in 150 alcohol (90 p.c.); on ignition it gives off phenol, and leaves a residue of sodium sulphate.

Medicinal properties: A **Gastric and Intestinal Antiseptic**. Used in flatulence and gastric acidity, also in enteric fever, and septic conditions of the alimentary canal.

SODIUM THIOSULPHATE, B.P. Sodium Hyposulphite.

The crystalline salt, $\text{Na}_2\text{S}_2\text{O}_3, 5 \text{ H}_2\text{O}$. 2.4644 grammes should decolorise 100 c.c. of the volumetric solution of iodine.

Lithium. Li. Atomic weight 6.97.

A silver-like body; the lightest metal known; its salts colour the Bunsen flame, or (with the addition of a strong acid) the spirit flame, a crimson colour.

Medicinal properties of Lithium salts: Are those of a **non-volatile alkali**; useful more especially as a **diuretic** in acid conditions of the urine. Its special advantage is the solubility of its combination with uric acid. In this particular it is even more powerful

LITHII CARBONAS, B.P. Lithium Carbonate, Li_2CO_3 . Obtained from native silicates of lithium.

Dose: 2 to 5 grains; may be given in aerated water.

Characters: White powder or minute crystalline grains, reaction alkaline; solubility 1 in 70 of cold water, insoluble in alcohol (90 p.c.); it is dissolved with effervescence by hydrochloric acid.

Medicinal properties: A powerful **Diuretic** and **Remote Alkali**. Used to aid the elimination of urates in gouty conditions. Externally as a lotion or fomentation (1 p.c.) in water.

LITHII CITRAS, B.P. Lithium Citrate prepared by saturating lithium carbonate with citric acid.

Dose: 5 to 10 grains.

Characters: White crystalline salt; deliquescent; solubility 1 in 2 of cold water; it yields the reaction of lithium and of citrates.

LITHII CITRAS EFFERVESCENS, B.P. Effervescent Lithium Citrate.

Dose: 60 to 120 grains.

Contains Lithium Citrate 5, Citric Acid 21, Tartaric Acid 31, and Sodium Bicarbonate 58.

Medicinal properties: **Diuretic, Remote Antacid**. Being more soluble it is better adapted for fluid administration than the carbonate.

Calcium. Ca. Atomic weight 39.71.

A brilliant white metal, combustible.

Reactions:—

1. With ammonium carbonate, solutions of calcium salts give a white precipitate (=calcium carbonate) which after boiling is insoluble in solution of ammonium chloride.
2. With ammonium oxalate, they give a white precipitate soluble in hydrochloric acid but insoluble in acetic acid.
3. Potassium chromate gives no precipitate with weak solutions of calcium salts, on boiling strong solutions partial precipitation takes place.

Calcium Carbonate, B.P. Appendix, the pure white marble or calc spar of commerce.

CALCI CARBONAS PRÆCIPITATUS, B.P. Precipitated Calcium Carbonate.

Synonym: Precipitated Chalk, CaCO_3 . Prepared by the interaction of calcium chloride and sodium carbonate.

Characters: White micro-crystalline powder, insoluble in water; it gives the reactions of Calcium and of Carbonates.

Medicinal properties: Antacid and Astringent.

CALX, B.P. Lime, known also as quick lime; calcium oxide, CaO ; obtained by calcining chalk, limestone or marble.

Characters: Compact whitish masses which readily absorb water, and which when rather less than their weight of water is added, swell and fall to powder with the development of much heat; an aqueous solution of this powder gives after filtration a clear alkaline solution which gives the reactions of calcium; less soluble in boiling than in cold water.

A feeble caustic, injuring delicate structures, e.g., the eyes. The remedy is to wash the affected part with very dilute vinegar or acids.

Milk of Lime, B.P. Appendix. 100 grammes of Lime and 200 grammes Distilled Water, mixed.

CALX SULPHURATA, B.P. Sulphurated Lime.

A mixture containing not much less than 50 p.c. of calcium sulphide, CaS , with calcium sulphate and carbon.

Dose: $\frac{1}{4}$ to 1 grain, may be made into a pill with glucose.

Characters: A greyish white powder with odour of hydrogen sulphide.

Medicinal properties: Antisuppurative. Used for abscesses, boils, fistula and skin eruptions.

Its actions are those of a sulphide. It hastens the discharge of pus already formed, but checks its formation in the early stage of inflammation.

CALX CHLORINATA, B.P. Chlorinated Lime.

A product obtained by exposing slaked lime to the action of chlorine gas until absorption ceases; it contains 33 p.c. of available chlorine.

Characters: A dull white powder, with a feeble odour of chlorine; it becomes moist and gradually decomposes on exposure to air; partly soluble in water, the solution giving the reactions of calcium and chlorides, decolorising solution of indigo sulphate and evolving chlorine copiously on the addition of an acid.

LIQUOR CALCIS CHLORINATÆ, B.P. Solution of Chlorinated Lime.

Strength: When fresh it should yield 3 p.c. of available chlorine.

Preparation: Mix 1 pound chlorinated lime in 1 gallon Distilled Water, transfer to a stoppered bottle; set aside for 3 hours shaking occasionally; strain through calico, preserve the filtrate in a stoppered bottle in a dark place.

Medicinal properties: Chlorinated Lime is a powerful disinfectant.

lotion in skin diseases, foul ulcers, &c. The vapour evolved by moistening a little Chlorinated Lime, and inhaled through a suitable apparatus, is used in chronic respiratory diseases.

It is not used internally.

Chlorinated Lime owes its action to the chlorine gas evolved.

CALCII HYDRAS, B.P. Calcium Hydroxide.

Synonym: Slaked Lime. $\text{Ca}(\text{HO})_2$, recently prepared by the interaction of water and calcium oxide. It should be kept in well-stoppered bottles to exclude the air and so prevent the formation of the Carbonate.

Characters: A white powder, strongly alkaline and caustic; only slightly soluble in water: much more soluble in solution of sugar. Strongly heated it loses nearly one-fourth of its weight of water; it gives the reactions of calcium.

LINIMENTUM CALCIS, B.P. Liniment of Lime.

Preparation: Shake together equal parts of Solution of Lime and Olive Oil.

A soothing external application for burns, scalds, small-pox, and in eczema, affecting a large area of the skin.

The efficacy of this is much improved by adding about $2\frac{1}{2}$ p.c. each of Carbolic Acid and Eucalyptus Oil.

Carron Oil is a cream-like liniment formed by shaking together equal parts of Linseed Oil and Lime Water. It takes its name from the Carron Iron Works in Scotland where it has been long used.

LIQUOR CALCIS, B.P. Solution of Lime.

Synonym: Lime Water. A saturated Solution of Lime.

Dose: 1 to 4 fl. oz., may be given in milk.

Strength: 1 fl. oz. contains the equivalent of about $\frac{1}{2}$ grain.

Preparation: Wash 2 oz. Calcium Hydroxide with Distilled Water until free from chlorides and alkalis; then shake it with 1 gallon of Distilled Water in a stoppered green bottle for 2 or 3 minutes; set aside for 12 hours. The clear solution may be drawn off with a siphon as required for use and should then be transferred to a green bottle.

LIQUOR CALCIS SACCHARATUS, B.P. Saccharated Solution of Lime.

Dose: 20 to 60 mins. may be given in milk when it is desired not to dilute this overmuch.

Strength: Nearly 2 p.c. by weight, or 1 fl. oz. contains about 8 grains of Lime.

Preparation: Mix equal parts of Calcium Hydroxide with a solution of 2

stoppered green-glass bottle for a few hours shaking occasionally, separate the clear solution by means of a siphon avoiding unnecessary exposure to air.

Medicinal properties: Slaked Lime is a very mild **Caustic**. It is used in medicine only in solution. It then is an **Antacid** and **Astringent Sedative**.

Applied *externally* to surfaces from which watery discharge is issuing it is **astringent**. As a lotion Lime Water is applied to cracked nipples; and as an injection to lessen discharges from the ears, vagina and urethra; and as an **anthelmintic** enema to destroy thread worms.

Internally, it is **antacid** and gastric **sedative**. A mixture of equal parts of Lime Water and milk can often be taken when all other food is rejected. Lime Water is very useful in the chronic vomiting, and diarrhoea of children, where the milk is vomited in hard lumps. Also as an **astringent** in diarrhoea. It is given to children in ricketts.

After absorption it is a slight remote **antacid**.

CALCII CHLORIDUM, B.P. Calcium Chloride, $\text{CaCl}_2, 2 \text{H}_2\text{O}$.

Formed by neutralising hydrochloric acid with calcium carbonate, and carefully desiccating at a temperature not exceeding 392°F .

Dose: 5 to 15 grains.

Characters: Dry white, masses, very deliquescent; solubility 1 in 1 of water, 1 in 3 of alcohol (90 p.c.); it gives the reactions of calcium and of chlorides.

Medicinal properties: Gastric **sedative**: **alterative** in phthisis and glandular disease.

CALCII HYPOPHOSPHIS, B.P. Calcium Hypophosphite.

$\text{Ca} (\text{PH}_2\text{O}_2)_2$; obtained by the interaction of phosphorus, calcium hydroxide and water.

Dose: 3 to 10 grains.

Characters: A white crystalline salt with a pearly lustre; taste bitter nauseous; solubility 1 in 8 of cold water, insoluble in alcohol (90 p.c.); it gives the reactions of calcium.

Medicinal properties: A **Tonic** in nervous and general debility.

CALCII PHOSPHAS, B.P. Calcium Phosphate.

May be prepared by dissolving bone ash in dilute hydrochloric acid, adding the liquid to dilute solution of ammonia, washing the precipitate with cold water, and drying the washed precipitate at a temperature not exceeding 212°F .; or by the interaction of calcium chloride and sodium phosphate.

Dose: 3 to 15 grains.

Characters: A light white amorphous powder; odourless, tasteless, insoluble in water, soluble in diluted hydrochloric acid or diluted nitric acid; it gives the reactions of calcium and of phosphates.

Medicinal properties: Nervine Tonic, Nutrient.

Phosphate of lime is a constituent of the body. This drug is therefore given in conditions of active growth, as during youth or pregnancy, where material for building up the tissues is deficient, e.g., in fractures, mollities ossium, also in scrofula. It lessens the toothache of pregnancy or lactation. In rickets it is best combined with Cod Oil.

Chemical Food, formerly Parrish's (now Squire's) Chemical Food, one fluid drachm contains $2\frac{1}{2}$ grns. Phosphate of Lime and 1 grn. Phosphate of Iron, with Phosphates of Sodium and Potassium.

A strengthening Tonic specially useful for children in scrofula and rickets.

Dose: Half to one teaspoonful in water with meals.

Calcium Sulphate, B.P. Appendix. $\text{CaSO}_4, 2 \text{H}_2\text{O}$. Pure Native Calcium Sulphate; known also as Gypsum.

Creta. Chalk.

The native friable carbonate of calcium; it is insoluble in water, but very absorbent of moisture. As whiting, or the whitewash of walls, it occurs in every house.

Whiting, or Plaster from walls is a antidote for poisoning by acids, specially for Oxalic Acid.

CRETA PRÆPARATA, B.P. Prepared Chalk. Native calcium carbonate, freed from most of its impurities by elutriation.

Dose: 10 to 60 grains; in powder, or suspended in mucilage.

Characters: White friable masses, or a white powder, taste slight earthy, yielding the reactions of calcium and of carbonates.

MISTURA CRETÆ, B.P. Chalk Mixture.

Dose: $\frac{1}{2}$ to 1 fl. oz.; given with astringent tincture of Opium.

Preparation: Triturate $\frac{1}{4}$ oz. Prepared chalk, 15 grains Tragacanth powdered, $\frac{1}{2}$ oz. Refined Sugar, mix and make a powder; add Cinnamon water sufficient to make 8 oz.

As chalk mixture rapidly decomposes especially in hot weather, it is convenient to keep the powder ready mixed, adding the Cinnamon water as required. 47 grains of the Powder added to $7\frac{1}{4}$ fl. drms. Distilled Water makes 1 fl. oz. Chalk mixture.

Medicinal properties: Chalk has the antacid and astringent properties of lime, without its irritating qualities.

however the diarrhoea is due to an irritating substance in the intestinal canal, the chalk should be preceded by a dose of castor oil.

• It is usually given combined with Aromatics.

PULVIS CRETÆ AROMATICUS, B.P. Aromatic Powder of Chalk.

Dose : 10 to 60 grains.

Preparation : Mix 4 oz. Cinnamon Bark, 3 oz. Nutmeg, $1\frac{1}{2}$ oz. Cardamom Seeds, 25 oz. Refined Sugar, all in powder, with 11 oz. Prepared Chalk.

Characters : A yellow coloured powder, with an aromatic taste and smell.

PULVIS CRETÆ AROMATICUS CUM OPIO, B.P. Aromatic Powder of Chalk with Opium.

Dose : 10 to 40 grains.

Strength : $2\frac{1}{2}$ p.c. of Opium.

Preparation : Mix $\frac{1}{4}$ oz. Opium with $9\frac{3}{4}$ oz. Aromatic Powder of Chalk.

• It is rather browner in colour than Aromatic Chalk Powder.

Magnesium, Mg. Atomic weight 24.18.

A brilliant grey metal: when burned it produces a powerful actinic light.

Reactions :—

1. With solution of sodium phosphate in presence of ammonia magnesium salts yield a white crystalline precipitate (=ammonio-magnesium phosphate.)
2. With solution of potassium, sodium, ammonium, or calcium hydroxide, magnesium salts give a white precipitate insoluble in excess of the reagent, but soluble in solution of ammonium chloride.

MAGNESIA LEVIS, B.P. Light Magnesia.

Synonym : Light Calcined Magnesia, Light Magnesium Oxide, MgO, prepared by exposing light magnesium carbonate to a dull red heat.

Dose : 5 to 30 grains for repeated doses; for a single dose 30 to 60 grains.

Characters : A bulky white powder differing from Heavy Magnesia only in its greater lightness; the volume corresponding to the same weight being to each other in the ratio of $3\frac{1}{2}$ to 1.

MAGNESIA PONDEROSA, B.P. Heavy Magnesia.

Synonym : Heavy Calcined Magnesia, Heavy Magnesium Oxide, MgO, prepared by exposing heavy magnesium carbonate to a dull red heat.

Dose: 5 to 30 grains for repeated doses; for a single dose 30 to 60 grains.

Characters: A white powder, insoluble in water but readily dissolved by acids; the solution giving the reaction of magnesium.

MAGNESII CARBONAS LEVIS, B.P. Light Magnesium Carbonate, $3 (\text{Mg CO}_3), \text{Mg} (\text{HO})_2, 4 \text{H}_2\text{O}$.

May be prepared by the interaction of solution of magnesium sulphate and sodium carbonate boiling for 15 minutes, purifying and drying.

Dose: 5 to 30 grains for repeated doses; for a single dose 30 to 60 grains.

Characters: A very light powder, which under the microscope is found to consist of amorphous particles with numerous slender prisms intermixed. It occupies the same bulk as six times its weight of water, other characters are the same as those of Heavy Magnesium Carbonate.

MAGNESSII CARBONAS PONDEROSUS, B.P. Heavy Magnesium Carbonate, $3 (\text{MgCO}_3), \text{Mg} (\text{HO})_2, 4 \text{H}_2\text{O}$.

May be prepared, by the interaction of solutions of magnesium sulphate and sodium carbonate, evaporating, purifying, and drying.

Dose: 5 to 30 grains for repeated doses; for a single dose 30 to 60 grains.

Characters: A white granular powder, dissolving readily with effervescence in diluted mineral acids, the solution giving the reaction of magnesium.

LIQUOR MAGNESII CARBONATIS, B.P. Solution of Magnesium Carbonate.

Synonym: Fluid Magnesia. Carbonate of Magnesia dissolved in water aerated with carbonic anhydride.

Dose: 1 to 2 fl. oz.

Strength: 10 grains of Magnesium Carbonate in 1 oz.

Characters: A clear liquid which effervesces slightly or not at all on the containing vessel being first opened.

Medicinal properties: In small doses **Antacid**, in large doses **Laxative**, used especially for children; and to render the urine alkaline, in gouty persons when Soda or Potash disagree.

The different forms of Magnesia have the same actions and doses. Being insoluble it does not render the gastric juice alkaline. It is preferred to Potash or Soda salts for neutralising acid in the stomach after food. It is **antacid** and **laxative**, and being partly excreted by the kidneys is a **remote antacid**.

The heavy preparations of Magnesia are more compact, and more palatable with water but are more expensive.

MAGNESII SULPHAS, B.P. Magnesium Sulphate.

Synonym: Epsom Salts: so named because first prepared by evaporating the water of Epsom spring. $\text{MgSO}_4, 7 \text{H}_2\text{O}$.

May be prepared by the interaction of the native Magnesium Carbonates and dilute sulphuric acid; or by purifying the native sulphate.

Dose: 30 to 120 grains for repeated doses; for a single dose $\frac{1}{4}$ to $\frac{1}{2}$ oz. Its taste may be disguised by adding spirit of chloroform.

Characters: Small colourless transparent rhombic prisms; taste bitter, solubility 1 in 1 of cold water (measuring $1\frac{1}{2}$) it gives the reactions of magnesium and of sulphate.

It resembles Zinc Sulphate, but differs in taste; Epsom salts being bitter, while Zinc Sulphate is strongly metallic.

MAGNESII SULPHAS EFFERVESCENS, B.P. Effervescent Magnesium Sulphate.

Synonym: Effervescent Epsom salts.

Dose: 60 to 240 grains for repeated doses; for a single dose $\frac{1}{2}$ to 1 oz.

Medicinal properties: A mild and safe saline **Cathartic**, useful in biliousness. In 1 or 2 drms. doses repeated every 2 hours, it is a specific for commencing dysentery. A saturated solution is used to reduce dropsies.

It may be used as a purgative enema; dissolve 1 oz. Magn. Sulph. in 15 oz. Mucilage of Starch, add 1 oz. Olive Oil, mix. For one enema.

Magnesium Sulphate is an **intestinal**, but not a hepatic, **stimulant**. It causes copious secretion from the intestinal glands, but does not stimulate the muscular coat, therefore does not produce griping or peristalsis; a portion of the secretion may therefore be re-absorbed. It is better given with a carminative, and a drug that will increase peristalsis (e.g., Senna). Absorbed in the blood it acts as **diuretic**, and **diaphoretic**.

Powdered Talc, B.P. *Appendix.*

A natural magnesium silicate, powdered and purified by boiling with diluted hydrochloric acid, washing with Distilled Water until neutral to litmus, and drying.

Cerium, Ce. Atomic weight 139.20, is one of the rarer metals.

It is a grey powder with metallic lustre and resembling iron in its properties.

CERII OXALAS, B.P. Cerium Oxalate, $\text{Ce}_2(\text{C}_2\text{O}_4)_3, 9 \text{H}_2\text{O}$.

May be obtained by the interaction of a soluble cerium salt and a soluble oxalate; it usually contains some lanthanum oxalate, and didymium oxalate.

Characters: An almost white granular powder insoluble in water; when incinerated it loses 53 p.c. of its weight (=water of crystallisation and oxalic acid); it decomposes at a dull red heat yielding a reddish-brown powder which dissolves completely and without effervescence in boiling hydrochloric acid; the resulting solution gives with a saturated solution of potassium sulphate a white crystalline precipitate.

Medicinal properties: Sedative and tonic. In actions it resembles Bismuth Subnitrate. It is used especially in the vomiting of pregnancy; in chronic vomiting; in dyspepsia, gastrodynia and pyrosis; in chronic cough it is most efficacious; also spasmodic cough and the cough of phthisis and in convulsive diseases, as chorea, epilepsy, etc. For sea sickness the dose is 10-20 grs. every 3 hours. It does not discolour the skin, as does Nitrate of Silver.

Barium. Ba. Atomic weight 136.40. This metal is present in heavy spar (=sulphate of baryta) and in baryta. It is a yellowish metal; it quickly combines with oxygen forming the oxide, baryta, an earth resembling quick lime; at ordinary temperatures it decomposes water.

Barium Chloride, B.P. *Appendix.* $\text{BaCl}_2, 2 \text{H}_2\text{O}$; occurs as colourless crystals.

Barium Nitrate, $\text{Ba } 2 \text{NO}_3$, or Barium Acetate, may also be used provided they answer the required tests.

Barium Hydroxide. $\text{Ba} (\text{OH})_2, 8 \text{H}_2\text{O}$; colourless crystals entirely soluble in water; prepared by mixing concentrated solution of barium chloride and sodium hydroxide, and purifying by crystallisation.

Reaction of solutions of Barium:

1. With sulphuric acid a white precipitate is formed, insoluble in nitric acid.
2. With ammonium hydrosulphide, no precipitate.
3. On adding excess of diluted sulphuric acid, filtering and evaporating the filtrate to dryness in a platinum dish, no residue should remain, or in the case of the hydroxide only a very slight residue.

Barium Sulphide. BaS .

A thin paste, containing 2 of Barium Sulphide (strength 70 p.c. pure BaS), 5 of Starch, and 1 of powdered orris root, with sufficient water added, makes an efficient depilatory.

Barium Chloride has been recommended for aneurism and as a Nervine Tonic, but is not now so used. In large doses it temporarily stimulates the circulation, but this is soon marked by a profound depression, the heart stopping in systole.

Barium is recognised in the Pharmacopœia only for chemical

A whitish metal, having an appearance something between silver and zinc; very malleable and ductile; capable of being highly polished; it does not tarnish under ordinary circumstances; it is a very light metal being only one-fourth the sp. gr. of silver; if cast into moulds it is soft like silver, but if hammered or rolled it becomes as hard as iron; it is sonorous, a bar of it if struck giving out a sweet clear ringing sound: it is a good conductor of heat and electricity.

During recent years its price has been greatly reduced and an extensive sphere of usefulness seems to be opening up for it.

Reactions:—Solution of ammonia gives a white gelatinous precipitate (=aluminium hydrate) soluble in hydrochloric acid, in acetic acid, in solution of potassium hydroxide or solution of sodium hydroxide, but nearly insoluble in solution of ammonia or ammonium salts, and quite insoluble when the solutions have been boiled.

ALUMEN, B.P. Alum.

Potassium Alum or Aluminium and Potassium Sulphate, $\text{Al}_2(\text{SO}_4)_3, \text{K}_2\text{SO}_4, 24 \text{ H}_2\text{O}$, a combination of Aluminium Sulphate with Potassium Sulphate.

Ammonium Alum or Aluminium and Ammonium Sulphate, $\text{Al}_2(\text{SO}_4)_3, (\text{NH}_4)_2\text{SO}_4, 24 \text{ H}_2\text{O}$; produced by the combination of Aluminium Sulphate with Ammonium Sulphate.

Dose: 5 to 10 grains, for children 2–5 grs. may be given with milk. A teaspoonful in honey or treacle acts as an emetic.

Characters: Colourless transparent crystalline masses; exhibiting the faces of the regular octahedron; no smell; taste sweetish astringent; solubility 1 in 10 of cold water, 3 in 1 of boiling water, the solution having an acid reaction, freely soluble in glycerin; insoluble in alcohol (90 p.c.); it gives the reactions of its constituents.

On exposure to air it acquires a whitish coating; on heating it melts in its own water of crystallisation.

GLYCERINUM ALUMINIS, B.P. Glycerin of Alum.

Preparation: Take 1 oz. Alum in powder, 3 fl. drms. Distilled Water, and Glycerin sufficient to produce 6 fl. oz.; triturate until solution is effected, warming slightly if necessary; set aside; pour off the clear liquid from any deposited matter that may be present. A powerful local astringent: diluted with water it forms a useful gargle.

Medicinal properties: Alum is **Astringent, Emetic**.

A saturated solution is used as a **styptic** for hæmorrhage, leech bites, etc.; a 1 per cent. solution as an **astringent**, nasal douche, or injection in leucorrhœa; a 2 to 4 per cent. solution as a gargle for relaxed throat; as a snuff in epistaxis 3 grains Alum mixed with

Internally as an **emetic**, it acts promptly and without producing much depression; given in croup; as an **antidote** for chronic lead poisoning, as it forms an insoluble Lead Sulphate; as an **astringent** in chronic diarrhoea, dysentery, in internal hæmorrhages and menorrhagia, and in the later stages of whooping cough; also to prevent the vomiting of phthisis.

As it has a solvent action on the cornea, it should not be used as a collyrium.

Alum precipitates albumen and gelatin. It has no action on the unbroken skin; but applied to parts from which the epidermis has been removed, it is **astringent** and **styptic**, contracting the tissue and so relieving congestion and lessening discharges.

In addition to Potassium Alum and Ammonium Alum, which are official, there is also Sodium Alum in which Sodium takes the place of the other alkalis; also Chrome Alum and Iron Alum, in which these metals replace the Aluminium.

Alum (*Phitkari*, Hind.), of fair quality is obtainable in nearly every Indian bazaar.

ALUMEN EXSICCATUM, B.P. Exsiccated Alum.

Known also as Dried Alum or Burnt Alum.

Preparation: Heat 4 oz. Potassium Alum in a porcelain dish or other suitable vessel until it liquefies; then increase and continue the heat until aqueous vapour ceases to be disengaged and the salt has lost about 45 p.c. of its weight.

Characters: A white powder, slowly and completely soluble in 20 times its weight of cold water, or in three-fourths its weight of boiling water; it absorbs moisture on exposure to the air.

Medicinal properties: **Caustic**, **astringent**.

Used only as an external caustic and astringent in indolent ulcers and ulcerative stomatitis.

KAOLIN, B.P. Kaolin.

A native aluminium silicate, powdered, and freed from gritty particles by elutriation.

Characters: A soft whitish powder, insoluble in water or in diluted acids. The product of its fusion with alkalis digested in water and neutralised with hydrochloric acid, gives the reactions of aluminium.

Uses: An excipient for pills. The finer qualities may be used as a form of Fuller's earth for infants.

ZINC, B.P. *Appendix.* (Zincum), Zn. Atomic weight 64.91.

The laminated or granulated metal; entirely soluble in diluted hydrochloric acid: the solution should not yield the characteristic

Zinc is a bluish-white metal; taste peculiar; when rubbed it gives a perceptible smell.

Reactions of soluble Zinc salts.

• 1. With a solution of the salt, Liquor Ammoniae or Liquor Potassae gives a white gelatinous precipitate of Zinc Hydrate, soluble in excess of the reagent.

2. With alkaline solutions, Sulphuretted Hydrogen or Ammonium Sulphide gives a white precipitate of Zinc Sulphide soluble in dilute mineral acid but not in acetic acid. This action is prevented by the presence of a free mineral acid.

3. With a solution of a Zinc salt, Potassium Ferrocyanide yields a white precipitate (=Zinc Ferrocyanide), insoluble in diluted hydrochloric acid.

General Medicinal Properties of Zinc Salts:—

Externally.—The stronger preparations of Zinc are caustic or even escharotic; the weaker are astringent, causing contraction of the blood vessels, and so relieve local inflammations.

Internally.—Small doses absorbed into the blood act as a Nerve Tonic, specially useful in controlling conditions of nervous irritability as chorea, epilepsy, &c.

In large doses the sulphate is emetic, in still larger doses it is poisonous.

Granulated Zinc is made by pouring fused Zinc into cold water. It is used to prepare Zinc salts.

ZINCI ACETAS, B.P. Zinc Acetate, $\text{Zn} (\text{C}_2\text{H}_3\text{O}_2)_2, 3\text{H}_2\text{O}$; prepared by neutralising acetic acid with Zinc Carbonate.

Dose: 1 to 2 grains.

Characters: Thin translucent and colourless crystalline plates of a pearly lustre, taste sharp unpleasant; solubility in 2.5 of water; it gives the reactions of zinc and of acetates.

• *Medicinal properties:* Tonic, Astringent.

Its actions are similar to those of Zinc Sulphate.

ZINCI CARBONAS, B.P. Zinc Carbonate or Zinc Oxycarbonate.

$\text{ZnCO}_3, (\text{Zn} \text{H}_2\text{O}_2)_2, \text{H}_2\text{O}$; produced by the interaction of zinc sulphate and sodium carbonate.

Characters: A white powder without odour or taste; insoluble in water; soluble with effervescence and without residue in diluted nitric acid. It gives the reactions of zinc and of carbonates

Used: To make Zinc Oxide.

Calamine is native Zinc Carbonate.

ZINCI CHLORIDUM, B.P. Zinc Chloride.

ZnCl_2 produced by the interaction of zinc and hydrochloric acid.

Characters: Colourless opaque rods or tablets; very deliquescent and caustic; almost entirely soluble in water, alcohol (90 p.c.) or ether; it gives the reactions of zinc and of chlorides.

LIQUOR ZINCI CHLORIDI, B.P. Solution of Zinc Chloride.*

Preparation: Dissolve Granulated Zinc in hydrochloric acid: standardise: evaporate to specified strength.

Characters: A colourless liquid, taste sweetish astringent; sp. gr. 1.530. It should give the tests of zinc and of chlorides.

Medicinal properties: Zinc Chloride is **Astringent, Antiseptic, Escharotic**. It is used externally as a **Caustic**; and as a lotion (gr. 20 to 1 oz. water) for syringing offensive pus cavities, &c. It is never given internally.

Sir W. Burnett's Disinfecting Solution is a solution of Zinc Chloride of sp. gr. 2.00. It is a powerful disinfectant.

ZINCI OXIDUM, B.P. Zinc Oxide.

$Zn\ O$; may be prepared by exposing Zinc Carbonate to a dull red heat; or from metallic zinc by combustion.

Dose: 2 to 10 grains; may be made into pills with glucose.

Characters: A powder without odour or taste; giving the reactions of zinc; if prepared from the carbonate, it is a soft nearly white powder becoming pale yellow on heating; if prepared by combustion it is white.

UNGUENTUM ZINCI, B.P. Zinc Ointment.

Strength: 15 p.c.

Preparation: To 17 oz. Benzoated Lard melted at a low temperature add 3 oz. Zinc Oxide finely sifted; stir constantly until cold.

UNGUENTUM ZINCI OLEATIS, B.P. Oleate of Zinc Ointment.

Preparation: Mix equal weights of Zinc Oleate and melted soft paraffin, stir until cold.

The Zinc Oleate is prepared as follows:—

Dissolve 2 oz. Zinc Sulphate in 4 fl. oz. Distilled Water; mix this with a solution of 4 oz. Hard Soap or shavings dissolved in 40 fl. oz. Distilled Water; collect the precipitated Zinc Oleate; wash with hot Distilled Water until the washings give little or no reaction for sulphate: dry on a water-bath.

Medicinal properties: Zinc Oxide is **Tonic** and **Antispasmodic**. It checks the night sweats of Phthisis.

Externally, Astringent, Absorbent. Used in Eczema, and as a dusting powder with starch.

ZINCI SULPHAS, B.P. Zinc Sulphate, $ZnSO_4, 7\ H_2O$; formed by the interaction of diluted sulphuric acid and zinc.

Characters: Colourless transparent prismatic crystals; taste strongly metallic, styptic; solubility, 10 in 7 of water; insoluble in alcohol (90 p.c.). It gives the reactions of zinc and of sulphates.

Medicinal properties: In small doses tonic, antispasmodic; in large doses emetic.

Used 3 grns. to 1 oz. water as an **astrigent injection** for sub-acute gonorrhœa or leucorrhœa; one-third of this strength as a collyrium in ophthalmia.

Red Lotion (*Lotio Rubra*), a **stimulant** application to chronic ulcers.

Made by dissolving 2 grns. Zn. Sulph. with 10 mins. Tr. Lavand. Co. in Water up to 1 oz.

ZINCI SULPHOCARBOLAS, B.P. Zinc Sulphocarbolate or Zinc phenol-para-sulphonate, $\text{Zn}(\text{OH} \cdot \text{C}_6\text{H}_4 \cdot \text{SO}_3)_2, \text{H}_2\text{O}$.

May be made by heating a mixture of Carbolic Acid and Sulphuric Acid, and saturating the product with Zinc Oxide.

Characters: Colourless transparent tabular efflorescent crystals; solubility, 1 in 2 of water; 1 in $2\frac{1}{2}$ of alcohol (90 p.c.).

Medicinal properties: **Antiseptic, Astringent.** Not used internally. As a **spray** for the throat 1 p.c. in water; as an **eye wash**, or vaginal injection $\frac{1}{2}$ p.c. in water.

ZINCI VALERIANAS, B.P. Zinc Valerianate or Zinc iso-valerianate, $\text{Zn}(\text{C}_5\text{H}_9\text{O}_2)_2$.

May be prepared by saturating iso-valerianic acid with zinc carbonate, or by the interaction of zinc sulphate and sodium iso-valerianate.

Dose: 1 to 3 grains; may be made into pills with Extract of Gentian or Glucose.

Characters: White pearly tabular crystals; odour disagreeable; taste metallic; very slightly soluble in cold water or in ether; soluble in hot water or alcohol (90 p.c.).

Medicinal properties: **Antispasmodic.** Used chiefly for neuralgias and hysterias. Its actions are those of a zinc salt.

PLUMBUM. Lead. **Pb.** Atomic weight, 205.35.

Lead is a soft metal, with a bright metallic lustre when newly cut or melted. Its surface soon tarnishes on exposure to air, becoming a bluish white colour; sp. gr. 11.3; melting point 325°C . It occurs extensively in nature as Galena, a sulphide; in various saline combinations, and rarely as the oxide.

Reactions of soluble Lead salts:—

(1) with soluble Sulphates, they give a white precipitate of

- (2) with soluble Chlorides, a white precipitate of Lead Chloride, sparingly soluble in cold water, but very soluble in boiling water;
- (3) with Iodides, a yellow precipitate of Lead Iodide which readily dissolves on heating, and on cooling reappears as thin hexagonal plates.
- (4) with chromates, a yellow precipitate of Lead Chromate, readily soluble in strong hot Nitric Acid, sparingly soluble in dilute Nitric Acid, insoluble in Acetic Acid.
- (5) with Sulphuretted Hydrogen both soluble and insoluble Lead salts give a black precipitate of Lead Sulphide.

Medicinal properties: The actions of preparations of Lead externally, and in the alimentary canal, are due to their coagulating the albumen of the part, so being **protective and astringent**; also to their contracting the blood vessels, so being **sedative and controlling inflammation**. The solution of the subacetate is the only liquid preparation. It is used externally in lotions, injections and ointments.

The acetate is the only salt of lead given *internally*. It is used as an intestinal astringent in diarrhoea, &c., also in cases of hæmorrhage when the bleeding vessel can be reached only through the circulation, e.g., hæmoptysis. Lead is excreted by the intestine as sulphide, hence the faeces are blackened, also by the urine, sweat, and milk.

Chronic Lead Poisoning. Lead enters the blood as the albuminate, and is tenaciously retained in the tissues. Taken in small doses long continued, it produces a condition known as **plumbism**, characterised by intestinal symptoms (dyspepsia, colic, constipation), cardiac symptoms, (increased heart action and full, tense infrequent pulse), nervous symptoms (neuralgic pains, tremors, going on to what is known as **lead paralysis**; which affects chiefly the extensor muscles of the wrist). The **blue line** on the gums seen where the teeth are present is due to the formation of Lead Sulphide.

PLUMBI ACETAS, B.P. Lead Acetate, known also as **Sugar of Lead**, $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2, 3\text{H}_2\text{O}$.

A salt obtained by dissolving lead oxide or carbonate in Acetic Acid.

Dose: 1 to 5 grains; may be given in pill; or in solution, with excess of Acetic Acid, to clear any turbidity.

Characters: Small white monoclinic prisms, slightly efflorescent; odour acetous; taste sweet astringent; solubility 1 in less than 3 of cold water, 1 in 30 alcohol (90 p.c.); its solution only slightly turbid, and is clear or has only a slight milky appearance.

PILULA PLUMBI CUM OPIO, B.P. Pill of Lead with Opium.

Strength : $12\frac{1}{2}$ p.c. of opium.

Dose : 2 to 4 grains.

Preparation : Mix 36 grains Lead Acetate, 6 grains Opium, both powdered, Syrup of Glucose 4 grains, or a sufficient quantity to form a mass.

Given every 3 or 4 hours as a hæmostatic.

SUPPOSITORIA PLUMBI COMPOSITA, B.P. Compound Lead Suppositories.

Each suppository contains 3 grains Lead Acetate and 1 grain Opium made with oil of Theobroma as directed for Tannic acid suppositories.

UNGVENTUM PLUMBI ACETATIS, B.P. Lead Acetate Ointment.

Strength : 4 p.c. Lead Acetate.

Preparation : Mix 20 grains Lead Acetate with 480 grains white paraffin ointment.

Medicinal properties : Lead Acetate, **Sedative, Astringent**. Used *Internally* to check excessive mucous discharges and hæmorrhages from the alimentary canal, and to diminish secretion in bronchitis and phthisis.

Externally, to reduce inflammatory swelling after sprains, to diminish the profuse discharge of ulcers, and as an injection in gonorrhœa.

Incompatibles : Sulphuric Acid, Sulphates. (See Reactions of Lead).

PLUMBI CARBONAS, B.P. Lead Carbonate.

2 Pb CO_3 , Pb (OH)_2 ; may be prepared by the interaction of lead, water and carbonic anhydride in the presence of vapour of acetic acid. It is known in commerce as **White Lead**.

Characters : A soft heavy white powder; insoluble in water, entirely soluble in diluted acids; it gives the reactions of lead and of carbonates.

UNGVENTUM PLUMBI CARBONATIS, B.P. Lead Carbonate Ointment.

Strength : 10 p.c.

Preparation : Mix $\frac{1}{4}$ oz. Lead Carbonate powdered with $2\frac{1}{4}$ oz. white Paraffin ointment.

Medicinal properties : Lead Carbonate is used only externally as a dusting powder or ointment; it is a **sedative** and **astringent**.

PLUMBI IODIDUM, B.P. Lead Iodide.

Precipitated Lead Iodide, Pb I_2 ; obtained by the interaction of Lead Nitrate or Acetate and Potassium Iodide.

Characters: A heavy bright yellow powder; solubility 1 in 2000 of cold water, 1 in about 200 of boiling water and depositing in golden-yellow crystalline scales as the latter solution cools, entirely soluble in solution of ammonium chloride; it gives the reactions of lead and of iodides.

EMPLASTRUM PLUMBI IODIDI, B.P. Lead Iodide Plaster.

Strength: 10 p.c.

Preparation: Melt together 16 oz. Lead Plaster and 2 oz Resin at as low a temperature as possible; in this mix 2 oz. finely powdered Lead Iodide.

UNGUENTUM PLUMBI IODIDI, B.P. Lead Iodide Ointment

Strength: 10 p.c.

Preparation: Mix $\frac{1}{4}$ oz. Lead Iodide finely powdered in $2\frac{1}{4}$ oz. yellow Paraffin ointment.

Medicinal properties: Lead Iodide is used only externally as an **absorbent** of chronic swellings.

PLUMBI OXIDUM, B.P. Lead Oxide.

Synonym: Litharge.

Pb O ; prepared by the action of air on melted lead.

Characters: Heavy pale yellowish-red scales, insoluble in water, completely soluble without effervescence in nitric acid or acetic acid; it gives the reactions of lead.

EMPLASTRUM PLUMBI, B.P. Lead Plaster.

Preparation: Take 16 oz. Lead Oxide, 2 pounds olive oil, 16 fl. oz. Distilled Water; boil all together gently by the aid of a steam bath; keep simmering for 4 or 5 hours, stirring constantly, until the product acquires a proper consistence for a plaster; add more Distilled Water during the process if necessary.

Known as **Diachylon Plaster**. It is an Oleate of Lead with glycerin mechanically included.

Medicinal properties: Lead Oxide is used chiefly for making other Lead preparations.

The ointment is **sedative** and **protective** to parts requiring support.

Lead Peroxide, B.P. Appendix. Pb O_2 . The pure lead peroxide of commerce.

LIQUOR PLUMBI SUBACETATIS FORTIS, B.P. Strong

Preparation : Boil 5 oz. Lead Acetate and $3\frac{1}{2}$ oz. Lead Oxide powdered in one pint of Distilled Water for $\frac{1}{2}$ hour, constantly stirring, and maintaining the volume of the liquid by occasional additions of Distilled Water; filter; add Distilled Water sufficient to produce one pint.

Characters : A clear colourless liquid; reaction alkaline; taste sweet astringent; with mucilage of gum acacia, it forms an opaque white jelly; it becomes turbid on exposure to the air (due to formation of Carbonate); it gives the reactions of lead and of acetates. The strong Solution of Lead Subacetate is a powerful irritant; it is rarely used undiluted.

LIQUOR PLUMBI SUBACETATIS DILUTUS, B.P. Diluted Solution of Lead Subacetate.

Synonyms : Goulard's Lotion, Goulard Water.

Preparation : Mix 2 fl. drms. alcohol (90 p.c.) with $19\frac{1}{2}$ fl. oz. of recently boiled and cooled Distilled Water, add 2 fl. drms. strong solution of Lead Sub-acetate.

GLYCERINUM PLUMBI SUBACETATIS, B.P. Glycerin of Lead Subacetate.

Preparation : Mix 5 oz. Lead acetate, $3\frac{1}{2}$ oz. Lead Oxide in powder, 1 pint Glycerin, 12 fl. oz. Distilled Water; boil for $\frac{1}{4}$ hour; filter; evaporate at a temperature not exceeding 222° F., until the product weighs $32\frac{3}{4}$ oz., and has a sp. gr. of 1.48.

UNGUENTUM GLYCERINI PLUMBI SUBACETATIS, B.P. Lead Subacetate Ointment.

Preparation : Mix 1 oz. Glycerin of Lead Subacetate with 5 oz. white Paraffin ointment.

Medicinal properties : The Diluted Solution of Lead Subacetate is **Astringent, Antiphlogistic, Sedative**. Used applied by means of cloths kept moist, to sprains and bruises, and to reduce inflammation. Also in Rose Water as an astringent gargle in tonsillitis.

It acts probably by constricting the blood vessels.

FERRUM, B.P. Iron. Fe. Atomic weight, 55.90.

Metallic Iron exists officially in two forms.

Annealed iron wire having a diameter of about $\frac{1}{200}$ of an inch (=No 35 wire guage); or wrought iron nails free from oxide.

Iron forms two series of salts:—

(a) the **Ferrous** or **proto salts** (e.g., Protochloride of Iron, or Ferrous Chloride, Fe Cl_2). These are generally pale green, and contain the largest proportion of iron. They tend to take oxygen from the atmosphere or

(b) the **Ferric**, or **Persalts**, or **Sesquisalts** (e.g., Perchloride of Iron, or Ferric Chloride, Fe_2Cl_6). These contain a smaller proportion of iron.

Reactions: Common to both Ferrous and Ferric salts:—

1. With ammonium sulphide they give a black precipitate (=ferrous sulphide or ferric sulphide depending on the substance used), soluble in Hydrochloric acid.
2. With potassium ferrocyanide. They give a blue precipitate (with ferric salts, or with ferrous salts a white precipitate rapidly becoming blue). This precipitate is **Prussian blue**, a compound of ferrous and ferric cyanide.

The two series of salts react differently with test chemicals.

Reagent.	Ferrous Salt.	Ferric Salt.
Hydrogen Sulphide.	No precipitate in slightly acid solution.	White ppt. of Sulphur.
Caustic Alkalis and Ammonia.	Nearly white ppt. of ferrous hydrate rapidly turning a dull green.	Reddish brown ppt. of ferric hydrate soluble in solution of citric or tartaric acid.
Pot. Ferricyanide	Dark blue ppt. insoluble in dilute hydrochloric acid.	Reddish brown coloration, but no precipitate.
Tannic Acid.	Blue-black coloration gradually appearing.	Blue-black coloration at once.

General actions of Iron Salts.

Applied to *Mucous Membranes* or to a *raw surface*, the Ferric salts coagulate the albumen of the tissues, and so are powerfully **astrigent and caustic**. Ferrous salts have hardly any such local action. In the mouth both varieties have an inky taste, and may blacken the teeth or tongue.

In the *Alimentary Canal* both varieties are **astrigent and irritative**, the ferric more so than the ferrous salts. In small doses they tend to produce constipation.

In large doses the hydrogen sulphide present in the intestines changes them into sulphide of iron, which may increase peristalsis causing diarrhoea.

Absorbed into the blood they increase both the red corpuscles and the hæmoglobin, and thus, by facilitating oxidation, they increase the functional activity of the different organs.

Iron is excreted by the mucous membrane of the stomach and intestine, and by the bile and kidneys. The stools become black

Uses : Ferric salts are used as local **Styptics** and as **hæmatinics** in cases when the tongue is pale and flabby. They may be given with Infusion of Quassia, or Calumba; they tinge Infusion of Chiretta and hops; and blacken all astringents.

Ferrous salts are used as a **hæmatinic** in cases when the intestinal mucous membrane is irritable.

To get the best results from iron tonics, they should be taken with or after meals and continued for several weeks. A purgative every 7 to 10 days increases their efficacy.

Iron preparations should not be given in acute inflammatory diseases, as they excite the circulation, producing headache, &c.

Being a normal constituent of the blood, iron is **not poisonous** as ordinarily given.

VINUM FERRI, B.P. Iron Wine.

Dose : 1 to 4 fl. drms.

Preparation : Set aside 1 oz. Iron Wire with 1 pint Sherry Wine for 30 days in a closed vessel; the Iron Wire being almost but not quite immersed in the Sherry, the vessel being frequently shaken, and the stopper occasionally removed; filter.

Medicinal properties : A stimulating blood Tonic.

FERRUM REDACTUM, B.P. Reduced Iron.

A fine powder containing at least 75 p.c. of metallic iron, with a variable amount of metallic oxide: prepared by reducing ferric hydroxide heated to a dull redness by a stream of dry hydrogen. It should be carefully preserved from the air.

Dose : 1 to 5 grains in powder, or pill.

Characters : A fine greyish-black powder; strongly attracted by the magnet; producing a metallic streak when rubbed with firm pressure in a mortar.

Trochiscus Ferri Redacti, B.P. Reduced Iron Lozenge.

Each contains 1 grn. Reduced Iron made with simple basis.

Medicinal properties : Reduced Iron is one of the most powerful **non-astringent hæmatinics**. Being tasteless, it is a convenient form in which to give iron to children. It is useless as a hæmostatic.

One grain of Reduced Iron equals 5 grns. of Iron and Ammonium Citrate.

FERRUM TARTARATUM, B.P. Tartarated Iron.

Prepared by the interaction of ferric hydroxide obtained by the action of ammonia or ferric sulphate and acid potassium tartrate the result being purified and dried in flakes.

Dose : 5 to 10 grains.

Characters: Thin transparent scales of a deep garnet colour, taste sweetish astringent; soluble in water, sparingly soluble in alcohol 90 (p.c.); it gives the reactions of a ferric salt.

Medicinal properties: A **Blood Tonic**.

Liquor Ferri Acetatis, B.P. Solution of Ferric Acetate.

Preparation: Dissolve in glacial acetic acid the ferric oxide obtained by the interaction of ammonia on ferric sulphate; purify.

Dose: 5 to 15 mins.

Characters: A red liquid, odour acetous, taste sour styptic; miscible in all proportions in water or alcohol (90 p.c.); it gives the reactions of ferric salts and of acetates.

Medicinal properties: A **blood tonic** in action resembling Liquor Ferri Perchloridi, but less astringent.

FERRI ARSENAS, B.P. Iron Arsenate.

Arseniate of Iron, B.P., 1885.

Ferrous Arsenate, $\text{Fe}_3 (\text{AsO}_4)_2, 6 \text{H}_2 \text{O}$, with ferric arsenate, and some iron oxide; prepared by the interaction of sodium arsenate ferrous sulphate, and sodium bicarbonate; the precipitate being purified and dried.

Dose: $\frac{1}{16}$ to $\frac{1}{4}$ grain; may be given thrice daily in a pill.

Characters: A greenish amorphous powder tasteless; insoluble in water but soluble in hydrochloric acid. It gives the reactions of ferrous and ferric salts and of arsenates.

Medicinal properties: **Nerve tonic and alterative.**

It has the constitutional actions of arsenious acid, but contains too little iron to be of use as an Iron preparation.

FERRI CARBONAS SACCHARATUS, B.P. Saccharated Iron Carbonate.

Ferrous Oxycarbonate, $x \text{FeCO}_3, y \text{Fe}(\text{OH})_2$, more or less oxidised, mixed with sugar; the ferrous salt, if reckoned as carbonate, forming one-third of the mixture.

The precipitate formed by a mixture of ferrous sulphate and ammonium carbonate, triturated with refined sugar and dried. The sugar is added to prevent oxidation.

Dose: 10 to 30 grains.

Characters: Small coherent lumps or powder, colour brownish-grey, taste sweetly chalybeate; it dissolves, with effervescence, in warm hydrochloric acid, diluted with half its volume of water.

Mistura Ferri Composita, B.P. Compound Mixture of Iron.
Known as Griffith's Mixture.

Dose: $\frac{1}{2}$ to 1 fl. oz.

small quantity of Rose Water so as to form a thin paste; add gradually 50 minims spirit of nutmeg, and Rose Water sufficient to make 7 oz. This mixture may be kept ready in stock.

• When required for use, dissolve 25 grains Ferrous Sulphate in 3 oz. Rose Water; mix the liquids. **Stimulating Iron Tonic.**

PILULA FERRI, B.P. Iron Pill. Known as **Blaud's Pill.**

Dose: 5 to 15 grains.

Strength: 5 grains contains 1 grain ferrous carbonate.

Preparation: To 150 grains Syrup, 10 grains Glycerin, 20 grains Distilled Water, add 150 grains exsiccated Ferrous Sulphate; mix, add quickly 95 grains exsiccated Sodium Carbonate both finely powdered; mix; set aside for 15 minutes or until the reaction is complete; add 50 grains Gum Acacia and 15 grains Tragacanth both powdered; incorporate thoroughly.

Medicinal properties: Iron Carbonate is a good **Iron Tonic**; non-astringent. Useful in anæmic amenorrhœa.

Incompatibles: Acids and Acid Salts displace the Carbonic Acid forming other iron compounds; also Vegetable Astringents.

Iodide of Iron. (*Ferri Iodidum*); occurs as reddish-brown dense masses, soluble in water. FeI_2 .

SYRUPUS FERRI IODIDI, B.P. Syrup of Ferrous Iodide.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Strength: 11 mins. contains 1 grain Ferrous Iodide.

Medicinal properties: **Tonic.** Useful in scrofulous and cachectic diseases requiring Iron.

Made by treating Iron, Iodine, Sugar and Water.

FERRI ET AMMONII CITRAS, B.P. Iron and Ammonium Citrate.

Preparation: Dissolve Ferric hydroxide (obtained by the interaction of ammonia and ferric sulphate, and purified) in Citric Acid; add Ammonia; dry the product in thin flakes.

Dose: 5 to 10 grains.

Characters: Thin transparent scales, colour deep red, deliquescent, taste astringent slightly sweetish; reaction feebly acid, solubility 2 in 1 of water, almost insoluble in alcohol (90 p.c.).

VINUM FERRI CITRATIS, B.P. Wine of Iron Citrate.

Dose: 1 to 4 fl. drms.

Preparation: Dissolve 160 grains Iron and Ammonium Citrate in orange wine sufficient to form 1 pint; agitate occasionally for 3 days; filter.

It may be given flavoured with Tr. Orange, and diluted with water. An aqueous solution may be kept for dispensing:—1 part dissolved in $1\frac{1}{2}$ part water, measures 2 parts and is permanent.

Incompatibles: Fixed Alkalis drive off the Ammonia. Mineral acids displace the Citric Acid. Vegetable Astringents form an unpleasant inky mixture.

FERRI ET QUININÆ CITRAS, B.P. Iron and Quinine Citrate.

Preparation: Dissolve Ferric hydroxide (obtained by the interaction of ammonia with ferric sulphate, and purified) in a solution of Citric acid; when fully dissolved add quinine (precipitated from an acid solution of quinine sulphate by adding ammonia) purify; dry the product in thin layers.

Dose: 5 to 10 grains.

Characters: Thin greenish golden-yellow scales, somewhat deliquescent: taste bitter chalybeate; solubility 2 in 1 of water.

Medicinal properties: Astringent, Tonic. It combines the actions of Iron and Quinine.

For dispensing purposes an aqueous solution made by dissolving 1 part in $1\frac{1}{2}$ parts water may be kept. This measures 2 parts and is permanent.

Incompatibles: Alkalis and their Carbonates precipitate the Quinine. Vegetable Astringents produce an unpleasant inky mixture.

Ferric Chloride, B.P. Appendix.

The pure anhydrous ferric chloride of commerce. It occurs in yellowish-brown crystalline masses, deliquescent, soluble in water or Alcohol (90 p.c.).

LIQUOR FERRI PERCHLORIDI FORTIS, B.P. Strong Solution of Ferric Chloride.

Prepared by the action of hydrochloric acid on iron; an excess of hydrochloric acid being added.

Strength: 110 mins. contains $22\frac{1}{2}$ grains of iron.

Characters: An orange-brown solution, taste strongly styptic; miscible with water or alcohol in all proportions; it gives the reactions of ferric salts and chlorides.

Medicinal properties: A powerful local Styptic and Astringent. For internal use it is always diluted.

LIQUOR FERRI PERCHLORIDI, B.P. Solution of Ferric Chloride.

Dose: 5 to 15 mins. This solution and the Tincture of Ferric Chloride contain identical proportions of ferric chloride.

Preparation: Mix 5 fl. oz. strong Solution of Ferric Chloride

Medicinal properties: **Astringent and Hæmatinic:** used internally in cases of anæmia with pale flabby tongue, indented by the teeth at the margin.

• It is contra-indicated if the tongue be red and irritable.

Medicinal properties: **Astringent, Hæmatinic Tonic.** **Liquor Ferri Perchloridi** is probably used more than any other preparation of iron.

TINCTURA FERRI PERCHLORIDI, B.P. Tincture of Ferric Chloride.

Dose: 5 to 15 mins.

Preparation: Mix 5 fl. oz. strong Solution of Ferric Chloride with 5 fl. oz. alcohol (90 p.c.); add Distilled Water sufficient to make 1 pint.

Medicinal properties: The same as Liq. Ferri Perchl.; in erysipelas large doses (15 to 20 mins.) are given every hour or two.

Dialysed Iron: (*Liquor Ferri Dialysatus*): is a solution of a highly basic ferric oxychloride or chloroxide of iron, with most of the acidulous matter removed by dialysis.

It may be readily prepared by adding dilute ammonia to a solution of Ferric Chloride, until the precipitate which first forms just redissolves. This probably is quite as efficacious without dialysis.

Characters: A clear brownish liquid with only very slight ferruginous taste; reaction neutral. After heating with Ac. Hydrochlor. it gives the reactions of a ferric salt.

Medicinal properties: Is a non-astringent hæmatinic: given in cases where the astringent salts would derange the stomach.

Dose: 10 to 20 mins.

LIQUOR FERRI PERNITRATIS, B.P. Solution of Ferric Nitrate.

Preparation: Dilute $4\frac{1}{2}$ fl. oz. Nitric Acid with 16 fl. oz. of Distilled Water; introduce 1 oz. Iron; set aside until the metal is dissolved, moderating the action, if too violent, by adding more Distilled Water; add Distilled Water sufficient to produce 30 oz.

Dose: 5 to 15 mins.

Strength: 110 mins. contain $3\frac{1}{2}$ grains of Iron.

Characters: A clear solution, colour reddish-brown, taste distinctly acid and astringent; it gives the reactions of Ferric salts and of Nitrates.

Medicinal properties: **Tonic and Astringent;** used in diarrhoea and chronic dysentery.

FERRI PHOSPHAS, B.P. Iron Phosphate.

A powder containing not less than 47 p.c. of hydrous ferrous phosphate, $\text{Fe}_3(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$, with ferric phosphate, and some

Prepared by the interaction of ferrous sulphate, sodium phosphate and sodium carbonate, purifying and drying.

Dose: 5 to 10 grains.

Characters: A slate-blue amorphous powder; insoluble in water; soluble in hydrochloric acid.

Medicinal properties: An **Iron Tonic**, used in Amenorrhœa, Rachitis, etc.

SYRUPUS FERRI PHOSPHATIS, *B.P.* Syrup of Ferrous Phosphate.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Strength: 1 fl. drm. represents 1 grain of the anhydrous salt.

Preparation: Place 75 grains Iron Wire and $1\frac{1}{4}$ fl. oz. concentrated Phosphoric acid, previously diluted with an equal volume of Distilled Water, into a small flask; plug the neck with cotton wool; heat gently until the iron is dissolved; when cold, filter into 14 fl. oz. Syrup, and pass Distilled Water through the filter sufficient to make one pint.

Medicinal properties: An **Iron Tonic**, suitable for anæmic cases.

Syrupus Ferri Phosphatis cum Quinina et Strychnina, *B.P.*
Syrup of Phosphate of Iron with Quinine and Strychnine.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Strength: 1 fl. drm. represents 1 grain anhydrous Ferrous Phosphate, $\frac{4}{5}$ grain Quinine Sulphate, and $\frac{1}{32}$ grain Strychnine.

Preparation: Place 75 grains Iron Wire and $1\frac{1}{4}$ fl. oz. concentrated Phosphoric acid, previously diluted with an equal bulk of Distilled Water, in a small flask; plug the neck with cotton wool and heat gently until the iron is dissolved; in the resulting solution dissolve 5 grains Strychnine in powder, and 130 grains Quinine Sulphate, filter into 14 fl. oz. of Syrup; pass Distilled Water through the filter sufficient to make one pint.

Medicinal properties: A good **strengthening Tonic**, suitable for general cases.

FERRI SULPHAS, *B.P.* Ferrous Sulphate.

$\text{FeSO}_4, 7 \text{H}_2\text{O}$; may be prepared by the interaction of diluted sulphuric acid and iron.

Dose: 1 to 5 grains.

Characters: Oblique rhombic prisms, colour pale bluish-green; taste astringent; insoluble in alcohol (90 p.c.), soluble in less than 2 parts cold water; it gives the reactions of ferrous salts and of sulphates.

Medicinal properties: **Astringent Iron Tonic**, used—*Externally*

Internally an **Astringent Iron Tonic**, useful in anæmias, especially those associated with discharges of any kind, e.g., chronic catarrh, or with enlarged spleen. It is apt to produce gastric irritation.

Its solutions rapidly oxidise, forming Ferric salts; it should therefore not be kept in solutions.

A more or less pure variety of Sulphate of Iron (*Hira Kasis*, Hind.), is obtainable in Indian bazaars.

LIQUOR FERRI PERSULPHATIS, B.P. Solution of Ferric Sulphate.

A solution of Ferrous Sulphate dissolved in excess of Sulphuric acid, with nitric acid added in order to change all the iron present into the ferric form.

Characters: A dense solution, colour dark red, very astringent without odour; miscible in all proportions with alcohol or water; it gives the reactions of ferric salts and of sulphates.

Medicinal properties: Externally a good **styptic**, not used internally.

It was introduced in order to make other preparations of iron.

FERRI SULPHAS EXSICCATA, B.P. Exsiccated Ferrous Sulphate.

Dried Sulphate of Iron, Brit. Pharm. 1885.

Preparation: Expose Ferrous Sulphate in a porcelain or iron dish to a temperature of 212° F., stirring occasionally until aqueous vapour ceases to be given off; reduce the residue to a fine powder. This should weigh about 60 p.c. of the original salt.

Dose: $\frac{1}{2}$ to 3 grains.

Characters: A nearly white powder, slowly but entirely soluble in water.

Medicinal properties: Similar to Ferrous Sulphate. It is given in pills when these are required to be of small bulk.

MANGANESE. Mn. Atomic weight 55.

One of the heavy metals, somewhat resembling iron in character. It is feebly magnetic; readily oxidises on exposure.

Manganese Peroxide, B.P. Appendix.

MnO_2 . The powdered native Peroxide or Pyrolusite; known also as Black Oxide of Manganese. It is a heavy black powder; dissolves almost entirely in Hydrochloric Acid with evolution of Chlorine; on heating to redness it gives off oxygen.

As a small proportion of Manganese is found in the blood, it has been recommended as a **blood tonic**, and has been used instead of Iron in anæmia and debilitation diseases.

and as a remedy the drug has fallen into disuse. It has ceased to be official.

It is used in the preparation of Oxygen, Chlorine, and Potassium Permanganate.

Copper, B.P. Appendix. Cuprum. Cu. Atomic weight 63.12.

The metal in foil, wire or turnings.

Copper takes its name from the island of Cyprus, where it was wrought by the Greeks from the earliest ages. Before the discovery of iron, it was used to make instruments of war, domestic utensils, &c. The purest copper is that deposited by electricity.

Reactions of solutions of Copper salts :—

- (1) With Sulphuretted hydrogen in acid solution, a brownish-black precipitate of Cupric Sulphide, insoluble in dilute acids.
- (2) With Ammonia, a blue precipitate, which dissolves in excess of Ammonia, forming an intensely blue solution.
- (3) Metallic Iron receives a reddish coating of copper when placed in a solution of a copper salt.
- (4) With Liquor Potassæ, solutions of copper give a light-blue precipitate of cupric hydrate: this on boiling is decomposed into brownish-black Cupric Oxide, and water.

CUPRI SULPHAS, B.P. Copper Sulphate.

Synonym : Cupric Sulphate. $\text{Cu SO}_4, 5\text{H}_2\text{O}$.

May be obtained by the interaction of water, sulphuric acid, and copper or cupric oxide. It is known also as **Blue Vitriol** or **Blue-stone**.

Dose : As an astringent $\frac{1}{4}$ to 2 grains; as an emetic 5 to 10 grains.

Characters : Blue triclinic prisms, solubility 1 in $3\frac{1}{2}$ of cold water, forming a strongly acid solution, very soluble in glycerin, insoluble in alcohol (90 p.c.); it gives the reactions of copper and of sulphates.

Medicinal properties : Astringent both externally and internally.

In large doses emetic.

Cupric Sulphate has no action on the unbroken skin; applied to wounded surfaces it precipitates the albumen of the tissues, therefore is a mild caustic and astringent.

Internally in small doses it is astringent, and is used in chronic diarrhoea, in large doses it is a powerful emetic, especially useful in cases of narcotic or phosphorus poisoning, and in croup.

Used Externally as a stimulating application to chronic ulcers; as a lotion $\frac{1}{2}$ to 2 p.c. in water; as an astringent injection 1 p.c. in water. Solid Cupric Sulphate is applied locally as a mild caustic.

Copper Sulphate is obtainable in most bazaars in India. (*Nela-tuta*, Hind.).

Copper Oxyacetate, B.P. Appendix.

The pure copper oxyacetate or verdigris of commerce.

Solution of Potassio Cupric Tartrate, B.P. Appendix.

Synonym: Fehling's Solution, for testing sugar in Urine.

Copper Solution. Dissolve 34.64 grammes crystallised Sulphate of Copper and 5 c.c. Sulphuric acid in water up to 500 c.c.

Alkaline Tartrate Solution. Dissolve 176 grammes Sodium Potassium Tartrate, 77 grammes Sodium Hydroxide in Distilled Water up to 500 c.c.

Mix these in equal volume when required.

CHROMIUM. Cr. Atomic weight 52.5.

A metal named from the Greek word for colour, on account of its many coloured compounds, as chrome iron ore, it is found extensively throughout America and Europe.

ACIDUM CHROMICUM, B.P. Chromic Anhydride, CrO_3 commonly termed Chromic Acid; produced by the interaction of Sulphuric Acid, and Potassium Bichromate.

Characters: Crimson acicular crystals; very deliquescent inodorous; acting corrosively on the skin; very soluble in water or in ether; it melts at a temperature of 377.6°F. , and at a still higher temperature decomposes evolving oxygen, leaving a greenish-black residue; warmed with hydrochloric acid chlorine is evolved; mixed with cold alcohol (90 p.c.) aldehyde is produced and a green residue remains.

Incompatible: If placed in contact with relatively small proportions of alcohol (90 p.c.), ether, glycerin, or some other organic substances sudden combustion or explosion may ensue.

LIQUOR ACIDI CHROMICI, B.P. Solution of Chromic Acid.

An aqueous solution containing 25 p.c. by weight of chromic anhydride. An orange-red, inodorous, caustic, strongly acid liquid.

Preparation: Dissolve 1 oz. Chromic Anhydride in 3 fl. oz. Distilled Water.

Medicinal properties: Chromic anhydride is used externally as a caustic. It is never used internally.

Cadmium Iodide, B.P. Appendix.

The pure crystals, Cd I_2 , of commerce.

Tin, B.P. Appendix.

Granulated by letting drops of tin in a molten state fall into water. It should yield no reaction with the tests for lead, copper, iron or zinc.

Uranium Nitrate, B.P. Appendix.

The crystals of pure uranium nitrate of commerce.

HYDRARGYRUM, B.P. Mercury. Hg. Atomic weight 198.80.

A metal obtained from native Mercuric Sulphide.

Characters: Silvery white liquid lustrous on exposure to moist or dry air; it is the only metal that is liquid at ordinary temperatures; boils at 662°F. , becomes solid at 39°F. below zero; easily divisible into spherical globules; readily volatilises at a temperature below that of visible redness leaving only an insignificant amount of fixed residue; Sp. gr. 13.6: it expands uniformly on being heated between temperatures considerably below zero and over 300°F. , hence its value for thermometers. If pure it runs in small spherical drops over smooth surfaces; if impure the drops are tailed and often leave a grey stain. It is purified by being squeezed through chamois leather. It can be separated from other metals by volatilisation.

Mercurial preparations are either decomposed or volatilised by heat; if heated with Sodium Carbonate they yield metallic Mercury.

Reactions: Common to Mercurous and Mercuric salts:—

- (1) With Hydrogen sulphide they give a black precipitate, insoluble in boiling diluted nitric acid.
- (2) Copper foil immersed in a solution, free from excess of nitric acid, becomes coated with a deposit of mercury, which on rubbing becomes bright, and from which the mercury may be volatilised by heat and obtained in globules.
- (3) Solution of strannous chloride reduces mercuric salts, first to mercurous salt, and then to metallic mercury.

Reactions distinguishing Mercurous from Mercuric salts:—

- (1) Solution of potassium or sodium hydroxide gives a black precipitate of Mercurous oxide with Mercurous salts, and a yellow precipitate of Mercuric oxide with Mercuric salts.
- (2) Solution of Ammonia gives a black precipitate of Mercurous-amido salt with Mercurous salt and a white precipitate with Mercuric salt: the latter is a double

- (3) **Solution of Potassium Iodide** gives a green precipitate with Mercurous salts soluble in excess, and with Mercuric salts a precipitate at first yellow, but rapidly becoming red (Mercuric Iodide), soluble in excess of Potassium Iodide or of Mercuric Chloride.

Mercury is used medicinally in three forms:—

- (1) **Metallic Mercury** mixed with some excipient (*e.g.*, Blue pill, Grey Powder).

- (2) **Subsalts, or Mercurous preparations** (*e.g.*, Mercurous Chloride, *synonym*, Calomel).

None of the soluble Mercurous salts are used in medicine.

- (3) **Persalts, or Mercuric preparations** (*e.g.*, Mercuric Chloride, *synonym*, Corrosive Sublimate).

Medicinal properties: *Externally*, Weak preparations of mercury, (*e.g.*, the ointments or solutions of the Perchloride very dilute), are **astrigent** and **stimulating**; stronger preparations (*e.g.*, the Perchloride in moderately dilute solutions) are **anti-septic** and **disinfectant**; still stronger preparations (*e.g.*, Acid Solution of the Nitrate, or very strong solution of Perchloride) are **caustic**, causing sloughing. The **specific action** of mercury can be obtained by local application as inunction, fumigation, baths, suppositories, &c.

Internally. In small doses **alterative**; in large doses calomel is **purgative**.

Actions. Mercury in metallic form has no action on the tissues save the mechanical one due to its weight. But in contact with the secretions of the body, it gradually forms compounds which become more and more soluble, and with their solubility their activity increases. The **insoluble salts** (*e.g.*, Calomel) are acted on in the same way, tending while in contact with the living tissue to become more soluble and active. The **soluble salts** are **extremely** active and poisonous. Mercurial poisoning may occur from the absorption of mercury applied in large quantity to a wounded surface or even to the unbroken skin.

In the stomach every form of mercurial preparation in small doses is acted on by the gastric secretion to form a complex chloride, which is soluble in excess of either Sodium Chloride or of Albumen, and therefore although sometimes precipitated at first, is readily absorbed. Neither mercury nor any of its preparations, except the Perchloride has any direct action on the liver, but as they stimulate the duodenum, they are efficient **cholagogues**. Large doses are irritant and purgative, and are expelled too rapidly to have much constitutional action.

Acute mercurial poisoning is due to the irritating effects of soluble preparations of mercury on the alimentary canal.

Only a small proportion of the mercury given by the mouth

secondary stage. How it acts in this disease is not understood, but it is unquestionably the most efficient treatment known. In small doses it has the power of breaking up newly formed fibrinous deposits.

Mercury is excreted from the system by the secretions (saliva, bile, urine, sweat and milk) and stimulates many of the excretory glands. Thus it is sialagogue. Its diuretic action is taken advantage of to assist the action of Digitalis and Squills.

Prolonged overdoses of mercury produces impoverishment of the body tissues and of nutrition, especially if the food given be deficient in quantity or quality. For mercurial poisoning see *Mercuric Chloride*.

Mercurial preparations should not be given in alterative doses to debilitated persons unless their debility be due to syphilis. In scrofula, tuberculous conditions, and in kidney disease, its bad effects more than counterbalance the good. Persons taking a course of mercury should be carefully nourished.

Children as a rule take mercury well; if syphilitic, nearly adult doses may be given.

Considerable difference is found in the amount necessary to produce constitutional effects of mercury in different patients: some requiring large doses; while in others very small doses cause the symptoms of chronic mercurial poisoning. The following gives an indication of the proper dose for each case: Begin with very small doses twice or thrice daily and gradually increase until the gums begin to be painful or other symptom of chronic mercurial poisoning occur. Half the dose which produces this is the proper amount of the preparation which may be given for a lengthened period (e.g., for 12 or 18 months).

EMPLASTRUM HYDRARGYRI, B.P. Mercurial Plaster.

Preparations: Heat 56 grains Olive Oil, add gradually 8 grains Sublimed Sulphur and stir until they are uniformly blended; with this mixture triturate 3 oz. Mercury until metallic globules are no longer visible; add 6 oz. Lead Plaster; mix.

Medicinal properties: Disentient, applied locally to chronic swellings, syphilitic nodes, &c.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO, B.P.

(See Ammoniacum, page 85).

Medicinal properties: Similar to Mercurial plaster. The ammoniacum added makes it more stimulating.

LINIMENTUM HYDRARGYRI, B.P. Liniment of Mercury.

Preparation: To 160 mins. strong solution of Ammonia add Liniment of Camphor sufficient to produce $1\frac{1}{2}$ fl. oz. Triturate 1 oz. Ointment of Mercury with Liniment of Camphor sufficient to produce $1\frac{1}{2}$ fl. oz., mix the two liquids.

Stimulating absorbent

Placed on lint in the armpit to produce salivation, or applied to indolent ulcers, chronic swellings, joints, or to the abdomen in chronic peritonitis.

PILULA HYDRARGYRI, B.P. Mercury Pill.

Synonym : Blue Pill.

Dose : 4 to 8 grains, followed by a saline purgative.

Preparation : Rub together 2 oz. of Mercury, with 3 oz. of Confection of Roses, until metallic globules are no longer visible; add 1 oz. of Liquorice Root finely powdered; beat together until thoroughly mixed.

Medicinal properties : Cholagogue : Purgative, followed by a saline purgative; with Digitalis or Squills as a diuretic, and in small doses with opium as an antisymphilitic.

UNGVENTUM HYDRARGYRI, B.P. Mercury Ointment.

Strength : About 48 p.c. mercury.

Preparation : Triturate 16 parts by weight Mercury with 16 of prepared Lard, and 1 of Suet until metallic globules cease to be visible.

Medicinal properties : Alterative.

Used as an Inunction for syphilitic children, a piece the size of a pea being rubbed daily on some soft part of the skin, e.g., the Axilla.

UNGVENTUM HYDRARGYRI COMPOSITUM, B.P. Compound Mercury Ointment.

Known also as **Scott's Absorbent Ointment.**

Strength : About 20 p.c. mercury.

Preparation : Mix 10 oz. Mercury Ointment 6 oz. Olive Oil with the aid of heat; add 3 oz. Camphor in flowers; triturate until cold.

Medicinal properties : Absorbent; applied to carbuncles and indolent tumours.

HYDRARGYRUM CUM CRETA, B.P. Mercury with Chalk.

Synonym : Grey Powder.

Dose : 1 to 5 grains. For making into pills glucose is the best excipient.

Preparation : Triturate 1 oz. Mercury with 2 oz. Prepared Chalk until metallic globules cease to be visible to the naked eye, and the mixture acquires a uniform grey colour.

Characters : A light-grey powder, free from grittiness insoluble in water: partly dissolved by diluted hydrochloric acid leaving the mercury in a finely divided state.

Test for absence of Mercuric Compounds : The solution formed with hydrochloric acid does not yield any white or grey

Medicinal properties : **Antacid, Intestinal Antiseptic.**

Useful for children in alimentary troubles; may be given by itself or with Rhubarb or Alkalis. Useful also in small doses as an antisyphilitic.

Incompatibles : Grey powder should not be made up with Acids or Acid Salts, as poisonous Mercuric Salts may be formed. This is specially liable to occur in the tropics during the hot season.

Hydrargyrum cum Creta Saccharata. Saccharated Grey Powder.

Dose : 2 to 8 grains.

Preparation : Triturate 1 part Mercury, with $1\frac{1}{2}$ of Prepared Chalk, and $\frac{1}{2}$ of Sugar of Milk.

The sugar is added to prevent oxidation, and consequent formation of Mercuric Salts.

Medicinal properties : The same as Grey Powder.

HYDRARGYRI SUBCHLORIDUM, B.P. Mercurous Chloride.

Synonyms : Calomel; Hydrargyri Chloridum; Subchloride of Mercury, Hg_2Cl_2 ; obtained as a sublimate when a mixture of mercurous sulphate and sodium chloride is heated.

Dose : $\frac{1}{2}$ to 5 grains.

Characters : A dull-white heavy powder, nearly tasteless; sometimes rendered yellowish by prolonged trituration; insoluble in water, alcohol (90 p.c.), or ether; it gives the reactions of mercurous salts and of chlorides; hydrocyanic acid converts it into mercuric salt and a black powder readily yielding metallic mercury.

Medicinal properties : **Cholagogue, Purgative, Alterative**; in small doses antisyphilitic. Calomel should not be applied to the eye of a patient taking Iodides as it may set up a severe inflammation.

Incompatibles : Calomel should not be compounded with acids or acid salts as Poisonous Mercuric salts may be formed.

LOTIO HYDRARGYRI NIGRA, B.P. Black Mercurial Lotion.

Synonym : Black Wash.

Preparation : Triturate 30 grains Mercurous Chloride, with $\frac{1}{2}$ fl. oz. Glycerin, and $1\frac{1}{2}$ fl. oz. Mucilage of Tragacanth; transfer to a bottle; add 2 fl. oz. solution of lime; shake well; add Solution of Lime sufficient to produce 10 oz. The glycerin is added to prevent oxidising into Yellow Wash.

Medicinal properties : A useful application in syphilitic sores.

PILULA HYDRARGYRI SUBCHLORIDI COMPOSITA,

B.P. Compound Pill of Mercurous Chloride.

Synonyms : Compound Calomel Pill; Plummer's Pill.

Dose : 4 to 8 grains.

Preparation : Mix 1 oz. Mercurous Chloride, 1 oz. Sulphurated Antimony, 2 oz. Guaiacum Resin in powder, 180 grains Castor Oil, with 1 fl. drm. Alcohol (90 p.c.); form a mass.

Medicinal properties : **Hepatic Stimulant and Alterative**; one pill is given every night for a week in gout or biliousness.

Plummer's Pill sometimes gives very satisfactory results in obscure chronic affections.

UNGUENTUM HYDRARGYRI SUBCHLORIDI, B.P.

Mercurous Chloride Ointment.

Synonym : Calomel Ointment.

Strength : 10 p.c.

Preparation : Mix $\frac{1}{4}$ oz. Mercurous Chloride with $2\frac{1}{4}$ oz. Benzoylated Lard.

A useful application to syphilitic and scrofulous sores and pruritus.

HYDRARGYRUM AMMONIATUM, B.P. Ammoniated Mercury.

Synonyms : Mercuric Ammonium Chloride. Ammonio-chloride of Mercury. White Precipitate, NH_2HgCl .

The precipitate resulting from the interaction of a solution of Mercuric Chloride and Ammonia, washed free from Chloride, and dried.

Characters : An opaque white powder; insoluble in alcohol (90 p.c.) or ether; water has but little action on it; soluble in Hydrochloric Acid.

It is never given internally. It may be used either alone or mixed with Rose Water for pediculi.

UNGUENTUM HYDRARGYRI AMMONIATI, B.P. Ammoniated Mercury Ointment.

Synonym : White Precipitate Ointment.

Preparation : Mix 1 oz. Ammoniated Mercury with 9 oz. White Paraffin Ointment. Used as a stimulating ointment for chronic skin diseases and scabies.

Zinco-cyanide of Mercury. A powerful Antiseptic recommended by Lord Lister. Being insoluble, it is comparatively non-irritating, and its effects are long continued. It is specially suited for deep seated injuries.

HYDRARGYRI IODIDUM RUBRUM, B.P. Mercuric Iodide.

Synonym : Biniodide of Mercury. Precipitated Mercuric Iodide, HgI_2 ; formed by the interaction of mercuric chloride and potassium iodide.

Dose : $\frac{1}{32}$ to $\frac{1}{16}$ grain : usually given in pilules.

Characters: A crystalline powder, colour vermillion, becoming yellow when a film of it spread on a sheet of paper is gently heated over a lamp.

Almost insoluble in water, but soluble in solution of potassium iodide; soluble in oil or lard; insoluble in vaselin.

Test for absence of Mercurous Iodide: it dissolves freely and entirely in ether.

Medicinal properties: Alterative, used internally in syphilitic diseases. A powerful irritant poison.

The Green Iodide of Mercury is Mercurous Iodide, Hg I. It is an unstable salt insoluble in water with a tendency to form Mercuric Iodide; therefore uncertain in action.

UNGUENTUM HYDARGYRI IODIDI RUBRI, B.P. Mercuric Iodide Ointment.

Synonym: Ointment of Red Iodide of Mercury; known also as Red Ointment.

Strength: 4 p.c.

Preparation: Mix 20 grains Mercuric Iodide in fine powder in 480 grains Benzoated Lard. Vaseline should not be used as it does not dissolve the Iodide.

Medicinal uses: An external application for goitre, warts, or syphilitic nodes. For application to the eyelids it should be diluted to one quarter this strength, even then it is too strong for delicate skins.

HYDRARGYRI PERCHLORIDUM, B.P. Mercuric Chloride.

Synonyms: Bichloride of Mercury; Corrosive Sublimate; Perchloride of Mercury. Hg Cl_2 ; obtained as a sublimate by heating a mixture of mercuric sulphate, and sodium chloride, with a little black oxide of manganese.

Dose: $\frac{1}{8}$ to $\frac{1}{16}$ grain.

Characters: Heavy, colourless masses of prismatic crystals; taste highly acrid and metallic; solubility 1 in 16 of cold water, 1 in 2 of boiling water, 1 in 3 of alcohol (90 p.c.), 1 in 4 of ether, and on trituration 1 in 2 of glycerin. An aqueous solution boiled with copper foil gives a grey deposit, which on being rubbed assumes a silvery lustre.

LIQUOR HYDRARGYRI PERCHLORIDI, B.P. Solution of Mercuric Chloride.

Dose: $\frac{1}{2}$ to 1 fl. drm.

Strength: 1 fl. drm. contains $\frac{1}{16}$ grain.

Preparation: Dissolve 10 grains Mercuric Chloride in 1 pint.

Externally. Antiseptic and mild Astringent. Used as an antiseptic lotion, 1 in 1,000 to 1 in 10,000; as an injection for chronic mucous discharges, 1 in 4,000; as a collyrium, 1 in 4,000; as a gargle for ulcerated sore throat, 1 in 2,000.

Internally. As an intestinal Antiseptic Astringent; also internally or by hypodermic injection in doses of about $\frac{1}{20}$ grn. with sodium chloride in divided portions during the 24 hours as an antisyphtic. It is a powerful hepatic, but a feeble intestinal stimulant.

Incompatibles: With solutions of Alkalis, Alkaline Carbonates and Alkaline earths, it tends to become reduced to Mercurous Chloride which is less active; with Nitrate of Silver it forms Chloride of Silver and Mercurous Oxy-nitrate both insoluble. With Acetate of Lead it forms Lead Chloride. It coagulates albumen. With Pot. Iod. it forms a yellow precipitate of Mercuric Iodide, soluble in excess of either the iodide or the perchloride.

Mercuric Chloride as a Poison. Fatal dose 5 grns. and upwards.

Symptoms of acute poisoning (one poisonous dose); acrid metallic (=coppery) taste, and burning feeling in the throat felt at once; then vomiting, pain in the stomach; later diarrhoea often bloody, suppression of urine, strangury and general collapse. Death occurs in 1 to $1\frac{1}{2}$ days on an average, but often earlier. If the patient survives, salivation may occur on the second or third day.

Treatment. Raw egg (white and yolk) mixed with water in large quantity, milk, raw flour and water.

Symptoms of Chronic poisoning (continued overdosing); salivation, mercurial foetor, sore mouth and salivary glands swollen. In long continued cases there may be "shaking palsy," affecting the arms first.

Treatment. Removal to fresh air, and moderate (i.e., 5 grns.) doses of Potassium Iodide.

LOTIO HYDRARGYRI FLAVA, B.P. Yellow Mercurial Lotion.

Synonym: Yellow Wash.

Strength: 2 grains to 1 oz.

Preparation: Mix 20 grains Mercuric Chloride with 10 fl. oz. Solution of Lime.

Used as an external application to spreading ulcers. Mercuric Oxide to which this preparation owes its efficacy is precipitated.

Sal Alembroth is the double chloride of mercury and ammonium. It is soluble in water, or alcohol (90 p.c.).

Medicinal Action and Uses. Like Perchloride, only not so irritating.

Medicinal properties: Of Mercuric Chloride.

Hydrargyri Persulphas. Persulphate of Mercury.

Prepared by dissolving mercury in sulphuric acid and evaporating. Occurs as white heavy crystals; on adding water it is decomposed into mercurous sulphate (which is insoluble) and free sulphuric acid.

Used to prepare the subchloride of mercury: and for working small medical batteries. Not used internally.

LIQUOR HYDRARGYRI NITRATIS ACIDUS, B.P. Acid Solution of Mercuric Nitrate.

Preparation: Mix 5 fl. oz. Nitric Acid with $1\frac{1}{2}$ fl. oz. Distilled Water in a flask; dissolve 4 oz. Mercury in the mixture without heat: boil gently for 15 minutes; cool: preserve it in a stoppered bottle not exposed to light. It should weigh about 12 oz.

Characters: A colourless strongly acid liquid, sp. gr. about 2.0. It gives the reactions of mercuric salts and of nitrates.

Medicinal properties: A powerful **Caustic** used externally for syphilitic and malignant growths, or diluted (1 in 300 of water) as an astringent gargle, and (1 in 1,000) as an injection.

UNGUENTUM HYDRARGYRI NITRATIS, B.P. Mercuric Nitrate Ointment.

Synonym: Ointment of Nitrate of Mercury, known also as **Citrine Ointment**.

Strength: about 1 in 15.

A pale lemon-coloured ointment of firm consistence, made by dissolving 1 of Mercury in 3 of Nitric Acid without heat; adding it to a mixture of 4 of Lard and 7 of Olive Oil, and stirring constantly until cold. For details see Brit. Pharm.

Medicinal properties: **Stimulating** application in chronic skin diseases.

UNGUENTUM HYDRARGYRI NITRATIS DILUTUM, B.P. Diluted Mercuric Nitrate Ointment.

Synonym: Diluted Ointment of Nitrate of Mercury.

Preparation: Mix 1 oz. Mercuric Nitrate Ointment with 4 oz. soft yellow Paraffin.

Medicinal properties: A mild absorbent: useful in chronic ophthalmic diseases. Applied to the eyelids by means of a camel hair pencil.

HYDRARGYRI OLEAS, B.P. Mercuric Oleate.

Precipitated Mercuric Oleate, formed by the interaction of Mercuric Chloride and Sodium Oleate.

Characters: A substance of unctuous consistence; colour light greyish yellow; odour somewhat saponaceous. It is liable to darken by keeping (due to deposition of Metallic Mercury).

UNGUENTUM HYDRARGYRI OLEATIS, B.P. Mercuric

Preparation: Mix 1 oz. Mercuric Oleate with 3 oz. Benzoated Lard.

Uses: Externally as an absorbent application to chronic inflammations of joints and non-ulcerative syphilitic indurations; as an inunction for syphilis; also for killing pediculi.

Is not used internally.

HYDRARGYRI OXIDUM FLAVUM, B.P. Yellow Mercuric Oxide.

Precipitated Mercuric Oxide, Hg O ; obtained by the interaction of Mercuric Chloride and Sodium Hydroxide.

Characters: A yellow powder yielding nothing to water: readily soluble in hydrochloric acid, the solution giving the reactions of mercuric salts. Gently heated it assumes a red colour, heated to incipient redness it gives off oxygen and vapour of mercury.

UNGUENTUM HYDRARGYRI OXIDI FLAVI, B.P. Yellow Mercuric Oxide Ointment.

Strength: 2 p.c.

Preparation: Mix 10 grains Yellow Mercuric Oxide finely powdered with 490 grains soft yellow Paraffin.

Medicinal uses: A good application in corneal ulceration, *ophthalmia tarsi*, &c.

HYDRARGYRI OXIDUM RUBRUM, B.P. Red Mercuric Oxide. Red Precipitate.

Hg O ; obtained by heating mercurous nitrate until acid vapours cease to be evolved.

Characters: Orange-red crystalline scales or powder; when gently heated it becomes dark violet, but resumes its orange-red colour on cooling; insoluble in water (or alcohol 90 p.c.), soluble in hydrochloric acid.

Medicinal properties: A powerful irritant. Used externally in powder or ointment as an escharotic to indolent ulcers. Never used internally.

UNGUENTUM HYDRARGYRI OXIDI RUBRI, B.P. Red Mercuric Oxide Ointment.

Synonym: Red Precipitate Ointment.

Strength: 10 p.c.

Preparation: Mix $\frac{1}{4}$ oz. Red Mercuric Oxide in fine powder, with $2\frac{1}{4}$ oz. Paraffin Ointment.

Medicinal uses: A stimulating application to indolent ulcers.

SILVER. Argentum. Ag. Atomic weight 107.11.

A white metal, malleable, ductile, sp. gr. 10.5, fuses about 1800°F . If pure it is very soft. British standard silver, or "sterling," of which coins are made, is harder than pure silver. It contains

Reactions of Silver Salts :—

- (1) With solutions of chlorides they give a white curdy precipitate (=silver chloride) insoluble in dilute acid, soluble in ammonia.
- (2) With solution of potassium chromate in the absence of chlorides, bromides, and iodides, they give a red precipitate (silver chromate).
- (3) With hydrogen sulphide both soluble and insoluble silver salts give a black precipitate (silver sulphide), insoluble in dilute nitric acid.

Metallic Silver, (*Chandi*, Hind.) as thin sheets, is sometimes applied by Hindu native doctors with good effects to chronic ulcers. It forms a soluble albuminate with the serum excreted and this has all the good effects of a weak solution of silver nitrate.

ARGENTI NITRAS, B.P. Silver Nitrate.

Synonym: **Lunar Caustic**. Ag NO_3 ; prepared by the interaction of nitric acid and silver.

Dose: $\frac{1}{4}$ to $\frac{1}{2}$ grain; may be given in pills made with kaolin and tragacanth.

Characters: Colourless tabular crystals, the primary form of which is the right rhombic prism. Solubility 1 in less than 1 of cold water, soluble in ether or glycerin, slightly soluble in alcohol (90 p.c.); it gives the reactions of silver and of nitrates. If exposed to the light it turns a brownish-black colour.

Medicinal properties: Externally as a solid or in very concentrated solution it is perhaps the best **Caustic** for ordinary use for poisoned wounds, and unhealthy tissue of all sorts. Also as a **hæmostatic** in small bleeding wounds, e.g., leech bites. The pain it causes is severe but of brief duration.

At first it produces a white stain but this soon becomes black, the affected portion coming away in a few days leaving a healing surface below. The black stain may be removed by cyanide of potassium.

In dilute solutions it acts more powerfully than any other of the metals producing local contraction of blood vessels and in coagulating albumen; hence its great value as an **antiphlogistic** and as a **stimulating astringent** to the skin or mucous surfaces. As a collyrium or injection the strength is 2 grns. to 1 oz. water, as an enema in chronic dysentery 30 to 60 oz. of a solution 1 grn. in an oz.

Internally. It is **astringent** in catarrhal gastric conditions; and after absorption into the blood a **Tonic** useful in chronic nervous conditions.

It is excreted by the albuminous secretions, e.g., the bile.

- **Long** continued administration of Silver Nitrate produces a dark line on the edges of the gums which is removable by a course of Acid Tartrate of Potassium. If the drug be persisted in after this, an almost irremovable livid discoloration of the skin comes on; to remove which Potassium Iodide internally and Hyposulphites externally may be tried.

ARGENTI NITRAS INDURATUS, B.P. Toughened Caustic.

Preparation: Fuse and mix thoroughly in a capsule of platinum, or thin porcelain, 475 grains Silver Nitrate and 25 grains Potassium Nitrate; pour the melted mass into suitable moulds.

Characters: White or greyish-white cylindrical rods or cones; freely soluble in water, sparingly soluble in alcohol (90 p.c.); it gives the reactions of silver, of potassium and of nitrates.

• *Medicinal properties*: Are those of Silver Nitrate, its advantage being that it is less liable to break off. Used for application to the tonsils, pharynx, &c.

ARGENTI NITRAS MITIGATUS, B.P. Mitigated Caustic.

Preparation: Fuse and mix thoroughly in a capsule of platinum or thin porcelain 1 oz. Silver Nitrate and 2 oz. Potassium Nitrate; pour the melted mass into suitable moulds.

Characters: White or greyish-white cylindrical rods or cones; freely soluble in water, sparingly soluble in alcohol (90 p.c.); it gives the reactions of silver, of potassium and of nitrates.

Medicinal properties: A mild Caustic, useful for application to delicate structures, e.g., the conjunctiva.

ARGENTI OXIDUM, B.P. Silver Oxide.

Ag_2O ; prepared by mixing solutions of Silver Nitrate and Calcium Hydroxide.

Dose: $\frac{1}{2}$ to 2 grains.

Characters: A brown powder which at a low red heat gives off oxygen and yields metallic silver.

Test for absence of metallic silver it dissolves in nitric acid without the evolution of nitrous fumes.

Incompatibles: Silver oxide is liable to decompose with violence if mixed with creosote, phenol, potassium permanganate and many other substances. It may however be compounded with these substances if first diffused through some inert powder as Kaolin.

Medicinal properties: A Nerve Tonic.

Silver Oxide has none of the local effects of Silver Nitrate, but after absorption has the same actions. It is used when action on chronic nervous conditions only is desired.

GOLD. Aurum. An. Atomic weight 195.70. (Soná, Hind.), is used by Bengali native practitioners, combined with silver, mercury or arsenic in the treatment of chronic nervous diseases.

On the continent of Europe the tribromide of gold (dose $\frac{1}{4}$ to $\frac{1}{2}$ grain in pill made with Kaolin) is used for hysteria, epilepsy, &c.

The chloride has been much lauded as a remedy for confirmed dipsomania, but its value may well be questioned.

THE PARAFFIN SERIES OF HYDROCARBONS.

An important series of compounds each member of which contains CH_2 more than that immediately below it in the series. The lowest members, are gaseous and highly inflammable but as the molecule increases they become richer proportionately in carbon and the temperature at which they solidify or pass into vapour becomes higher and conversely their inflammability diminishes. The different members of the series can be separated from each other by fractional distillation.

The gas discharged in quantity from the oil wells of Petroleum producing countries which is used locally for lighting and heating is composed largely of the lower members of this series (CH_4), the liquid pumped from the wells is a mixture of higher members, while the solids (mineral wax, bituminous shales, &c.), contain still higher compounds.

Marsh gas or Methane, (CH_4), is the fire-damp which so often produces disastrous explosions in coal mines.

Petroleum Spirit, B.P. Appendix. *Synonym:* Petroleum Ether.

A colourless very volatile and highly inflammable liquid; obtained from petroleum, and consisting of a mixture of the lower members of the Paraffin series of hydrocarbons; boiling point 122° to 140° F.; sp. gr. 0.670 to 0.700. It consists chiefly of Pentane, C_5H_{12} . It is used as a solvent of India rubber and for making varnishes.

Kerosine Oil. *Synonyms:* Petroleum, Paraffin Oil or Shale Oil, *Pathar-ka-tel*, Hind.

Kerosine Oil consists principally of Heptane, C_7H_{16} .

The "**Flashing point**" is the temperature at which a hydrocarbon evolves vapour sufficient to form an inflammable mixture with the air. In England no Kerosine Oil is considered safe for burning which kindles from a flame brought near its surface when it is heated to 100° F. in an open vessel. For tropical countries a higher limit is necessary.

Purchasable in Indian bazaars, and much used for lighting.

Medicinal actions and uses: **Antiparasitic** in skin diseases, e.g., scabies. May be applied pure, or diluted with equal parts of a bland oil. It also destroys lice, bugs and white ants.

The hydrocarbons distilling between 300° and 400° F. are used for lubricating purposes.

PARAFFINUM LIQUIDUM B.P. Liquid Paraffin.

Characters: Colourless, odourless, tasteless, not fluorescent; boiling point not below 680° F.; sp. gr. from 0.885 to 0.890.

The name Paraffin (meaning with little affinity) was first given by its discoverer to Paraffin wax because it resisted the action of most chemical reagents.

PARAFFINUM MOLLE, B.P. Soft Paraffin.

A semisolid mixture consisting of the soft members of the paraffin series of hydrocarbons; usually obtained by purifying the less volatile portions of petroleum.

Characters: White or yellow, translucent; soft, unctuous to the touch; free from acidity, alkalinity or any unpleasant odour or flavour even when warmed to 120° F.; melts at 96° to 102° F. or even higher; sp. gr. at melting point 0.840 to 0.870; volatilises without giving off acrid vapours; burns with a bright flame leaving no residue; insoluble in water, slightly soluble in absolute alcohol, freely soluble in ether, chloroform or benzol.

Test for absence of fixed oil, fats or resin: after treating with boiling solution of sodium hydroxide, the aqueous liquid yields no precipitate or oily matter on adding excess of acid.

The yellow variety of soft paraffin is known as **Vaselin**. If the white variety is intended the term **White Vaselin** is used.

PARAFFINUM DURUM, B.P. Hard Paraffin.

Known also as Paraffin wax, Solid Paraffin.

A mixture of several of the harder members of the paraffin series of hydrocarbons; usually obtained by distillation from shale, separation of the liquid oils by refrigeration, and purification of the solid product.

Characters: Colourless, semi-transparent, crystalline: without odour or taste; slightly greasy to the touch: sp. gr. 0.82 to 0.94; insoluble in water, slightly soluble in absolute alcohol, almost entirely soluble in ether: it melts at 130° to 135° F.; burns with a bright flame leaving no residue; an alcoholic solution does not redden litmus.

UNGUENTUM PARAFFINI, B.P. Paraffin Ointment.

Preparation: Melt together suitable proportions of Hard and Soft Paraffin in a shallow evaporating dish, triturating constantly so that when cold a uniform plastic ointment is obtained. The proportions of hard and soft paraffin should vary with variations in temperature.

For white ointments white Vaselin should be used; for coloured ointments yellow Vaselin.

Medicinal properties: Paraffin is used as an emollient, and as a

to pass through the skin, and to produce their action constitutionally. It has the advantages of not irritating, nor turning rancid.

Paraffin is not saponified by alkalis.

Alcohols. The ordinary alcohols may be regarded as hydroxides of the radicals of the Marsh gas series. Thus Ethyl, C_2H_5 , combined with hydroxyl, HO , forms Ethylic Alcohol, C_2H_5HO , or C_2H_6O . The most important alcohols are—

Methyl Hydroxide ...	...	CH_3HO	or CH_4O .
Ethyl ,, ...	...	C_2H_5HO	or C_2H_6O .
Amyl ,, ...	...	$C_5H_{11}HO$	or $C_5H_{12}O$.

They are all poisonous if given in sufficiently large doses; acting on the nervous centres: as their atomic weight increases they become less volatile, but more toxic.

Methyl Hydroxide. Methylic Alcohol or Wood Spirit, CH_4O ; prepared from the destructive distillation of wood. If pure it is a colourless liquid with a peculiar odour. It resembles ethyl hydroxide, only is more mobile and volatile, it is not used as a remedy.

Methylated Spirit. An impure alcohol sold duty free, and therefore cheaper than ordinary Rectified Spirit. It is intended only for use in manufactures and lighting. As sold to the public it has about 10 p.c. Wood Naphtha and $\frac{1}{4}$ p.c. Petroleum Oil added. The Petroleum Oil renders it too nauseous for drinking, and also causes it to become turbid on the addition of water, thus facilitating recognition.

Amylic Alcohol, B.P. Appendix.

A liquid consisting principally of iso-primary Amylic Alcohol.

It may be prepared by shaking commercial fusel oil with a saturated solution of common salt; separating the oily layer; distilling, reserving the portion which distils over between 257° and $289^\circ F$.

A poisonous oily liquid, odour penetrating oppressive; taste burning; exposed to air in contact with platinum black it slowly oxidises yielding Valerianic Acid.

It is used to prepare Sodium Valerianate and Nitrite of Amyl.

Benzolated Amylic Alcohol, B.P. Appendix.

Preparation: Mix 3 parts Benzol with 1 part Amylic Alcohol (both by volume): decant from any deposited water.

AMYL NITRIS, B.P. Amyl Nitrite.

A liquid produced by the interaction of Amylic Alcohol and nitrous acid; it consists chiefly of Iso-Amyl Nitrite, $C_5H_{11}NO_2$; but contains other nitrites of the homologous series.

It deteriorates unless kept in a well-stoppered bottle.

Characters: An ethereal liquid of a yellowish colour; fragrant odour, and faint acid reaction; almost insoluble in water, soluble in all proportions of alcohol.

Medicinal properties: **Antispasmodic.** Useful in all cases where a rapid fall of the arterial tension is desired (*e.g.*, angina pectoris, or in chloroform poisoning).

It is sold in small glass tubes, covered with cotton cloth one of which is to be broken in a handkerchief and the vapour inhaled when required.

Action: When inhaled, it paralyses the muscular layer of the arterial coats, and so produces cutaneous flushing, fulness in the head and increased pulse rate; it thus relieves the blood tension.

The vapour of Amyl Nitrite explodes on heating.

• **ALCOHOL ABSOLUTUM, B.P.** Absolute Alcohol.

Ethyl hydroxide, C_2H_5O , with not more than 1 p.c. by weight of water; obtained by the removal of water from less strong ethylic alcohol, and subsequent distillation.

Characters: Sp. gr. from 0.794 to 0.7969; very volatile and hygroscopic at ordinary temperatures; in other characters it resembles Rectified Spirit.

Medicinal properties: Owing to its great affinity for water it is a powerful caustic, but is not employed for this purpose.

It is used to prepare chloroform and Liquor Sodii Ethylatis.

SPIRITUS RECTIFICATUS, B.P. Alcohol 90 p.c.

Synonym: Rectified Spirit.

A liquid containing 90 p.c. by volume of ethyl hydroxide and 10 p.c. of water; obtained by the distillation of fermented liquids.

Characters: A colourless transparent very mobile and inflammable liquid; odour characteristic pleasant; taste strong burning spirituous; sp. gr. 0.834; burns with a blue smokeless flame.

Rectified Spirit dissolves Camphor, Balsams, Oils, Iodine, Phosphorus, Potassium salts (except the carbonate), Soda, Tannic and Gallic Acids.

Test for absence of fixed matter; it leaves no residue when evaporated.

Test for absence of oily or resinous matter; it remains clear when mixed with water.

Test for absence of fusel oil and allied impurities, a little exposed on clear white filter paper leaves no unpleasant smell after the alcohol has evaporated.

Test for absence of more than traces of aldehyde: mixed with half its volume of

Test for absence of tannic acid, excess of aldehyde and other organic impurities; with Liquor Ammoniae, it does not immediately darken.

The following dilutions of Alcohol are official:—

Alcohol (70 p.c.). To 100 fl. oz. Alcohol (90 p.c.) add 31 fl. oz. Distilled Water; mix; sp. gr. 0.8900.

Alcohol (60 p.c.). To 100 fl. oz. Alcohol (90 p.c.) add $53\frac{2}{3}$ fl. oz. Distilled Water; mix; sp. gr. 0.9135.

Alcohol (45 p.c.). To 100 fl. oz. Alcohol (90 p.c.) add $105\frac{1}{8}$ fl. oz. Distilled Water; mix; sp. gr. 0.9436.

Alcohol (20 p.c.). To 100 fl. oz. Alcohol (90 p.c.) add $355\frac{3}{4}$ fl. oz. Distilled Water; mix; sp. gr. 0.9760.

SPIRITUS VINI GALLICI, B.P. Brandy.

A spirituous liquid distilled from wine and matured by age, containing not less than $43\frac{1}{2}$ p.c. by volume of ethyl hydroxide.

Characters: A light sherry coloured liquid with a characteristic odour.

MISTURA SPIRITUS VINI GALLICI, B.P. Mixture of Brandy.

Dose: As a draught, 1 to 2 fl. oz.

Preparation: Rub 2 yolks of eggs with $\frac{1}{2}$ oz. Refined Sugar; add 4 fl. oz. each of Brandy and Cinnamon Water; mix.

Medicinal properties: Stimulating, restorative, useful in cases of prostration or in the later stages of fevers.

The percentages of ethyl hydroxide in the following are:—

Whiskey, Rum, Gin and strong liquors...	about 40 to 50 per cent.
Port, Sherry	15 „ 18 „ „
Hock, Claret	8 „ 12 „ „
Beer, Ale and Porter	2 „ 6 „ „

SPIRITUS TENUIOR. Proof Spirit contains 49 p.c. by weight, or 57 p.c. by volume of ethyl hydroxide.

It obtained this name from the rough test adopted by smugglers in olden days: gunpowder was moistened with the spirit to be tested and a light applied; if the burning spirit exploded the gun-powder it was “proof,” or “over proof”; if the gun-powder was too wet to explode the spirit it was “under proof.”

Medicinal properties of Rectified Spirit. Externally applied to a free surface diluted alcohol is a refrigerent; as Eau de Cologne or Brandy it is applied to the forehead to prevent syncope or relieve headache or as an antiphlogistic to sprains, commencing inflammations, &c. If applied undiluted, and evaporation pre-

burning; it has an intense affinity for water and coagulates albumen, so **hardening** the tissues, hence it is rubbed on the affected parts to prevent bed sores, and also applied to the nipples to prevent cracking. Either alone or with $\frac{1}{2}$ p.c. of Carbolic or Salicylic acid it makes a good **antiseptic** wash in pruritus, added to liniments it increases their **stimulating** effect. Port Wine has been used as an **astrigent** gargle. A good **evaporating** lotion is made by mixing 1 of Rectified Spirit with 2 of Camphor water.

Internally as Brandy, Wine or in other form, Alcohol is very valuable in fevers, acting as a food, an **antipyretic** and a **cardiac stimulant**; in the later stages of wasting diseases as a food and **cardiac stimulant**, in the sleeplessness of cardiac debility as a **hypnotic**. In cholera as a **rapid cardiac stimulant**. The **effervescing** wines (e.g., Champagne) are useful as **antemetus** in the vomiting of pregnancy and of stomach disease, also in sea sickness.

It is also very useful as a **digestive** in aged or debilitated persons.

In a single small dose alcohol increases the salivary and gastric secretion, so assisting digestion. It stimulates the circulation and thus excites the cerebrum and respiratory centre. It dilates the cutaneous blood vessels, so producing diaphoresis (hence its value as an **antipyretic** in fever), and a feeling of warmth, but without rise of temperature. In a very cold atmosphere the blood thus brought to the surface of the body is more rapidly cooled, and thus the bodily temperature may be reduced to a dangerous extent. For this reason the use of any form of alcohol has been forbidden in several of the arctic expeditions.

Alcohol is oxidised in the tissues, and so is a true food, supplying the place of carbohydrate, but not of nitrogenous diet. In doses which are not excessive it is altogether burnt up (oxidised) in the tissues, so that no alcohol appears in the excretions. In too large doses the excess of alcohol is excreted by the lungs, skin, and kidneys, as it is being excreted it acts as an irritant, it may re-excite an old gonorrhœa, or in habitual tipplers may bring fibrosis of the excreting organs.

Alcohol in disease. The indications for the use of alcohol in acute diseases running a limited course are (1) tongue dry, (2) pulse weak and too quick or too slow, (3) respiration hurried, (4) skin hot and dry, (5) delirium and sleeplessness. If the alcohol is doing good it should bring the patient nearer the normal as regards these conditions. To test this the practitioner should compare the condition fifteen minutes after the alcohol has been given with that just before. The time of special danger is between midnight and three or four in the morning. Then the patient's powers are at their lowest, and the attendants are apt to be

If it causes vomiting the best treatment is the free administration of ice with two or three minims of Liquor Morphinae and of dilute Hydrocyanic Acid, frequently repeated until the vomiting is arrested.

Alcohol in health. Aged or debilitated persons or those whose digestive power is impaired, a small quantity of alcohol after the day's work is done is helpful as a digestive and stimulant. The amount taken should never exceed the equivalent of $1\frac{1}{2}$ oz. of absolute alcohol during twenty-four hours. This as nourishment equals about one quarter of a standard daily diet.

Alcohol as a food. With a sufficient diet alcohol leads to a temporary increase in weight, but soon dyspepsia and impaired health comes on. If the food is insufficient either in quantity or in quality, a small quantity of alcohol may temporarily supply the lack, and maintain the health and body weight.

As a stimulant during work, strong beef tea, milk or Refined Sugar is much to be preferred as they are not followed by depression as is the case with alcohol.

In the case of young persons who are healthy, and have sufficient nourishing diet, alcohol in any form is unnecessary and if taken regularly as a habit can only do harm.

The habitual use of even what are called moderate quantities of alcohol leads to the dyspepsia of chronic gastric catarrh; the organs become congested and go on to fatty or cirrhotic degeneration in varying degrees, so that the person becomes hopelessly diseased, the nervous tissue being specially affected, which explains the tremors and other nervous manifestations of habitual tipplers.

Chronic Alcoholism. Treatment of:—

When the craving is felt, give a gastric stimulant, *e.g.*, Spt. Amm. Arom. m. 20–30; Tr. Capsici m. 5–10; Infusion of Gentian or Cascarilla oz. 2.

Or a lemon may be sucked: or iced, cold or effervescing water may be sipped.

Also to strengthen the patient give Tonics. Iron, Strychnine, Cinchona: plenty of nutritious easily digested food, *e.g.*, warm beef tea, cocoa.

Alcohol as a poison. Large doses at first cause exhilaration, but soon the body temperature falls owing to diminished oxidation of the tissues and the nervous system becomes paralysed, in the following order: the cerebrum (**judgment**), motor centres (**speech thick and uncertain**), cerebellum (**double vision and inability to walk**), respiratory centre (**breathing becomes rapid shallow, and at last ceases**) and cardiac centre (**heart ceases**).

Larger doses produce a brief stage of excitement, then insensibility with dilated pupils.

ÆTHER, B.P. Ether: formerly known as **Sulphuric Ether**.

A volatile liquid prepared from ethylic alcohol by interaction with sulphuric acid. It contains not less than 92 p.c. by volume of ethyl oxide, $(C_2H_5)_2O$.

Dose: 10 to 30 mins. in repeated doses: for a single dose 40 to 60 mins.

Characters: A colourless very volatile and inflammable liquid; odour strong, characteristic; taste hot; boils at 105° F.; sp. gr. 0.735; it evaporates without residue, its vapour is heavy and highly inflammable forming an explosive mixture with air; miscible in all proportions with alcohol (90 p.c.), chloroform, fixed and volatile oils; 1 part dissolves in 10 of water.

Test for absence of excess of ethylic alcohol. Shaken with an equal volume of water, its volume should not be reduced by more than 10 p.c.

Test for absence of organic impurities. It should dissolve without discoloration when introduced drop by drop into sulphuric acid, kept cool during the test.

Medicinal properties: A powerful diffusible stimulant, anti-spasmodic and narcotic.

Used: In dyspnoea, gastralgia, flatulence and colic. As it stimulates the pancreas it is sometimes given with cod liver oil.

Action: Applied to the skin it evaporates and so freezes or even may kill the part. A spray of ethyl has been used as a local anæsthetic for minor operations, but the pain during the subsequent return of sensibility is considerable.

In the alimentary canal it acts as a stimulant, increasing the secretion of saliva and gastric juice, and increasing co-ordination and peristalsis, hence facilitating the expulsion of flatus and relieving spasmodic pain.

Absorbed into the blood either from the alimentary canal or by inhalation through the lungs, it stimulates the circulation. Large doses or prolonged administration may depress the power of the nerve centres, causing delirium and then unconsciousness. The heart is less liable to be paralysed by ether, than by chloroform.

ÆTHER PURIFICATUS, B.P. Purified Ether.

Ether from which most of the ethylic alcohol has been removed by washing with Distilled Water, and most of the water by subsequent distillation in the presence of calcium chloride and recently prepared lime.

Sp. gr. not above 0.722 nor below 0.720. Its vapour is heavy and highly inflammable.

Medicinal uses: As an anæsthetic by inhalation, as a cardiac

Ether is the best general anæsthetic for cases of cardiac weakness, but it requires complicated apparatus for its administration.

It is contraindicated in cranial surgery and where respiratory or renal complications exist, as it tends to congest the brain, cool the respiratory channels, and irritate the kidneys.

SPIRITUS ÆTHERIS, B.P. Spirit of Ether. Sp. gr. 0·806 to 0·811.

Dose : 20 to 40 mins. in repeated doses : for a single dose 60 to 90 mins.

Preparation : Mix 10 fl. oz. Ether with 1 pint alcohol (90 p.c.).

Medicinal properties : **Diffusible stimulant.**

A convenient form in which to give ether.

SPIRITUS ÆTHERIS COMPOSITUS, B.P. Compound Spirit of Ether.

Synonym : Hoffman's Anodyne.

A mixture of ether, alcohol, and the ethereal liquid obtained after treating with sodium bicarbonate and water the upper layer of the distillate from a mixture of sulphuric acid and alcohol.

Dose : 20 to 40 mins. in repeated doses ; for a single dose 60 to 90 mins.

Characters : A colourless mobile liquid with characteristic ethereal odour and taste ; sp. gr. 0·808 to 0·812 ; when mixed with twice its volume of water it becomes opalescent.

Medicinal properties : **Stimulant Anodyne.**

SPIRITUS ÆTHERIS NITROSI, B.P. Spirit of Nitrous Ether.

Synonym : Sweet Spirit of Nitre. An alcoholic solution containing ethyl nitrite, aldehyde, and other substances.

It should be preserved in small well closed bottles and kept in a cool dark place.

Prepared by distilling (with special precautions) a mixture of alcohol, sulphuric acid, nitric acid, and copper, and dissolving the distillate in alcohol (90 p.c.).

Characters : A limpid liquid with a faint yellowish tinge ; inflammable ; odour peculiar penetrating, apple-like ; taste characteristic, sp. gr. 0·838 to 0·842.

If carefully poured over an acidulated strong solution of ferrous sulphate in a test tube a deep olive-brown line of coloration which widens as the tube is gently shaken, is produced at the surface of contact of the two liquids.

Medicinal properties : **Diffusible stimulant, Carminative, Anti-spasmodic, Diaphoretic, Diuretic.**

ÆTHER ACETICUS, B.P. Acetic Ether.

An ethereal liquid consisting principally of ethyl acetate; obtained by fractional distillation; after treating with potassium carbonate the distillate obtained from a mixture of ethylic alcohol, sulphuric acid, and sodium acetate.

Dose: 20 to 40 mins. in repeated doses; for a single dose 60 to 90 mins.

Characters: A colourless liquid with a fragrant odour; reaction neutral; sp. gr. 0.900 to 0.905; solubility 1 in not less than 10 of cold water, soluble in all proportions in alcohol (90 p.c.), ether or chloroform.

Medicinal properties: **Antispasmodic, Carminative.** Used as a sedative inhalation in irritation of the larynx, 30 mins. in a pint of water.

LIQUOR ETHYL NITRITIS, B.P. Solution of Ethyl Nitrite.

A mixture of 95 parts by volume of Absolute Alcohol with 5 of Glycerin, and containing from 3 p.c. to $2\frac{1}{2}$ p.c. by weight of ethyl nitrite. The ethyl nitrite is obtained by the interaction of alcohol (90 p.c.), sodium nitrite, and diluted sulphuric acid at a low temperature. It should be stored in small bottles.

Dose: 20 to 60 mins.

Characters: A limpid colourless liquid; odour and taste characteristic apple-like; highly inflammable; sp. gr. 0.823 to 0.826.

Medicinal properties: **Antispasmodic.** It relieves arterial spasm by dilating the arterials. Its action resembles that of other nitrites.

Pure ethyl nitrite may be preserved unchanged; but if even traces of water or other impurities are present it is liable to decompose, becoming acid, evolving red vapour and bursting the bottle.

CHLOROFORMUM, B.P. Chloroform.

Trichloromethane, CHCl_3 , with sufficient absolute alcohol added to produce a liquid having a specific gravity of from 1.490 to 1.495. Trichloromethane may be prepared by heating a mixture of chlorinated lime, slaked lime, ethylic alcohol and distilled water. As air and light tend to decompose it, chloroform should be kept cool and in a dark place.

Dose: 1 to 5 mins.

Characters: A limpid, colourless, heavy, volatile liquid; odour, agreeable, ethereal; taste, pungent sweet. Specific gravity 1.490 to 1.495; boils between 140° and 143.6° F.; on allowing 20 c.c. to evaporate from a large piece of filter paper placed on a warm plate no foreign odour is perceptible at any stage of the evaporation: it does not burn, but its vapour colours a bunsen

in Rectified Spirit, Æther, Oils, and Oil of Turpentine; it dissolves caoutchouc, fats, guttapercha, mastic, tolu, benzoin, iodine and oils. It reduces Fehling's solution.

Medicinal properties: Inhaled as an **anæsthetic** in surgical operations; given by mouth as a **sedative** and **antispasmodic** in vomiting and flatulence and in cough mixtures.

Applied to the skin Chloroform evaporates rapidly, producing a feeling of cold. If evaporation be prevented it acts as an irritant, or if strong even as a vesicant. It diffuses through the epidermis and has the power of carrying active remedies through with it. Applied to mucous membranes it is stimulant and then anæsthetic.

Swallowed in large quantities it produces vomiting; if retained, it acts as an irritant, producing gastro-enteritis, and, after absorption, causes anæsthesia and coma, so that the vomiting, epigastric pain, and purging, gradually cease, and are followed by stupor, coma, abolition of reflexes, which may go on to death, or may pass off, the symptoms of gastro-enteric irritation returning and continuing for some time. The treatment of an overdose of Chloroform is fresh pure air and artificial respiration.

Chloroform as a general anæsthetic.

Given by Inhalation, moderate doses are absorbed into the blood and paralyse the nervous system much as does Alcohol; only Chloroform is more rapid and deranges the mental faculties from the first. The order of effects is (1) Imperfect consciousness and impairment of special senses. (2) Excitement, motor and mental. In weak persons and children, this stage is as a rule wanting. (3) Complete anæsthesia, and (4) Paralysis, the muscles relax, breathing becomes slow and stertorous, pulse becomes feeble, respiration ceases, and, lastly, the heart stops.

Chloroform inhalation should never be given except in the presence of a third person, as delusions sometimes occur to the patients which have led to false charges of assault. If it can be avoided no one should attempt both to Chloroform a patient, and to perform an operation on him, the risks of failure are too many.

All patients fit for extensive operation are fit subjects for anæsthetics. Chloroform is the most convenient and most easily administered of all the anæsthetics, and, except in cases of cardiac weakness or irregularity, is the most suitable. When anæsthetising, the Chloroformist must devote his whole attention to this work; if he allows anything to distract him disaster may follow. Before commencing he must provide himself with Towel or Mask, Tongue forceps (or Artery forceps), Hypodermic Syringe, and Ether.

The great rule in giving Chloroform is "**watch the breathing,**" that this is regular and natural, seeing that not only are the respiratory muscles acting, but that air is passing in and out of the lungs and that the patient's circulation remains normal; that

The stage at which surgical operations are performed is when the patient is "**under**," that is fully under the influence of the drug. This is shown by the patient breathing regularly, no longer responding to pinching, the limbs lying limp and motionless, and the conjunctival reflex being abolished, which is tested by raising the upper eyelid with one finger and touching the eyeball with the other—if the conjunctival reflex is abolished there is no winking; so long as sensation remains there is danger of shock, which may result in death. Cases where the heart has ceased before the breathing, have generally been operations in the vicinity of the 5th nerve in patients who have not been quite "*under*."

Rules to be observed in giving Chloroform.

1. The patient must have abstained from solid food for 6 hours before the operation, but 2 hours before it, he should have some strong soup.
2. Examine to see that there are no foreign bodies (*e.g.*, false teeth) in his mouth; if there are they must be removed.
3. He should lie comfortably in the horizontal position.
4. His dress should be loose, especially over the chest, throat and abdomen.
5. He should breathe regularly and freely while the Chloroform is being inhaled.
6. If coughing be excited, draw the towel away, as the vapour is too strong.
7. If vomiting occur, turn the head to one side, so that the vomit escapes by the mouth and does not enter the air passages.

The risks attending the careful administration of Chloroform are few. But occasionally **complications** arise requiring promptness and skill, if the patient is to be saved. In every case of **complication** occurring, the first thing to be done is to **remove the Chloroform**. The chief complications are as follows:—

- (a) **Sudden respiratory arrest**, is usually due to the tongue falling back and obstructing the breathing; or it may be due to a **foreign body** in the mouth or larynx.

Treatment. Remove the Chloroform; turn the head to one side; examine mouth or throat for foreign bodies, and if present remove them; this failing seize the tongue with the forceps and pull it forcibly forwards.

Gradual respiratory arrest is usually the result of an **overdose** of Chloroform. It is shown by the breathing becoming shallow, irregular, and laboured. Or there may come on crowing croup-like breathing, due to **spasm of the glottis**.

Treatment. Remove the Chloroform, push the lower jaw forward by the fingers on the ascending ramus, just below the ears; as a rule recovery almost immediately takes place.

(b) **Cardiac complications** which are of two kinds.

Congestive, due to **difficulty in breathing**, and **distension of the right ventricle**. The patient's face becomes congested and somewhat livid.

Treatment. Remove the Chloroform and encourage breathing, or if this be not enough, the external jugular vein may be opened, as a last resort the right ventricle may be punctured with the hypodermic needle, blood withdrawn and so the heart muscle stimulated.

Syncopal, evidenced by irregular and feeble pulse, and extreme pallor. For this Ether should be given hypodermically or by towel.

If the symptoms become alarming and there is danger of the heart stopping, raise the end of the table where the patient's feet are, so inclining his body with the head lowermost. This will increase the blood flow to the vital centres, and probably he will recover. Artificial respiration must also be resorted to

AQUA CHLOROFORMI, B.P. Chloroform Water.

Strength : 1 in 400.

Preparation : Take 30 minims Chloroform with Distilled Water sufficient to form 25 fl. oz.; shake together until dissolved.

Dose : $\frac{1}{2}$ –2 oz. or less.

Uses : A flavouring agent and carminative.

LINIMENTUM CHLOROFORMI, B.P. Liniment of Chloroform.

Preparation : Mix 2 fl. oz. each of Chloroform and Liniment of Camphor.

The oil of the Lin. Camph. prevents the evaporation of the Chloroform.

A stimulating and anæsthetic application to a tender skin.

SPIRITUS CHLOROFORMI, B.P. Spirit of Chloroform.

Synonym : Chloric Ether. Spirit of Chloric Ether.

Dose : 5 to 20 mins. in repeated doses; for a single dose 30 to 40 mins.

Preparation : To 1 fl. oz. Chloroform, add alcohol (90 p.c.) sufficient to form 1 pint.

Used : As a carminative and sedative, or added to sweeten draughts, or to cover nauseous flavours.

A.C.E. Mixture. A mixture of equal parts of Alcohol, Chloroform and Ether.

Used : As a diffusible stimulant in doses of 10–30 min.

TINCTURA CHLOROFORMI ET MORPHINÆ COMPOSITA, B.P. Compound Tincture of Chloroform and Morphine.

Dose: 5 to 15 mins.

Preparations: Mix $1\frac{1}{2}$ fl. oz. Chloroform, $\frac{1}{2}$ fl. oz. Tincture of Capsicum, 2 fl. oz. Tincture of Indian Hemp, 14 mins. oil of Peppermint, 5 fl. oz. Glycerin, with 9 fl. oz. alcohol (90 p.c.); in this dissolve $87\frac{1}{2}$ grains Morphine Hydrochloride; add 1 fl. oz. Diluted Hydrocyanic Acid; mix with Alcohol (90 p.c.) sufficient to form 1 pint.

Strength: This contains in 10 mins. $\frac{3}{4}$ mins. Chloroform, $\frac{1}{2}$ min. Dilute Hydrocyanic Acid, and $\frac{1}{11}$ grn. Morphine Hydrochloride, i.e., more than four times the proportion of Morphine present in the corresponding preparation of the Brit. Pharm. 1885.

Medicinal properties and doses: Anodyne and Diaphoretic. 2 to 8 mins.; may be given for cough, colds, influenza, ague, &c.

Sedative and Antispasmodic. 5 to 10 mins., for asthma, bronchitis, spasms, cramp, sea sickness, &c.

Astringent. 8 to 15 mins. for cholera, dysentery, diarrhoea, colic, &c.

It may be continued in half these doses every one or two hours, until the effect is attained.

CHLORODYNE. A patent medicine introduced by Dr. Collis Browne. Its composition has not been made public, but an analysis shows that it contains Opium, Chloroform, Diluted Hydrocyanic Acid and Indian Hemp, flavoured with Sugar and Peppermint. As the heavier portion is apt to settle on standing, it should never be taken without the bottle first being well shaken. It sometimes succeeds as an anodyne and hypnotic when opiates fail.

The Brit. Pharm. preparation **Tinctura Chloroformi et Morphinæ Composita**, is intended to take the place of Chlorodyne; only it is very much stronger and has a smaller dose.

IODIFORMUM, B.P. Iodoform or tri-iodomethane, CHI_3 .

A product of the action of iodine on ethylic alcohol in the presence of solution of potassium carbonate.

Dose: 1 to 3 grns. powdered and suspended in Mucilage, or made into pills with Glucose.

Characters: Shining, lemon-yellow, small hexagonal crystals, somewhat unctuous to the touch; odour saffron-like, persistently disagreeable; taste sweetish unpleasant; solubility, 1 in 80 of cold or 10 of boiling alcohol (90 p.c.) 1 in 5 of cold ether; very slightly soluble in cold water, soluble in Chloroform, carbon bisulphide or oils: when heated it first melts to a brown liquid.

Medicinal properties: **Antiseptic, local anæsthetic.** Weak non-irritating antiseptic it acts mainly by favouring the growth of granulation tissue. It is used extensively for surgical dressing.

Internally Iodoform has no specially beneficial action. In a few cases where absorption has taken place from wounds it has produced the symptoms of Iodine poisoning. It contains over 90 p.c. of Iodine, to which its action is mainly due. It is excreted as Sodium Iodide.

SUPPOSITORIA IODOFORMI, B.P. Iodoform Suppositories.

Each contains 3 grains of Iodoform with oil of Theobroma.

Made in the same way as Tannic Acid Suppositories.

UNGUENTUM IODOFORMI, B.P. Iodoform Ointment.

Strength: 10 p.c.

Preparation: Mix $\frac{1}{4}$ oz. Iodoform in fine powder with $2\frac{1}{4}$ oz. yellow Paraffin ointment.

Iodoform Wool: absorbent cotton wool with 3 to 10 p.c. Iodoform.

Actions and Uses: **Antiseptic, Disinfectant, and local anæsthetic.** Used externally in syphilitic sores, powdered on, or dissolved in Eucalyptus or Winter-green oil which disguises its smell. A powder of Iodoform and Quinine or Bismuth is used as an Insufflation in ozæna, ulcerated throat or ear. An anæsthetic paint for relaxed throats is made by dissolving 1 part Iodoform in 8 of Ether.

CHLORAL HYDRAS, B.P. Chloral Hydrate or trichlorethylidene glycol, $C Cl_3 CH (OH)_2$.

Obtained by the addition of water to the liquid chloral produced by the action of dry chlorine gas on ethylic alcohol.

Dose: 5 to 20 grains. A convenient solution for dispensing is made by dissolving 3 oz. Chloral Hydrate in 1 oz. and 23 mins. water. This will measure 3 oz., and each minim will contain 1 grn. of Chloral Hydrate.

Characters: Colourless monoclinic plates, which do not deliquesce on exposure to air; odour fruity, pungent but not acrid; taste pungent bitter; solubility, 1 in less than 1 of water, alcohol (90 p.c.) or ether, 1 in 4 of Chloroform; on heating it fuses to a colourless liquid: in presence of alkaline substances it decomposes, chloroform being liberated.

SYRUPUS CHLORAL, B.P. Syrup of Chloral.

Dose: $\frac{1}{2}$ to 2 fl. drms.

Strength: 1 fl. drms. contains 10 grns. Chloral Hydrate.

Preparation: Dissolve 1600 grns. Chloral Hydrate in 30 fl.

Medicinal properties : **Hypnotic, Antispasmodic, Sedative.**

Useful for chronic cases where a hypnotic has to be given for a lengthened period. It is often combined with Bromides.

The sleep it induces comes on in about half an hour; and is quiet and refreshing. Unlike opium, it is not followed by sickness, headache or depression. It is used as a **sedative** in spinal excitability of all kinds (e.g., tetanus, strychnine poisoning, chorea, etc.), and to relieve the dyspnoea of spasmodic asthma. It should not be given to persons suffering from cardiac debility.

It is very useful in labour cases, as it relieves the pain and relaxes the vagina without diminishing the expulsive power of the uterus.

Incompatibles : Alkalis decompose Chloral Hydrate, forming a formate, and liberating Chloroform.

Poisoning by Chloral Hydrate :—

In large doses it causes profound insensibility, the temperature falls very low, the respiration becomes slower and weaker. Towards the end the pupils dilate, lividity and collapse come on, then anæsthesia and paralysis which gradually end in death. The fatal dose is stated as 30 grns. and upwards, the symptoms coming on in 15 to 30 minutes, and fatal termination in 3 to 6 hours; much larger doses have been recovered from; the explanation of the difference in lethal dose being probably found in the condition of the patient's heart.

Treatment of Chloral Poisoning.—Evacuate the stomach, keep up the patient's temperature by warm blankets, bottles, warming the room and giving stimulants, e.g., hot coffee.

Chronic Chloralism.—A craving for chloral is often acquired by patients who have been accustomed to take this drug. Its habitual use tends to produce great loss of appetite, nervous irritability, with diminution of mental powers, going on even to disturbance of mental equilibrium. To produce the effects the patient desires the doses have to be increased, but tolerance is not so readily effected as in the case of opium, and so patients have died from a slight increase in the dose they have been accustomed to.

BUTYL CHLORAL HYDRAS, B.P. Butyl Chloral Hydrate.

Formerly known as Croton Chloral Hydrate, or Trichlorobutylidene; a crystalline hydrate, obtained by the addition of water to the liquid butyl chloral produced by the action of chlorine on aldehyde.

Dose : 5 to 20 grains.

Characters : Pearly white trimetric laminæ; odour pungent but not acrid; taste acrid, nauseous; solubility 1 in 50 of water, 1 in 1 of glycerin, 1 in 1 of alcohol (90 p.c.).

Used in Neuralgias of the face and head, but useless where the pain arises from decayed teeth.

PARALDEHYDUM, B.P. *Paraldehyde.* $C_6H_{12}O_3$.

A product of the polymerisation of Aldehyde by various acids or salts.

Characters: A clear colourless liquid; odour characteristic, ethereal; taste at first, acrid, afterwards cooling; solubility, 1 in 10 of water at 60° F., less soluble in hot water; miscible in all proportions with alcohol (90 p.c.), or with ether; sp. gr. 0.998.

Dose: $\frac{1}{2}$ to 2 fl. drms., may be given dissolved in 1 or 2 fl. oz. water. Smaller doses, given every hour, are more effective. Its pungent taste may be covered by Tr. Aurant. and Syrup. When given in larger doses than will dissolve in water, some Tragacanth should be added to suspend it.

Medicinal properties: **Hypnotic, Diuretic.** Given in the sleeplessness of cardiac debility. It rather strengthens the heart. It is excreted by the lungs.

SULPHONAL, B.P. Sulphonal or dimethyl-methane-diethylsulphone.

A product of the oxidation of mercaptol; obtained from acetone and mercaptan.

Dose: 10 to 30 grains; it may be given in powder, or in water with Mucilage of Tragacanth.

Characters: Colourless prismatic crystals; inodorous; nearly tasteless; solubility 1 in 450 of cold water, 1 in 15 of boiling water, 1 in 50 of cold alcohol (90 p.c.).

Medicinal properties: **Hypnotic**, ordinarily innocuous, but instances of poisoning by this drug, in lunatics and cases of heart disease, have been reported.

PIPERAZINE. $C_4H_{10}N_2$.

A substance prepared synthetically from ethylene-diamide.

Characters: Colourless deliquescent crystals, non-caustic and harmless, soluble in water.

Medicinal properties: A remote **Antacid**, and **Lithontriptic**. Used in gouty conditions, renal colic, &c.

Its combinations with Uric Acid are very soluble, hence its value in uric acid diathesis. The Urate of Piperazine is about 7 times as soluble as the Urate of Lithium.

Adult dose: 5 grns. thrice daily, well diluted.

PIX CARBONIS PRÆPARATA, B.P. Prepared Coal Tar.

Prepared by placing commercial Coal Tar in a shallow vessel

LIQUOR PICIS CARBONIS, B.P. Solution of Coal Tar.

Preparation : To a Tincture of Quillaia, (prepared by the percolation process with 1 oz. Bark and Alcohol (90 p.c.) sufficient to produce 20 oz.) add 4 oz. Prepared Coal Tar, digest at 120° F. for 2 days, occasionally stirring; cool and decant or filter.

Medicinal properties. **Stimulating, Antiseptic.** Used externally in skin diseases.

BENZOL, B.P. Benzol.

A mixture of homologous hydrocarbons; obtained from light coal tar oil. It contains about 70 p.c. of benzene, C_6H_6 , and 20 to 30 p.c. of toluene, C_6H_5, CH_3 .

Characters : A colourless volatile liquid, free from opalescence; odour strong, characteristic; sp. gr. from 0.880 to 0.888.

Used as a solvent for fats, oils, &c.

GLUSIDUM, B.P. Gluside.

Synonym : Glucosimide; commonly known as **Saccharin**.

Gluside or Benzoyl sulphonimide, is a sweet imide derivable from toluene.

Characters : A light white minutely crystalline powder, having an intensely sweet taste in dilute solutions; solubility 1 in 400 parts cold water, 1 in 24 of boiling water, 1 in 25 of Alcohol (90 p.c.).

Test for absence of Sugar; it is not blackened by sulphuric acid, even when the mixture is gently warmed for a short time.

SOLUBLE GLUSIDE, B.P. A compound of Gluside with Sodium.

Made by neutralising a warm solution of sodium carbonate with gluside and evaporating to dryness. It is very soluble in water and is more palatable than Gluside.

Medicinal properties : Gluside is **Antiseptic, Sweetening**. It is used as a substitute for sugar in diabetic patients, and to disguise the taste of nauseous drugs. It is not nourishing, nor has it any curative action in diabetes. It is excreted unchanged in the urine. It is not poisonous, and so may be given in doses to suit the patient's taste.

Dose : 1 grain is sufficient to sweeten 4 oz. of liquid.

Pure Gluside is 500 times sweeter than cane sugar; so sweet that it can be recognised when dissolved in 100,000 times its bulk of water; leaves a faint disagreeable after-taste resembling Bitter Almonds.

ACIDUM CARBOLICUM, B.P. Phenol. C_6H_5OH ; obtained from Coal Tar by fractional distillation.

Dose : 1 to 3 grains.

Solubility: freely soluble in alcohol (90 p.c.), ether, benzol, chloroform, carbon bisulphide, glycerin, or the fixed and volatile oils, and in solutions of alkalis; it coagulates solutions of albumen or collodion, and liquifies camphor at 60° F. Phenol is liquified on adding 10 p.c. of water, forms a clear liquid with 30 or 40 p.c. of water; it completely dissolves in 12 times its weight of water.

Exposed to moist air it may acquire a pinkish tint (due to the presence of aurin).

ACIDUM CARBOLICUM LIQUEFACTUM, B.P. Liquefied Phenol. Commonly known as Liquefied Carbolic Acid.

Phenol 90 p.c. with 10 p.c. by weight of water added and dissolved.

Dose: 1 to 3 mins.

Characters: A liquid at first colourless, but usually acquiring a pinkish hue. On adding 18 to 27 p.c. of water at 60° F. it forms a clear solution.

GLYCERINUM ACIDI CARBOLICI, B.P. Glycerin of Phenol.

Strength: 1 oz. Phenol in 5.

Preparation: Triturate 1 oz. Phenol in Glycerin sufficient to produce 5 fl. oz.

SUPPOSITORIA ACIDI CARBOLICI, B.P. Phenol Suppositories.

Each suppository contains 1 grain Phenol.

Preparation: Dissolve 12 grains Phenol in 24 grains Beeswax and Oil of Theobroma, melted sufficient to form a mixture which will fill 12 suitable moulds each capable of holding 15 or 16 grains Oil of Theobroma; melt together at a low temperature, pour the mixture into the moulds.

Or let the mixture cool and then divide into 12 equal parts of a conical or other convenient shape for a suppository.

TROCHISCUS ACIDI CARBOLICI, B.P. Phenol Lozenge.

Preparation: Phenol 1 grain, mix with Tolu basis, to form a lozenge.

UNGUENTUM ACIDI CARBOLICI, B.P. Phenol Ointment.

Ointment of Carbolic Acid, Brit. Pharm. 1885.

Strength: 4 p.c. of Phenol.

Preparation: Dissolve $\frac{1}{2}$ oz. Phenol, in $1\frac{1}{2}$ oz. Glycerin, add $10\frac{1}{2}$ oz. white Paraffin ointment; mix.

Medicinal properties: Phenol is antiseptic and local anaesthetic; used as a disinfectant in sick rooms, &c.

Used as a saturated solution for instruments in surgery, also

strength 1 to 5 p.c., are used in surgical practice; a $1\frac{1}{4}$ p.c. solution applied to the skin relieves itching in chronic skin diseases. Placed in a carious tooth it relieves toothache; as a paint to the throat (carbolic acid glycerin) or as a gargle (grains 2 to an oz. water) for sore throats with foetid breath; as an inhalation (grains 20 in 1 pint hot water); as a vaginal or urethral injection (1 grn. in 1 oz. water).

Carbolised Oil, 5 to $2\frac{1}{2}$ per cent. Phenol in olive oil. It relieves pain, but is not antiseptic.

Internally.—As an intestinal antiseptic and sedative in sickness, flatulence, diarrhoea and intestinal worms; also in phthisis and whooping cough, both internally and by inhalation.

Phenol undiluted stains the skin or mucous membrane white, producing local anæsthesia. Continued application may act as a caustic, or even produce dry gangrene of the part.

It is excreted partly by the lungs as free Phenol, and partly by the kidneys as decomposition products, which are not antiseptic. In large doses it is poisonous. Half an ounce has been fatal.

Antidote for Phenol poisoning. Vinegar and water in equal proportions should be swallowed. Use the stomach pump, emetics, to remove the poison; counteract narcotism by stimulants, warmth, hypodermic injections of Atropine, inhalations of Nitrite of Amyl.

Phenol is not a true acid, although it forms weak salts (carbates). With a neutral solution of Ferric Chloride it gives a deep purple colour.

Antiseptic Solution or *Lister's Strong Solution*. Dissolve 1 oz. Carbolic Acid in 19 oz. Distilled Water, add 19 grns. Hydrarg. Perchlor.

Strength: Carbolic 1 in 20, Corrosive 1 in 500.

Is a powerful antiseptic. Used for washing the hands before operations, or it may be diluted with 1 to 15 times its bulk of water.

Picric Acid, B.P. *Appendix*.

Trinitro-phenol or Carbazolic Acid, $C_6H_2(NO_2)_3OH$; obtained by the action of Nitric Acid on phenol.

It occurs in pale yellow crystalline scales which with the alkalis and ammonia forms salts which are explosive.

It is used as a test for albumen. During recent years Picric Acid has been much lauded as an application (in dilute solution) to burns. There seems however to be considerable risk from absorption.

Phenol Phthalein, B.P. *Appendix*.

A crystalline substance produced by interaction of phenol and phthalic anhydride. Used as an indicator in the volumetric

IZAL is an emulsion containing 40 p.c. of Izal oil. A substance obtained from coal by a special process. The oil has a high boiling point; is insoluble in water, is not poisonous to the higher forms of life, does not causticise the skin; nor does it injure metal instruments.

Izal mixes readily with water. It is a useful **antiseptic**.

As a Germicide it is 4 times more powerful than phenol 1 part in 200 destroys all microbes within 5 minutes while 1 in 1000 inhibits their growth.

Izal Lint. Cotton wool, medicated soap, Cream and Ointment are also sold.

IOHTHYOL. *Sulpho-ichthyolate of Ammonium*; obtained by distillation from certain fishy fossil deposits.

Characters: A reddish-brown syrupy liquid, with taste and odour of tar; on the addition of Liquor Potassæ it develops an odour of ammonia.

Used in skin diseases, e.g., eczema, acne.

Dose: 15 to 30 grns. may be given in Capsules. An ointment of 5 to 30 p.c. in Lard or Vaseline is used in Eczema.

ACIDUM SALICYLICUM, B.P. Salicylic Acid.

A crystalline Acid, $C_6H_4 \cdot OH \cdot COOH$. There are two kinds:—

(a) **Natural Salicylic Acid** obtained from natural salicylates, as the oil of wintergreen, or of sweet-birch.

(b) **Artificial Salicylic Acid** obtained by the interaction of sodium carbolate and carbonic anhydride.

Artificial Salicylic Acid is now supplied **physiologically pure** and is probably just as good for internal use as the natural acid.

Dose: 5 to 20 grains.

Characters: Distinct prismatic colourless crystals; taste at first sweetish, then acid, leaving a burning sensation in the throat. Solubility 1 in 500 cold water, 1 in 15 hot water, 1 in 3 alcohol (90 p.c.), 1 in 2 ether, 1 in 200 glycerin, readily in solutions of ammonium citrate, ammonium acetate, sodium phosphate, or borax, with solutions of alkaline hydroxides or carbonates it dissolves forming salicylates. Its aqueous solution with ferric chloride gives a reddish-violet colour.

UNGUENTUM ACIDI SALICYLICI, B.P. Salicylic Acid Ointment.

Strength: 2 p.c.

Preparation: Mix 10 grains Salicylic Acid with 490 grains white Paraffin Ointment.

Medicinal properties: **Antiseptic, antipyretic.** Used specially in rheumatic conditions. Is usually given as Sodium Salicylate. Used also as an antiseptic lotion (4 p.c.) in skin diseases. As an

injection ($1\frac{1}{2}$ grains to 1 oz. water) in the dysenteric diarrhoea of children; and mixed with starch as a dusting powder for infants.

SALOL, B.P. Salol, or Phenyl Salicylate.

Prepared by the interaction of salicylic acid and phenol; or of their sodium salts with phosphoryl chloride or carbonyl chloride.

Dose: 5 to 15 grains. It may be given suspended in Mucilage.

Characters: Colourless crystals; odour faint aromatic; very little taste; almost insoluble in water, soluble 1 in 10 of cold Alcohol.

Medicinal properties: **Antipyretic**, and **Intestinal Antiseptic**. Used in fermentative diarrhoea and in rheumatism. Its actions are those of Salicylic Acid.

Salol is insoluble in acid solutions, but heated with an alkali splits up into 60 p.c. Salicylic Acid and 40 p.c. Carboic Acid. Thus it is inert in the stomach, but acts as an Intestinal Antiseptic. It has been tried but proved useless in cholera.

Frequently given, or in too large doses, it is poisonous.

ACETANILIDUM, B.P. Acetanilide.

Synonym: Phenyl-acetamide; commonly known as **Antifebrin**. $\text{CH}_3\cdot\text{CO}\cdot\text{NH}\cdot\text{C}_6\text{H}_5$; may be obtained by the interaction of glacial acetic acid and aniline.

Dose: 1 to 3 grains best given dissolved in weak spirit, or with a cardiac stimulant (e.g., Caffeine), repeated every two hours until the desired effect is attained.

Characters: Colourless, glistening, lamellar crystals, inodorous; taste slightly pungent; solubility 1 in 200 cold water, 1 in 18 hot water, 1 in 4 alcohol (90 p.c.), freely soluble in ether, benzol, or chloroform; reaction neutral.

Heated in free access of air it burns, leaving no residue. Heated with Liquor Potassæ, aniline is liberated. Its solution in boiling water, after cooling, is not affected by Ferric chloride, but this with a hot solution produces a deep red colour, almost entirely discharged by hydrochloric acid.

Test distinction from Phenacetin. Acetanilide heated with Liquor Potassæ until odour of aniline is given off and then warmed with a few drops of chloroform, develops the unpleasant and penetrating odour of phenyl-isonitrile (isocyanide); and an aqueous solution mixed with solution of bromine gives a yellowish-white precipitate.

Test for absence of Acetone phenazone and salts of aniline. An aqueous solution is not affected by ferric chloride.

Test for absence of free acid. A cold saturated aqueous solution is not affected by solution of litmus.

amount given. It has the same effect as about four times the quantity of antipyrin.

It is less constant in its effects than either antipyrin or phenacetin. In large doses it sometimes produces alarming symptoms (collapse, cyanosis, rigors, profuse sweating, &c.).

EXALGINE, Methylacetanilide.

Characters: Needle like crystals; white, almost tasteless; slightly soluble in water, readily soluble in Rect. or Proof Spirit.

Medicinal properties: In small doses is **Analgesic** without other effects. It is used for Neuralgia and Toothache. It is also slightly antipyretic, but is not used as such. Large doses are poisonous.

Dose: $\frac{1}{2}$ to 2 grains; best given with a Cardiac Stimulant, *e.g.*, Brandy. To be repeated every hour until the pain is relieved.

Larger doses (up to 8 grains) have been given.

PHENAZONUM, *B.P.* Phenazone or Phenyl-dimethyl-iso-pyrazolone. Commonly known as **Antipyrin**.

Obtained from phenyl-hydrazine by interaction with aceto-acetic ether, and the subsequent interaction of the resulting phenyl-methyl-iso-pyrazolone with methyl iodide.

Dose: 5 to 20 grains; may be given in cachets, powder or solution. The commencing dose should not exceed 10 grns., and then it should be carefully watched and not given too often. A case of poisoning from 10 grns. Antipyrin has been recorded.

Characters: Colourless scaly crystals, odourless, taste bitter; solubility 1 in 1 of water, 1 in $1\frac{1}{3}$ of Alcohol (90 p.c.), 1 in $1\frac{1}{3}$ of chloroform, 1 in 40 of ether. Melting point about 235.4° F.

Medicinal properties: **Antipyretic, Anodyne**. Used in Neuralgias, &c. It is excreted by the urine. Large doses produce great depression with profuse sweating. It is contra-indicated in cardiac debility, in extreme exhaustion, and during the menstrual period.

Incompatibles: (1) Spirit of Nitrous Ether decomposes it, forming a deep green solution. (2) Solutions of Tannic acid.

Neither Chloral Hydrate, nor Sod. Salicyl. are incompatible with Phenazone, if in dilute aqueous solution.

PHENACETINUM, *B.P.* Phenacetin, Para-acet-phenetidin; produced by the interaction of glacial acetic acid and para-phenetidin, a substance obtained from para-nitro-phenol.

Dose: 5 to 10 grains.

Characters: White glistening scaly crystals; without odour or taste; melting point 275° F.; solubility 1 to 20 of Alcohol

* **Medicinal properties:** Antipyretic, Analgesic, Hypnotic. It is comparatively free from injurious effects.

May be given in cachets or suspended in Tragacanth.

NAPHTHOL, *B.P.* Beta-Naphthol or beta-mono-hydroxy-naphthalene, $C_{10}H_7OH$; usually prepared from naphthelene-sulphonic acid.

Dose: 3 to 10 grains; may be given dissolved in olive oil with which it forms an emulsion.

Characters: Nearly white crystalline laminæ, or in powder; odour resembling phenol; taste sharp pungent; solubility, 1 in 1000 of. cold water, 1 in 75 of boiling water, 1 in less than 2 of cold Alcohol (90 p.c.), very soluble in boiling Alcohol (90 p.c.), ether, chloroform or solution of sodium hydroxide.

* *Medicinal properties:* **Disinfectant Antiseptic.**—Used *externally* as a surgical antiseptic, and in chronic parasitic skin diseases.

Internally as an intestinal antiseptic.

NOTES ON PHARMACY.

GENERAL RULES.

Rules to be observed while compounding or dispensing—

1. Give undivided and concentrated attention. Promiscuous conversation should never be allowed in a dispensary.
2. Read through the prescription carefully, and note any inconsistencies in dose or incompatibilities. If difficulty occurs in deciphering (=reading) the prescription, compare the formation of the doubtful letters with other unmistakable portions of the prescription.
3. Then begin compounding. After finishing, it is well to again read the prescription and check the items.
4. When measuring poisonous substances, another person should check the quantity.
5. In labelling drugs, the writing should be small, neat, distinct and regularly spaced. Never put a label over an old one. Never substitute one drug for another.
6. Always have the label uppermost when pouring a liquid from a bottle; this prevents it being dirtied by drops running down the side.
7. Never leave bottles lying on the table, nor be careless or untidy, nor allow prescriptions or labels to be soiled.

Excessive doses: if a prescriber orders an excessive dose, the compounder should not make it up, as in the event of the death of the patient from poisoning, the dispenser is legally responsible, even though the prescriber has erred. The proper course to adopt is to consult the prescriber: if he be a fully qualified doctor and confirms the prescription, get this confirmation in writing, then dispense it—the responsibility rests with the prescriber; if it is not possible to get this confirmation, the dispenser should reduce the dose to a safe one, and inform the prescriber at the earliest opportunity of his having done so.

If the prescriber is not a fully qualified doctor, the compounder should absolutely refuse to make up the prescription.

Contractions. Special care must be taken to correctly distinguish between contractions—often the dose will help; thus Hydrarg. Chlor., might be either Calomel or Corrosive Sublimat. If in doubt decide by the dose; if more than gr. $\frac{1}{8}$ for one

Great and even fatal errors may result from over-contracting, thus—

Hyd. Chlor. has been written for Chloral Hydrate; for Hydrarg. Subchlor.; and also for Hydrarg. Perchlor.

Ac. Hydroc. may be either Ac. Hydrocyan. dil. or Ac. Hydrochloric, or Ac. Hydrochloric. dil.

Each word should be so written that it cannot be mistaken for any other.

Method of prescribing powders or pills.

The usual way is to write the amount required for one powder or pill, and then direct so many to be sent, *e.g.*—

R. Ferri Sulphatis.

Potassæ Carbonatis, āā Gr. ijss.

Mucilaginis Tragacanthæ, q.s.

M. ft. pil. (*i.e.*, mix and make a pill). Tales mitte XCVI (*i.e.*, of these send 96). Sig. Three pills thrice daily.

This means that each pill is to contain the amount of the drug mentioned above, and that 96 are to be made; of which 3 are to be taken thrice daily.

But sometimes they are prescribed in a different way, *e.g.*—

R. Ferri. Sulph.,

Potass. Carb., āā $\frac{1}{2}$ oz.

Mucil. Trag., q.s.

M. fiant. pil. XCVI (*i.e.*, mix and make 96 pills). Sig. Three pills thrice daily.

or M. et divid. in pilulas XCVI (*i.e.*, mix and divide into 96 pills).

This means that the amounts of the drugs named above are to be made into 96 pills.

Special attention must be paid to distinguish these, as fatal errors may be committed if it is not done.

WEIGHING AND MEASURING.

In **Weighing**, the essential elements are **Accuracy** and **Cleanliness**. Have the pan for the weights on your left hand and that for the drug on your right. Invariably wipe the pan with a dry cloth after weighing, and replace the weights in their box.

For **weighing small quantities** (*i.e.*, under 2 grns.) of powerful drugs;

The simplest plan is to weigh a manageable quantity of the drug: dissolve this in a given quantity of water, and then divide

grain of Arsenious Iodide be ordered, 1 grain of the drug may be weighed, dissolved in 1 drm. of water, and 5 mins. of the solution given as a dose; or if $\frac{1}{16}$ grn. Hydrarg. Perchl. be ordered for a mixture, 1 drm. Liq. Hydrarg. Perchl. may be dispensed.

To weigh small quantities of soft Extract :—

Fold a piece of paper double, then cut out equal pieces, put one piece in the pan with the weight, and the soft substance on the other paper in the other pan and weigh: then remove the drug with a spatula from the paper.

Corrosive Substances (*e.g.*, Iodine) should be weighed in this way if the scales be not glass, as they corrode metals.

To Measure Liquids: Hold the bottle containing the drug in your right hand with its label upwards towards the palm of the hand, and the measure-glass in your left hand, with its lip towards the bottle; open the bottle by grasping its stopper between the little finger and palm of left hand; raise the measure glass so that the graduated marks are at the same level as your eye; then pour out the liquid until it reaches the level of the desired marks on both sides of the measure-glass.

Care should be taken not to pour out too much. Pouring back a portion into the bottle should never be done.

Before returning the stopper to a bottle, the drop hanging from the lip should be caught on the stopper by simply touching it—thus the bottles will be kept clean.

In measuring less than 2 drams, use a minim measure.

Viscid substances (*e.g.*, Castor Oil, Copaiba), should not be measured in the measuring glass but poured direct into the bottle, having previously marked with a strip of paper the volume occupied by the same quantity of water.

Drops.—Fluids should be measured, not dropped, as the drops of different substances vary so much in size.

Thus, one fluid dram contains :—

About 60 drops of watery solutions (Infusions and Syrups).

About 120 drops of alcoholic solutions (Tinctures and Liniments) and Volatile Oils.

About 150 drops of Æther.

About 200 drops of Chloroform.

The only occasion when a fluid may be dropped is when one or two drops of a volatile oil are to be added to a mixture to flavour it.

Dropping liquids, is best done as follows :—

(1) Grasp the bottle lightly in the right hand by all the fingers save the index one, holding the bottle vertically and the label towards the palm of the hand.

- (3) As the bottle is tilted gradually over, press the stopper downwards with the right index finger, and the drops will usually flow readily.
- (4) Drop a few drops into another vessel before dropping into the bottle, so as to control the flow.

MIXTURES.

A Mixture is a fluid compound of drugs intended for internal use. Of these some have special names, *e.g.*, Enema, and Draught.

The following mixtures are official: Ammoniacum mixture; Almond mixture; Creosote mixture; Chalk mixture; Compound mixture of Iron; Guaiacum mixture; Castor Oil mixture; Compound mixture of Senna; Mixture of Brandy.

Mixtures are usually dispensed in bottles containing from 1 to 20 oz.

The sizes which are most convenient, are—

For Adults 6 oz. bottles to contain 12 doses of $\frac{1}{2}$ oz. each.

For Infants $1\frac{1}{2}$ oz. bottles, to contain 12 doses of 1 dram each.

The special advantage of these sizes is the facility in calculating the quantities. Each dram of a drug in the mixture equals 5 mins. or grns. in the dose, there being 12 doses in the bottle, *e.g.*, ʒiij in the bottle = M. 15 for each dose.

A convenient way of indicating to the patient the quantity for each dose is to paste on the bottle a strip of paper, notched at intervals, corresponding to the quantity to be taken.

If resinous tinctures be added singly to water, the resin will be precipitated and so yield unsightly mixtures. The best way to compound mixtures containing such tincture is—

- (1) Pour the tinctures and spirituous fluids into the bottle and mix them.
- (2) Add the syrups or essences and if necessary some Powdered Tragacanth.
- (3) Fill up with the infusion or water ordered.

Mucilage ordered in a mixture should be added last or largely diluted with water.

Substances difficult of solution should be pulverised in a mortar and then dissolved.

Substances insoluble in water (*e.g.*, Rhubarb, Bismuth, Ginger, Sulphur), prescribed with water thickened with Gum or Syrup, are best compounded as follows:—

- (1) Weigh the drug and put it in a mortar;
- (2) Add as much water as will make a paste;
- (3) Rub it smooth with a retatory motion.
- (4) Add the Gum or Syrup.

(5) Then add more water and again rub it.

(6) Then gradually add water until all is mixed.

Mucilage of Tragacanth is the best substance to suspend heavy drugs (*e.g.*, Bismuth).

Scale preparations, *e.g.*, Ferri et Quininæ Citras, Ferri et Ammoniae Citras or Ferrum Tartaratum should be either dissolved in a clean mortar with warm water, or poured into the bottle full of the vehicle.

Vegetable extracts should be most carefully rubbed up in a slightly warmed mortar with a little warm water until a soft cream results, and the vehicle then gradually added. If the extract contain resinous matter, Mucilage should be added.

Volatile liquids (*e.g.*, Prussic Acid or Chloroform), should be added to the preparations last of all so as to prevent undue evaporation.

In cases where froth rises in a mixture after shaking, a few drops of Rect. Spt. will at once cause it to subside.

Mixtures with a deposit should be labelled "**Shake the Bottle.**" If in doubt as to whether or not a sediment will form label it thus. In half filled bottles containing a volatile ingredient, the volatile substance may condense on the upper part of the bottle and a shake label will be required.

It is an excellent rule always to shake the bottle with the cork downwards before pouring out the dose.

After compounding a Mixture, put it into a bottle with a clean, well fitting cork. Briskly shake it so that it be thoroughly mixed.

After finishing, examine the bottle, and if any foreign body (*e.g.*, a piece of straw) has got in, it may be removed by straining through tow, or filtering through paper.

Then label it neatly and correctly.

Quinine ordered without an acid to dissolve it, should be rubbed up in a mortar with a little water, or added in its crystalline state, and the bottle marked—"To be shaken." If **Quinine** be prescribed with **Sulphuric Acid** for its solution; dilute the acid before adding the quinine; otherwise a sparingly soluble sulphate is formed. **Quinine** compounded with **Sulphuric Acid** and **Tannin** causes a precipitate of the insoluble Tannate of Quinine; which should not be filtered out.

Salicylic Acid or **Salicylate of Soda**, if prescribed with **Quinine**, may be compounded by adding Mucilage to the Quinine, then gradually adding the Salicylate dissolved in a large quantity of water, and shaking briskly.

Spirit of Nitrous Ether requires to be neutralised with an alkali, *e.g.*, Pot. Bicarb., before being compounded with Bromides or Iodides, otherwise free Iodine or Bromine is liberated, which darkens the liquid.

Subnitrate of Bismuth with Bicarbonates, *e.g.*, Sod. Bicarb. leads to evolution of Carbonic Acid which may burst the bottle. They may be mixed by allowing decomposition by gentle heat, or using the same quantity of Carbonate of Bismuth.

Infusions, Decoctions and solutions of Vegetable substances should always be made fresh; as they soon deteriorate. The Brit. Pharm. has 9 concentrated Liquors. Others are sometimes prepared by concentrating to 8 times the normal strength, adding 15 per cent. Rect. Spirit to preserve them, but they are deficient in flavour and often disappointing in action.

A **Draught** is a small mixture to be swallowed at one dose, usually about 1 to 2 ounces. It is compounded and dispensed like a Mixture. **Liniments, Injections, Lotions, Collyria and Gargles** are also compounded as mixtures.

All **poisonous substances** intended for external applications should be dispensed in blue hexagonal bottles with three sides fluted and marked "**Poison.**"

EMULSIONS.

An **Emulsion** is a watery mixture, in appearance resembling milk, containing oil or resin in suspension, and not capable of ready separation.

Natural Emulsions are formed by rubbing up gum-resins, such as Ammoniacum, Myrrh, Asafetida, with water only.

A substance which does not contain gum may be made into an emulsion, by means of either gum, yolk of egg, Saponin (*e.g.*, *Quillaia*) or alkalis.

Castor Oil is best emulsified by fresh Acacia Mucilage; Cod Oil by Tragacanth.

Volatile oils require to be mixed with a fixed oil before being made into an emulsion, or they may be rubbed up with yolk of egg.

For Turpentine or Terebine, the best emulsifying agent is yolk of egg; one yolk being required for each ounce of Turpentine. Or thick mucilage may be used.

Liquid Extract of Male Fern is best emulsified by egg, but milk, fresh mucilage or Tragacanth may be used.

To make an emulsion with an Oil:—

(1) Weigh or measure the mucilage or other excipient into a mortar.

(2) Add the Oil gradually with continual light rubbing; move the pestle always in the same direction.

(3) If the mixture gets too thick, add a little water to thin it.

- (5) Add tinctures, spirituous liquids and solutions of salts last. They should be added very gradually, stirring all the time.

Alkalis and Alkaline Salts tend to strengthen emulsions; acids, acid salts, and solutions containing alcohol tend to spoil the union of the oil with the excipient.

Tincture of Senega or Tincture of Quillaia, both of which contain Saponin, have the power of emulsifying Fats.

An Alkali added to an Oil or Resin readily forms an emulsion (it unites to form a soap). The disadvantage is, that when such an emulsion is received into the stomach the acid of the gastric juice unites with the alkali so disuniting the ingredients of the emulsion, and in the case of a disagreeable drug (*e.g.*, Castor Oil), leading to nausea and vomiting.

CONFECTIONS.

Confections, are compounds usually of a pasty consistence made with Sugar, Treacle, Syrup, or Honey. The drug must be reduced to a fine powder and the saccharine substance gradually added and mixed thoroughly,

The following confections are official:—

Confection of Pepper; of Roses; of Senna; and of Sulphur.

POWDERS.

A term used in Pharmacy to denote a substance in the form of minute dry particles. It may be either a single drug pulverised, or a compound of different drugs. Powders are graded No. 20—100, corresponding to the number of meshes to an inch of the sieve.

To pulverise vegetable substances. Use an Iron Mortar—

- (1) Grasp the pestle between the fingers, and the palm of the hand.
- (2) Raise and lower it a distance of 2 or 3 inches with a quick jerky motion aiming each blow at a particle.
- (3) After the coarser particles have been crushed, use the pestle as for mixing powders. See *infra*.
- (4) Then sift out the coarser particles (a sieve may be extemporised by stretching a piece of fine muslin over a large pill box with the bottom knocked out).

In case of emergency substances may be powdered by means of an ordinary nutmeg grater, or by one of the methods adopted by natives for making curry powder.

Substances difficult to pulverise (*i.e.* roots, leaves, herbs) are

In using the **mortar for grinding** substances, move the arm from the shoulder, keep the wrist rigid, and hold the pestle firmly between all fingers and palm.

• For **mixing powders**, hold the pestle like a pen, and move the wrist, keeping the shoulder rigid and the elbow nearly stiff.

• Powders are, as a rule, prescribed in doses of from 5 to 20 grns.

In **compounding powders**: Weigh the total quantity of each substance, and place it in a mortar; thoroughly mix and then proceed as before explained.

If a **very small quantity of an active ingredient** (say $\frac{1}{40}$ grain of Strychnine) is prescribed, after carefully weighing it, put it into the mortar, and add double its weight of some inert substance, *e.g.*, Sugar of Milk, and mix them; then add and mix a further quantity of the inert substance, and so on until an appreciable quantity is obtained. Then add the other ingredients and mix the whole. The mixing must be very thoroughly done; if not, one dose may be a poisonous one.

If **different substances** are prescribed together in a powder (*e.g.*, Quinine and Dover's powder), or if loose or dry materials, (*e.g.*, Pot. Iod.) or roots (*e.g.*, Gentian) be prescribed with directions for their solutions, or infusion by the patient himself, the dispenser should **destroy their identity** by pulverising and thoroughly mixing them so that they appear of uniform colour.

The best **paper** for wrapping powders is white printing paper. It is known in India as **Serampore paper** but different shades may be used. Newspaper, or printed paper, should not be used.

Papers for powders are cut in different sizes. The size for **small powders**, is 5 by 4 inches.

• The best way of folding **small powders** (below 10 grns.)—

1. Place the paper on the counter with the powder in the centre.
2. Turn the nearer margin over to within $\frac{1}{2}$ inch of the further one. Secure this in position with the thumb.
3. With the index finger turn the $\frac{1}{2}$ inch of margin over as a flap.
4. Again fold this flap over on itself.
5. Turn the ends down by the fingers, or knife, or powder folder.

This is "folding *from* the compounder."

It may be done *towards* the compounder, but the former is perhaps the better way.

A powder-folder may be used; this ensures that all the papers are folded to one size.

The best way of folding **large powders** (above 20 grns.)—

1. Place powder in the centre of the paper.

2. Seize the margin furthest off between the second finger and thumb of both hands.
3. Bring the margin of the paper together; so that the margin nearest you is $\frac{1}{2}$ inch beyond the other.
4. Turn over the $\frac{1}{2}$ inch projecting to form a flap.
5. The flap thus produced is turned over and folded upon itself.
6. Fold in the ends by bending them over between finger and thumb, or if the powder be very large by creasing them at the ends.

In the case of **very large powders** (say 1 oz. Magnes. Sulph.)—

Place the paper and contents as before, and fold over as for small powders.

To close the end: Gather in loosely the left end and close it so that the packet can stand upright upon it. Into the open right end insert your right index finger, and folding the paper round it, withdraw it so that the paper retains its folds. Then bend this over, and proceed with the other end in the same way.

If more powders than one are ordered: say 12 powders of 5 grns. each of Dover's powder—

1. Spread 12 papers on the counter in 4 rows of 3 each.
2. Weigh 60 grns. of the drug (*i.e.*, 12 times 5 grns.).
3. With a spatula place one-twelfth on each paper.
4. Fold up as before.

This method must be very accurately performed, otherwise the doses will be unequal. Its special advantage is its rapidity. If the compounder has not much experience, or if great accuracy of dose is required, it is better to weigh each dose separately.

It is very difficult describing these processes, and each one must learn them for himself. The principal points to aim at are first, **neatness** and then **quickness**.

Nauseous powders are best dispensed in wafer paper.

Large quantities of powders as Gregory's powder, should be sent in a wide-mouthed bottle with a good cork or stopper.

If **many powders** are prescribed, they should be: (1) made all of one length on a powder folder, and (2) sent in a cardboard box or a bottle or an oblong envelope, with directions on a label on the outside.

PILLS.

Pills should be made perfectly spherical, and of small size so as to be easily swallowed. They should not contain more than

There are 20 Pills official in the British Pharmacopœia.

The more common excipients are—

Syrup of Glucose, and **Confection of Roses**, see *B.P.*

These are officially used in making pill masses.

Other excipients are—

Mucilage of Acacia is often used. It is suitable for pills meant for immediate consumption; if kept for a long time such pills become hard, insoluble, and so useless.

A mixture of **Honey** and **Treacle** is better than Mucilage; it makes nearly as good a body and does not become so hard.

Compound Tincture of Gentian and **Treacle** in equal parts, is good for light powders as Quinine; it gives firmness, toughness, and ensures solubility.

Proctor's Paste, consists of—Powdered Tragacanth 1 dram, Glycerin $3\frac{1}{2}$ drams, water 1 dram. It improves by keeping, and is a good excipient for general purposes.

To compound a Pill Mass.

(1) Examine the prescription, and decide on the excipient.

(2) Weigh out the drugs, and pulverise any substance requiring it.

(3) Then add any dry powders and mix.

(4) Then add any soft extracts.

(5) Mix all together in a mortar, if necessary using the pestle for squeezing and kneading.

To prepare pills—

(1) Transfer the pill mass to a porcelain slab.

(2) Roll it into a cylinder, of the same length on the slab as the number of pills you wish to make.

(3) Cut this cylinder into lengths corresponding to the marks on the slab.

(4) Roll these lengths into spherical masses.

(5) Powder with fine flour, chalk or lycopodium.

To soften hard Pill Masses, warm the slab, by immersing it in hot water, or placing before a fire; the heat of this will soften the pill mass.

Many machines are in use for pill making, but these are useful only when a large number is required.

Pill boxes should be large enough to hold the pills in a single layer: otherwise they may flatten.

Pills containing volatile ingredients should always be dispensed in a wide-mouthed stoppered bottle, some powder being placed in the bottle to prevent them sticking (French chalk is best for this, but liquorice powder or lycopodium, may be used).

Powerful Alkaloids (*e.g.*, Strychnine) should be rubbed up with some Sugar of Milk crystals into a fine powder, then about $\frac{1}{4}$ grn. each of Liquorice Powder and Proctor's Paste for each pill added, to make the pill mass, and the weight of each pill made up to 1 grain.

A **BOLUS** is a large pill (*e.g.*, 10 grns. Quinine). To make it up honey, treacle, syrup, or any thick fluid may be used.

OINTMENTS.

There are 44 official ointments described in the British Pharmacopœia.

In compounding ointments it is better, as a rule, not to melt the ingredients, but mix them in a mortar with a pestle.

Be careful that the ingredients are thoroughly pulverised. Also that the basis is not rancid.

To mix two ointments, or an ointment and an oil, or a liquid—

Weigh or measure the ingredients, place them on a slab and thoroughly incorporate with a spatula.

To make ointments of extracts, powders or gritty substances—

Place the drug in a mortar, and thoroughly pulverise it, then add a little of the basis, and mix to an impalpable ointment. Add the remainder of the basis, and mix.

If an **Extract** has to be added to an Ointment, first put it into a mortar, then rub it to absolute smoothness with a little Spirit, Water, or Glycerin.

If the **extract** be hard, first warm the mortar by filling it with boiling water, and dry it, then rub the extract to smoothness before adding the basis.

Soluble crystals (*e.g.*, Pot. Iod., and Carbonates of the Alkalis) should be pulverised with a little water, before adding the remaining ingredients.

In making ointments of substances liable to be destroyed by contact with steel (*e.g.*, Alkaloids, Acids, Acid Salts or Mercurial Salts), a bone or wooden knife should be used.

SUPPOSITORIES AND PESSARIES.

A **suppository** is a medicinal preparation for introduction into the rectum.

There are seven official suppositories: for their preparation

A suppository is usually conical in shape; it should weigh about 15 grains; it may be made in a special mould of gun-metal, or may be shaped approximately by the hand.

• Oil of Theobroma is usually chosen as the excipient, as it is solid at ordinary temperatures, but melts at the temperature of the body.

To make a suppository; prepare the drugs as for an ointment, mix them with the melted oil of Theobroma, then pour into moulds or shape with a knife. To prevent suppositories adhering to the mould smear its interior with Soap Liniment.

Gelatine Basis for suppositories is preferable to oil of Theobroma in the case of alkaloidal salts, and watery extracts. It is made thus—

1 Oz. Gelatine is washed in cold water, and then left to soak for 1 hour in 3 oz. water.

3 Oz. Glycerin by weight is then added, and thoroughly mixed on a water bath until the weight is reduced to 5 oz. Then the melted mass is skimmed, and poured into a wide-mouthed stoppered bottle. When cold it is covered with a layer of alcohol (90 p.c.), and stored until required.

When required, the basis is melted with the alkaloid or extract in a small evaporating dish and poured into moulds previously greased with oil. The relative proportion of ingredients may be varied to suit the consistence of the drug.

A pessary is a medicinal preparation for introduction into the vagina. It is compounded in the same way as a suppository only is 3 or 4 times as large.

Very small pessaries may be made by uniting at their bases two suppositories, or shaped like this by the hand.

Suppositories and pessaries should be dispensed in large pill boxes, or small square card-board boxes, packed in wool, with directions plainly marked on the box.

BLISTERS.

A blister is a medicinal preparation for application to the skin, and intended to produce irritation or vesication. The drug is usually spread on adhesive plaster, or brown paper.

To prepare a blister:—

Make a mould by cutting out from the centre of a sheet of paper a piece the size and shape of the blister. The outer part of this paper will serve as the mould.

Cut a piece of brown paper about 1" larger all round, than the required blister. Lay the mould on this and slightly fasten it on.

Take a small quantity of the drug; soften it equally throughout; and spread it with the thumb of the right hand, on the brown paper. Warm a long spatula slightly, and press the surface smooth, removing excess of the drug. Now peel off the paper mould, and trim the edges neatly, leaving a margin of $\frac{3}{4}$ inch of brown paper all round.

Cover the surface with a piece of oiled or waxed paper and send in an envelope or box.

Before using the blister the waxed paper must be removed.

PLASTERS.

A **plaster** is an external application, containing resin, and so requiring heat for its preparation.

Plasters are spread on sheep skin, chamois leather, or strong adhesive plaster. The method of spreading is the same as for blisters; only that they are melted and spread by means of a "plaster iron," heated sufficiently to melt, but not to burn the drug.

SIGNS AND ABBREVIATIONS OCCURRING IN PRESCRIPTIONS.

R.	Recipe.	Take, take thou.
M.	Misce.	Mix.
F.	Fac. Fiat.	Make, let it be made.
Div.	Divide.	Divide.
Sol.	Solve.	Dissolve.
F.S.D.	Fac, secundum artem.	Prepare according to custom.
M.S.D.	Misce, signa, da.	Mix, write the label, and deliver to patient.

A. āā.	Ana.	of each, of each ingredient.
Q.S.	Quantum sufficiat.	a sufficient quantity.
Ss. fs.	Semis.	a half.

Ad lib.	Ad libitum.	at pleasure.
b. i. d.	bis in die.	twice daily.
t. i. d.	ter in die.	thrice daily.
Ph. B. or B.P.	British Pharmacopoea.	
P. I.	Pharmacopoea of India.	

Aq.	Aqua.	water.
Bol.	Bolus.	a large pill.
Coll.	Collyrium.	an eye wash.
Comp.	Compositus.	compound.
Conc.	Concentratus.	concentrated.
Dec. Decoc.	Decoctum.	a decoction.
Empl.	Emplastrum.	a plaster.
En.	Enema.	a clyster.
Ext.	Extractum.	an extract.
Garg.	Gargarisma.	a gargle.
Inf.	Infusum.	an infusion.
Inj.	Injectio.	an injection.
Lin.	Linimentum.	a liniment.
Liq.	Liquor.	a solution.
Lot.	Lotio.	a lotion.
Mist.	Mistura.	a mixture.
Ol.	Oleum.	an oil.
Pil.	Pilula.	a pill.
Pulv.	Pulvis.	a powder.
Sp.	Spiritus.	a spirit.
Syr.	Syrupus.	a syrup.
Tinct.	Tinctura.	a tincture.

TERMS USED IN PHARMACY.

Ablution } pouring water on any substance to cleanse it from
Affusion } impurities.

Agitation : shaking briskly.

Analysis : finding out what a thing is composed of.

Analysis, qualitative : finding out what things (not the quantity)
 are in a substance.

Analysis, quantitative, volumetric, } finding out the quantity of each
or gravimetric } constituent in a substance.

Baths : sand, steam, and water-baths are used.

Boiling or Decoction : boiling at a temperature of 212° F.

Calcination or } exposing substances to a high temperature in a
Incineration } furnace or flame of a lamp.

Clarification or } purification.
Depuration }

Condensation : cooling a vapour into a liquid.

Contusion : bruising (as of roots.)

Crystallisation : the change which bodies undergo in passing from
 a liquid or gaseous state, to assume definite and
 regular geometrical forms called crystals.

Decoction : the ebullition of a liquid containing some vegetable
 substance.

Decoloration : depriving a substance of its colour.

Digestion : prolonged treatment at a heat above ordinary temperature but below boiling point, of a substance, so as to dissolve out its soluble principles.

Distillation : the converting of a liquid into vapour by heat, and condensing it in a separate vessel or cooler part.

„ *Dry or Destructive* : } decomposing a body by heat into products, often volatile, which did not previously exist in it.

„ *Fractional* : successive distillations of a mixture at different temperatures so as to separate its constituents.

Ebullition : boiling ; the formation of bubbles of vapour within the liquid which rise to the surface.

Elutriation : separating the heavier from the lighter portion of a substance—e.g., an ore ; the substance is pulverised, mixed with water, the heavier portion sinks rapidly, and the lighter portion sinks more slowly, or may float away in the running water.

Evaporation : driving off volatile substances by means of heat.

Expression : squeezing oils or juices out of vegetable or other matter, by means of a press.

Filtration : separating the insoluble matter from the soluble by means of a filtering substance.

Fusion, Liquefaction, Melting : rendering solid bodies liquid by heat.

Granulation : reducing coarsely crystalline salts to a granular powder, by dissolving in water and evaporating the solution.

Infusion : extracting from a body (usually vegetable) its virtues or soluble parts, by treating it for a short time with hot or cold water in a covered vessel.

Levigation : the same as elutriation.

Lixiviation : treating a mixed solid with water, to dissolve out one part leaving the insoluble part.

Maceration : steeping a substance in a liquid at ordinary temperature to dissolve out its soluble portion. *Menstruum* : the liquid used for dissolving. *Marc* : the insoluble part which is rejected.

Percolation } filtration of a liquid through a porous column of a
Displacement } powdered drug, so as to extract its soluble constituents.

Precipitation : throwing down a solid from a solution in which it is contained. *Precipitate* : the substance so thrown down. *Precipitant* : the substance which causes the precipitate.

Pulverisation : reducing solids to powder.

Sifting : separating the coarser from the finer particles, by means of a sieve.

Solution, Saturated; a solution in which so much of a substance has been dissolved that it can dissolve no more.

Straining: a rough and rapid separation of the more visible particles—using muslin, tow, asbestos, netting, &c.

Sublimation: the turning of a solid into vapour by heat and depositing it in a cooler part of the vessel.

Testing: proving: by chemical reagents finding out the composition or purity, &c., of a substance.

Trituration: reducing solids to powder by continued rubbing.

WEIGHTS AND MEASURES OF THE BRITISH PHARMACOPŒIA.

Weights.—Used for solids and heavy liquids, *e.g.*, chloroform, glycerin, syrups.

1 Grain	... gr.		
1 Ounce avoird.	... oz.		= 437½ grs.
1 Pound	... lb.	= 16 oz.	= 7,000 grs.

The preface to the British Pharmacopœia 1898 gives permission for the use of the scruple as the equivalent of 20 grns., and drachm as the equivalent of 60 grns.; $7\frac{7}{24}$ such drms. equal 1 oz. (weight).

The weight of a new rupee is exactly 3 drms (180 grains): from this other weights can be made.

Measures.—Used for ordinary liquids.

1 Minim	... min.	$\left\{ \begin{array}{l} \text{This equals 0.9114 grains of water.} \\ \text{Therefore 100 grains of Distilled} \\ \text{Water measures 100 minims,} \\ \text{nearly.} \end{array} \right.$	

1 Fluid Drachm	... fl. drm.	= 60 mins.	
1 Fluid Ounce	... fl. oz.	= 8 fl. drms.	
1 Pint	... o	= 20 fluid oz.	
1 Gallon	... c.	= 8 pints,	= 10 lbs.

1 Fluid Ounce is the volume of 1 oz. by weight of water at 62° F.

THE METRICAL OR FRENCH SYSTEM OF WEIGHTS AND MEASURES.

This has been admitted for the first time into the 1898 edition of the British Pharmacopœia, the quantities for making up preparations being given in both the old Imperial and in the metrical systems. The ease and simplicity of the latter system will doubtless ere long gain for it universal acceptance.

The origin of the metrical system, was as follows. The need of a universal and simple system of weights and measures being very apparent, the French Government about the end of last century appointed a Commission to decide on the best basis for a new system.

The decimal system was the one fixed on and the unit of measure "the ten-millionth part of a quadrant of the meridian of the earth." To this the name of metre was given. This measurement was stated as 39·37079 English inches (i.e., 3 ft. $3\frac{3}{8}$ inches nearly, the error in this being only $\frac{1}{240}$ part of an inch). From the metre all other weights and measures are calculated. A litre is the volume of a cubic decimetre, a gramme is the weight of a cubic centimetre of Distilled Water at 4° C.

METRICAL MEASURE OF WEIGHT.

1 Milligramme	= the thousandth part of 1 gram.	= 0·015432 gr. nearly.
1 Centigram.	= the hundredth " " "	= 0·15432 " "
1 decigramme	= the tenth " " "	= 1·5432 " "
1 gramme		= 15·432 " "
1 decagramme	= ten grammes	= 154·32 " "
1 hectogram.	= one hundred grammes	= 1543·2 " "
1 kilogramme	= one thousand " "	= 2lbs $3\frac{1}{4}$ oz. "

MEASURE OF CAPACITY.

1 Millilitre	= 1 Cub. Centim.	= measure of 1 gm. Dis. Water at 4° C.
1 Centilitre	= 10 " "	= 10 " "
1 Decilitre	= 100 " "	= 100 " "
1 Litre	= 1000 " "	= 1 kilo " "

MEASURE OF LENGTH.

1 Millimetre	= one thousandth part of a metre	= 0·03937 Eng. inch.
1 Centimetre	= " hundredth " "	= 0·3937
1 Decimetre	= " tenth " "	= 3·937
1 Metre		= 39·37

RELATION OF METRICAL WEIGHTS AND MEASURES TO THOSE OF THE BRITISH IMPERIAL SYSTEM.

1 Gramme	...	...	=	$15\frac{1}{2}$ grs.	nearly.
1 Kilogramme	= 1000	grammes	=	$35\frac{1}{4}$ oz.	"
1 Litre	...	...	=	$35\frac{1}{4}$ fl. oz.	"
1 Metre	...	...	=	$39\frac{3}{8}$ in.	"
1 Centimetre	= $\frac{1}{100}$	metre	=	39 in.,	nearly $\frac{2}{5}$ in.
1 Cubic Centimetre (c.c.)			=	15.432	grns.

1 Grain	=	$\frac{2}{3}$ decigramme	nearly,	0.0648	grms.
1 Ounce	=	$28\frac{1}{3}$ grammes	"	28.3495	"
1 Pound	=	453.59	grammes	"	
1 Gallon	=	4.54	litres	"	
1 Fl. Ounce	=	28.39	c.c.	"	
1 Fl. Ounce	=	$\frac{2}{7}$	decilitre	"	
1 Inch	=	$2\frac{1}{2}$	centimetres	"	

Other measures (non-official.)

A teaspoonful of liquid	...	=	1 fl. drm.
A dessertspoonful	" ...	=	2 fl. drms.
A tablespoonful	" ...	=	4 fl. drms.
A wineglassful	" ...	=	about 2 fl. oz.
A teacupful	" ...	=	" 7 fl. oz.
A breakfastcupful	" ...	=	" 10 fl. oz.
A tumblerful	" ...	=	" 10 fl. oz.

A teaspoonful of light magnesia weighs about 10 grs.

A teaspoonful of powdered herb weighs about 20 grs.

A teaspoonful of salt, sugar, or sulphur weighs about 30 grs.

A teaspoonful of metallic oxides weighs about 1 to $1\frac{1}{2}$ drams.

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