

ringworm. As a remedy against tapeworm it is perhaps next after Male-fern in efficiency and requires no preparatory treatment.

**KAVA-KAVA, Ava-Kava** (Unofficial),—the root of *Piper methysticum*, a shrub of the nat. ord. Piperaceæ, growing in South America and the South Sea Islands. It contains a crystalline principle, *Kavahin* or *Methysticin*, which is analogous to Piperine, an acrid, greenish-yellow resin, *Kawin*, which is probably the active principle, also a Volatile Oil. Dose, ʒss-j macerated in water, or the same quantity of a fluidextract.

Kava is intoxicant, diuretic and motor-depressant. A beverage is prepared in the Hawaiian Islands by chewing the root and then infusing it in water or coconut milk, which produces a drowsy intoxication with pleasant dreams often of erotic character, and followed by severe headache. A moderate dose is tonic and stimulant, lessening the sense of fatigue and sharpening the mental faculties. It is highly recommended in gonorrhœa and gout, also in chronic gleet and obstinate cystitis.

**KINO, Kino**,—is the inspissated juice of *Pterocarpus Marsupium*, a tall tree of the nat. ord. Leguminosæ, growing in India. It contains 75 per cent. of a variety of tannin named *Kinotannic Acid*, which gives a greenish precipitate with persalts of iron; also a crystalline, neutral substance, *Kinoin*, and *Kino-red*, gum, pectin, etc. There are several other varieties of Kino in the market, brought from S. America, Africa, and Australia, which are products of other trees than the official one. Dose, gr. v-x [av. gr. vijss.]

**Tinctura Kino**, *Tincture of Kino*,—has of Kino 5, in Alcohol 65, Water 14, and Glycerin 15. Dose, ʒss-ij [av. ʒj.]

**Pulvis Kino Compositus**, *Compound Powder of Kino* (Unofficial),—contains 5 per cent. of Opium, and has of Kino 15, Opium 1, Cinnamon 4. Dose, gr. v-xx.

The action of Kino is the same as that of Tannic Acid, though less powerful, and it may be used for the same purposes, both internally and locally. It is chiefly employed as an astringent gargle and as a constituent of diarrhea-mixtures. The tincture, in drachm doses, is one of the most efficient means of combating the atonic diarrhea which results from the disuse of opium or morphine. Its incompatibles are the same as for Galls (see page 70).

**KRAMERIA, Krameria** (*Rhatany*),—is the dried root of *Krameria triandra*, or two other species, nat. ord. Krameriaceæ, shrubs which grow in Peru and Brazil. It contains 20 to 45 per cent. of *Rhatania-tannic Acid*, also *Rhatanine*, an alkaloid, and wax, gum, etc. Dose, gr. x-xx [av. gr. xv.]

**Extractum Krameria**, *Extract of Krameria*, aqueous. Dose, gr. v-x [av. gr. vijss.]

**Fluidextractum Krameria**, *Fluidextract of Krameria*.—Dose, ʒv-xx [av. ʒxv.]

**Tinctura Krameria**, *Tincture of Krameria*,—20 per cent. Dose, ʒss-ij [av. ʒj.]

**Syrupus Krameria**, *Syrup of Krameria*,—has of the Fluidextract 45 parts, with Syrup 55. Dose, ʒss-ʒss, [av. ʒj.]

**Trochisci Krameria**, *Troches of Krameria*,—each troche contains nearly gr. j of the extract, with Tragacanth, Sugar and Orange-Flower Water.

Krameria possesses the same astringent qualities as Tannic Acid and may be employed for the same purposes, except as an antidote to Antimony. It has long had a high reputation as an injection for fissure of the anus, as a local application to spongy gums, as a tonic for debilitated subjects, in chronic diarrhea, also in passive hemorrhages and mucous discharges, as menorrhagia and leucorrhœa. Its incompatibles are the same as for Galls (see page 70).

**LACTUCARIUM, Lettuce**,—is the concrete milk-juice of *Lactuca virosa*, the Acrid Lettuce, a biennial European plant of the nat. ord. Compositæ. It is partly soluble in alcohol and in ether, and yields a turbid mixture when triturated with water. Lactucarium is a mixture of several substances, the most important being *Lactocin*, which is thought to be the active principle. It occurs in white scales, is soluble in water, and is used as a sedative and hypnotic in doses of gr. j-v. Lactucarium also contains three bitter principles, *Lactucin*, *Lactopicrin* and *Lactucic Acid*; also *Lactucerin*, an inert, waxy substance, constituting nearly one-half of the drug. A minute quantity of a mydriatic alkaloid, believed to be *Hyoscyamine*, has been found in the plant, but not in commercial lactucarium. Dose, gr. x-xx [av. gr. xv.]

**Tinctura Lactucarii**, *Tincture of Lactucarium*,—50 per cent. Dose, ʒj-ʒij [av. ʒxxx], according to the activity of the drug.

**Syrupus Lactucarii**, *Syrup of Lactucarium*,—has of the Tincture 10 per cent. Dose, ʒj-ʒj [av. ʒij.]

Lactucarium is feebly hypnotic, somewhat sedative and diuretic. It is supposed to act similarly to Opium, but very feebly and without depressing after-symptoms. As much as half an ounce has been given to a dog without causing any special effect. Its preparations are very uncertain in activity, and are chiefly used as placebos, to allay cough and quiet nervous irritability. The syrup is a good vehicle for expectorants and antispasmodics.

**LAPPA, Lappa**, (*Burdock*),—is the dried root of *Arctium Lappa*, and of other species of *Arctium*, the common burdock, a biennial weed of the nat. ord. Compositæ, found in waste places and along roadsides in Europe, Asia and N. America. Three varieties are recognized, formerly known as *Lappa major*, *L. tomentosa*, and *L. minor*, of which the first-named is most frequently met with in this country. It contains a bitter principle, traces of a volatile oil, also inulin, resin, tannin, mucilage, sugar, etc. Dose, gr. xx-xlv [av. gr. xxx].

**Fluidextractum Lappæ**, *Fluidextract of Lappa*,—made with diluted alcohol. Dose, ʒxx-xlv [av. ʒxxx.] Dr. Squibb recommended a tincture of the seed; lb. j of ground seed to gall. j of whisky, allowed to stand for two weeks before decanting, and used in doses of ʒij-ij before meals.

Lappa promotes all the secretions and is considered aperient, diuretic and diaphoretic, without irritating qualities. In decoction it has been a popular domestic remedy for many morbid conditions, especially rheumatism, gout, pulmonary catarrhs, and chronic cutaneous affections. By several practitioners it is praised as an alterative in constitutional diseases, as syphilis and scrofula, also as an external application to swellings, hemorrhoids and chronic sores. A tincture of the seed has proved remarkably efficient as a stomachic tonic and has cured several cases of psoriasis inveterata.

**LAVANDULA, Lavender**,—the source of the official Oil of Lavender Flowers, is the fresh flowers of *Lavandula officinalis*, a small European shrub of the nat. ord. Labiata, largely cultivated in England. They have a fragrant odor, and an aromatic, camphoraceous taste; and contain resin and tannin, also a *Volatile Oil*.

**Oleum Lavandulæ Florum**, *Oil of Lavender Flowers*,—is a volatile oil distilled from fresh Lavender, and having the fragrant odor of the flowers. It is soluble in alcohol in all proportions, in 3 times its volume of a mixture of alcohol 3 and water 1, and in glacial acetic acid. Dose, ʒj-v [av. ʒij.]

**Spiritus Lavandulæ**, *Spirit of Lavender*,—has of the Oil 5, in Alcohol 95. A perfume and flavoring agent. Dose, ʒx-xlv [av. ʒxxx.]

**Tinctura Lavandulæ Composita**, *Compound Tincture of Lavender*,—an aromatic stimulant, composed of the Oil 8, Oil of Rosemary 2, Saigon Cinnamon 20, Cloves 5, Nutmeg 10, Red Saunders 10, Alcohol 750, Water to 1000. Is a constituent of Liquor Potassii Arsenitis. Dose, ʒx-xlv [av. ʒxxx.]

Lavender is aromatic, stimulant and carminative, but is rarely used alone as a medicine. It is an agreeable flavoring and perfume, in the form of the official spirit, which is sold under the name of *Lavender-water*, after the addition of Oil of Bergamot and Essence of Ambergris. The compound tincture is a very agreeable combination of spices, and is much used as a remedy for gastralgia, nausea, and flatulence, and as an adjuvant or corrigent of other medicines.

**LEPTANDRA, Leptandra** (*Culver's Root*),—is the rhizome and rootlets of *Veronica virginica*, an indigenous perennial plant of the nat. ord. Scrofulariaceæ. It contains a gluco-

side named *Leptandrin*, which is probably the active principle, also Saponin, resin, tannin, etc. The *Leptandrin* of the shops is an impure alcoholic extract. Dose of *Leptandra*, gr. x-xx [av. gr. xv.]

**Extractum Leptandræ**, *Extract of Leptandra*,—is a constituent of *Pil. Catharticae Vegetabiles*. Dose, gr. j-vj [av. gr. iv.]

**Fluidextractum Leptandræ**, *Fluidextract of Leptandra*.—Dose, ℥x-xx [av. ℥xv.]

*Leptandra* is tonic, laxative, and like other resin-bearing purgatives decidedly cholagogue. The recent root is a violent cathartic, but in the dried state it is less active. It is indicated in duodenal indigestion and chronic constipation with insufficiency of the biliary and intestinal secretions.

**LICOPERDON GIGANTEUM**, *Puff-Ball* (Unofficial),—is a common fungus of the nat. ord. *Trichogastres*, found in hilly and wooded districts. The dust, which consists of the capillitium and spores, is a valuable hemostatic, and dusted over bleeding surfaces acts promptly in arresting hemorrhage. It has been proposed as a surgical dressing, but while useful in emergencies where other agents are unattainable, the fetor which results from its application to wounds will prevent its use becoming general for this purpose. It may prove of value as an internal hemostatic in hematemesis and the hemorrhage of typhoid fever.

**LIMON**, *Lemon*,—is the fruit of *Citrus Limonum*, a tree of the nat. ord. *Rutaceæ*, native in Asia, but cultivated in Southern Europe and many other countries. It is official in the two forms described below. The Orange, *Citrus vulgaris* and *C. Aurantium*, the Citron, *Citrus medica*, and the Lime, *Citrus acris*, belong to the same genus.

**Limonis Cortex**, *Lemon Peel*,—is the rind of the ripe fruit, and contains a *Volatile Oil* which is official, and a bitter crystalline glucoside, *Hesperidin*, chiefly contained in the white of the rind.

**Limonis Succus**, *Lemon Juice*,—is the freshly expressed juice of the ripe fruit, each lemon yielding from  $\frac{3}{4}$  to 1 fluid ounce. It contains about 7 per cent. of free Citric Acid, besides phosphoric and malic acids, citrates of potassium and of other bases, etc. Dose, ℥ss-iv [av. ℥j.]

**Acidum Citricum**, *Citric Acid*,  $H_3C_6H_5O_7 + H_2O$ ,—is obtained from the juice of the Lemon or the Lime by adding chalk to form calcium citrate, which is then decomposed by dilute sulphuric acid. It occurs in colorless, rhombic crystals which are very soluble in water. A solution of gr. xvij in ℥ss of water corresponds to ℥ss of fresh lemon-juice, and this quantity of either will neutralize of Potassium Bicarbonate gr. xxv, of Sodium Bicarbonate gr. xx, and of Ammonium Carbonate gr. xivss. Dose, gr. v-xv [av. gr. vijss.]

Citrates of Bismuth, Bismuth and Ammonium, Iron, Iron and Ammonium, Iron and Quinine, Iron and Strychnine, Lithium, Magnesium, Potassium and Sodium, ten in all, are official. They are described under their respective bases, to which their medicinal qualities are due.

#### Preparations.

**Oleum Limonis**, *Oil of Lemon*,—is the volatile oil, extracted from fresh lemon peel by mechanical means. It is used for flavoring and is an ingredient of *Spiritus Aurantii Compositus*, and *Spiritus Ammonia Aromaticus*. Dose, ℥j-v [av. ℥iij.]

**Tinctura Limonis Corticis**, *Tincture of Lemon Peel*,—a 50 per cent. tincture, made with alcohol. Dose, according to the amount of alcohol desired to be given, ℥ss-iv.

**Syrupus Acidi Citrici**, *Syrup of Citric Acid*,—has of Citric Acid 1, Distilled Water 1, Tincture of Lemon Peel 1, Syrup to 100. Used for flavoring. Dose, indefinite.

#### Incompatibles.

Incompatible with *Citric Acid* are: Acetates, Acids (mineral), Carbonates, Potassium Tartrate, Sulphides. With *Citrates* are: Alcohol, Lead Acetate, Potassium Permanganate in acid solution, Silver Nitrate. With *Tincture of Lemon Peel* are: Acacia, Aqueous fluids, Gelatin.

#### PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Lemon-peel is bitter and probably tonic to the stomach, but is used only for flavoring purposes. Lemon-juice, on the other hand, is refrigerant and antiscorbutic, entering the blood as alkaline citrates, potassium salts and phosphoric acid, the citrates being therein partly oxidized into  $CO_2$  and  $H_2O$ , while the potassium salts and phosphoric acid probably act upon the red corpuscles. Citric Acid has the same general action as Acetic and the other vegetable acids. It is wholly decomposed in the blood, and appears to be non-toxic in man, but used internally it may precipitate uric acid and thus promote the formation of calculi. Lemon-juice is employed largely in the treatment and prevention of scurvy, in which disease it possesses powers of specific rank, but whether its action therein is due to the citric acid, the phosphoric acid or the salts of potassium is not known. Lime-juice is equally efficient but citric acid itself is not so.

As refrigerants and diuretic mixtures in fevers, Lemon-juice and Citric Acid are much used, entering into the composition of lemonades and effervescing draughts, to allay thirst and subdue restlessness, and to promote the action of the skin and the kidneys. For acidity of the stomach they are efficient if given in small doses before meals, but the mineral acids are usually preferred for this purpose. Long continued they will impair digestion and impoverish the blood. Atheromatous degeneration of the vessels is said to be retarded by the daily use of lemon-juice, which is supposed to dissolve the excess of inorganic matter and to aid its excretion. Obesity may be reduced by using the juice of limes or lemons in large quantity, but it will be done at the expense of the digestion. Lemon-juice has been found of service in acute rheumatism, probably through the alkalies which it conveys into the blood. As a local application it has been found efficient in pruritus scroti, sunburn, post-partum hemorrhage, and as a gargle in diphtheritic sore throat.

**LINUM**, *Linseed*, *Flaxseed*,—is the seed of *Linum usitatissimum*, flax, a cultivated annual plant of the nat. ord. *Linaceæ*. It contains 15 per cent. of *Mucilage* in the epithelium, also 30 to 40 per cent. of *Fixed Oil* in the embryo. Ground linseed should yield not less than 30 per cent. of the fixed oil.

#### Preparations.

**Oleum Lini**, *Linseed Oil*,—the fixed oil expressed from Linseed without the use of heat. A yellow, oily liquid, of slight odor, bland taste, and neutral reaction, soluble in about 10 of absolute alcohol and in  $1\frac{1}{2}$  of ether. Consists chiefly of the Glyceride of *Linoleic Acid*,  $C_{18}$ .

$H_2O_4$ , which having a powerful affinity for oxygen becomes resinoid on exposure to the air, making it a "drying oil." Dose,  $\mathfrak{ss}$ - $\mathfrak{ij}$  [av.  $\mathfrak{ij}$ .]

**Infusum Lini**, *Linseed Tea* (Unofficial), Linseed  $\mathfrak{ij}$ , Licorice-root  $\mathfrak{ij}$ , Boiling Water  $\mathfrak{ix}$ , infused for four hours and strained. Dose, indefinite.

**Linimentum Calcis**, *Lime Liniment*, (*Carron Oil*),—consists of equal volumes of Linseed Oil and Lime-water, emulsified by agitation. A favorite application for burns.

#### PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Linseed is demulcent, emollient, expectorant and diuretic. The oil is laxative in a dose of  $\mathfrak{ij}$ , and in smaller doses is oxidized in the system and excreted as a resinoid body by the kidneys, which it stimulates slightly. The Infusion contains the mucilaginous principle and a small portion of the oil, and is advantageously used in inflammations of the mucous membrane of the throat, the gastro-intestinal tract and the urinary passages. It is an excellent demulcent in coughs of various kinds, and will be found very serviceable in cystitis, irritable bladder, renal colic and strangury. The Oil may be administered internally as a laxative, and has considerable reputation as a remedy for hemorrhoids in doses of  $\mathfrak{ij}$  twice daily. For laxative purposes, especially in children, it is usually administered as an enema. Externally it is a favorite application to burns, when made into an emulsion with lime-water, as in the official *Linimentum Calcis*. The ground seed, linseed or flaxseed meal, is commonly employed for making poultices, though objectionable from the aseptic point of view. [Compare the article on *POULTICES* in Part III.]

**LITHIUM**, Li,—is represented in the pharmacopœia by five of its salts, of which the Carbonate is but slightly soluble, while the others are readily so. The low atomic weight of this metal (7) makes its saturating power greater than that of other alkaline metals, hence the value of its salts in medicine.

#### Salts of Lithium.

**Lithii Benzoas**, *Lithium Benzoate*,  $LiC_7H_5O_2$ ,—is classed with the Benzoates and described under *BENZOINUM*. Dose, gr. v-xx [av. gr. xv.]

**Lithii Bromidum**, *Lithium Bromide*, LiBr,—is classed with the Bromides and described under *BROMUM*. Dose, gr. v-xx [av. gr. xv.]

**Lithii Carbonas**, *Lithium Carbonate*,  $Li_2CO_3$ ,—a light, white powder, permanent in the air, odorless, of alkaline taste and reaction, soluble in 80 of water; insoluble in alcohol. Dose, gr. ij-xv [av. gr. vijss.]

**Lithii Citras**, *Lithium Citrate*,  $Li_3C_6H_5O_7$ ,—a white, deliquescent powder, odorless, of faintly alkaline taste and neutral reaction, soluble in 2 of water, almost insoluble in alcohol. Dose, gr. v-xx [av. gr. vijss.]

**Lithii Citras Effervescens**, *Effervescent Lithium Citrate*,—prepared from the Citrate 5, with Sodium Bicarbonate 57, Tartaric Acid 30, Citric Acid 19½. Dose,  $\mathfrak{ij}$ - $\mathfrak{ij}$  [av.  $\mathfrak{ij}$ ] in water, as an effervescent drink.

**Lithii Salicylas**, *Lithium Salicylate*,  $2LiC_7H_5O_3$ ,—is classed with the Salicylates and described under *SALICINUM*. Dose, gr. v-xx [av. gr. xv.]

#### Unofficial Preparations.

**Alkalithia**,—is the trade name of a granulated effervescent preparation, containing in each heaping teaspoonful 5 grains of Lithium Carbonate, 10 grains each of Sodium Bicarbonate and Potassium Bicarbonate, and 1 grain of Caffeine. Dose, a heaping teaspoonful in a glass of warm water, 3 or 4 times daily.

**Thialion**,—is a proprietary preparation, described in advertising chemical language as a *sodio-trilithic-anhydrosulphate*, but is probably nothing more than a mixture of Lithium Carbonate and Sodium Sulphate. It is laxative, and is given in doses of a heaping teaspoonful in a glass of warm water, 3 or 4 times daily.

#### Incompatibles.

Incompatibles depend on the acid constituent of the Lithium salt (see under Carbonates, Citrates, etc.)

#### PHYSIOLOGICAL ACTION AND THERAPEUTICS.

The Lithium salts have strong alkaline qualities and act on the system in the same manner as other alkalies (see under *POTASSIUM*). The high saturating power of this metal makes its salts more alkaline than those of potassium, sodium, or calcium, hence more efficient in alkalinizing the urine. The Carbonate and Citrate are the salts referred to in this connection, the others partaking more of the qualities of their acid factors. Both these salts are antacid and strongly diuretic; the carbonate being but slightly soluble should be given in carbonic acid water, and the citrate in dilute solution. They are rapidly absorbed, and rapidly eliminated by the kidneys, giving an alkaline reaction to the urine. No case of poisoning by them is recorded, but large doses may cause gastro-enteritis, and if frequently repeated may produce depression of the circulation, malaise, and excessive muscular weakness. In the test-tube lithium and uric acid have a combining affinity for each other, forming lithium urate, which is the most soluble of the alkaline urates, but when taken internally the lithium salts have a greater affinity for the acid sodium phosphate in the blood than for uric acid. The Carbonate and Citrate are extensively used in gout and lithemia, in which affections they have an established reputation, though their value is a limited one, and their reputed solvent power on uric calculi is very doubtful. Their prolonged local application is said to relieve gouty joints, and gouty conjunctivitis is efficiently treated by washing the eye with a solution of the carbonate. They are useful in the indigestion and rheumatic pains of obese subjects, also in irritable bladder from excessive acidity of the urine. Lithiated arsenical water, made by dissolving the carbonate gr. v-x, and sodium arsenate, gr.  $\frac{1}{30}$ , in half a pint of water for one dose, repeated thrice daily, has proved an efficient remedy in diabetes mellitus. Many mineral waters contain small quantities of the carbonate, varying from a mere trace to grain 0.01 in a pint, an amount so minute as to be practically inert in comparison with the much greater quantities of potassium and sodium salts in the same waters.

**LOBELIA**, *Lobelia*, (*Indian Tobacco*),—the dried leaves and tops of *Lobelia inflata*, nat. ord. Campanulaceæ, collected after a portion of the capsules have become inflated. The plant is a common annual weed growing on roadsides throughout the United States, having pale-green alternate leaves, and small, pale-blue flowers. It contains gum, resin, fixed oil, wax, lignin, salts of cal-

cium, potassium and iron, a liquid alkaloid *Lobeline*,  $C_{16}H_{24}NO$ , also *Lobelie Acid*, and an acrid substance named *Lobelacrin*. Dose, gr. ij-xv [av. gr. vijss.]

*Preparations.*

- Fluidextractum Lobeliæ**, *Fluidextract of Lobelia*. Dose, ℥j-xv [av. ℥vij.]  
**Tinctura Lobeliæ**, *Tincture of Lobelia*,—10 per cent. Dose, as expectorant ℥v-xx [av. ℥xxv]; as emetic ℥ss-ij [av. ℥j.]  
**Infusum Lobeliæ**, *Infusion of Lobelia* (Unofficial),—℥j to a pint. Dose, ℥j-℥j.  
**Lobelinum**, *Lobelin* (Unofficial),—an impure resinoid. Dose, gr. ss-j.

*Incompatibles.*

Incompatible with *Lobelia* preparations are: Caustic Alkalies, Alkaloidal precipitants (see page 5).

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

*Lobelia* has an acrid, nauseous taste, and a heavy, unpleasant odor. It is expectorant, diaphoretic, emetic, purgative, antispasmodic, motor-depressant and narcotic. It excites an abundant flow of saliva, much gastric mucus, profuse urination and sweating, with nausea, vomiting and great depression. The heart's action is enfeebled and the blood-pressure, at first increased, soon falls; muscular debility, reduced temperature and coma follow, and death occurs by paralysis of the respiratory apparatus. The drug produces paralysis of the motor nerve-trunks, the peripheral vagi, and probably the respiratory and vaso-motor centres. It strongly resembles tobacco in its action, and is highly dangerous in full medicinal doses, having caused many deaths when administered therapeutically, the most important instance of its fatal results being the case of Ezra Lovett, Jr., who in 1809 was poisoned by *Lobelia* administered by the founder of the Thomsonian sect of medical practitioners. The responsible party escaped conviction on the plea that he gave the drug in ignorance of its qualities.

*Lobelia* was a favorite remedy with the Indians at the time of the first settlement of the United States, and was introduced into regular practice as an anti-asthmatic, after having served as the main stock-in-trade of irregular practitioners for many years. Its principal therapeutic action is that of an anti-spasmodic, and in cautious hands it is extremely useful in paroxysmal spasmodic asthma, also in dry cough with constant tickling in the throat. As an enema in cases of strangulated hernia the infusion is much safer than tobacco and fully as efficient, and may overcome the obstruction in intussusception, while the tincture in 2-drop doses every hour will often relieve a case of impacted cecum. In constipation from atony and deficient secretion a 10-minim dose of the tincture at bedtime acts excellently, and in poison-oak eczema the infusion is a good local application. The tincture with an equal quantity of glycerin is an efficient application for the pain of acute epididymitis. As an emetic it is dangerous and unreliable, and much too depressant for use in children.

**LYCOPODIUM**,—is a very mobile, pale-yellow, fine powder, consisting of the spores of the Club-moss, *Lycopodium clavatum*, and other species of *Lycopodium*, nat. ord. Lycopodiaceæ,

a native of Europe and the United States. *Lycopodium* is odorless, tasteless, floats on water, which does not wet it, and burns quickly when thrown on a flame. It should be free from pine-pollen, starch, sand and other impurities, which are detected by means of the microscope, the *Lycopodium* spores being about  $\frac{1}{800}$  of an inch in diameter, four-sided and reticulated, with short projections on the edges. They contain about 47 per cent. of a bland, fixed oil.

The plant was formerly considered to be diuretic and antispasmodic, and was used in rheumatism and epilepsy, also in pulmonary and renal disorders. The powder is employed quite extensively in pharmacy to facilitate the rolling of a pill-mass and to prevent adhesion of pills to each other. It makes an excellent absorbent and protective powder when dusted over an excoriated surface, as between the thighs of infants.

By the homeopathic practitioners *Lycopodium* is elevated to the rank of an active drug when triturated with sugar of milk sufficiently long to break up the seeds and liberate their oily contents. In their first centesimal trituration ( $\frac{1}{100}$ ) it is said to have produced symptoms of excitement of the circulation and irritation of the urinary organs, and they profess to use it with benefit in affections of the mucous tracts, dyspepsia, pyrosis, flatulence, constipation, ileo-colitis of infants, hepatic congestion, aneurism, chronic affections of the lungs and bronchi, diphtheria, lithiasis, intertrigo, porrigo capitis, plica polonica and pruritus ani, in all of which as an internal remedy and in high attenuation.

**MAGNESIUM**, Mg.—This metal is represented by its Carbonate, Citrate, Oxide, and Sulphate, of which the last occurs native in sea-water, caves, etc., the others being prepared from it. Its salts are either white or colorless, and those which are official are as follows:—

*Official Salts of Magnesium.*

**Magnesii Carbonas**, *Magnesium Carbonate* ( $MgCO_3$ ),  $Mg(HO)_2 + 5H_2O$ ,—light, friable masses, or powder, odorless and tasteless, insoluble in alcohol, almost insoluble in water. Dose, gr. x-℥j [av. gr. xlv.]

**Magnesii Oxidum**, *Magnesium Oxide*, *Magnesia*,—is made by heating the light carbonate in a crucible to expel nearly all the carbonic acid. A white, light and very fine powder, almost insoluble in water, insoluble in alcohol, and gelatinizes with 15 of water after standing  $\frac{1}{2}$  hour, having become hydrated. Is a constituent of Pulvis Rhei Compositus, and Ferri Hydroxidum cum Magnesii Oxido. Dose, gr. x-xlv [av. gr. xxx.]

**Magnesii Oxidum Ponderosum**, *Heavy Magnesium Oxide*, *Heavy Magnesia*,—is a white, dense and very fine powder, corresponding in other properties and reactions to *Magnesia*, except that it does not gelatinize with water. It is made by calcining the heavier carbonate, and is much slower in action than the light *magnesia*. Dose, gr. x-xlv [av. gr. xxx.]

**Magnesii Sulphas**, *Magnesium Sulphate*, (*Epsom Salt*),  $MgSO_4 + 7H_2O$ ,—colorless prisms or acicular needles, slowly efflorescent, odorless, of cooling, saline taste, and neutral reaction, very soluble in water, insoluble in alcohol. Is a constituent of Infusum Sennæ Compositum. Dose, ℥j-℥j [av. ℥iv.] in plenty of water.

*Preparations.*

**Magnesii Sulphas Effervescens**, *Effervescent Magnesium Sulphate*,—is prepared from the Sulphate 50, Sodium Bicarbonate 40.3, Tartaric Acid 21.1, Citric Acid 13.6. A coarsely granular, white, deliquescent salt, of acid taste and reaction, soluble in water, insoluble in alcohol. Dose, ℥j-℥j [av. ℥iv.]

**Liquor Magnesii Citratis**, *Solution of Magnesium Citrate*,—prepared from the Carbonate 15, Citric Acid 33, Syrup of Citric Acid 60, Potassium Bicarbonate 2½, Water to 360. Dose, ℥vj-xx [av. ℥xij.] for catharsis.

**Mistura Magnesiae et Asafœtida**, *Magnesia and Asafœtida Mixture*, *Dewees' Carminative* (Unofficial),—contains of the Carbonate 5, Tincture of Asafœtida 7, Tincture of Opium 1, Sugar 10, and Distilled Water to 100. Dose, ℥ss-iv. Used for flatulent colic and diarrhea in infants.

*Incompatibles.*

Incompatible with Magnesium Oxide are: Acids, Copaiba (forms a solid mass), Water (in small quantity hydrates it). With *Magnesium Salts* are: Alkalies, Arsenates, Carbonates, Lead Acetate, Lime-water, Oxalates, Phosphates, Silver Nitrate, Sulphites, Tartrates.

## PHYSIOLOGICAL ACTION.

Magnesia and the Carbonate are mildly laxative and antacid, neutralizing free acids in the stomach and forming therewith laxative salts. If used in large quantity for any length of time Magnesia may become hydrated and produce intestinal concretions. The freshly precipitated Hydroxide is an antidote to arsenic in solution, but less effective than the hydroxide of iron, with which it is combined in the official ferri hydroxidum cum magnesii oxido. Magnesia may also be used in poisoning by acids or phosphorus.

The Citrate and Sulphate are saline cathartics, the latter being the more powerfully hydragogue, producing large watery discharges. It is the chief aperient constituent of many popular laxative waters, as Friedrichshall, Püllna, and Hunyadi. If administered in plenty of water the sulphate usually produces a prompt and free discharge from the intestines with little irritation or griping, but often accompanied by a sense of coldness and depression. The purgative action is chiefly due to its causing a greatly increased secretion of intestinal fluids, not by outward osmosis from the vessels as was formerly taught, but by stimulation of the intestinal glandular appendages. If the purgative action should not take place a diuretic one may result, but to secure the desired catharsis the drug should be administered in a considerable quantity of water. When injected into the circulation it is powerfully toxic, paralyzing first the respiration and then the heart. It abolishes sensation and paralyzes the sensorimotor reflex centres (Murrell). Large doses taken internally may cause serious results,  $\text{ʒj}$  in a boy of 15 years produced cyanosis, a roseolous rash, tetanic spasms, cold hands and feet, imperceptible pulse, weak and rapid heart, and an axillary temperature of  $105^{\circ}$  F. (Neale). A boy of 10 years was killed by  $\text{ʒij}$  (Christison), and an adult was fatally poisoned by  $\text{ʒj}$  (Luff).

## THERAPEUTICS.

Magnesia and the Carbonate are used as antacids and laxatives, in acidity, sick headache, and flatulent colic, also as antidotes in poisoning by acids, arsenic, phosphorus, and mercuric and cupric salts. The Citrate is an agreeable laxative, cooling and acceptable to the stomach. The Sulphate is one of the most efficient of the saline cathartics and has a wide field of application. In acute inflammatory conditions, renal and cardiac dropsy, ascites from obstruction of the portal circulation, increased blood-pressure within the cranium, intestinal obstruction without acute inflammation, the constipation of lead poisoning, and habitual constipation from deficiency of the intestinal secretions, it is an excellent remedy. As it has but little influence on intestinal peristalsis it is usually combined with Senna, as in the Black Draught, which increases its purgative action. Acute dysentery is well treated by magnesium sulphate combined with diluted sulphuric acid, and followed by opium and starch enemata. Bleeding from hemorrhoids and uterine hemorrhage are often relieved by the same combination when other agents fail. In acne vulgaris and other

obstinate eruptions due to derangement of the stomach and intestinal canal, good results are often obtained by a purgative dose of the sulphate daily before breakfast, or by doses of 5 grains in water three or four times a day, and finely triturated it makes an excellent dusting powder for acne rosacea. The ferrosaline mixture (see page 279) is a useful laxative in the constipation of anemic women. The bitter taste of this salt is best covered by coffee. Hypodermically, in doses of gr. jss-v, it is said to produce purgative effects without causing dangerous symptoms, but this method of administration is at best a doubtful one, and is open to many objections.

**MANACA** (Unofficial),—is the root of *Franciscea uniflora*, a shrub of the nat. ord. Scrophularineae, indigenous to Brazil, where it is known as Mercurio-vegetal, or vegetable mercury, a name applied by charlatans to a number of widely differing plants. Very little is known about Manaca, but it has been extensively advertised as an unfailing remedy for sub-acute and chronic rheumatism. It is also considered purgative, diuretic, emmenagogue and antisiphilitic, being official in the Brazilian Dispensatories, and noticed as follows in the *Dict. de Botan. Brasileira*.

"This whole plant, but especially the root, excites powerfully the lymphatic system, eliminating morbid matter by the skin and kidneys. It is antisiphilitic; the interior bark is nauseating and stimulates the throat. In small doses it is resolvent; in larger purgative, diuretic and emmenagogue. In large doses it is an acrid poison."

A fluidextract is on the market, the average dose of which is  $\text{ʒxx}$ .

**MANGANUM, Manganese, Mn.**—This metal is represented in the Pharmacopœia by four salts, including the Hypophosphite, which is described under Phosphorus. The others are—

**Mangani Dioxidum Præcipitatum, Precipitated Manganese Dioxide**,—is chiefly manganese dioxide,  $\text{MnO}_2$ , with small amounts of other oxides of manganese; a heavy, fine black powder, odorless and tasteless, insoluble in water or alcohol, giving off oxygen gas at a red heat, and if heated with hydrochloric acid it causes the evolution of chlorine gas. Dose, gr. ij-x [av. gr. iv.]

**Mangani Sulphas, Manganese Sulphate**,  $\text{MnSO}_4 + 4\text{H}_2\text{O}$ ,—colorless prisms, of slightly bitter and astringent taste and faintly acid reaction, very soluble in water, insoluble in alcohol. Dose, gr. ij-vj [av. gr. iv.]

**Potassii Permanganas, Potassium Permanganate**,  $\text{KMnO}_4$ ,—deep, purple-violet prisms, of sweet and astringent taste, neutral reaction, soluble in 16 of water with a scanty, brown residue, decomposed by alcohol and by heating to  $464^{\circ}$  F. It should be kept in well stoppered bottles, and should not be triturated or combined in solution with organic or readily oxidizable substances. Dose, gr. ss-ij [av. gr. j] in pill.

## Unofficial Preparations.

**Syrupus Mangani Iodidi, Syrup of Manganese Iodide**,—contains about  $\text{ʒj}$  of the Iodide in each  $\text{ʒ}$ . Dose,  $\text{ʒxx-xxx}$ . For formula see U. S. Dispensatory.

**Syrupus Ferri et Mangani Iodidi, Syrup of Iron and Manganese Iodide**,—each  $\text{ʒ}$  contains 50 grains of the mixed iodides in the proportion of 3 of the Iodide of Iron to 1 of that of Manganese. Dose,  $\text{ʒxx-xxx}$ . For formula see U. S. Dispensatory.

**Pepto-mangan, Liquor Mangano-ferri Peptonatus**,—a proprietary preparation, advertised to contain in each half-ounce "the equivalent of 3 grains of metallic Iron and 1 grain of metallic Manganese (as peptonates) in organo-chemical combination." It is claimed for this preparation that it does not have the astringent effect of the inorganic salts of these metals upon the glands of the stomach, and that it does not affect the alkalinity of the bowels. Dose,  $\text{ʒss}$ , three to four times a day, in white wine or milk, or alone.

**Condyl's Red Fluid**,—is a solution of Potassium Permanganate in Distilled Water, of about  $1\frac{1}{4}$  per cent. strength,  $8\frac{1}{2}$  grains to the ounce, or 176 grains in 20 ounces. It is used as a

disinfectant and deodorant for closets and bed-pans, also to wash the hands and utensils, but it cannot be employed to disinfect rooms. It is not irritant, and shows by its change of color when it has lost its efficacy. A one per cent. solution is official in the Br. Phar. the dose of which is given as ℥ij-iv.

*Incompatibles.*

Incompatible with *Manganese Salts* are Alkalies, Carbonates; Bromine, Chlorine and Iodine in alkaline solutions; Cyanides, Phosphates. With *Potassium Permanganate* are Acids (mineral), Alcohol, Ammonia, Arsenites, Bromides, Chlorides, Charcoal, Fats, Ferrous salts, Glycerin, Gums, Hydrogen Dioxide, Hypophosphites, Hyposulphites, Mercurous salts, Oils, Organic substances, Oxalic Acid, Oxalates, Phenol, Picric Acid, Piperazin, Sulphites, Tannic Acid, Tartaric Acid.

PHYSIOLOGICAL ACTION.

Manganese salts are gastro-intestinal irritants, but in small doses they improve the appetite and the digestion and stimulate the action of the heart. Used in larger doses and for a considerable length of time they lower the heart's action, paralyze the muscular system especially the muscular coat of the arteries, and cause progressive wasting, paraplegia, and acute fatty degeneration of the liver. According to some observers they are motor-excitant in action, increase arterial tension, and act specifically on the uterus; but others deny that they are absorbed in sufficient quantity to have any effect on the organism. The Sulphate is emeto-cathartic and decidedly cholagogue, and the Dioxide is considered emmenagogue. Traces of manganese are found in the blood and tissues, but the metal is apparently introduced accidentally with food, and is not considered to be an essential constituent of the organism.

Potassium Permanganate is a powerful oxidizing agent, and hence is actively antiseptic, disinfectant, and deodorant; but its germicidal power is limited, the salt being quickly reduced by surrendering its oxygen to all organic material present. A solution of 1 in 833 destroys the pus micrococci in two hours (Sternberg). Its oxygen constituent is largely given up to organic substances in the presence of water, it being thereby converted into manganese dioxide and potassa. Taken internally it is quickly decomposed by the albuminous contents of the stomach, at the same time oxidizing any oxidizable material present, and is not absorbed in its own form. Concentrated solutions are irritant and corrosive to the skin, and if swallowed in quantity may cause gastro-enteritis. It is considered an efficient emmenagogue, and has been successfully employed to produce abortion.

THERAPEUTICS.

Manganese salts are administered by physicians who affect to see a manganese-anemia in cachectic subjects, but they are always prescribed in anemia with iron. The Sulphate is used in jaundice of malarial origin and in that due to catarrh of the biliary passages. The Dioxide is employed in gastrodynia and pyrosis, amenorrhea and other derangements of the menstrual function, also in menorrhagia and metrorrhagia. It is used as an ointment in many skin diseases.

Potassium Permanganate has generally been the preparation given when

the effects of Manganese were desired; but as it causes great gastric irritability, with abdominal pains and burning sensations, besides other decidedly unpleasant symptoms, it is a difficult matter to get patients to take it for any length of time. It is an efficient remedy in amenorrhea, and is used with benefit in dyspepsia, flatulence, lithemia, obesity, and acute rheumatism. For internal administration it should be given in pill or capsule, the taste of a solution being very disagreeable. The injection of a strong solution in the immediate vicinity of the bites of venomous reptiles is reported to be a very efficient antidote to their poisons. Solutions of the strength ℥j to the pint are employed as antiseptic and germicidal washes for wounds, ulcers, abscesses, and caries, also to correct fetor in cancer, ozena, leucorrhœa, and perspiring feet. It is used as a test and a corrigent for organic impurities in drinking water, also in strong solution (1 in 20), followed by a solution of oxalic acid to remove the stain, as a disinfectant for the hands of the surgeon. The stain left by it on fabrics may be removed by sulphurous acid, but as sulphuric acid is formed in the reaction the fabric should be immediately washed or rinsed in water.

Potassium Permanganate is an efficient antidote for morphine in the stomach, and as the latter is constantly excreted into that viscus however administered, the former may be used efficiently in any form of opium or morphine poisoning. If given soon after the ingestion of the poison, the dose should be double that of the morphine supposed to be present, and after washing out the stomach, small doses may be administered at intervals during the acute stage, to prevent reabsorption of the morphine excreted by the stomach. It has long been known that this agent deoxidizes morphine and renders it innocuous, but it was supposed that the presence of albumin in the stomach would prevent their reaction. It is now shown that the permanganate reduces morphine sulphate more rapidly than it does albuminous matter, and in fact exhibits a marked selective affinity for morphine and also for physostigmine (eserine), but gives up its oxygen more quickly to albuminous substances than to strychnine, oxalic acid, colchicum or hydrocyanic acid. It exerts no oxidizing effect, in the presence of albumin, on atropine, hyoscyamine, hyoscyne, caffeine, cocaine, aconitine, veratrine, pilocarpine, muscarine or phosphorus. (Murrell.) Laboratory experiments have determined that it destroys many and probably all alkaloids, acting very rapidly on morphine and cocaine, but slowly on strychnine (Wood).

**MANGO** (Unofficial),—is the bark of *Mangifera indica*, an Indian tree of the nat. ord. Guttiferae. It is supposed to be an astringent with special tonic action upon mucous membranes. It is highly recommended by its vendors for nasal catarrh, hemorrhages and mucopurulent discharges from the intestines, uterus, vagina and bronchi. A fluidextract is sold, which may be used in doses of ℥x-℥j.

**Mango-Fruit**, or *Mangosteen*, is the fruit of *Garcinia mangostana*, nat. ord. Guttiferae, also from India. It is a powerful astringent, and is used for nasal catarrh, diarrheas, dysentery, and leucorrhœa.

**MANNA**,—is the concrete, saccharine exudation of *Fraxinus Ornus*, the flowering ash, a tree of the nat. ord. Oleaceae, growing in Southern Europe. Manna is produced also by