

## THERAPEUTICS.

Picrotoxin is used chiefly in nervous diseases. Epilepsy is somewhat amenable to it, especially when the attacks are nocturnal, also in anemic cases and those attributable to onanism. Paralysis of several forms have been greatly benefited by it, especially paralysis of the sphincters, hemiplegia from cold, glosso-labio-laryngeal paralysis and paralysis agitans. Chorea is well treated by it but requires full doses. It is remarkably efficient in vaso-motor disorders of the menopause, and is sometimes effective in controlling the night sweats of phthisis and in flatulent colic, also in dyspepsia with flatulence and severe epigastric pain, and in vomiting with giddiness, headache and intolerance of light and sound. Dysmenorrhea is often benefited by Cocculus administered for two days before the period; and leucorrhœa, when the discharge is sero-purulent with lumbar pains, is frequently controlled by it. Parasitic skin diseases are well treated by an ointment of Picrotoxin (gr. x to the ℥) which will also kill pediculi, but it must be used cautiously and with special care to avoid an abraded surface. The tincture may be used undiluted as a wash to kill bodylice. Cocculus berries are used to stupefy fish, being thrown into ponds containing them. They are also employed to adulterate beer and porter in order to make these drinks more intoxicating. A decoction of the berries or Picrotoxin itself, is used for "knock-out" purposes by criminals, administered in beer or other intoxicating beverages.

**PILOCARPUS, Pilocarpus** (*Jaborandi*),—the leaflets of *Pilocarpus Jaborandi* or of *Pilocarpus microphyllus*, Brazilian plants of the nat. ord. Rutaceæ, yielding on assay not less than  $\frac{1}{2}$  per cent. of alkaloids. They contain the alkaloids *Pilocarpine*,  $C_{11}H_{16}N_2O_2$ , a syrupy fluid, slightly soluble in water, and forming salts; *Jaborine*, isomeric with pilocarpine, but antagonistic thereto in action, and does not form crystallizable salts; *Pilocarpidine*, which acts like pilocarpine; also a volatile oil, which consists chiefly of *Pilocarpene*,  $C_{10}H_{16}$ , and a peculiar acid. Dose, gr. x-xlv [av. gr. xxx.]

*Preparation and Salts.*

**Fluidextractum Pilocarpi**, *Fluidextract of Pilocarpus*,—Dose, ℥x-xlv [av. ℥xxx.]

**Pilocarpinæ Hydrochloridum**, *Pilocarpine Hydrochloride*,—white, transparent crystals, deliquescent in the air, very soluble in water or alcohol. Dose, gr.  $\frac{1}{8}$ - $\frac{1}{2}$  [av. gr.  $\frac{1}{2}$ .]

**Pilocarpinæ Nitras**, *Pilocarpine Nitrate*,—white, shining crystals, permanent in the air; soluble in 4 of water and in 60 of alcohol. Dose, gr.  $\frac{1}{8}$ - $\frac{1}{2}$  [av. gr.  $\frac{1}{2}$ .]

*Incompatibles.*

Incompatible with *Pilocarpus* are: Alkaloidal precipitants (see page 5), Calomel, Potassium Permanganate. Atropine is physiologically incompatible with pilocarpine.

## PHYSIOLOGICAL ACTION.

Pilocarpus is a paralyzer of the vaso-motor system, and a stimulant of the peripheral terminations of nerves supplying glands and involuntary muscular

fibre, subsequently paralyzing the latter. It is therefore a powerful diaphoretic and sialogogue, a cardiac depressant by stimulation of the vagus ends, also myotic, emetic, and under some circumstances abortifacient. Its taste is hot and pungent. It causes prompt and profuse perspiration (℥ix-xv in quantity) and salivation (℥x-xxvij) after a preliminary flushing of the skin. The nasal, bronchial and lachrymal secretions are much increased, sometimes watery diarrhoea occurs; the action of the heart at first increased is afterwards lowered, the arterial tension is reduced, and the temperature falls from  $1^{\circ}$  to  $4^{\circ}$  F. Drowsiness, pallor, chilliness and debility succeed, and last several hours; the pupils are contracted and accommodation is impaired; elimination of urea is greatly increased, but not the quantity of urine; the respiratory power is lowered and apnea may occur from increase of the bronchial mucus. Its active principle is rapidly absorbed, and is eliminated by the skin, the salivary glands and the kidneys, the effects passing off usually in from three to six hours. Children are less affected than adults by proportionate doses. It causes contraction of the bladder, uterus and spleen, in the latter case whether the organ is enlarged or of normal size. The desire to urinate, which is experienced after a full dose, is due to the drug causing contraction of the bladder. Pilocarpus is not a diuretic but tends rather to diminish the quantity of urine as a result of its powerful diaphoretic action.

Pilocarpine is the principle to which the foregoing actions are due, but Jaborine, though chemically identical, is perfectly antagonistic thereto in its effects on the heart, pupils, lungs and salivary glands, acting precisely like atropine on these organs.

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Pilocarpus is used with benefit in dropsies, especially the renal form, also in eclampsia of renal origin, in uremia, pleuritis, meningitis and other inflammations of serous membranes, but is contraindicated when from any cause there is a weak heart. In diabetes insipidus it reduces the quantity of urine remarkably, relieving the kidneys by throwing their work on the skin. In the acute and chronic forms of Bright's disease it has been used with advantage, but being very depressant it must be employed with great caution in this disorder. For alopecia it is the most efficient remedy known, stimulating the skin and improving the color and condition of the hair. In agalactia it stimulates the secretion of milk, and it often gives prompt relief in parotitis. Ptyalism is frequently relieved by minute doses of Pilocarpine (gr.  $\frac{1}{30}$ ), which, acting specifically on the same gland, may correct its morbid action, and similar doses used thrice daily will check profuse perspiration. The hypodermic use of Pilocarpine will arrest a paroxysm of spasmodic asthma and is equally efficient in hiccough. Atropine-poisoning is best combated by the use of Pilocarpine hypodermically.

Diphtheria has been treated with Pilocarpine successfully, Guttman having reported eighty-one cases without a single death; but other clinicians have

not found it so efficient, and Lashkewitz and Jacobi condemn it absolutely. In children above the age of five years, in whom the condition of the heart does not contraindicate it, this drug often gives pronounced satisfaction in detaching the false membrane and preventing its reformation; but care must be taken to give full support by food and alcohol throughout its use, and to avoid it altogether in cases which manifest cardiac weakness or great depression. In erysipelas it is often highly efficient, and for the purpose of breaking up a common cold it is one of the best agents at our command. For the latter purpose the fluidextract of *Pilocarpus* may be used in doses of  $\text{m}\bar{x}$ - $\text{z}\bar{j}$  according to age, given at bed-time and repeated once or twice during the night if necessary. Children bear it well in all its physiological actions.

Ophthalmologists employ *Pilocarpine* with most excellent results in the amblyopia of alcoholism and that from the abuse of tobacco, in detachment of the retina, chronic iritis, keratitis, glaucoma, hemorrhage into the vitreous, atrophic choroiditis, white atrophy, to promote resolution and absorption in inflammatory conditions with exudation, and instead of physostigmine as a myotic. *Pilocarpine* is highly efficient as an aid to sorbefacient remedies in removing inflammatory exudations and promoting the absorption of effusions. When iodides and mercurials are being used for these purposes their action is greatly aided by this drug administered occasionally for a few days at a time. It has been suggested by Waldstein as a remedy in phthisis for the purpose of inducing leucocytosis and stimulating glandular activity, and is one of the ingredients in a "cure" for consumption named *Aseptolin*, (see page 381.)

**PIMENTA, Allspice**,—is the dried, nearly ripe fruit of *Pimenta officinalis*, a West Indian tree of the nat. ord. Myrtaceæ. The berries contain a Volatile Oil which is official, a green fixed oil, fat, tannin, gum, resin, etc. Dose, gr. x-xl [av. gr. xv.]

**Oleum Pimentæ, Oil of Pimenta**,—the volatile oil, colorless or pale yellow, of aromatic odor, pungent taste and slightly acid reaction. It contains *Eugenol* 65 per cent. (see under *Caryophyllus*, page 208); and is a constituent of Bay Rum. Dose,  $\text{m}\bar{i}\bar{j}$ -v [av.  $\text{m}\bar{i}\bar{i}\bar{j}$ .]

Allspice is a warm, aromatic stimulant, very useful as a condiment, improving digestion by increasing the vascularity of the gastric mucous membrane and by stimulating the salivary secretion. The oil is an agreeable remedy for flatulence, nausea, and intestinal colic, and is used to prevent the griping of purgatives and to cover the taste of nauseous medicines.

**PIPER, Pepper, (Black Pepper)**,—is the dried, unripe fruit of *Piper nigrum*, or Pepper-vine, a perennial plant of the nat. ord. Piperaceæ, growing in India, Siam, Java, and Borneo. It contains a base, *Piperine*, which is official, also agree, acrid, concrete oil, a balsamic volatile oil, starch, lignin, gum, extractive, etc. Dose, gr. v-xx [av. gr. vijss.]

**Oleoresina Piperis, Oleoresin of Pepper**,—contains almost all the volatile oil and acrid resin extracted by acetone, with but little of the *Piperine*. Dose, gr.  $\frac{1}{4}$ -j [av. gr. ss.]

**Piperina, Piperine**,  $\text{C}_{17}\text{H}_{19}\text{NO}_3$ ,—a feeble base obtained from Pepper, and other plants of the Piperaceæ. Occurs in colorless or pale-yellowish prisms, of neutral reaction, almost insoluble in water, slightly so in ether, but soluble in 30 of alcohol. Dose, gr. j-x [av. gr. iij.]

**Piperidinum, Piperidin** (Unofficial),—is produced by the hydrolysis of *Piperine*, or synthetically by reducing pyridine by nascent hydrogen. It occurs as a colorless, limpid liquid, and is a powerful base. The *Acid Tartrate* is a white, crystalline powder, readily soluble in water, the dose of which is gr. x-xv.

Pepper when applied to the skin acts as an irritant; internally its effects are similar to those of other aromatics, being a warm carminative and stimulant, increasing slightly the action of

the heart, stimulating the kidneys somewhat, and toning up the mucous membrane of the urinary and intestinal passages, by which channels it is eliminated. It has been thought to possess antiperiodic power, and was formerly much employed in intermittents. Its chief medicinal use is to correct flatulence, and to excite action of the stomach, being very commonly taken as a condiment with food. It is occasionally employed in gleet, but more extensively in hemorrhoids and other diseases of the rectum. Its active constituents are the concrete oil or resin and the volatile oil, *Piperine* having very slight action on the system except as an antiperiodic and antipyretic, qualities which it certainly possesses.

*Piperidin Tartrate* increases the solvent power of serum for sodium biurate to a much greater extent than *Piperazin*, *Lysidin*, or *Urotropin*, and has been employed as a solvent for gouty deposits, uric acid gravel and calculi.

**PIPERAZINUM, Piperazin, Diethylene-diamine**,  $\text{C}_4\text{H}_{10}\text{N}_2$  (Unofficial),—is a synthetical basic compound formed by the action of ammonia upon ethylene bromide or chloride; and occurs as a white, crystalline powder, soluble in water and liquefying when exposed to the air, from which it absorbs water and carbon dioxide. Dose of the base or its hydrochloride, gr. v-xv. It may be injected hypodermically in 3 to 5 per cent solution.

#### Incompatibles.

Incompatible with *Piperazin* are Acetanilide, Acetphenetid (Phenacetin), Alkaloidal salts, Alum, Butyl-chloral Hydrate, Chloral Hydrate, Copper Sulphate, Ferric Chloride, Ferrous Sulphate, Mercuric Chloride, Phenol, Phenocoll, Picric Acid, Potassium Permanganate, Quinine, Silver Nitrate, Solution of Arsenic and Mercury Iodide, Sodium Salicylate, Spirit of Nitrous Ether, Tannic Acid.

#### Analogues.

**Lycetol, Dimethyl-piperazin Tartrate** (Unofficial),—is a uric acid solvent, which is said to combine the solvent properties of *Piperazin* with the alkalizing and diuretic effects of a tartrate. The dose is gr. xv-xxx daily, administered in carbonated water or in the form of lemonade.

**Lysidin** (Unofficial),—is a base obtained by the action of sodium acetate upon ethylenediamine hydrochloride, and said to possess a solvent power on uric acid five times greater than that of *Piperazin*. It has been tried in cases of chronic gout with excellent results. The stiffness of the joints was lessened, and a conspicuous reduction occurred in the tophi around the joints, and on the epiglottis in one case. The dose is  $\text{z}\bar{ss}$ - $\text{z}\bar{i}\bar{j}\bar{ss}$  of the 50 per cent. alkaline solution in a glassful of carbonated water.

**Piperidin Tartrate**,—a powerful solvent of sodium biurate, is described above, under the title *PIPER*.

**Hexamethylenamine (Urotropin)**,—a uric acid solvent, is described under *FORMALDEHYDE*, page 284.

*Piperazin* possesses the valuable property of forming with uric acid a very soluble compound, *piperazin urate* being seven times more soluble in water than is *lithium urate*, the former requiring but 50 parts and the latter 368 parts of water for solution. It is non-toxic, and devoid of powerful physiological effects, being well borne without ill results, even when administered for prolonged periods. It is non-irritant to mucous membranes, is readily absorbed from the stomach, and circulates in the blood unchanged, reaching the parts affected by gouty deposits in a condition in which it neutralizes and dissolves the latter thus facilitating their removal from the body.

The administration of *Piperazin* in gout promptly reduces the redness and swelling of the affected joints, and is frequently followed by a discharge of gravel. The minimum daily dosage for this purpose is about 15 grains, which

should be dissolved in half a pint of water, and the solution should be added to a pint or more of any convenient carbonated water, and taken in divided doses through the day. It gives marked relief in the pruritus of the uric acid diathesis due to the irritation of imperfect nitrogenous elimination. In solution it may be introduced into the bladder in order to dissolve vesical calculi of the uric character, and in gout it may be locally employed by hypodermic injection. A one per cent. solution, applied locally to open gouty sores, relieves the pain and reduces the inflammation. It should be tried in rheumatic arthritis of difficult diagnostic differentiation. As a solvent for uric acid and urate concretions Piperazin has been highly praised by many observers and its efficacy disputed by many others. It is patented, which fact, together with its extremely high price, prevents its general use. It is supplied in vials containing 10 grammes (150 grains), which is sufficient for ten days' dosage and may be prescribed in ℥viiij of water, of which solution the daily dose would be ℥j (equal to 18½ grains), taken in a quart or more of any carbonated water during the day in broken doses.

**PISCIDIA, Jamaica Dogwood** (Unofficial),—is the bark of the root of *Piscidia erythrina*, a tree of the nat. ord. Leguminosæ, growing in the West Indies. It occurs as a tough, fibrous bark, of heavy, narcotic odor, and contains a yellowish, resinoid substance named *Piscidin*. Its active principle has not been isolated. A fluidextract is on the market, of which the dose is ℥ss-j, carefully increased.

*Piscidia* has a narcotic effect on many animals, and has been used in Jamaica for many years to stupefy fish, so that they may be easily taken. It produces muscular relaxation, incoördination of movement, lowered sensibility, increased action of the heart and increase of the arterial tension by stimulation of the vaso-motor centre. Soon however the heart is weakened, vascular tension falls, and a tetanoid state results from stimulation of the spinal cord, with reduced reflex action. On the brain its effects resemble those of Opium, but it causes deep sleep without any unpleasant after results. It relieves pain in less degree however than Opium does, but its hypnotic action is greater. It also relieves cough and spasm, produces diaphoresis and salivation and dilates the pupil. From toxic doses death occurs by asphyxia in animals. In man its action is probably the same, but in decidedly less marked degree.

*Piscidia* is used chiefly as a general nervous sedative. Its hypnotic and anodyne powers are somewhat uncertain, but have in many cases been very decided. It is useful in whooping-cough and spasm, and has proved almost specific in many cases of neuralgia, while in others it has caused great gastric distress without the least anodyne effect.

**PIX, Pitch**,—is a resinous exudation from the stems of certain trees of the genera *Pinus* (pines) and *Abies* (firs and spruces), and may also be obtained as a residue of the distillation of tar. Its chief constituents are Resin and a Volatile Oil which is a mixture of several isomeric terpenes in varying proportions. The only official form is—

**Pix Liquida, Tar**,—a product obtained by the destructive distillation of the wood of *Pinus palustris* and other species of *Pinus*, nat. order Pinaceæ. It is thick, viscid, semi-fluid, blackish-brown, of acid reaction, terebinthinate odor, and sharp, empyreumatic taste; slightly soluble in water, soluble in alcohol, in oils and in a solution of potassa or of soda. Its principal constituents, are Oil of Turpentine, Creosote, Phenols, Pyrocatechin, Acetic Acid, Acetone

Xylol, Toluol, Methylic Alcohol, and Resins. By distillation it yields an acid liquor *Pyroligneous Acid*, and an empyreumatic oil (see *Oleum Picis Liquidæ* below), the residue being pitch. Dose, gr. v-xx [av. gr. vijss], in pill, up to ℥ij daily.

**Pix Burgundica, Burgundy Pitch**,—the prepared resinous exudation of *Abies excelsa*, the Norway Spruce, a native of Europe and Northern Asia. It occurs in hard, brittle, opaque or translucent mass, with a shining, conchoidal fracture, almost entirely soluble in glacial acetic acid; is very fusible, and at the body-heat it softens and becomes adhesive. It is mildly stimulant to the skin, and is used as a basis for plasters.

**Pix Canadensis, Canada or Hemlock Pitch** (Unofficial),—is the prepared resinous exudation of *Abies canadensis*, the Hemlock spruce of the U. S. and Canada. Its properties are much the same as those of Burgundy Pitch.

#### Preparations.

**Oleum Picis Liquidæ, Oil of Tar**,—a volatile oil distilled from Tar. Dark, reddish-brown (almost colorless when fresh), of tarry odor and taste and acid reaction, readily soluble in alcohol. Contains a great variety of compounds, including Cresols, Guaiacol, Phenol, Xylol, Toluol, Pyrocatechin, Methylic Alcohol, and Acetone. Dose, ℥j-v [av. ℥iij.]

**Syrupus Picis Liquidæ, Syrup of Tar**,—has of Tar ½ per cent.; and is a sweetened Tar-water. Dose, ℥ss-ij [av. ℥j.]

**Unguentum Picis Liquidæ, Tar Ointment**, contains of Tar 50 Parts, Yellow Wax 15, Lard 35. Is irritating unless mixed with finely levigated chalk.

**Infusum Picis Liquidæ, Tar Water** (Unofficial),—made by shaking Tar 1 with Water 4 frequently during 24 hours, decanting and filtering. Dose, Oss-j daily.

**Vinum Picis Liquidæ, Wine of Tar** (Unofficial),—Tar ℥xvj, Glycerin, White Wine, Honey, āā ℥viiij, Acetic Acid ℥j, Boiling Water Ovj, shaken together and digested in a closed vessel for two hours at 150° to 160° F., then macerated for a few days, frequently shaken, strained and filtered. Dose, ℥j-iv.

**Oleum Pini Sylvestris, Oil of Scotch Fir** (Unofficial),—a colorless, fragrant oil, distilled from the leaves of *Pinus Sylvestris*, resembling Turpentine in action. Used by inhalation (℥ss to Oj of boiling water), or locally.

**Concentrated Extract of Pinus Canadensis** (Unofficial),—is an aqueous, non-irritant astringent, prepared from the *Abies Canadensis* or Hemlock Spruce. It is said to have a specific tonic action upon mucous membranes. Two kinds are sold, one being called the White Extract, in reality a golden yellow, and the other the Dark Extract, the former intended for use when it is desirable to avoid staining the linen. This preparation received the endorsement of Dr. J. Marion Sims, and has been extensively employed, both locally and internally, as a topical application in uterine and vaginal catarrhs, and as a systemic remedy in catarrhal inflammation of the gastro-intestinal and broncho-pulmonary mucous membranes.

#### PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Tar is a complex mixture of resins and hydrocarbons, containing creosote and phenol, which give it irritant qualities. Internally it is expectorant, and produces gastro-intestinal irritation, sometimes severe headache, giddiness and febrile phenomena. It is eliminated chiefly by the kidneys, which it stimulates and may congest, causing increased diuresis. Externally it is a decided stimulant to the skin, often giving rise to considerable irritation and pain. It is antiseptic and in most of its effects it resembles the turpentines. Tar is used as a local application in chronic scaly skin diseases, especially psoriasis and chronic eczema. As an atomized inhalation it is of decided benefit in bronchitis, pharyngitis, laryngitis and winter cough. Internally it may be employed with advantage in these affections, also in hemorrhoids, bronchial catarrh, and phthisis.

The best preparation for internal administration is the syrup, which is a sweetened tar-water, the sugar forming with the tar a soluble compound.

Burgundy Pitch has been dismissed from the pharmacopœia, its place as a basis for plasters being now taken by Lead Plaster. It is a gentle rubefacient when applied to the skin, but in some persons if used extensively it causes a vesicular and pustular inflammation. Locally as a plaster it is beneficial in lumbago, chronic rheumatism, chronic pleurisy, painful joints, and superficial neuralgia, protecting the part from variations of temperature, and perhaps by gentle pressure stimulating the lymphatics and promoting absorption. A volatile oil from the Hemlock Spruce has been used as an abortifacient, with danger to the life of the subject. Pitch is supposed to have a special influence on the rectum, and in pill with tar has been used as a remedy for hemorrhoids.

**PLANTAGO, Plantain** (Unofficial),—is the leaf of *Plantago major* and *Plantago lanceolata*, nat. ord. Plantaginaceæ, the common ribbed grass. The pounded leaves applied as a paste or the dry leaf powdered, are actively hemostatic, stopping hemorrhages speedily. Among the ancients it had a good reputation as a remedy for toothache and earache, which still adheres to it in Switzerland and other parts of Europe. In many other painful affections it is extremely efficient, especially in mastitis, rhus-poisoning, erysipelas, burns, scalds, wounds and bruises. A poultice of the leaves may be applied to the affected part, and an infusion administered internally. A fluidextract is sold in the shops, of which the dose is  $\text{ʒv-xv}$ .

**PLUMBUM, Lead, Pb**,—is a soft solid metal, which occurs in nature chiefly as a sulphide (*galena*), also as carbonate, phosphate and sulphate, and as an oxide rarely. It resists the action of air, some strong acids, and pure water free from air, but aerated water oxidizes and dissolves it in small quantity. Its official salts are as follows:—

*Official Salts of Lead.*

**Plumbi Acetas, Lead Acetate, (Sugar of Lead)**,— $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2 + 3\text{H}_2\text{O}$ ,—colorless, shining, prismatic crystals or scales, efflorescent, of faintly acetous odor and acid reaction, and a sweetish, astringent and metallic taste. Soluble in 2.3 of water and in 21 of alcohol at 59° F., in 0.5 of boiling water and in 1 of boiling alcohol. Dose, gr. ss-ij [av. gr. j.]

**Plumbi Iodidum, Lead Iodide,  $\text{PbI}_2$** ,—a heavy, bright, citron-yellow powder, odorless and tasteless, fusible and volatilizable by heat; soluble in about 2000 of water at 59° F., and in about 200 of boiling water. Used externally as an ointment. May be given internally in doses of gr.  $\frac{1}{2}$  twice daily.

**Plumbi Nitras, Lead Nitrate,  $\text{Pb}(\text{NO}_3)_2$** ,—colorless, opaque, octahedral crystals, odorless, of sweetish, astringent and metallic taste and acid reaction; soluble in 2 of water at 59° F., almost insoluble in alcohol. Used locally as an astringent and deodorizer in solutions up to 1 per cent., also as an escharotic and a disinfectant.

**Plumbi Oxidum, Lead Oxide, (Litharge),  $\text{PbO}$** ,—a heavy, yellowish, or reddish-yellow powder, odorless and tasteless; insoluble in water or alcohol, almost but wholly soluble with slight effervescence in dilute nitric acid. When heated in contact with charcoal it is reduced to metallic lead. Used as Plaster and sometimes with oil as an external application.

*Preparations.*

**Liquor Plumbi Subacetatis, Solution of Lead Subacetate, (Goulard's Extract)**,—an aqueous solution containing about 25 per cent. of the salt, prepared from Acetate of Lead 18, Oxide of Lead 11, and Distilled Water to 100. It is a clear, colorless liquid, of sweetish, astringent taste and alkaline reaction, and when added to a solution of acacia it produces a dense, white precipitate. Used locally as an astringent and cooling lotion, diluted usually with an equal quantity of water.

**Liquor Plumbi Subacetatis Dilutus, Diluted Solution of Lead Subacetate, (Lead Water)**,—has of the preceding 4, in Distilled Water to 100. Used locally as a mildly astringent and cooling lotion.

**Ceratum Plumbi Subacetatis, Cerate of Lead Subacetate, (Goulard's Cerate)**—has of the solution of Lead Subacetate 20 per cent., with Camphor 2, Wool Fat 20, Paraffin 20, White Petrolatum 38. An astringent application.

**Emplastrum Plumbi, Lead Plaster**,—has of Lead Acetate 60, Soap 100, each dissolved in hot water, mixed, and the liquid decanted. It is pliable and tenacious, and forms the basis of other plasters.

**Emplastrum Adhæsivum, Adhesive Plaster**,—has of Rubber 2, Petrolatum 2, Lead Plaster 96.

**Unguentum Diachylon, Diachylon Ointment**,—has of Lead Plaster 50, Olive Oil 49, Oil of Lavender Flowers 1. Used locally in eczema and other cutaneous disorders.

**Unguentum Plumbi Carbonatis, Ointment of Lead Carbonate, (Unofficial)**,—has of the Carbonate in very fine powder 10, Benzoinated Lard 90. Used as a dressing for burns.

*Incompatibles.*

Incompatible with *Lead Salts* are: Alkalies, Mineral Acids and their salts, Albuminous solutions, Opium, Potassium Iodide, Vegetable Acids, Vegetable Astringents, Waters containing lime, sulphates, carbonates, and carbonic acid gas. With *Lead Acetate* are: Acids, Acetamide, Alkalies, Bromides, Carbonates, Chloral Hydrate, Chlorides, Chromates, Cyanides, Glucosides, Gums, Hydrochloric Acid, Iodides, Opium, Phenol, Pyrocatechin, Pyrogallol, Resorcinol, Salicylic Acid, Sodium Phosphate, Sodium Salicylate, Sulphates, Sulphides, Sulphites, Tannic Acid, Urea, Urethane, Vegetable decoctions, infusions and tinctures. With *Solution of Lead Subacetate* are: Acacia, Acids (organic), Albumin, Alkaloids, Antipyrine, Glucosides, and otherwise like Lead Acetate.

PHYSIOLOGICAL ACTION.

Lead salts are all more or less poisonous, but metallic Lead is inert until converted into a soluble salt by the acids of the stomach. The Acetate in large doses is emetic, so that acute lead-poisoning therefrom is rare. Its chief phenomena are intense gastro-intestinal irritation, vomiting, paralysis, coma and collapse. Chronic lead-poisoning, *Plumbism*, has its principal sources in pure water conveyed by leaden pipes, the use of hair dyes, handling of printing-type, and working in the smelting of lead ores. It produces loss of appetite, emaciation, pallor and constipation, followed by slowing of the heart's action, and accompanied by violent colic, muscular impairment evinced by paralysis of the extensor muscles of the forearm (drop-wrist), impaired sensibility and albuminuria. Occasionally aphonia, vertigo, gastralgia, headache, stupor and convulsions are manifested. Rheumatism without fever or tenderness in the joints, which however are red and swollen, is a frequent symptom. A blue line (sulphide) is seen along the margins of the gums in those who do not clean their teeth. Neuralgic troubles may arise and amblyopia often occurs from impairment of the optic nerve. The metal becomes deposited in the affected muscles and other tissues, and probably acts by impairing the isolating power of the nerve-fibres, thus enfeebling the nerve-currents. It also produces contraction of the smaller vessels, and may affect any muscles of the body, also the brain, producing delirium, coma, and convulsions. Abortion is a frequent result, either through an influence on the muscular tissue of the uterus, or from a toxic action on the fetus. Death may occur from extension of the paresis to

the muscles of respiration, from gradual impairment of nutrition, or from convulsions and coma, a form of disease known as Lead-encephalopathy.

Astringency is the chief quality of the lead salts; they lessen secretion, contract muscular tissue and then destroy its contractile power, slow both the heart and the respiration, and in time destroy the red blood-corpuscles. Lead enters the blood as an albuminate, in which form it is retained by the tissues. It is slowly excreted by the liver, kidneys, skin and mammary glands. That which escapes by the bile is reabsorbed by the bowel, and is again excreted by the intestinal glands, escaping with the feces as a sulphide. It lessens the excretion of uric acid.

#### THERAPEUTICS.

Lead salts are chiefly used as astringents and hemostatics. The solution of the Subacetate diluted with 4 parts of glycerin and water is locally employed in many skin-diseases, especially in eczema, lichen, impetigo, and erythema; also in catarrhal discharges of muco-purulent character from the ear, vagina, and urethra, particularly gonorrhœa and leucorrhœa. Inflammations of external parts are constantly treated by the lotion of Leadwater and Laudanum (liquor plumbi subacetatis dilutus 7 parts to 1 of tinctura opii). Though the constituents of this lotion are chemically incompatible it is a valuable sedative and astringent. The Acetate, in 2-grain doses every three hours, is an efficient internal styptic in various hemorrhages, particularly in hemoptysis, hematemesis, and gastric ulcer, as it lowers the action of the heart and constricts the vessels. Its astringent action is well manifested in bronchorrhea and other pulmonary affections with excessive secretion. It is well used in diarrheas, gr. ij with gr. j of powdered opium in choleraic diarrhea, and smaller doses for the summer complaint of children. In caseous pneumonia the Acetate is highly recommended as the best remedial agent, combined with opium and digitalis; and in cardiac hypertrophy it may be used to lower the action of the heart. It is serviceable in whooping-cough with profuse bronchial secretion and in humid asthma.

The Carbonate is only used externally to protect irritated surfaces, as erythema, erysipelas, and intertrigo, in which it may be dusted over the surface if unbroken. The unofficial ointment, or white paint mixed with linseed oil, is an excellent application to burns or scalds, but if applied on the broken cuticle it may prove rapidly poisonous. The Iodide is employed externally as an ointment to enlarged lymphatic glands and enlarged spleen, also for chronic eczema and psoriasis. It has been used internally to reduce a malarial spleen.

The Nitrate is an efficient application to fissured nipples, gr. x to ʒj of glycerin. In powder, dusted over unhealthy granulations, and sanious ulcers resulting from onychia, it gives prompt relief after a brief period of pain, and is said to have cured epithelioma when used in the same manner. In solution (gr. x to the ʒ) it is a most efficient deodorizer against the fetor from gangren-

ous sores, ozena and other offensive discharges. The Oxide is employed in the manufacture of plasters and most of the other salts of lead. It may be used as an external application mixed with sweet oil in superficial burns, but care should be taken that it is applied only to the unbroken cuticle. It is not employed internally.

**PODOPHYLLUM, Podophyllum** (*May Apple*),—is the rhizome of *Podophyllum peltatum*, the Mandrake, an herbaceous perennial of the nat. ord. Berberidaceæ, growing in the woodlands of Canada and the United States, having a pale-green stem, with a single white flower at its summit. Its active principle is a *Resin* which is official and contains two isomeric glucosides, *Podophyllotoxin* and *Picropodophyllin*; also podophyllinic acid and protocatechuic acid. Podophyllum probably contains the alkaloid *Berberine*, which is found also in Berberis, Hydrastis and other plants. Dose, gr. v–xx [av. gr. vijss.]

#### Preparations.

**Fluidextractum Podophylli**, *Fluidextract of Podophyllum*,—Dose, ℥j–xx [av. ℥vijss.]

**Resina Podophylli**, *Resin of Podophyllum*,—is prepared by maceration and percolation in alcohol, and precipitation by acidulated water. Soluble in all proportions in alcohol, soluble in ether, chloroform, and solutions of soda or potassa. Dose, as a laxative, gr. ʒ–ʒj [av. gr. ʒj]; as a purgative, gr. ʒ–j [av. gr. ʒ]. It is an ingredient of the Vegetable Cathartic Pills (see page 247).

**Pilulæ Podophylli, Belladonnæ et Capsici**, *Pills of Podophyllum, Belladonna and Capsicum*,—have in each pill gr. ʒ of the resin, with Extract of Belladonna gr. ʒ, and Capsicum gr. ʒ. Dose, j–ij pills [av. j.]

Podophyllum is a tonic-astringent and resin-bearing purgative, having action similar to that of jalap but slower, like calomel taking 6 to 10 hours to produce its cathartic effect. It increases the intestinal secretions and the flow of bile, causing copious watery stools, with considerable griping pain and some nausea. The powder is irritant to the respiratory passages and to the skin. The Resin is an excellent purgative in cases of habitual constipation or portal congestion and a useful cholagogue. Laxative effects are produced by small doses but grain-doses are necessary for its full action. It should be combined with hyoscyamus, belladonna or cannabis indica, in order to counteract its griping tendency. It is an efficient derivative in cases of catarrhal or malarial jaundice, and is recommended in very small doses for prolapse of the rectum, remittent fevers of children, dyspepsia, hepatic derangement, bilious vomiting and headache, and in the vomiting and diarrhea of gastro-enteritis.

**POLYGONUM, Smart-weed, Water-pepper** (Unofficial),—is the plant *Polygonum Hydropiperoides*, nat. ord. Polygonaceæ, indigenous to the United States, having narrow, lanceolated leaves and slender spikes of whitish flowers. It contains *Tannin* and an active principle, *Polygonic Acid*, which is green, crystallizable, insoluble in water, but soluble in alcohol, ether, and chloroform. Dose, of the Extract, gr. j–v; of the Fluidextract, ℥x–xxx or more.

Smart-weed has a pungent, acrid taste, producing a sensation of heat in the stomach, and a peculiar tingling throughout the system. It stimulates the action of the heart, raises the arterial tension, increases the warmth of the surface, promotes the cutaneous, bronchial and renal secretions and the menstrual flow. It is an efficient diuretic, emmenagogue and aphrodisiac. The juice applied to the skin excites inflammation and vesication.

Amenorrhœa from functional inactivity of the uterine system is remarkably benefited by this remedy in ʒss doses of the fluidextract four times daily for a week before the expected period. It has considerable influence over functional impotence, but produces aching pains in the hips and loins, and a sense of weight and fullness within the pelvis. It has been used with benefit in diarrhœa, dysentery and gravel, also locally in mercurial salivation and the sore mouth of nursing women.

**PONGAMIA, Kurung Oil** (Unofficial),—is a yellow oil expressed from the seeds of *Pongamia glabra*, an Indian tree of the nat. ord. Leguminosæ. It has been used for many years in India for skin affections, and in professional hands has proven an excellent application in pityriasis versicolor, rubbed in twice daily. It promises to be a valuable remedy in parasitic diseases of the skin, is not irritating and does not discolor the surface to which it is applied.

**POTASSIUM, Kalium, K**,—is represented by a number of official salts, which are colorless or white, sometimes anhydrous, and generally soluble in water. The metal itself is not official. The chief source of its salts is the ash remaining after the combustion of plants or trees, which contains the Carbonate, from which most of the other salts are prepared. There are also two subsidiary sources,—the Nitrate, found native, and the Bitartrate, which under the name of *Crude Tartar* or *Argol* is deposited during the fermentation of wine. It is distinguished from all other bases (except magnesium, sodium and ammonium) by not being precipitated by ammonium sulphide or ammonium carbonate. It is positively known by the violet color it imparts to flame, by its very sparing solubility when converted into the bitartrate, and by its precipitation by platinum perchloride.

*Potassium Salts and their Preparations.*

**Potassii Hydroxidum, Potassium Hydroxide, Potassa, KOH**,—a very deliquescent, white, hard and dry solid, of very acrid and caustic taste and strongly alkaline reaction, soluble in 0.5 of water and in 2 of alcohol. It is a powerful and deeply-acting escharotic, and should be kept in well-stoppered bottles made of hard glass.

**Liquor Potassii Hydroxidi, Solution of Potassium Hydroxide, Liquor Potassæ**,—is an aqueous solution, containing about 5 per cent. of the hydroxide, and prepared by dissolving 6 of the latter in 95 parts of distilled water. It is a clear, colorless, odorless liquid, of acrid and caustic taste, and strongly alkaline reaction. Dose, ʒv–ʒss, [av. ʒxxv], well diluted with water.

**Potassii Acetas, Potassium Acetate, KC<sub>2</sub>H<sub>3</sub>O<sub>2</sub>**,—a white, satiny, crystalline mass, very deliquescent, odorless, of pungent, saline taste, and a neutral or faintly alkaline reaction, soluble in 0.4 of water and in 1.9 of alcohol at 59° F. Dose, gr. v–ʒj [av. gr. xxx.]

**Potassii Carbonas, Potassium Carbonate, K<sub>2</sub>CO<sub>3</sub>**,—a white, crystalline or granular powder, very deliquescent, odorless, of alkaline taste and reaction, soluble in 1.1 of water at 59° F., insoluble in alcohol. Dose, gr. ij–xx [av. gr. xv.]

**Potassii Bicarbonas, Potassium Bicarbonate, KHCO<sub>3</sub>**,—colorless prisms of saline and alkaline taste and alkaline reaction, soluble in 3.2 of water at 59° F., decomposed by boiling water, almost insoluble in alcohol. Dose, gr. v–xlvi [av. gr. xxx.]

**Potassii Chloras, Potassium Chlorate, KClO<sub>3</sub>**,—colorless prisms or plates, of pearly lustre, of cooling, saline taste and neutral reaction, soluble in 16.7 of water at 59° F. and in 1.7 of boiling water; slightly soluble in mixtures of alcohol and water, insoluble in absolute alcohol. Dose, gr. j–x [av. gr. iv.]

Potassium Chlorate should be kept in glass-stoppered bottles, and great caution should be observed in handling the salt, as dangerous explosions are liable to occur when it is mixed with organic matters (cork, tannic acid, sugar, etc.), or with sulphur, antimony sulphide, phosphorus, or other easily oxidizable substances, and either heated directly or subjected to trituration or concussion. It should not be mixed with glycerin in the presence of a free acid. [For the combination of this salt with the tincture of the chloride of iron, see page 226.]

**Gargarysma Potassii Chloratis, Potassium Chlorate Gargle** (Unofficial),—has of the salt ʒj, in Glycerin ʒiv and Water to ʒvj.

**Trochisci Potassii Chloratis, Troches of Potassium Chlorate**,—each troche contains about 2½ grains of the salt, with sugar and tragacanth. Dose, j–ij, slowly dissolved in the mouth.

**Potassii Citras, Potassium Citrate, K<sub>3</sub>C<sub>6</sub>H<sub>5</sub>O<sub>7</sub> + H<sub>2</sub>O**,—transparent, prismatic crystals, odorless, of cooling, saline taste, and neutral reaction, soluble in 0.6 of water, very soluble in boiling water, sparingly soluble in alcohol. Dose, gr. x–xxx. [av. gr. xv.]

**Potassii Citras Effervescens, Effervescent Potassium Citrate**,—consists of the Citrate 20, Sodium Bicarbonate 47.7, Tartaric Acid 25.2, and Citric Acid 16.2. Dose, ʒj–ij [av. ʒj], in a glass of water, as an effervescing drink.

**Liquor Potassii Citratis, Solution of Potassium Citrate**,—contains about 9 per cent. of the anhydrous salt, together with small amounts of citric and carbonic acids. Prepared by dissolving Citric Acid 6, and Pot. Bicarb. 8, each in water 40, filtering the solutions separately, and adding in each case enough water to bring to 50 parts, then mixing the two together. Dose, ʒss–ʒj or more [av. ʒiv].

**Potassii Nitras, Potassium Nitrate (Saltpetre, Nitre), KNO<sub>3</sub>**,—colorless, transparent prisms or a crystalline powder, of pungent, cooling and saline taste and neutral reaction; soluble in 4 of water at 59° F. and in 0.4 of boiling water; almost insoluble in alcohol. Is a constituent of Argenti Nitras Mitigatus. Dose, gr. v–xx [av. gr. vijss.], well diluted.

**Potassii Silicas, Potassium Silicate, Soluble Glass, K<sub>2</sub>SiO<sub>3</sub>** (Unofficial),—is used in solution of a syrupy consistence for the preparation of immovable dressings for fractured limbs, etc. [See under SILICATES.]

**Potassii Sulphas, Potassium Sulphate, K<sub>2</sub>SO<sub>4</sub>**,—colorless, hard, rhombic prisms, of sharp, saline and bitter taste and neutral reaction, soluble in about 9.5 of water at 59° F., and in 4 of boiling water, insoluble in alcohol. Dose, gr. x–xlvi [av. gr. xxx.], well diluted.

**Potassii Bitartras, Potassium Bitartrate, (Acid Tartrate of Potash, Cream of Tartar) KHC<sub>4</sub>H<sub>4</sub>O<sub>6</sub>**,—colorless rhombic crystals, or a white, gritty powder, of acidulous taste and acid reaction; soluble in about 201 of water at 59° F., and in about 16.7 of boiling water, very slightly soluble in alcohol. Is a constituent of Pulvis Jalapæ Compositus. Dose, as a diuretic, gr. xx–ʒj [av. gr. xxx]; as a purgative ʒss–j.

**Potassii et Sodii Tartras, Potassium and Sodium Tartrate, (Rochelle Salt), KNaC<sub>4</sub>H<sub>4</sub>O<sub>6</sub> + 4H<sub>2</sub>O**,—colorless, rhombic crystals, or a white powder, of cooling and slightly saline and bitter taste, and neutral reaction; soluble in 1.4 of water at 59° F., very soluble in boiling water, almost insoluble in alcohol. Is a constituent of the following preparation. Dose, ʒj–iv [av. ʒij.]

**Pulvis Effervescens Compositus, Compound Effervescing Powder, Seidlitz Powder**,—each powder has of the preceding salt about 120 grains, of Sodium Bicarbonate 40 grains, mixed in one paper; and of Tartaric Acid 35 grains in another paper. Dose, 1 to 2 pair, dissolved separately in water and the solutions poured together.

The Arsenite is described under ARSENUM,—the Bromide under BROMUM,—the Dichromate under CROMII TRIOXIDUM,—the Iodide under IODUM,—the Cyanide and Ferrocyanide under ACIDUM HYDROCYANICUM,—the Hypophosphite under PHOSPHORUS,—the Permanganate under MANGANUM.

*Incompatibles.*

Incompatible with *Liquor Potassii Hydroxidi* are: Acids, Acid salts, Metallic salts; Preparations of Ammonia, Belladonna, Hyoscyamus, and Stramonium. With *Potassium and Sodium Tartrate* are: Acids, Ammonium Chloride, Barium salts, Calcium salts, Lead salts, Magnesium Sulphate, Potassium Sulphate, Silver Nitrate, Sodium Sulphate. With the *Acetate* are: Mineral Acids. With the *Carbonate* and *Bicarbonate*, see page 205. With the *Chlorate*, see above Potassium Chlorate, also under CHLORUM. With the *Citrate*, see under LIMON. With the *Nitrate* see under AC. NITRICUM. With the *Sulphate* see under AC. SULPHURICUM.

PHYSIOLOGICAL ACTION.

Potassium Hydroxide, like other caustic alkalies, destroys the tissues by combining with their water, dissolving the albumin and saponifying the fats, and converting the tissue to which it is applied into a moist, gray slough, with considerable surrounding inflammation. Internally it acts as a powerful corrosive