

affections the flexible collodion should be used, but where it is desirable to produce pressure on the part the ordinary form is best, as it contracts with considerable force in drying. This property makes it highly useful in drawing the edges of wounds together, bringing pressure on buboes, incipient boils, and carbuncles. Styptic Collodion has many uses as a hemostatic and protective which will suggest themselves, and the cantharidal form is a convenient epispastic for uneven surfaces, the therapeutics of which are detailed under CANTHARIS.

GRANATUM, Pomegranate,—is the bark of the stem and root of *Punica Granatum*, a small tree of the nat. ord. Punicaceæ, cultivated in subtropical countries. It contains tannic and punico-tannic acids, mannite and an active mixture of alkaloids named *Pelletierine*, which is soluble in water, alcohol, ether, chloroform, etc., and has strong basic properties.

Preparations.

Fluidextractum Granati, *Fluidextract of Pomegranate*.—Dose, ℞x-℥j [av. ℥xxx.]

Decoctum Granati, *Decoction of Pomegranate* (Unofficial)—℥xvij of bark from the fresh root in ℥xvij of boiling water, boiled down to ℥xij and strained. Dose, ℥iv-vj every hour, preceded and followed in a few hours by a brisk cathartic. The decoction of the Br. Phar. is of 1 in 50 strength and is given in doses of ℥ss-ij.

Pelletierinæ Tannas, *Pelletierine Tannate*,—is a mixture of the tannates of four alkaloids (punicine, iso-punicine, methyl-punicine, and pseudo-punicine), obtained from *Punica Granatum*. Dose, gr. iij-vij [av. gr. iv.], in powder, taken fasting and followed after 20 minutes by a full dose of Castor Oil.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Granatum and its alkaloids are teniafuge, and very efficiently so, rarely failing to bring away the whole worm. The decoction is usually employed, but latterly *Pelletierine* has come into fashion, a proprietary form being sold as *Tanret's Pelletierine*, in bottles containing one adult dose at three dollars each. The decoction in full doses causes nausea and vomiting, flatulence, purging, and sometimes cramps in the legs, giddiness, dimness of vision, general numbness of the limbs and increase of the quantity of urine.

For the expulsion of tape-worm a mixed treatment by Pomegranate-root bark, Pumpkin seeds and Oleoresin of Male-fern is preferred by many practitioners. The following formula has proved very efficient: ℞. Granati ℥ij, Aquæ Ojss, boiled to ℥vij; Pepinis ℥j, deprived of outer coats and beaten to a paste with fine powdered sugar; Oleoresinæ Aspidii, gr. xxx, made into emulsion with Acacia and the above decoction of Granatum, then added to the paste of Pepo, and flavored with Syrups up to ℥ix. One-third of this to be taken in the morning after a light diet and a laxative on the previous day. If not successful the second and third portions may be taken at intervals of 3 hours. The worm should be passed sitting in a tepid sitz-bath, to prevent the expelled portion tearing off the head by its weight.

GRINDELIA,—is the dried leaves and flowering tops of *Grindelia robusta*, or of *Grindelia squarrosa*, herbaceous perennial plants of the nat. ord. Compositæ, indigenous to the Pacific slope of the United States and Mexico, where they are common along the coast and in the mountains, having yellow flowers, a bal-

samic odor and a pungent, aromatic and bitter taste. They contain a resin, which is probably the active constituent, a fixed and a volatile oil, also *Robustic Acid* and an alkaloid named *Grindelime*. There is but one official preparation,—

Fluidextractum Grindelie, *Fluidextract of Grindelia*,—is three-fourths alcohol and contains much resin. Dose, ℞x-℥j or more [av. ℥xxx], every 3 or 4 hours, in sweetened water or milk, the mixture being well stirred to prevent the resin adhering to the glass.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Grindelia has an acrid, bitter taste, and excites the secretion of saliva when chewed. Its principal action is that of an antispasmodic, but it is also a motor-depressant, somewhat expectorant and decidedly diuretic. Given in large doses to small animals it induces paralysis, beginning in the hind extremities and affecting the sensory nerve-trunks first, then the sensory side of the spinal cord, afterwards involving the motor nerve-trunks, and finally the spinal motor tract. It stimulates the cardiac inhibitory apparatus and the vaso-motor centre, slowing the heart and respiration, and raising the blood-pressure. In sufficient quantity it causes dilatation of the pupils, reduced cutaneous sensibility and sluggish reflexes, even narcotism in small animals. Its elimination occurs by the bronchial mucous membrane and the kidneys, both of which it stimulates, and in large doses it has produced renal irritation.

Grindelia is chiefly employed as a palliative in spasmodic asthma and the dyspnea accompanying bronchitis. In several cases of recurring asthma in elderly persons ℥ss of the fluidextract has afforded almost instantaneous relief, but has not prevented the return of the paroxysms. It is an efficient remedy in chronic bronchitis, especially that of the aged, also in whooping-cough and other spasmodic coughs, in hay fever and in the dyspnea of various pulmonary and cardiac affections, and has been employed with benefit in chronic cystitis. Locally, it is used with advantage as a lotion for the dressing of burns and blisters, in vaginitis and uterine catarrh, and to allay the pain of herpes zoster. In the proportion of 1 part of the fluidextract to 9 of water, as a sedative lotion, it is a very efficient application for the cutaneous irritation due to poison-oak or ivy, also in skin diseases attended with itching and burning sensations.

GUAIAECUM, Guaiac,—is the resin of the wood of *Guaiacum officinale*, or of *G. sanctum*, trees of the nat. ord. Zygophyllaceæ. It consists of three resins, *Guaiaconic Acid*, $C_{19}H_{20}O_5$, 70 per cent., *Guaiacic Acid*, $C_6H_8O_3$, resembling Benzoic Acid, and *Guaiaretic Acid*, $C_{20}H_{26}O_4$; also an indifferent resin. The wood also contains a yellow coloring matter, gum, etc., and yields, by destructive distillation, *Guaiacol* (see page 252). Dose of Guaiac, gr. x-xxx [av. gr. xv] in wafer. The official preparations are—

Tinctura Guaiaci, *Tincture of Guaiac*.—20 per cent. Dose, ℥ss-jss [av. ℥j], in mucilage or syrups, as the resin is precipitated by water.

Tinctura Guaiaci Ammoniata, *Ammoniated Tincture of Guaiac*,—has of Guaiac 20, Aromatic Spirit of Ammonia to 100. Dose, ℞x-℥j [av. ℥xxx.]

Incompatible with Guaiac are: Acacia, Acids (mineral), Chlorine-water, Chromic Trioxide, Ferric Chloride, Gold Chloride, Metallic salts, Potassium Permanganate, Spirit of Nitrous Ether.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Guaiac is diaphoretic, expectorant and alterative; also laxative and purgative, according to the dose administered. Its taste is acrid and very disagreeable. Internally it is a local stimulant, producing salivation, an acrid sensation in the throat, warmth in the epigastrium, increase of the gastric and intestinal secretions and the flow of bile, and reflex stimulation of the heart. Its continued use causes gastric catarrh, and in large doses it is a gastro-intestinal irritant, causing vomiting, purging and severe congestive headache. Though a colloidal body it enters the blood, stimulates the liver and other excretory glands and the production of bronchial mucus, and causes increased circulation and diaphoresis. Sometimes it fails to act on the skin and is then markedly diuretic.

Guaiac was first used as an antisyphilitic, employed in decoction and in large quantity, with a spare diet and external warmth. It acquired a great reputation in that disease during the 16th century, but it is now abandoned therefor except as an ingredient of the compound decoction of Sarsaparilla. It is an efficient remedy in tonsillitis, given in ʒss doses of the tincture in emulsion with mucilage or yolk of egg, to abate the inflammation and abort the disease. It has considerable reputation in neuralgic dysmenorrhea, amenorrhea, chronic rheumatism, gout, lumbago and sciatica. The ammoniated tincture in water makes a cleanly and not very disagreeable gargle. The reputation of Guaiac in many chronic and obscure complaints is due, partly to its purgative property and partly to its nastiness, a quality which is highly appreciated by many patients.

GURJUN BALSAM, Balsamum Dipterocarpi, Wood Oil (Unofficial),—is an oleoresin obtained from incisions in various trees of the genus *Dipterocarpus*, growing in India. It is thick, opaque and grayish-brown by reflected light, soluble in chloroform and partly so in alcohol, ether and volatile oils, odor balsamic, taste bitter. It contains from 40 to 70 per cent. of a Volatile Oil, a Resin and *Gurjunic Acid*. Dose, ℥x-ʒij, in emulsion, or in capsules.

The properties of this balsam are similar to those of Copaiba, but it is less disagreeable and less apt to upset the stomach, also less actively diuretic. It has been used with good success in leprosy, given internally in full doses and used locally at the same time. Mixed with 4 parts of Lime-water it is well applied in chronic eczema, lupus and psoriasis.

HÆMATOXYLON, Log-wood,—is the heart-wood of *Hæmatoxylon campechianum*, a tree of the nat. ord. Leguminosæ, native of tropical America, but naturalized in the West Indies. It occurs in chips or powder of a dark brown-red color, often with a greenish lustre, and colors the saliva a dark pink when chewed. It contains *Tannic Acid*, and a sweet, crystalline coloring principle named *Hæmatoxylin*, which is colorless when pure, but turns red on exposure to light.

Extractum Hæmatoxyli, Extract of Hæmatoxylon. Dose, gr. v-xx [av. gr. xv.]

Decoctum Hæmatoxyli (Unofficial),—strength 1 in 17. Dose, ʒj-ij.

Incompatible with liquid preparations of *Hæmatoxylon* are Acids, Ammonia, Alum, Cinchona infusion, Copper Sulphate, Ferrous Sulphate, Lead Acetate, Opium, Tartar Emetic.

Logwood is mildly astringent, its properties depending on the Tannin contained in it. As it is devoid of irritating qualities it is well adapted to the diarrheas and hemorrhages of young children. It does not produce constipation or disorder the bowels, but colors the urine and stools blood-red, and has caused phlebitis. It has been used as a hemostatic in bleeding of the lungs, and in hemorrhages from the uterus and intestines, also as an astringent injection in leucorrhœa.

HAMAMELIS, Witch-hazel,—is *Hamamelis virginiana*, a shrub of the nat. ord. Hamamelidaceæ, growing in the United States. The leaves contain about 8 per cent. of *Tannic Acid*, a bitter principle and probably some volatile matters, but the chemistry of the plant has not been fully studied. It is official in two forms, viz.—

Hamamelidis Cortex, Hamamelis Bark,—the bark and twigs, of astringent taste, somewhat bitter and pungent. Dose, gr. x-xlv [av. gr. xxx.]

Hamamelidis Folia, Hamamelis Leaves,—the dried leaves, collected in autumn. Dose, gr. x-xlv [av. gr. xxx.]

Preparations.

Aqua Hamamelidis, Hamamelis Water,—has of the Bark 100, macerated 24 hours in 200 of Water; then distilled to 85 of distillate, to which 15 of Alcohol are added. Dose, ʒj-ij [av. ʒij.]

Fluidextractum Hamamelidis Foliorum, Fluidextract of Hamamelis Leaves,—is made with glycerin, alcohol and water. Dose, ℥xv-xlv [av. ℥xxx.]

Hamamelin (Unofficial),—is an uncertain extract of very indefinite composition. Dose, gr. j-ij.

Distilled Extracts, so-called, but really Waters distilled from the bark, are sold by various manufacturers and are said by the vendors to contain the volatile principles of the plant. *Pond's Extract* is such a preparation, said to be made by distilling the bark with a very dilute alcohol, and is a proprietary medicine of uncertain composition.

No trustworthy experimentation has yet been made with this drug. It is tonic, astringent, styptic and sedative, owing most of its properties to its tannin, but appears to possess some special influence over the venous circulation similar to that of Aconite on the arterial system. In full doses it may produce severe throbbing pain in the head. It is used both internally and locally with great benefit in hemorrhoids, particularly those of the bleeding variety, varicose veins and ulcers, varicocele, venous congestions and threatening local inflammations. It is recommended in hemorrhages from the nose, stomach, lungs, rectum and kidneys, in threatened abortion, and externally for sprains and bruises, foul ulcers, the pruritus of eczema, also in leucorrhœa and gonorrhœa. An ointment of Witch-hazel is found in the shops, and suppositories may be prepared extemporaneously by evaporating the fluidextract and incorporating the residue with cacao-butter.

HEDEOMA, Hedeoma,—the dried leaves and flowering tops of *Hedeoma pulegioides*, Pennyroyal, nat. ord. Labiata, a common plant in the United States. Dose, ʒj-ij [av. ʒij.]

Oleum Hedeomæ, Oil of Pennyroyal,—is the volatile oil, readily soluble in alcohol. Dose, ℥j-v [av. ℥ij.]

Spiritus Hedeomæ, Spirit of Pennyroyal (Unofficial),—contains 1 part of the oil in 9 of alcohol. Used externally or as a spray.

Hedeoma is a stimulant aromatic, also somewhat carminative and emmenagogue. Its

odor is extremely repulsive to insects, especially fleas and mosquitoes. In warm infusion it is a popular remedy for amenorrhea and flatulent colic. It may be used as a corrective with other medicines, and the spirit is well employed on the hands and face to keep away mosquitoes. The writer has known death by narcosis to result from an overdose of the oil taken to produce abortion.

HELLEBORUS, Hellebore (Unofficial),—the rhizome and rootlets of *Helleborus niger*, black hellebore, and *Helleborus viridis*, green hellebore, plants of the nat. ord. Ranunculaceæ, natives of Europe. A third variety, *Helleborus occidentalis*, growing in Greece, is probably the true hellebore of the ancients. Its most important constituents are two glucosides, *Helleborin* and *Helleborein*, both crystalline and poisonous.

Unofficial Preparations.

Extractum Hellebori Nigri, *Extract of Black Hellebore*. Dose, gr. j-x cautiously.

Fluidextractum Hellebori Nigri, *Fluidextr. of Black H.* Dose, ℥ij-xv.

Helleborin, $C_{36}H_{42}O_6$,—insoluble in water, soluble in alcohol, and in chloroform.

Helleborein, $C_{26}H_{44}O_{15}$,—crystalline, very soluble in water, slightly so in alcohol, insoluble in ether. Dose, gr. $\frac{1}{15}$ - $\frac{1}{10}$.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Black Hellebore is a drastic, hydragogue cathartic, and an emmenagogue. In overdoses it is a violent gastro-intestinal irritant, producing vomiting, hypercatharsis, vertigo, cramps and convulsions, which may result fatally. Locally applied, the fresh root is violently irritant to the skin, producing inflammation and vesication.

Helleborin is an active poison, acting on the tongue like Aconite, and on the nervous system as a narcotic, producing in animals paresis of motion and sensation, cerebral and spinal congestion, dilated pupils and death. It is less irritant than Helleborein to the mucous membranes.

Helleborein is less actively toxic to animals, but is very irritant, producing conjunctivitis, sneezing, salivation, nausea, vomiting and purging. It affects the heart like Digitalis, small doses frequently repeated slowing its action, but large ones quicken it and then suddenly paralyze it through the pneumogastric nerve. Respiration is at first accelerated, then slowed and rendered laborious. Diuresis is a constant result, the kidneys and uterus are congested, gradual paralysis and severe convulsions follow, and death occurs by paralysis of the heart.

Black Hellebore is an old remedy, having been highly esteemed by the early physicians in insanity, dropsies, worms, cutaneous affections and amenorrhea. It has gone out of fashion, but might be usefully employed in dropsies and as a revulsant in acute cerebral affections. Helleborein has come into notice as a substitute for Digitalis in cardiac affections, being of less bulk and more definite composition. Its action on the heart is attained by doses much smaller than those necessary to produce its irritant effects on the gastro-intestinal canal.

Its solubility in water and the freedom with which it can be used hypodermically are important qualities to recommend it.

HOANG-NAN, Hwang-Nao (Unofficial),—is the bark of *Strychnos Gauheriana*, Tropical Bind-weed, a creeping vine of the nat. ord. Loganiaceæ, found in the mountains of Tonquin. It contains the alkaloids *Strychnine* and *Brucine*, thus resembling in composition its congeners Nux Vomica and Ignatia, but differing from them, as they do from each other, in the proportional quantities in which the alkaloids are contained,—Brucine predominating in this plant, as Strychnine does in the other two.

Like the other members of the Strychnos family, Hoang-Nan is an active tetanizer, its action generally corresponding to that of Nux Vomica. It was first brought into notice by the missionary fathers stationed in the French colonies in Asia, they having found its employment general among the natives for leprosy and hydrophobia. Along the coast of Tonquin and Cochin-China, also in Pondicherry, Trinidad, and Venezuela, it has an established reputation in the two terrible diseases mentioned, also as a remedy for the bites of venomous serpents and other reptiles, scrofulous and syphilitic ulcers, and indolent sores. It has been used successfully for malarial fevers, in lieu of quinine, and is highly spoken of by Father Brosse, as a stimulant to the intellect, without producing any subsequent depression.

The dose of the powdered drug is about gr. iij-v; of the aceto-alcoholic Extract, gr. $\frac{1}{4}$ - $\frac{1}{2}$; and of the concentrated tincture, ℥j-v.

HUMULUS, Hops,—the dried strobiles (fruit-cones) of *Humulus Lupulus*, a cultivated creeping plant of the nat. ord. Moraceæ. Its constituents are a liquid volatile alkaloid named *Lupuline*, a volatile oil, which consists in part of *Valerol* and *Trimethylamine*, the crystalline, bitter principle *Lupulinic Acid*, also wax, resin, and tannin. Except the last named, the constituents are most abundant in the glandular powder of the strobiles, which is named *Lupulin*. Dose, gr. x-xlv [av. gr. xxx.]

Preparations.

Fluidextractum Humuli, *Fluidextract of Hops*,—Dose, ℥v-xv [av. ℥viiij.]

Infusum Humuli, *Infusion of Hops* (Unofficial),— \mathfrak{z} ss to the pint. Dose, \mathfrak{z} j-iv.

Lupulinum, *Lupulin*,—is the glandular powder separated from the strobiles, of bright, brownish-yellow color, aromatic and bitter taste. The Volatile Oil exists in the Lupulin grains, and contains *Valerol*, which is changed by long exposure, giving a disagreeable odor to old hops. Dose, gr. v-xv [av. gr. vijss.]

Oleoresina Lupulini, *Oleoresin of Lupulin*,—an acetone extract. Dose, gr. ij-v [av. gr. iij.]

Mineral acids and metallic salts are chemically incompatible with preparations of Hops.

Humulus is a bitter tonic, and a feeble hypnotic, also somewhat diaphoretic, astringent and anaphrodisiac. It increases the cardiac action and the cutaneous circulation. After slight cerebral excitement it produces calm and a soporific disposition, especially if the solution administered be strongly alcoholic. The stomachic and tonic effects are due to the bitter principle, Lupulinic Acid, and are found in bitter ale. The primary stimulant and secondary sedative effects are due to the volatile oil and are also possessed by ales and beer.

Hops are used as a tonic and calmative in delirium tremens, in which a combination of the tincture with tincture of capsicum is very efficient and is an excellent substitute for alcohol. In dyspepsia of atonic form Humulus is

an excellent stomachic tonic, and in nervous irritability the fluidextract may be used as a calmative and hypnotic, or the hop-pillow, which certainly exercises considerable influence, imaginary or otherwise. A poultice of hops is a favorite domestic application in inflammations and pain. Lupulin has been used with benefit in irritable bladder and alcoholism, and as an anaphrodisiac in the treatment of chordee, gonorrhoea, spermatorrhea and other affections of the genito-urinary organs.

HYDRANGEA (Unofficial).—is the root of *Hydrangea arborescens*, a plant of the nat. ord. Saxifragaceæ, growing in the southeastern states. It is a white, tough root, containing gum, albumin, starch, resin, and a ferrous salt, with other salts. Dose, ʒss–ʒij, best in fluidextract. A decoction of the root may be prepared and used in doses of ʒj–ij.

Hydrangea has been long used by the Cherokee Indians in calculous affections, and reports of cases by competent observers show that it is of unquestionable utility in this class of disorders, promoting the removal of gravel from the bladder, and relieving pain during the passage of renal concretions through the ureters. Large doses produce vertigo, oppression of the chest, and considerable cerebral disturbance.

HYDRARGYRUM, Mercury, (Quicksilver), Hg,—is a shining, silver-white metal, fluid and slowly volatile at ordinary temperatures, solidifies at -39° F., boils at 675° F., volatilizes at a temperature below that of visible redness, is odorless and tasteless, soluble in nitric acid, insoluble in ordinary solvents. It is obtained from its native sulphide (cinnabar), but occurs also in globules disseminated through the ore.

Preparations of Mercury.

Hydrargyrum cum Creta, Mercury with Chalk, (Gray Powder)—has of Mercury 38, Honey 10, Prepared Chalk 57, Water q. s., shaken, triturated together, dried to 100, and then reduced to a uniform gray powder. Dose, gr. ss–x [av. gr. iv.]

Massa Hydrargyri, Mass of Mercury, (Blue Mass, Blue Pill)—has of Mercury 33, Licorice 10, Althæa 15, Glycerin 9, Honey of Rose 33. Each grain contains gr. $\frac{1}{3}$ of Mercury. Dose, gr. ss–x [av. gr. iv.]

Unguentum Hydrargyri, Mercurial Ointment—Mercury 50, Lard 25, Suet 23, Oleate of Mercury 2, triturated together, until globules of Mercury cease to be visible under a lens having a magnifying power of ten diameters.

Unguentum Hydrargyri Dilutum, Blue Ointment,—has of the preceding 67 with Petrolatum 33, thoroughly mixed.

Emplastrum Hydrargyri, Mercurial Plaster,—has of Mercury 30, Oleate of Mercury 1, Hydrous Wool Fat 10, Lead Plaster 59.

Chlorides and their Preparations.

Hydrargyri Chloridum Corrosivum, Corrosive Mercuric Chloride, (Bichloride of Mercury, Corrosive Sublimate) $HgCl_2$,—heavy, colorless crystals, of acrid, metallic taste, and acid reaction; soluble in 16 of water and in 3 of alcohol, in 2 of boiling water, 1.2 of boiling alcohol, 4 of ether and in about 14 of glycerin. Dose, gr. $\frac{1}{80}$ – $\frac{1}{10}$ [av. gr. $\frac{1}{20}$.]

Hydrargyri Chloridum Mite, Mild Mercurous Chloride, (Subchloride of Mercury, Calomel) Hg_2Cl_2 ,—a heavy, white, impalpable powder, odorless and tasteless; insoluble in water, alcohol or ether. Is an ingredient of Pil. Cathartica Co. Dose, gr. $\frac{1}{20}$ –gr. v. The dose depends on the effect desired; [av. laxative, gr. ij; alterative, gr. j.]

Hydrargyrum Ammoniatum, Ammoniated Mercury, (White Precipitate, Mercuric Ammonium Chloride) $HgNH_2Cl$,—is a white, insoluble powder, odorless and tasteless. Only used externally.

Unguentum Hydrargyri Ammoniatum, Ointment of Ammoniated Mercury, (White Precipitate Ointment)—Ammoniated Mercury 10, White Petrolatum 50, Hydrous Wool Fat 40.

Oxides and their Preparations.

Hydrargyri Oxidum Flavum, Yellow Mercuric Oxide, HgO,—an orange-yellow, heavy, impalpable powder, odorless and tasteless, insoluble in water or alcohol, but wholly soluble in nitric or hydrochloric acid. Used to prepare:—

Unguentum Hydrargyri Oxidi Flavi, Ointment of Yellow Mercuric Oxide,—strength 1 to 9.

Oleatum Hydrargyri, Oleate of Mercury,—has of the Yellow Oxide 25, Distilled Water 25, Oleic Acid to 100.

Hydrargyri Oxidum Rubrum, Red Mercuric Oxide, (Red Precipitate) HgO ,—a heavy, orange-red, crystalline powder, having the same properties as the yellow oxide, from which it differs only in being crystalline, and in a less minute state of subdivision. Dose, gr. $\frac{1}{30}$ – $\frac{1}{10}$.

Unguentum Hydrargyri Oxidi Rubri, Ointment of Red Mercuric Oxide,—strength 1 in 10.

Lotio Hydrargyri Flava, Yellow Wash, (Unofficial),—prepared by adding Corrosive Sublimate gr. xvij to Lime-water ʒx, producing the yellow oxide; a favorite application for syphilitic sores.

Lotio Hydrargyri Nigra, Black Wash (Unofficial),—prepared by adding Calomel gr. xxx to Lime-water ʒx, producing the black oxide.

Iodides and their Preparations.

Hydrargyri Iodidum Rubrum, Red Mercuric Iodide, (Biodide of Mercury) HgI_2 ,—a scarlet-red, crystalline powder, almost insoluble in water, soluble in 130 of alcohol, in solution of potassium iodide or of mercuric chloride. Prepared by double decomposition between Potassium Iodide 5, and Mercuric Chloride 4 parts. Dose, gr. $\frac{1}{30}$ – $\frac{1}{10}$ [av. gr. $\frac{1}{20}$.]

Liquor Arseni et Hydrargyri Iodidi, Solution of Arsenous and Mercuric Iodide, (Donovan's Solution),—see page 159.

Hydrargyri Iodidum Flavum, Yellow Mercurous Iodide, (Protiodide of Mercury) HgI ,—a dull green or greenish-yellow powder, insoluble in alcohol or ether and almost so in water. Dose, gr. $\frac{1}{10}$ – $\frac{1}{2}$ [av. gr. $\frac{1}{2}$.]

Acid Combinations and their Preparations.

Hydrargyri Benzoas, Mercuric Benzoate (Unofficial),—a white, crystalline, tasteless powder, slightly soluble in water, but readily soluble in a solution of common salt. Dose, hypodermically, gr. $\frac{1}{2}$ – $\frac{1}{4}$, once daily.

Liquor Hydrargyri Nitratis, Solution of Mercuric Nitrate,—a liquid containing in solution about 60 per cent. of Mercuric Nitrate, with about 11 per cent. of free Nitric Acid. Prepared from the Red Mercuric Oxide 40, by Nitric Acid 45, and Distilled Water 15. Used as a caustic.

Unguentum Hydrargyri Nitratis, Ointment of Mercuric Nitrate, (Citrine Ointment),—Mercury 7 dissolved in Nitric Acid 17 $\frac{1}{2}$, adding Lard 76.

Unguentum Hydrargyri Nitratis Rubrum, Red Ointment of Mercuric Nitrate, Brown Citrine Ointment, (Unofficial)—differs from the official ointment only in being made with Cod-liver Oil, which gives it a brown color, and a more agreeable odor.

Hydrargyri Salicylas, Mercuric Salicylate (Unofficial),—a white, tasteless powder, insoluble in water or alcohol, but readily soluble in a solution of sodium chloride or any of the halogen salts. Dose, gr. $\frac{1}{2}$ –gr. j in pill; hypodermically gr. $\frac{1}{2}$ in Paraffin oil π j.

Hydrargyri Subsulphas Flavus, Yellow Mercuric Subsulphate, Basic Mercuric Sulphate, Turpeth Mineral, (Unofficial),—a heavy, lemon-yellow powder, practically insoluble in water or alcohol. Dose, as an emetic, gr. ij–v.

Unofficial Organic Preparations.

Mercuriol,—is a compound of metallic mercury and yeast nuclein, containing 10 per cent. of mercury; a brown powder, soluble in water, insoluble in alcohol. It is used in a 1 per cent. solution as an injection in gonorrhoea and cystitis. Dose, gr. ss–ij, thrice daily.

Sublamin,—is a combination of Mercuric Sulphate 3, and Ethylene-diamine 8, containing 43 per cent. of mercury, freely soluble in water, insoluble in alcohol. Used in 1 to 500 or 1 to 1,000 solution for disinfecting hands and instruments.

Triturations.

These may be prepared according to the general formula under the title TRITURATIONES in the Pharmacopœia, 10 parts of the substance to 90 of Sugar of Milk. Mercury itself or any of its salts may be so treated with excellent results, the particles being much finer and therefore more easily absorbed than if rubbed up with another agent. In this form a larger proportion of the drug is utilized for specific purposes, while but a small amount remains to give rise to local irritation (Piffard). All trouble concerning incompatibility may be avoided by using triturations.

Incompatibles.

Incompatible with *Mercuric Chloride (corrosive sublimate)* are: Albumin, Alkalies, Alkaloids, Ammonia, Antimonous and Arsenous salts, Bromides, Borax, Carbonates, Copper and Ferrous salts, Formic Acid, Glucosides, Honey, Hypophosphites, Hypophosphorous Acid, Iodides; Infusions of Cinchona, Calumba, Oak-bark, Senna; Lead salts, Lime-water, Milk, Phosphates, Piperazin, Silver Nitrate, Soap, Sulphates of Potassium or Sodium, Sulphides, Syrup of Sarsaparilla Compound, Tannic Acid, Tartar Emetic, Vegetable astringents, Zinc salts.

With *Mercurous Chloride (calomel)* are: Acacia, Acids mineral, Airol, Alkalies, Ammonia, Antimony Sulphide, Arsenites in alkaline mixtures, Bromides, Carbonates, Chlorides, Citric Acid, Cocaine, Copper salts, Cyanides, Hydrocyanic Acid, Hydrogen Peroxide, Hypophosphorous Acid, Iodides, Iodine, Iodoform, Lead salts, Lime-water, Mercuric Oxides, Pilocarpine, Sodium Bicarbonate; Sugar, both cane and milk; Silver salts, Soaps, Sulphides, Tragacanth.

With *Ammoniated Mercury* are: Acids, Alkalies, Bromine, Chlorine, Iodine, Lime-water. With *Mercuric Iodide*, as with Mercuric Chloride. With *Mercurous Iodide*, as with Mercurous Chloride. With *Mercuric Oxide* are Acids (mineral), Chloral Hydrate, Mercuric Chloride. With *Mercuric Subsulphate* are Acids, Caustic Alkalies.

PHYSIOLOGICAL ACTION.

Mercury is tonic, purgative, alterative, antiphlogistic and sorbefacient, and indirectly cholagogue. Some of its salts are corrosive poisons, others are local caustics, all produce by long-continued administration the peculiar cachexia termed Hydrargyris. The metal itself is inert, but by combination with the acids and fluids of the body it becomes active, and is readily absorbed in any form, passing into the blood from the skin, mucous membranes, lungs and stomach, in each case probably as an oxyalbuminate. Entering the stomach in any form it is first converted into a double chloride of sodium and mercury; it next unites with the albuminous juices to form a complex molecule of mercury, sodium, chlorine and albumin, which being soluble in an excess of sodium chloride or albumin, exists in solution and is easily absorbed, then being decomposed in the blood and changed to the oxyalbuminate. Entering the intestines a purgative action is soon set up, of more or less severity according to the preparation used, a small portion only is absorbed, the rest being converted into a sulphide and excreted with the feces, unless combined with Opium, which delays its progress through the intestines and permits of its freer absorption. On the blood its effects in small doses are tonic, but in quantity it indirectly produces impoverishment thereof, impairs the ozonizing function, diminishes the red corpuscles, and consequently disorders nutrition and deranges digestion. From the blood it enters the tissues, where it remains for an indef-

inite period, exerting a peculiar influence, termed "alterative," on all processes characterized by growth of young cells, but not producing any definite anatomical changes either in the viscera or the nervous tissue, though in the latter a low form of inflammation arises, resulting in loss of coördination-power. It stimulates most of the glands to the production of pathological secretions, especially the salivary glands and the pancreas, and is excreted with comparative slowness by all the excretory organs, being found in the saliva, sweat, milk, urine and bile. A single dose is entirely eliminated in 24 hours, but if repeated in less time it accumulates in the body, only gr. $\frac{1}{8}$ being eliminated daily by the kidneys, so that when its full desired effect is produced, the dosage should be decreased, and only enough should be given to maintain its action. It tends to accumulate in the liver, while stimulating its cells, and is not a direct cholagogue, though stimulating the flow of bile already secreted by reflex action on the bile-ducts due to its purgation of the duodenum. Its excretion is hastened and completed by the use of Potassium Iodide.

In small doses administered for a short time the mercurial preparations are blood-tonics, improving the general condition, increasing the number of red corpuscles and the body-weight. They soon begin to promote waste by stimulating the lymphatic system, and if the small doses are long continued or the quantity is increased, symptoms of mercurial poisoning begin to manifest themselves.

The first symptoms of *Hydrargyris* are fetid breath, swollen and spongy gums having a bluish line along their margins, stomatitis, sore and loosened teeth, inflamed and tender salivary glands pouring out a peculiar, thin saliva of foul odor in large quantity, and a metallic taste in the mouth. Anorexia, diarrhea and fever follow, also ulceration and in some cases even gangrene of the lips and tongue. If the use of the drug be continued nutrition will be greatly impaired through the extreme promotion of retrograde metamorphosis, and various nervous disturbances will follow, the effects being emaciation, pallor, edema, ulcerated skin, erythematous, vesicular or pustular eruptions, headache, insomnia, neuralgia, tremor through paresis of the muscles of the head and extremities, epilepsy, coma and convulsions. In pregnant women abortion will occur by reason of the impoverishment of the blood. As Dr. Ringer said in the earlier editions of his *Handbook of Therapeutics*, the phenomena produced by mercury are singularly similar to those which result from syphilis, and the serious symptoms known as secondary and tertiary syphilis can be produced both by syphilis and by mercury. The drug is a specific antagonist to the syphilitic virus, probably by reason of its affecting the same organs and tissues of the body on a similar line of action, both poisons mutually destroying each other in the organism. It is certainly capable of bringing about a radical cure of syphilis, if introduced into the system in considerable quantity and its use protracted over a very long time, the action of the drug in all cases being kept short of ptyalism or any pronounced physiological effects

The observations on the antiphlogistic and sorbefacient actions of Mercury are clinical rather than physiological, but it is generally agreed that exhibited in inflammation mercurials antagonize the increase of the hemic fibrin which is so constant an effect of the inflammatory process, and that in chronic diseases attended by the formation of semi-organized deposits, a mild mercurial course will almost insensibly remove the new-formed material.

Salivation is most readily produced by blue mass, next by calomel, and less easily by gray powder. Individuals differ greatly in their susceptibility to the action of mercury, some persons having been affected after a single moderate dose. Children are not easily salivated. Inhalation of mercurial vapors is most apt to affect the nervous system; the internal administration and that by inunction are more likely to produce salivation. A not uncommon result of full doses of blue pill is an acute coryza of very severe character, which the writer has frequently observed to follow on neglect of the old-fashioned precaution to "work off" the mercurial by a saline cathartic. The symptoms produced are those of a severe attack of influenza,—epistaxis, conjunctivitis and obstinate muco-purulent discharge from the nasal passages being especially marked. Similar effects have been observed during physiological experiments with mercury on animals by Overbeck and Bennett.

All mercurials are antiseptic, germicidal, and antiparasitic, the Bichloride and Biniodide being the most powerful in these respects. Micrococci and bacilli in active growth without spores are killed by solutions of the Bichloride of Hg in 20,000, while solutions of Hg in 1,000 will rapidly destroy the spores of bacillus anthracis and bacillus subtilis. The chemical instability of this salt prevents its general use as a disinfectant, it being rapidly decomposed by ammonia and other substances usually present in excreta. The oleate, oxide, ammoniate, nitrate, and bichloride, are the preparations generally used to destroy the animal and vegetable parasites which infest the skin. The toxic action of mercury on protoplasm is due to its great affinity for nitrogenous molecules. The insoluble preparations are less powerful as germicides than the soluble ones, owing to the difficulty of bringing them into intimate contact with the microbes; but the Subchloride (calomel) has considerable effect as an intestinal antiseptic.

Notes on the Action of the Preparations.

Metallic Mercury is not used internally except in the finely divided form obtained in blue pill and gray powder, which are capable of producing the effects previously described. Mercurial Ointment is the preparation generally used for inunction, a piece the size of a small nut being daily rubbed into the soft skin at the flexures of joints. The Oleate painted over the surface is a more cleanly method of making the same application. Both these preparations are efficient parasiticides.

The Bichloride (corrosive sublimate) is the most actively toxic of the mercurial salts. It is probably the most active germicide and parasiticide, a solu-

tion of 1 part in 2,000 being efficiently antiseptic for use as injections or dressings, and a solution of 1 in 250 being the usual strength for use against epizoa and in parasitic skin affections. It is a very active gastro-intestinal irritant, in toxic dose producing nausea, retching and vomiting, a metallic taste, constriction of the fauces, burning pain in the stomach, suppression of urine, bloody diarrhea, collapse and death often preceded by convulsions. It affects specifically the lower bowel [Calomel preferring the upper intestine], and produces inflammation and ulceration of the rectum. It is, however, one of the most manageable and efficient of the mercurials when used in proper doses.

The Subchloride (calomel) is very insoluble and unirritating, tasteless, laxative in grain doses, decomposed by the alkaline contents of the intestines, oxide of mercury being formed, and acts especially on the excrementitious glandular appendages of the upper intestine, stimulating the liver by indirect reflex action as a duodenal purgative. In the presence of alkaline chlorides it is converted into the bichloride, but not in sufficient quantity to render it dangerous in the gastro-intestinal canal. Externally applied it is sedative to the mucous membranes and the skin. It is an efficient diuretic, in small doses frequently repeated. Ammoniated Mercury is an ammonio-chloride, and a useful stimulant and parasiticide when used locally in the form of ointment.

The Iodides are actively poisonous, the red being much the most irritant, producing symptoms and results similar to those of the bichloride. The yellow Subsulphate is a prompt and usually harmless emetic, but has occasionally produced fatal results by its irritant action. The Oxides are irritant, the red being the most so, and are rarely used internally. The acid Nitrate is a good escharotic, the pain caused by it being transient though severe, and its caustic action being comparatively superficial. The Ointment of the Nitrate (citrine ointment) is more irritant than that of ammoniated mercury, and generally needs dilution. All these preparations may produce the constitutional effects of mercury, and the subjects of their administration should be carefully watched for the first symptoms of mercurialization.

THERAPEUTICS.

Mercury is undoubtedly a specific in syphilis, but it is not always applicable to the tertiary form of the disease. As an accurate diagnosis of syphilis is essential before administering mercury, it is now believed that it should be withheld until the secondary symptoms appear, for if there is no syphilitic virus to be antagonized the constitutional effects of mercurials will become manifest sooner and may do great harm in feeble subjects, besides the risk of mistaking them for the results of the disease supposed to be present. The yellow Iodide, in doses of gr. $\frac{1}{10}$ to $\frac{1}{6}$ thrice daily with opium to prevent its running off by the bowels, is one of the best preparations for internal use. It should be carefully watched, and its administration stopped just short of ptyalism, but renewed again, and continued in this manner for several months. Fumigation by Calomel