liquid, concreting on exposure to the air into a translucent solid. Dose, gr. iij–v in emulsion.

Venice Turpentine,—procured in Switzerland from *Larix Europæa* the European Larch; a viscid liquid of the consistence of honey, does not concrete on exposure, and is entirely soluble in alcohol. The Venice Turpentine of commerce is usually prepared by dissolving rosin in oil of turpentine.

Thus Americanum, *Frankincense* (B. P.),—the concrete turpentine scraped off the trunks of *Pinus australis* and *Pinus Tæda*. An ingredient of the Emplastrum Picis of the Br. Phar.

Official Preparations of Turpentine.

Oleum Terebinthinæ, *Oil of Turpentine*, $C_{10}H_{16}$, commonly called Spirit or Spirits of Turpentine,—is a volatile oil distilled from Turpentine. A thin, colorless liquid, of characteristic odor and taste; soluble in 3 times its volume of alcohol, mixes with other volatile and fixed oils, and dissolves resins, wax, sulphur, phosphorus and iodine. Bromine and powdered Iodine act violently on it, and when brought into contact with a mixture of Nitric and Sulphuric Acids it takes fire. It is isomeric with a number of volatile oils, and constantly absorbs oxygen from the air when exposed, becoming thicker and less active from formation of resin. It is a mixture of several hydrocarbons (*terpenes*), each having the same formula as itself.

Oleum Terebinthinæ Rectificatum, *Rectified Oil of Turpentine*,—prepared by shaking Oil of Turpentine with an equal volume of solution of Sodium Hydroxide, distilling three-fourths, and separating. This preparation should always be dispensed when Oil of Turpentine is required for internal use. Dose, as a stimulant or diuretic, ℥v–xxv [av. ℥xv], in emulsion 3 to 6 times daily;—as a cathartic or anthelmintic ℥ss or more, combined with other cathartics. A little glycerin and oil of gaultheria will disguise the taste.

Emulsum Olei Terebinthinæ, *Emulsion of Oil of Turpentine*,—has of the rectified Oil 15, Expressed Oil of Almond 5, Syrup 25, Acacia 15, Water to 100. Dose, ℥ss–ij [av. ℥j].

Linimentum Terebinthinæ, *Turpentine Liniment*,—has 35 parts of the Oil of Turpentine with 65 of Rosin Cerate.

Linimentum Terebinthinæ Aceticum, *Liniment of Turpentine and Acetic Acid* (B. P.),—has of the Oil of Turpentine 4, Glacial Acetic Acid 1, Liniment of Camphor 4. An imitation of St. John Long's celebrated liniment.

Official Derivatives.

Resina, *Rosin*,—is the residue left after distilling off the volatile oil from Turpentine. It is a transparent, amber-colored substance, hard and brittle, with a glossy and shallow conchoidal fracture and a faintly terebinthinate odor and taste; soluble in alcohol, ether, fixed or volatile oils, and in its own weight of oil of turpentine. Chemically it is considered the anhydride of *Abietic Acid*, $C_{44}H_{64}O_8$, into which acid it is converted by agitation with warm diluted alcohol. *Silvic*, *Pinic*, and *Palmaric Acids* are decomposition products, not constituents of rosin as was formerly taught. Dose, gr. j–vj [av. gr. iv].

For the definition of a Resin see page 9, also the title RESINÆ in Part II. Other official resins are, Resina Jalapæ, Resina Podophylli and Resina Scammonii, which are severally described under the titles of the plants forming their respective sources.

Ceratum Resinæ, *Rosin Cerate*,—has of Rosin 35, Yellow Wax 15, Lard 50. It forms 65 per cent. of Turpentine Liniment.

Ceratum Resinæ Compositum, *Compound Rosin Cerate*,—has of Rosin 22½, Yellow Wax 22½, Suet 30, Turpentine 11½, Linseed Oil 13½ per cent.

Terebenum, *Terebene*,—is a liquid consisting of dipentene and other hydrocarbons, obtained by the action of concentrated sulphuric acid on oil of turpentine, and subsequent rectification with steam. It is soluble in 3 of alcohol, slightly soluble in water. Dose, ℥v–xv [av. ℥viij], on sugar, or suspended in water ℥ss, by the aid of light magnesium carbonate gr. xx.

Terpini Hydras, *Terpin Hydrate*, $C_{10}H_{18}(OH)_2.H_2O$,—is the hydrate of the diatomic alcohol Terpin (Terebinthene), obtained by distilling oil of Turpentine with an alkali. Colorless, lustrous, rhombic prisms, nearly odorless, of slightly aromatic and somewhat bitter taste; soluble in 10 of alcohol and in about 250 of water at 59° F., in 32 of boiling water and in 2 of boiling alcohol. Dose, gr. j–v [av. gr. ij].

Unofficial Derivatives.

Terpinol,—an oily body obtained from the preceding by the action of an acid thereon. Dose, gr. ij–v.

Sanitas Disinfecting Fluid,—is an aqueous solution of turpentine which has been oxidized by exposure to the air. It contains Hydrogen Dioxide, Thymol, Camphor and Camphoric Acid, the latter in such small proportion, however, that its action cannot be expected. This proprietary preparation has many advantages. It is a good oxidizing agent and antiseptic, is not poisonous and does not stain the linen; qualities which recommend it as a disinfectant and for use in surgical operations.

Retinol, *Resinol, Codol*,—is obtained as a product of the destructive distillation of resin, and occurs as a yellowish, fluorescent, oily liquid. It is used as a solvent for aristol, iodol, camphor, creosote, phenol, phosphorus, cocaine, codeine, and other alkaloids. The term *Resinol* is used as a trade name for a secret proprietary preparation, which is advertised as a remedy for all varieties of skin disease. Heidingsfeld states that it is irritant, causes dermatitis, and has dangerous narcotic properties.

Official Analogues of Turpentine.

These include JUNIPERUS *Juniper*, SABINA *Savin*, and PIX LIQUIDA *Tar*, which are described under their respective titles.

Unofficial Analogues of Turpentine.

Oleum Succini, *Oil of Amber*,—a volatile oil obtained from the destructive distillation of Amber (Succinum), a fossil resin thought to be the exudation of *Pinites succinifer*, an extinct coniferous tree. Dose, gtt. v–x. See under SUCCINUM.

Oleum Thujæ, *Oil of Thuja*,—a volatile oil which is given in doses of ℥j–v. A saturated tincture may be used in drachm doses. Obtained from *Thuja occidentalis*, the Arbor Vitæ, a coniferous tree. See under THUJA.

Oleum Pini Sylvestris, *Oil of Scotch Fir* (B. P.),—a colorless liquid, obtained by distilling the fresh leaves of *Pinus sylvestris*, used externally and by inhalation (see page 395).

Incompatibles.

Incompatible with *Oil of Turpentine* are: Bromine, Chlorine, Iodine, Water. With *Rosin* are: Caustic Alkalies, Menthol, Phenol, Salol, Thymol, Urethane. With *Terebene* are: Chlorine, Bromine, Iodine, Water.

PHYSIOLOGICAL ACTION.

Turpentines are stimulant, diuretic, anthelmintic, and hemostatic; in large doses laxative and irritant, and externally used are rubefacient and antiseptic. Their virtues depend entirely on the volatile oil.

Oil of Turpentine in small doses causes a sense of heat at the epigastrium, burning in the mouth and salivation by reflex action. In moderate doses it at first stimulates the vaso-motor nervous system, afterwards paralyzing it, and thus causing a rise and then a fall of the arterial tension. It lowers the functions of the brain, spinal cord and medulla in the order stated, causing diminution of voluntary movement and reflex action, dilatation of the vessels, lowered blood-pressure and slowed respiration, the latter often becoming spasmodic. The pulse is sometimes slowed, sometimes quickened. Large doses produce gastro-enteritis, with vomiting and diarrhea, suppression of urine, pain in the lumbar regions, burning in the urethra, hematuria and strangury. The muscular power is diminished, coördination impaired and a state of intoxication

induced. In toxic dose it acts as a narcotic poison and causes complete muscular relaxation, profound insensibility with abolished reflexes, dilated pupils, cyanosed face, labored and stertorous breathing and death by paralysis of respiration. It is excreted by the various organs of excretion, all of which are highly irritated, the kidneys suffering particularly. Its vapor inhaled produces nasal and renal irritation, frontal headache, also frequently strangury and hematuria. Locally to the skin it is rubefacient and even vesicant if applied for any length of time or if evaporation be prevented.

The Oil, when exposed to the air, readily absorbs oxygen in the form of ozone, which it retains tenaciously. This ozonized oil of turpentine is an antidote to phosphorus, preventing the formation of phosphoric acid and converting the phosphorus into an insoluble substance resembling spermaceti. Worn about the neck in an open vial it is believed to prevent necrosis of the jaw and steatosis of the organs in workmen exposed to phosphorus-fumes. It is supposed to dissolve gall-stones.

THERAPEUTICS.

Oil of Turpentine is employed externally as a rubefacient and counter-irritant in many conditions producing pain and inflammation. Cloths wrung out of hot water and then sprinkled with the oil (turpentine stupes) are useful applications in sciatica and other neuralgiæ, lumbago, chronic rheumatism, chronic bronchitis, peritonitis with tympanites, pleurisy, and renal colic. It is one of the most efficient agents in hospital gangrene, applied in full strength to the part affected. The liniment is in constant use for sprains, neuralgia and other slight local affections.

Internally it is best employed in ulceration and hemorrhage of the intestines and in passive hemorrhages from other organs. Active bleeding with a plethoric condition and hematuria are states in which it is contraindicated. It is often used with ether (1 to 3) in biliary and flatulent colic as an anodyne and antispasmodic. As a vermifuge against tape-worm it must be employed in large doses (ʒss–ij) with castor oil to promote its rapid passage through the intestinal canal. It is well employed as a stimulant to the heart and vaso-motor system in puerperal fever, yellow fever, traumatic erysipelas, pneumonia, and capillary bronchitis. It is useful in chronic bronchial catarrh, chronic cystitis, subacute gonorrhea, and similar affections of the mucous surfaces generally. Inhalations of the vapor or atomized oil are beneficial in chronic affections of the larynx and bronchi. The pure vapor is a good irritant inhalation to provoke coughing and thereby cause the expulsion of morbid products in cases of bronchitis and pneumonia when expectoration is arrested by exhaustion and remedies by the mouth have no effect. It is too irritant for ordinary inhalation but may be diluted with steam from an atomizer. Chian Turpentine is one of the remedies which have been used for cancer.

Terebene has been extensively used by Murrell, with excellent results, as a remedy for obstinate winter-cough and emphysema of the lungs, in flatulence

and flatulent dyspepsia, in cystitis and gleet, and as a spray in phthisis and post-nasal catarrh, also with cocaine in solution as a spray for coryza and hay-fever. Other observers, of several years' experience with this remedy, praise it highly as an inhalant remedy in phthisis, bronchiectasis, chronic bronchitis and other pulmonary affections characterized by profuse, purulent expectoration. Rieu employs it in bronchitis and bronchorrhea, in doses internally of gr. xv–xxx per diem, but says that it does not affect the muco-purulent expectoration of phthisis. It probably has no superior efficacy to creosote or Venice turpentine, except that it is without much odor and has no taste.

Terpin Hydrate is praised in chronic and recurrent bronchitis, night-cough from habit, catarrhs and kindred affections. In fact, all acute and many chronic affections of the respiratory passages form the proper field for the therapeutical action of this preparation.

Rosin is used to give consistence and adhesiveness to plasters and cerates, and generally acts as a mild local stimulant, but the writer has seen persons with so susceptible a skin that the ordinary adhesive plaster would produce on them a high degree of cutaneous irritation. It is never employed internally, but in chronic bronchial catarrh the fumes from boiling rosin are inhaled with considerable advantage. Rosin Cerate is one of the most commonly used applications to promote the healing of indolent ulcers, also to blistered surfaces, burns, scalds and chilblains.

THEOBROMATIS OLEUM, Oil of Theobroma, (*Cacao-butter*),—is a fixed oil expressed from the roasted seeds of *Theobroma Cacao*, the Chocolate-tree, nat. ord. Sterculiaceæ, growing in Mexico, the West Indies and South America. The oil is a yellowish-white solid, of faint odor, bland taste and neutral reaction. The seeds are oval, about the size of almonds, and consist of shells and kernels, in both of which is found the alkaloid *Theobromine*, $C_7H_8N_4O_2$, which closely resembles Caffeine, the latter being its methyl derivative. *Chocolate* is prepared by roasting the seeds, removing the shells, then crushing or grinding the kernels to a smooth paste, which is cast in molds.

Oil of Theobroma consists chiefly of Stearin with a little Olein. Its action is demulcent, and it does not become rancid on exposure to the air. Its chief use is as a basis for making suppositories. A Cerate is prepared by melting together Cacao-butter 35, White Wax 35, Oil of Almond 30, adding a drop of Oil of Rose and coloring with a minute quantity of Carmine previously triturated with a drop of Water of Ammonia. This is known as *Red Lip-salve*.

Theobromine has the same action and uses as Caffeine. See under CAFFEINA, page 186, for this principle and for Diuretin.

THUJA, Arbor Vitæ (Unofficial),—the fresh tops of *Thuja occidentalis*, a tree of the nat. ord. Coniferæ, incorrectly called White Cedar, growing in swampy ground in Canada and in the northern United States. They contain a volatile oil, tannin, wax, resin, etc.; also *Pinipicrin*, a bitter principle, and *Thujin*, a yellow, astringent and crystallizable coloring principle, separable into glucose and *Thujetin*.

The dose of a saturated, fresh tincture or fluidextract is ʒj, 3 to 6 times daily. The Volatile Oil may be given in doses of ♏j–v.

Physiological Action and Therapeutics.

Thuja resembles Savin in action very closely. It is stimulant, irritant and astringent, also aromatic, diuretic and emmenagogue. The oil is a gastro-intestinal irritant and produces epileptiform convulsions in warm-blooded animals but paralysis in cold-blooded ones. It causes rhythmical contraction and dilatation of the vessels, lowers the temperature and is anthelmintic. Thuja is indirectly an abortifacient when given in doses sufficient to cause violent gastro-enteritis. It is reported to have produced an acute urethritis resembling gonorrhea.

Thuja in decoction has been usefully employed in coughs, rheumatic and arthritic pains, dropsy and amenorrhea. It has been given with benefit in intermittent fever and as an alterative blennorrhetic in chronic catarrh and bronchorrhea. It is highly praised by Phillips for the cure of warts with narrow base and pendulous body, a strong tincture being applied locally and given internally at the same time in 5-minim doses twice daily. Piffard speaks strongly in its favor as a valuable agent for non-syphilitic warts (condylomata acuminata) of the penis and vulva, for papillomatous growths in general and for gleet dependent on granular urethritis. It has been used in chronic gonorrhea and prostatitis with asserted success, and is said to have cured epithelioma. The oil has been employed as a vermifuge.

THYMI OLEUM, Oil of Thyme,—is a volatile oil distilled from the leaves and flowering tops of *Thymus vulgaris*, the Garden Thyme, a common shrub of the nat. ord. Labiatæ, indigenous to France but cultivated in our gardens. This oil is a pale yellow or colorless, thin liquid, having a strong odor of thyme, a warm, pungent and afterwards cooling taste and a neutral reaction; readily soluble in alcohol. It consists of two portions, the more volatile being a mixture of the hydrocarbons *Cymene* and *Thymene*, the less volatile being chiefly *Thymol*, which is official. Dose, ♏j–v [av. ♏iij].

Thymol, $C_{10}H_{14}O$,—is a phenol contained in Oil of Thyme and in the volatile oils of several other plants. It occurs in large, colorless, hexagonal crystals, of aromatic odor, pungent taste and neutral reaction; soluble in 1200 of water, in 900 of boiling water, in 1 of alcohol, freely in fats and oils, solutions of chloral and alkalies, ether or chloroform. It liquefies when triturated with an equal quantity of camphor, menthol, or chloral. Dose, gr. ss–iij [av. gr. ij]; for uncinariasis, gr. xv–℥j.

Thymolis Iodidum, *Thymol Iodide*, (*Aristol*),—is official, and is described under Iodum, page 314.

Unofficial Preparations.

Thymol Solution,—for antiseptic spray, 1 part in 1000.

Thymol Ointments,—vary in strength from 5 to 30 grains to the ℥.

Thymol Inhalation,—Thymol gr. xx, Alcohol ℥iij, Magnesium Carbonate gr. x, Water to ℥iij. A teaspoonful to a pint of water at 150° F. for each inhalation.

Volkmann's Antiseptic Fluid,—has of Thymol 1, Alcohol 10, Glycerin 20 and Water 100 parts.

Thymotal, *Thymol Carbonate*—is an efficient vermicide, and is particularly useful in ankylostomiasis. Dose, gr. ij–x.

Incompatibles.

Incompatible with *Thymol* are Acetamide, Acetanilide, Antipyrine, Borneol, Butyl-chloral Hydrate, Camphor, Chloral Hydrate, Euphorin, Exalgin, Gold salts, Menthol, Phenol, Pyrocatechin, Quinine Sulphate, Rosin, Salol, Spirit of Nitrous Ether, Urethane.

Physiological Action and Therapeutics.

Oil of Thyme has the same properties as the oils of other mints, and containing a large quantity of Thymol it is similar to the latter in action.

Thymol in its action stands between phenol and oil of turpentine. Like the former it is a powerful antiseptic and disinfectant, also a local irritant and anesthetic to the skin and mucous membranes, paralyzing the end-organs of the sensory nerves. When absorbed it paralyzes the nerve-centres in the spinal cord and in the medulla, lessening reflex action, slowing respiration, lowering the temperature and the arterial tension, and in poisonous doses causing weakness, coma and death. Internally administered in doses of 20 to 30 grains per diem it produces a sensation of epigastric heat, sweating, singing in the ears, deafness, a sense of constriction in the forehead and increase of the urinary discharge, which assumes a dark greenish hue. It is eliminated by the respiratory and urinary organs, which it irritates considerably during the process of its excretion. As an antiseptic it is much more powerful and permanent than phenol, and much less poisonous, but its insolubility in water prevents its general use for this purpose.

Thymol is chiefly employed as a gargle, spray or inhalation in laryngitis and diphtheria; as an ointment in ringworm, eczema and psoriasis, and as an injection in ozena. A solution of 1 part in 1000 is the strength usually prescribed. Internally it has been used with success in diphtheria, typhoid fever and other intestinal affections, diabetes, phthisis and vesical catarrh. Its fragrant odor renders it a very agreeable antiseptic application for ulcerated conditions of the mouth and fauces, but makes it very attractive to flies, which fact together with its high price will prevent it becoming a favorite in hospital practice. A solution, used as a mouth-wash, is very efficient in removing the odor of tobacco from the breath. Thymol is almost specific against the intestinal parasite ankylostomum duodenale (*uncinaria Americana*) for which it is given in three or four doses of 10 to 30 grains, well triturated, in capsules; care being taken that no alcoholic drink is ingested afterwards, in order to avoid the absorption of thymol and consequent poisoning thereby.

TIGLII OLEUM, Croton Oil,—is a fixed oil expressed from the seeds of *Croton Tiglium*, a small tree of the nat. ord. Euphorbiaceæ, a native of India. The oil is of a pale or brownish-yellow color, somewhat viscid and slightly

fluorescent, of fatty odor, acrid taste and slightly acid reaction; soluble in 60 of alcohol, freely in ether, chloroform, or carbon disulphide. Its composition is very complex and has not been thoroughly made out, but it is known to contain the glycerides of several fatty acids, also a peculiar acid named *Tiglinic Acid*, $C_5H_8O_2$, which is isomeric with Angelic Acid. Dose, ♏⅓–ij [av. ♏j], in pill, emulsion or tincture.

Corson's Paint (Unofficial),—has of Croton Oil ℥ij, Ether ℥iv, Compound Tincture of Iodine to make ℥ij; and is used as a counterirritant by painting over the part once daily.

Linimentum Crotonis, *Liniment of Croton Oil* (B. P.),—contains 1 part of the oil in 3½ each of Alcohol (90 per cent.) and Oil of Cajuput. It is a useful pustulant application, being more manageable than the oil itself.

Physiological Action and Therapeutics.

Externally Croton Oil is highly irritant, producing a pustular eruption which heals by scabbing and may leave unsightly cicatrices. Internally it is a powerful drastic cathartic, producing in one or two hours copious watery stools, in overdoses causing great congestion of the intestinal canal and perhaps death from gastro-enteritis. Vomiting usually occurs after large doses, so that the irritant hyper-catharsis is not always observed. It is absorbed into the blood, and produces glandular hyperemia as well as direct inflammation of the intestinal mucous membrane, together with increased peristaltic action. Its cathartic power is increased by the addition of an alkali, and is manifested, though in less degree, when applied to the integument.

Croton Oil is used as a hydragogue cathartic when a speedy and complete evacuation of the bowels, diminution of arterial pressure and prompt derivative action are desired, as in apoplexy, impaction of the intestines, dropsy, lead constipation, and paralysis. It is contraindicated when either debility, organic obstruction or an inflammatory condition of the stomach and bowels exists. The smallness of the dose makes it a very easily administered and manageable purgative. An inconsiderable fraction of a drop, absorbed by a pellet of sugar or bread, may be given in repeated doses until the desired effect is obtained. It has been used as a vermifuge against tapeworm. Externally it is employed as a counter-irritant in ovaritis, bronchitis, pleurisy, rheumatism, neuralgia, glandular swellings and in laryngeal and pulmonary diseases.

TRAGACANTHA, Tragacanth,—is a gummy exudation from *Astragalus gummifer* and from other species of *Astragalus*, shrubs of the nat. ord. Leguminosæ, growing chiefly in Asia Minor and Persia. It occurs in shell-like, curved or contorted bands, swelling with water to a gelatinous mass, which is tinged blue by test-solution of iodine, and consists of a mixture of *Arabin*, or gum-arabic, which is soluble in water, and *Bassorin*, a gum which is insoluble in water but swells up in it, also a little starch.

Mucilago Tragacanthæ, *Mucilage of Tragacanth,*—Tragacanth 6, Glycerin 18, Water to 100. Dose, ℥ss or more [av. ℥iv].

Incompatibles are Alcohol, Copper Sulpnate, Ferrous Sulphate, Lead Acetate both basic and neutral.

Tragacanth is demulcent, but in large quantities may cause indigestion. It is chiefly employed to suspend resins and heavy powders in emulsion. The mucilage may be used as a vehicle for active agents in gargles for pharyngitis, and to cause cohesion in the preparation of pills and troches. It is a constituent of 12 of the 16 official troches, and is a better agent than acacia for making emulsions of cod-liver oil.

TRITICUM, Couch-grass,—is the dried rhizome, gathered in the spring and deprived of its roots, of *Agropyron repens*, the Couch-grass, a perennial plant of the nat. ord. Gramineæ, abounding in meadows and cultivated grounds, where it ranks as a weed though of the same genus as wheat. It contains much sugar and a gum-like principle, *Triticin*. Dose, ℥j–℥j [av. ℥ij] in infusion or decoction.

Fluidextractum Tritici, *Fluidextract of Triticum.*—Dose, ℥j–℥j [av. ℥ij], well diluted.

Couch-grass is demulcent, emollient and a feeble diuretic. It is chiefly used in cystitis and irritable bladder The infusion is a popular fever-drink in Europe, and has had a considerable reputation in dysuria.

ULMUS, Elm, (*Slippery Elm*),—is the dried inner bark of *Ulmus fulva*, an indigenous tree of the nat. ord. Ulmaceæ. It contains a large quantity of mucilage which it readily parts with to water.

Mucilago Ulmi, *Mucilage of Elm,*—Elm 6, Water to 100, digested for an hour and strained. Dose, ad libitum [av. ℥iv]. Should be freshly made when wanted.

Slippery-elm Bark is demulcent, slightly astringent and somewhat tonic. It is used internally in diarrhea, dysentery and affections of the urinary passages, and externally in the form of poultice as an emollient application in cases of inflammation. It is employed for the dilatation of fistulæ, strictures, and the os uteri.

UVA URSI,—the dried leaves of *Arctostaphylos Uva-ursi*, the Bearberry, a low, evergreen shrub of the nat. ord. Ericaceæ, inhabiting the northern latitudes and high mountains of Europe, Asia and America. They contain tannic and gallic acids and 3 principles, *Arbutin*, a bitter glucoside, neutral, crystalline, resolvable into glucose and hydroquinone; *Ericolin*, bitter and amorphous; *Ursone*, resinous, neutral, crystalline and tasteless. The Californian Manzanita (*Arctostaphylos glauca*) is an allied plant and contains arbutin and tannin. Dose of the powdered leaves, gr. x–℥j [av. gr. xxx], in infusion or decoction.

Preparations.

Fluidextractum Uvæ Ursi, *Fluidextract of Uva Ursi.*—Dose, ♏x–℥j [av. ♏xxx].

Infusum Uvæ Ursi, *Infusion of Uva Ursi* (Unofficial),—℥j in Oj. Dose, ℥j–ij.

Arbutinum, *Arbutin*, $C_{12}H_{16}O_7$ (Unofficial),—occurs in colorless, odorless, bitter crystals, soluble in 8 of water and in 16 of alcohol. Dose, gr. v–xv.

Incompatibles are as for Glucosides and Tannic Acid (see pages 8 and 70).

Uva Ursi is astringent, tonic and feebly diuretic. Used in large quantity it produces vomiting and purging and is alleged to have oxytocic power. Arbutin is an efficient diuretic, and is decomposed in the body yielding hydroquinone, (see page 410), which is a powerful poison, and must be formed in the kidneys, as though appearing in the urine after arbutin is taken, it does not cause toxic effects under such circumstances, but powerfully disinfects the urine and the mucous membrane of the urinary passages. It imparts a greenish-brown color to the urine.

Uva Ursi was formerly used in calculous affections and chronic disorders

of the urinary passages. It has some reputation as an antilithic, and is useful in gravel, chronic nephritis, cystitis and urethritis. It relieves incontinence of urine, dysuria and strangury, and has proved serviceable even in uterine hemorrhages. The fluidextract is an excellent remedy for correcting the ardor urinæ of acute gonorrhea. Arbutin has been successfully employed in cardiac dropsy as a diuretic, also in urethritis.

VALERIANA, Valerian,—is the dried rhizome and roots of *Valeriana officinalis*, a large, herbaceous plant of the nat. ord. Valerianaceæ, having small, white, or rose-colored flowers, a native of Europe, but cultivated in Vermont and New York. It contains a *Volatile Oil*, from which are developed by oxidation *Valerene*, $C_{10}H_{16}$, a terpene; *Valerol* or Baldrian Camphor, $C_{12}H_{20}O$; and *Valeric Acid*, $C_5H_{10}O_2$, which occurs also in many other plants and in cod-liver oil. The valeric acid of pharmacy is obtained as a product of the oxidation of amylic alcohol, and from it are formed the various valerates. It is not therapeutically identical with the natural acid. Dose of the powdered root, gr. x–xlv [av. gr. xxx].

Preparations of Valerian.

Fluidextractum Valerianæ, *Fluidextract of Valerian.*—Dose, ♏x–xlv [av. ♏xxx].

Tinctura Valerianæ, *Tincture of Valerian,*—strength 20 per cent. Dose, ʒss–ij [av. ʒj].

Tinctura Valerianæ Ammoniata, *Ammoniated Tincture of Valerian,*—has of Valerian 20, Aromatic Spirit of Ammonia to 100. Dose, ♏v–xlv [av. ♏xxx].

Oleum Valerianæ, *Oil of Valerian* (Unofficial),—the volatile oil, a greenish or yellowish, thin liquid, having the odor of Valerian, an aromatic taste and a slightly acid reaction, readily soluble in alcohol. Dose, ♏j–v.

The Oil is by far the best preparation for use, as the tinctures are extremely nauseous and the fluidextract is too bulky. The taste is best covered by Cinnamon.

Preparations of Valerianic Acid.

Valerates of Ammonium and Zinc are official and are described under the titles of their respective bases. They are made with the artificial valeric acid and do not represent the action of the plant but rather that of the bases from which they are prepared.

Incompatibles.

Incompatible with *Valerian* preparations are: Cinchona infusion, Iron and Silver salts.

Physiological Action and Therapeutics.

Valerian is antispasmodic and a gentle stimulant to the nervous and circulatory systems. It is sedative to reflex excitability, antagonizing the action of strychnine, brucine, and thebaine, and is laxative, diaphoretic and anthelmintic. Its taste and odor are very disagreeable but cats are extravagantly fond of it. In these animals it excites the sexual appetite, probably from a resemblance between its odor and theirs when under venereal excitement; and after a time it produces in them violent spasms and convulsions. In full doses it increases the action of the heart and raises the temperature, in most persons producing exhilaration, in some a slight mental disturbance, with formication of the hands and feet. Long used it induces a condition of melancholia. Large doses cause hiccough, diarrhea, nausea and vomiting, frequent micturition with tenesmus of the bladder and lithates in the urine, mental disturbance even to delirium, reduced motility and sensibility and lessened reflex excitability. The Oil in large doses is paralyzant to the brain and the spinal cord, lowers the blood-pressure and slows the pulse.

The Valerates follow their bases in general action but are supposed to possess some of the sedative qualities of their acid constituent.

Valerian was formerly employed in epilepsy but was probably useful only in the hysterical form of that disease. It is a valuable remedy in all forms of hysteria, especially in young and delicate women. It is useful in the flatulence of infants and in that of hypochondriacal and hysterical subjects, also for coughs of nervous type, whooping-cough, diabetes insipidus, convulsions due to worms and in delirium with vital depression. In the coma of typhus fever the oil proved remarkably efficient in 135 out of 172 cases treated by it. Ammonium Valerate is used in the same class of disorders as is valerian. It is often a good remedy for nervous headache, administered in 10-grain doses in an elixir. Zinc Valerate has been supposed to combine the antispasmodic power of valerian with the nerve-tonic effect of a zinc salt. It has been used in cholera, epilepsy and neuralgia, frequently with considerable success

VANILLA,—is the fruit of *Vanilla planifolia*, a perennial climbing plant of the nat. ord. Orchidaceæ, native of the West Indies and tropical America, but cultivated in Java, etc. Its characteristic odorous principle is *Vanillin*, the methyl-ether of protocatechuic aldehyde, which oxidizes slowly in damp air to *Vanillic Acid*, and may be resolved into methyl chloride and protocatechuic acid. Vanillin may be made synthetically from Coniferin or from Eugenol. Dose, indefinite [av. gr. xv].

Tinctura Vanillæ, *Tincture of Vanilla,*—10 per cent. Dose, a few drops, according to the strength of flavor desired.

Vanillinum, *Vanillin*, $C_8H_8O_3$,—may be made artificially; occurs in fine, white needles, soluble in about 100 of water, easily soluble in alcohol. Dose, gr. ¼–j [av. gr. ss].

Vanilla is an aromatic stimulant, with considerable influence on the nervous system. It is chiefly employed as a perfume and for flavoring purposes but has been used with benefit in hysteria and low fevers.

VERATRUM, Veratrum,—is the dried rhizome and roots of *Veratrum viride*, American Hellebore, or *Veratrum album*, White Hellebore, plants of the nat. ord. Liliaceæ, the latter growing in the mountains of Europe. They contain the alkaloids *Jervine*, *Pseudo-jervine*, and *Rubijervine*; but Veratrum viride contains also *Veratrine* (*Cevadine*), and Veratrum album contains also *Protoveratrine*, *Protoveratridine* and other alkaloids. Dose, gr. j–iij [av. gr. ij].

Asagræa officinalis, *Veratrum Sabadilla*, *Cevadilla*,—the source of the official Veratrine, a mixture of alkaloids, is a bulbous plant of the nat. ord. Liliaceæ, indigenous to Mexico and Central America. It contains the alkaloids *Veratrine* (*Cevadine*), *Cevadilline*, *Sabadine*, *Sabadinine*, and another base known as *Wright's Veratrine.*

The nomenclature of the various veratriæ alkaloids is confusing, having undergone considerable modification. That given above is the most recent, but many authors follow Bullock, who gave the names *Jervine* and *Veratroidine* to the chief constituents of veratrum viride and *Veratralbine* to the principal alkaloid of veratrum album. The substance officially termed *Veratrine* is not the alkaloid so named but is a mixture of alkaloids.

Veratrine can be decomposed into Angelic Acid and *Cevine*, a base allied to aconine; Protoveratrine is probably a combination of Isobutyric Acid and a similar base. Veratrine and Protoveratrine are powerful alkaloids, the latter almost rivalling aconitine in toxicity. Jervine, Sabadine, and Sabadinine possess some action on the organism. Cevadilline has not been examined; the others are said to be inert.

Preparations.

Fluidextractum Veratri, *Fluidextract of Veratrum*,—Dose, ɱj–iv [av. ɱjss].

Tinctura Veratri, *Tincture of Veratrum*,—10 per cent. Dose, ɱx–xxx [av. ɱxv].

Norwood's Tincture of Veratrum Viride (Unofficial),—has a very high reputation for efficiency. Dose, ɱv, increased by ɱj every 3 hours, until pulse is down to 65, when the original dose will hold it there. Larger doses in puerperal convulsions.

Veratrina, *Veratrine*,—is a mixture of alkaloids obtained from the seeds of *Asagræa officinalis* (see p. 491). A white, or grayish-white, amorphous powder, highly irritant to the nostrils, of very acrid taste, producing tingling and numbness of the tongue and constriction of the fauces; slightly soluble in cold water, soluble in 3 of alcohol, in 6 of ether, in 2 of chloroform, in 96 of glycerin and in 56 of olive oil. Dose, gr. $\frac{1}{50}$–$\frac{1}{10}$ [av. gr. $\frac{1}{30}$].

Unguentum Veratrinæ, *Veratrine Ointment*,—Veratrine 4, Expressed Oil of Almond 6, Benzoinated Lard 90. For local use.

Oleatum Veratrinæ, *Oleate of Veratrine*,—Veratrine 2, Oleic Acid 50, Olive Oil to 100. For local use.

Incompatibles are as for alkaloids (see page 6).

Physiological Action.

Veratrum Viride is closely allied to Aconite in action, being a powerful cardiac depressant and spinal paralyzant. It differs from aconite in affecting the respiration to a much less degree, in being a systemic emeto-cathartic, in paralyzing the motor system centrally, impairing the reflexes but leaving sensation unimpaired, and in having little or no diaphoretic or diuretic action in ordinary medicinal doses. It causes great muscular depression but is seldom fatal; when death does result from its use it occurs by paralysis of respiration. In small doses Veratrum reduces the force of the pulse, but does not at first affect its rate. If continued for some time, the pulse becomes slow, soft and compressible; rising on the least exertion to be very rapid and feeble. At the same time there is great muscular weakness, and frequently nausea and vomiting. Large doses increase these symptoms, the pulse becoming very rapid and so small as to be almost imperceptible; the skin is cold and clammy, and constant vomiting, extreme debility, giddiness, impaired vision, and partial unconsciousness ensue.

Veratrum Album contains the powerful alkaloid Protoveratrine. Its general action is similar to that of its congener, but it is much more irritant to the gastro-intestinal mucous membrane, causing violent vomiting and purging, intense abdominal and esophageal pain, greatly reduced temperature and pulse, collapse and death from cardiac and respiratory paralysis.

The action of the alkaloid Veratrine on the central nervous system and

sensory nerve terminations resembles that of Aconitine very closely. Locally applied it causes the same prickling, warm sensation, followed after a time by a feeling of numbness and cold in the part. In contact with the mucous membrane of the nose and throat it gives rise to violent sneezing and coughing. Internally administered the characteristic prickling, burning sensation is soon felt in the mouth and throat, followed by a sense of heat in the stomach, salivation, nausea and vomiting. The prickling sensation spreads to the skin all over the body and profuse perspiration often occurs. The pulse becomes slow and irregular, the respiration slow and labored. In veratrine poisoning the bowels are more affected than with aconitine, severe colic and violent catharsis being usually experienced. Fibrillary contractions of the muscles and convulsions are commonly observed, and collapse occurs, followed by coma and finally by failure of the respiration.

Veratrine stimulates the central nervous system and the sensory nerve terminations, but by large doses this stimulation gives way to paralysis. Applied directly in solution to the peripheral nerves it abolishes their irritability. At first it slows the heart by stimulating the cardiac inhibitory centre, and contracts the bloodvessels by stimulation of the vaso-motor centre, but later it depresses both, the blood pressure and body temperature are lowered, and finally the respiratory centres are paralyzed. It stimulates the cerebral motor centres, causing convulsions, but does not effect consciousness or the pupils. In the frog it has a peculiar and characteristic action on the muscles, producing a prolonged period of contraction and causing an increase in the height and absolute strength of the contractions. The result is that the muscles remain shortened for a time after contraction and resist the action of their opposing muscles, so that the animal cannot extend a limb immediately after flexing it and its locomotion is greatly impaired.

H. C. Wood describes two principal alkaloids as responsible for the action of veratrum viride, viz.—*Jervine*, the cardiac, vaso-motor and spinal depressant; and *Rubijervine* (the Veratroidine of Bullock), a gastro-intestinal irritant, a stimulant and paralyzant of the pneumogastric, and a powerful respiratory poison.

Protoveratrine is much more poisonous than veratrine but acts on the same general lines as aconitine. It does not paralyze the motor nerve terminations even when applied to them in quantity. It shortens the contraction period of muscular tissue instead of prolonging it as veratrine does, and it increases the muscular force temporarily but induces its early exhaustion. Jervine, Sabadilline and Sabadinine have the same action as veratrine but are much less poisonous.

The official Veratrine is an acrid and intensely irritant powder, consisting of a mixture of alkaloids. It causes violent sneezing, a burning sensation, and free salivation. It affects the heart and circulation similarly to the other Veratriæ and in addition seems to be a direct poison to muscular tissue and to cause violent convulsions before the muscular paralysis sets in.