

several other trees, and substances resembling it are exuded by many plants. It contains from 40 to 90 per cent. of *Mannit*, $C_6H_{12}O_6$, or Manna-sugar, which does not undergo vinous fermentation, and is chemically allied to the alcohols and to glycerin. It also contains glucose, mucilage, some acrid resin, and a small quantity of the fluorescent glucoside *Fraxin*. There are no official preparations, but Manna itself may be given in doses of \mathfrak{zj} – \mathfrak{zj} [av. \mathfrak{ziv} .]

Manna is a mild laxative, with some tendency to produce flatulence and colic. It is usually combined with other purgatives, as Senna, Rhubarb, and Magnesia, to disguise the taste and increase the effect. It is a constituent of the official *Infusum Sennæ Compositum*. Manna may be eaten by children if of good quality, or may be readily dissolved in milk and so administered.

MARRUBIUM,—the leaves and tops of *Marrubium vulgare*, Horehound, a plant of the nat. ord. Labiatae, native in Europe, but naturalized in America. It contains a bitter principle named *Marrubiin*, also a volatile oil, resin, tannin, lignin, etc. There are no official preparations. Dose, gr. xx– \mathfrak{zj} [av. gr. xxx.]

Horehound in large doses is laxative, diuretic and diaphoretic, and in ordinary dosage a gentle tonic and stomachic. It is generally used in catarrhal states of the air-passages, over which it seems to have a soothing effect, and is much employed in confectionery as an ingredient of "cough drops."

MASTICHE, **Mastic**,—is a concrete, resinous exudation from *Pistacia Lentiscus*, a tree of the nat. ord. Anacardiaceae, growing in the island of Scio. Alcohol dissolves about 90 per cent., including the resin *Mastichic Acid*, the remainder consisting of another resin, *Mastichin*, which is soluble in ether and resembles copal. There are no official preparations, but Mastic is an ingredient of the official *Pil. Aloës et Mastiches*. Dose, gr. xx–xliv [av. gr. xxx.]

Mastic was formerly used for supposed properties analogous to those of other oleo-resins, but its application is now confined to dentistry, being employed as a temporary filling for carious teeth. A solution in ether is applied on cotton with moderate pressure, and remains as a firm plug after evaporation of the solvent.

MATICO,—the leaves of *Piper angustifolium*, a Peruvian shrub of the nat. ord. Piperaceae. It contains a crystallizable acid *Artanithic Acid*, also resin, tannin, and a volatile oil. Its odor is aromatic, and its taste astringent, spicy and somewhat bitter. Dose, \mathfrak{zss} – \mathfrak{jss} [av. \mathfrak{zj} .]

Fluidextractum Matico, *Fluidextract of Matico*. Dose, \mathfrak{zss} – \mathfrak{jss} [av. \mathfrak{zj} .]

Matico is an aromatic tonic and stimulant, also aphrodisiac, vulnerary and hemostatic. It acts like cubeb on the urinary passages, and is an excellent alterative stimulant to mucous membranes. It has been used with considerable success in mucous catarrhs, as gonorrhoea, leucorrhoea, and chronic cystitis, also in epistaxis, hemorrhoids, menorrhagia, hemoptysis, hematemesis and other hemorrhages. The under surface of the leaf is so formed as to promote coagulation of blood if applied to a bleeding surface, and is a good local hemostatic for trivial cuts or wounds.

MATRICARIA,—the dried flower-heads of *Matricaria Chamomilla*, German Chamomile, a European annual plant of the nat. ord. Compositae. They contain $\frac{1}{4}$ per cent. of a blue Volatile Oil, the color of which is due to *Azulen*, also a bitter extractive, tannin, etc. There are no official preparations, but the flowers may be eaten or a decoction used almost *ad libitum* [av. \mathfrak{ziv} .]

Matricaria is a mild tonic, in large doses emetic, anthelmintic and antispasmodic. It is much used in Germany, and in this country is a popular domestic remedy among German people, who use it in infusions as a diaphoretic. This plant is the *Chamomilla* of the homeopaths, who find in it remarkable power over morbid impressionability of the sensory and excito-motor nerves, and administer it in pains aggravated at night and by heat, clonic spasms of pregnancy, irritability of teething children, and flatulent colic.

MEL, **Honey**,—is a saccharine secretion deposited in the honeycomb by *Apis mellifica*, the honey-bee; occurring as a pale-yellowish, syrupy liquid, gradually becoming crystalline and opaque, of peculiar and heavy odor, and

a very sweet, faintly acrid taste. It is a strong aqueous solution of several sugars (cane and grape sugar, levulose), with wax-pollen, coloring and odorous matters, etc. The sugars, which may be resolved into levulose and dextrose, amount to 70 or 80 per cent. Honey is frequently adulterated with starch and artificial glucose, which may be detected by the official tests (see U. S. Phar.). Dose, \mathfrak{zss} – \mathfrak{ij} [av. \mathfrak{zj} .]

Preparations.

Mel Depuratum, *Clarified Honey*,—is honey heated, skimmed and strained, with Glycerin added in the proportion of 5 per cent. It is an ingredient of *Confectio Rosæ*, *Mel Rosæ*, and *Massa Ferri Carbonatis*. Dose, \mathfrak{zss} – \mathfrak{ij} [av. \mathfrak{zj} .]

Mel Rosæ, *Honey of Rose*,—Fluidextract of Rose $\mathfrak{r2}$, Clarified Honey to \mathfrak{roo} . It is generally used as a local application to the throat for its astringency and flavor, in combination with more active agents. Dose, \mathfrak{zss} – \mathfrak{ij} [av. \mathfrak{zj} .]

Oxymel, *Oxymel* (B. P.),—has of Honey 8, Acetic Acid \mathfrak{r} , Distilled Water \mathfrak{r} . Dose, \mathfrak{zj} – \mathfrak{ij} as a pleasant addition to gargles, or as a vehicle for expectorant medicines.

Honey is emollient, nutritive and laxative, in some persons giving rise to pyrosis, flatulence and colic, and in others to an eruption of urticaria, but generally constituting an agreeable article of diet. It is sometimes actually poisonous from the presence of toxic agents extracted by the bee from certain plants, in this country generally the mountain laurel, *Kalmia latifolia*. Honey is chiefly used as an emollient in diseases of the throat, to relieve dryness, pain, cough and dysphagia. Honey of Rose is somewhat astringent, and is used in gargles or in washes, for the treatment of inflammation and ulceration of the mucous membrane of the nasal passages, the mouth and the throat.

MENTHA PIPERITA, **Peppermint**,—the dried leaves and flowering tops of *Mentha piperita*, a perennial herbaceous plant of the nat. ord. Labiatae, a native of Britain, but largely cultivated elsewhere. They contain \mathfrak{r} to $\mathfrak{r}\frac{1}{4}$ per cent. of a Volatile Oil, which is official, and a little tannin.

Menthol, $C_{10}H_{18}OH$,—is a secondary alcohol, obtained from the official oil of peppermint, or from other oils of peppermint, by deposit therefrom on exposure to cold. It occurs in colorless, acicular crystals, of peppermint odor, and a warm, aromatic taste, followed by a sensation of cold when air is drawn into the mouth. Soluble only slightly in water, freely in alcohol, ether, or chloroform. Dose, gr. ss– \mathfrak{ij} [av. gr. \mathfrak{j}], in pill or spirituous solution, several times a day.

Preparations.

Oleum Menthae Piperitæ, *Oil of Peppermint*,—is the volatile oil distilled from the fresh herb; a colorless or pale yellow fluid, having the odor of peppermint, and a strongly aromatic taste followed by a cold sensation when air is drawn into the mouth. It consists of a liquid terpene and Menthol (see above). Dose, \mathfrak{xxj} – \mathfrak{v} [av. \mathfrak{xxij} .]

Aqua Menthae Piperitæ, *Peppermint Water*,—has of the Oil 2 parts in 1000 of distilled water. Dose, \mathfrak{zij} – \mathfrak{vj} [av. \mathfrak{ziv} .]

Spiritus Menthae Piperitæ, *Spirit of Peppermint*, (*Essence of Peppermint*),—is an alcoholic solution containing 10 per cent. of the Oil and 1 per cent. of the bruised herb. Is an ingredient of *Mistura Rhei et Sodæ*. Dose, \mathfrak{xxx} – \mathfrak{xlv} [av. \mathfrak{xxx} .]

Incompatibles.

Incompatible with *Menthol* are: Borneol, Bromal Hydrate, Butyl-chloral Hydrate, Chloral Hydrate, Camphor, Chromic Acid, Euphorin, Exalgin, Naphtol, Phenol, Potassium Permanganate, Pyrocatechin, Pyrogallol, Resorcin, Thymol, Urethane. With *Spirit of Peppermint* are: Acacia, Aqueous fluids, Gelatin.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Peppermint is an aromatic stimulant, also carminative and antispasmodic. The oil possesses these qualities in greater degree and is also a local anodyne and anesthetic when applied locally, especially if its evaporation be prevented. The Chinese oil contains a large quantity of Menthol and is particularly anodyne. Menthol is antiseptic and locally anesthetic, but not corrosive, and acts also as a vascular stimulant when applied to the surface.

Peppermint is used internally for the relief of nausea and colic, and to expel flatus by its local stimulant and after sedative action on the bowels. It is an agreeable corrigent for combination with purgatives to prevent griping, and efficiently covers the taste of many nauseous substances. The spirit is the best form for internal use. The oil is used locally to relieve the pain of superficial neuralgia, a cloth being wet with it, laid along the course of the affected nerve and covered with oiled silk to restrain evaporation. It is efficient in rheumatism as an anodyne and counterirritant application.

Menthol is highly praised as an external application in various neuralgia, sciatica, pleurodynia, and toothache. For neuralgia it is used in saturated alcoholic solution painted over the affected nerve. For toothache a crystal introduced into the carious cavity is promptly anodyne. In spray containing 5 to 20 per cent. it is highly efficient in epidemic influenza and in tuberculous laryngitis. It is a good application in parasitic skin diseases, and has marked value as an antipruritic. Its vapor by inhalation is efficient against cough, and it has considerable power as an anti-emetic, having stopped nausea and vomiting after the usual remedies had failed. For this purpose ten drops of a 20 per cent. solution in olive oil are given on sugar.

MENTHA VIRIDIS, Spearmint,—the dried leaves and flowering tops of *Mentha spicata*, the "mint" of the kitchen garden, a plant of the nat. ord. Labiatae, indigenous to England, but naturalized in many countries. Its constituents and properties are identical with those of peppermint, but its odor and taste differ therefrom.

Oleum Menthae Viridis, Oil of Spearmint,—is the Volatile Oil distilled from the plant. Dose, ℥ij–v [av. ℥iij.]

Aqua Menthae Viridis, Spearmint Water,—has 2 parts of the Oil in 1000 of Distilled Water. Dose, ℥ij–vj [av. ℥iv.]

Spiritus Menthae Viridis, Spirit of Spearmint, (Essence of Spearmint),—is an alcoholic solution containing 10 per cent. of the Oil and 1 per cent. of the bruised herb. Dose, ℥x–xliv [av. ℥xxx.]

Spearmint corresponds in action to Peppermint, but is less powerful. It is employed to correct flatulence and to relieve colic, and makes an agreeable flavoring for mixtures.

METHYLTHIONINÆ HYDROCHLORIDUM, Methylthionine Hydrochloride, Methylene Blue,—a derivative of Aniline, occurs as a dark green

crystalline powder, or as prismatic crystals of bronze-like lustre; readily soluble in water, less so in alcohol, the solutions having a deep blue color. Dose, gr. j–vj [av. gr. iv], up to gr. xx daily, with gr. ij of powdered nutmeg given with each dose to prevent strangury. *Incompatibles* are Caustic Potassa, Potassium Dichromate, Potassium Iodide, Sulphuric Acid and other reducing agents.

Methylene Blue should not be confounded with Methyl Blue, the dye, which is highly poisonous. It manifests a strong affinity for nerve tissue, and is the best staining agent for the malaria plasmodium. It destroys the plasma of this organism, and is curative in the forms of malaria showing the crescents and full-grown parasites, while quinine is more efficient when the nuclei are more developed than the plasma (Ehrlich). Its best action in malarial affections has been obtained in children, and being tasteless it may be administered to them more easily than quinine, besides being free from the vomiting and headache which so frequently result from the latter drug. It has very considerable anodyne power over neuralgic and rheumatic affections, and has been employed as an antipyretic and internal antiseptic in rheumatism of the joints and muscles, also in acute nephritis and cancer with varying results. In diphtheria and simple ulceration of the throat a 10 per cent. solution is used locally with benefit. It has been employed successfully in chronic cystitis and diabetes mellitus, and has given satisfaction in several very obstinate cases of arthritis deformans. It has been used hypodermically for conditions of excitement in a number of cases of different forms of insanity, with very satisfactory results. In the early stage of gonorrhoea its internal administration will shorten the duration of the disease. It is rapidly eliminated by the kidneys, and imparts a blue color to the urine.

MEZEREUM, Mezereum (Mezereon),—is the bark of *Daphne Mezereum* and of other species of Daphne, plants of the nat. ord. Thymeleaceae, growing in mountainous districts of Europe and Asia and cultivated as a garden shrub in Britain. It contains an inert, fixed oil, an inactive glucoside, *Daphnin*, and an acrid *Resin*, which is the anhydride of a resinous acid named *Mezereinic Acid*. Mezereum is an ingredient of the compound fluid extract of Sarsaparilla. Dose, gr. j–x [av. gr. vijss.]

Fluidextractum Mezerei, Fluidextract of Mezereum,—is too acrid for internal use.

Mezereum is a sialogogue, and an intensely acrid, irritant poison, producing violent vomiting, purging, nephritis and gastro-enteritis. In small doses it is laxative and diuretic, and has had considerable reputation as an alterative. Externally the recent bark is a powerful local irritant, speedily producing vesication.

Mezereum is rarely used internally by itself, but is employed in mixtures with Sarsaparilla, etc., as an alterative in syphilis, rheumatism and some skin diseases of chronic type, but with doubtful efficacy. It has been used with good effect in toothache and as a masticatory in paralysis of the tongue. Its principal use is as a local irritant to keep up the discharge from issues or blisters, and to stimulate indolent ulcers.

MORRHUÆ OLEUM, Cod Liver Oil, (Oleum Jecoris Aselli),—is a fixed oil obtained from the fresh livers of *Gadus Morrhua*, the cod-fish, also from other species of *Gadus*. It is a colorless or pale yellow, thin, oily liquid, of slightly fishy odor and taste, and faintly acid reaction, soluble in ether. It contains the fixed bases *Aselline* and *Morrhuline*, volatile bases, acids, etc. (see below); also traces of iodine and bromine, the ordinary inorganic salts of animal

tissue and products, and perhaps bile constituents. When saponified it does not yield glycerin, but *oxide of propyl*. Three kinds or varieties are found in the market, the pale, the light-brown and the dark. The pale is the official oil and the purest. Dose, ʒj-vj [av. ʒiv], beginning with a small dose, and increasing as assimilated.

Preparations.

Emulsum Olei Morrhuæ, *Emulsion of Cod Liver Oil*,—has of the Oil ʒo, Acacia ʒ½, Syrup ʒo, Oil of Gaultheria ʒ.4, and Water to ʒo. Dose, ʒj-vj [av. ʒij.]

Emulsum Olei Morrhuæ cum Hypophosphitibus, *Emulsion of Cod Liver Oil with Hypophosphites*,—has of the Oil ʒo, Acacia ʒ½, Calcium Hypophosphite ʒ, Potassium Hypophosphite ʒ.5, Sodium Hypophosphite ʒ.5, Syrup ʒo, Oil of Gaultheria ʒ.4, and Water to ʒo. Dose, ʒj-vj [av. ʒij.]

Morrhuoil (Unofficial),—is obtained from cod liver oil by treating it with sodium bicarbonate to remove the acids, then agitating with alcohol and evaporating the latter. Dose, gr. iij in capsule.

PHYSIOLOGICAL ACTION.

The action of Cod Liver Oil is that of any other fat, except that it is more easily assimilated than any other member of the class. Fats in small quantity are necessary for the digestion of nitrogenous food and form the molecular basis of the chyle, being prepared for absorption by the pancreatic juice and the bile, especially the latter. Fat is an essential constituent of the products of tissue formation, whether physiological or pathological, and is the principal material concerned in the production of force. After oxidation it is excreted as carbon dioxide and water. Locally applied fats reduce the body-temperature.

Cod Liver Oil is the most easily digestible of fats, penetrating animal membranes with comparative ease after being emulsified by the pancreatic and biliary secretions, hence entering the lacteal vessels readily and appearing to carry with it the oily and nitrogenous elements of the food. The result is facilitation of the digestive process, increase of the red blood-corpuscles and of the body-weight, and stimulation of healthy cell-formation throughout the tissues.

Gautier and Mourgues of Paris have made an exhaustive series of analytical researches upon Cod Liver Oil, and find that it contains—(1) FIXED BASES, *Aselline* and *Morrhaine*, the latter constituting about ⅓ of the total alkaloids, and being probably one of the most efficient principles in the oil. (2) VOLATILE BASES, *Butylamine*, ⅓ of the total bases; *Amylamine*, ⅓ of the whole; *Dihydrotoluidine*, ⅓ of the total alkaloids; *Hexylamine*, a small amount. (3) ACIDS, *Morrhucic Acid* 1½ per cent., also a mixture of *Formic* and *Butyric Acids*; and a small proportion of *Phosphoric Acid*, derived from the phosphates, phospho-glycerates and lecithins of the extracts. As to the properties of these constituents they state that *Butylamine*, *Hexylamine*, and particularly *Amylamine* increase the urinary secretions. *Dihydrotoluidine* is a convulsivant toxic base. *Aselline* in sufficient doses produces dyspnea, stupor, convulsive disturbances, and if continued death. *Morrhaine*, the most important of the extractive principles, is a powerful stimulant of the functions of nutrition and assimilation, promoting metabolic changes; it produces a rapid circulation of the extractive residues of cell life towards the excretory organs, where they are eliminated, provoking in their way indirectly a powerful movement of assimilation correlative of the losses consequent upon the inverse movement of de-assimilation. This is considered to be proved by the super-excitation of appetite in animals brought under its influence. The physiological experiments with these substances demonstrate that cod liver oil is a reconstituent of the tissues through its richness in phosphates, phospho-glyceric acid, and organically combined phosphorus. Bromine and iodine, which are present in small quantities, also contribute to the reparative action, but chiefly to the active principles butylamine, amylamine, and especially morrhaine and morrhucic acid, does the oil owe its true medicinal value.

THERAPEUTICS.

The value of Cod Liver Oil is wholly that of a nutrient, its action being most marked in wasting diseases. In high febrile states or catarrhal conditions of the gastro-intestinal tract its use is contraindicated, but in phthisis a slight degree of fever will not interfere with its beneficial employment. It is found to be of most value in the chronic forms of phthisis, in chronic bronchitis and emphysema, chronic rheumatic disorders, atheroma of the arteries, strumous skin diseases and diarrhea, syphilodermata, neuralgia, chorea and epilepsy. In many disorders referable to exhaustion or debility of the nervous centres it is of great value as a nerve tonic, and in convalescence from acute diseases it is of marked benefit. It should always be considered as a supplementary food, and if its use endangers the appetite for other food it should be abandoned.

The administration of this valuable agent is a serious matter, as many patients cannot overcome their repugnance to its taste and smell. Various emulsions are on the market, but they are objectionable because in no case do they conceal the taste, and the efficacy of the oil is seriously impaired by the processes used in their preparation. Moreover, the temptation is very great to employ an inferior grade of the oil or to adulterate it with other fish oils in the manufacture of these preparations, and when the commercial spirit of gain is remembered one can never be sure of the quality of the oil so prepared. The oil itself is the best form for use, in small doses, say a teaspoonful thrice daily for an adult, after meals, in black coffee, beer or lemon-juice. The essential oil of eucalyptus in the proportion of 1 part to 100 of cod liver oil will effectually extinguish the odor and taste to many persons. Alkaline stomachics given before meals, the oil after, and a teaspoonful of Liquor Pancreaticus given half an hour afterwards, would be a good routine in most cases, the latter agent preventing the fishy eructations which often give so much trouble. Extemporaneous emulsions may be prepared with glyconin, white of egg, mucilage of tragacanth, extract of malt, or any syrup, and flavored with lemon, cinnamon or bitter almond. The addition of ʒiv of Ether to each ʒ of the oil promotes its digestion by stimulating the pancreatic secretion, and enables a patient to take it with whom it had previously disagreed.

Inunction by Cod Liver Oil is a method of value in the wasting diseases of children. A tablespoonful may be rubbed into the skin of the abdomen twice a day, and covered with a flannel binder having oiled silk or mackintosh-cloth outside. It readily passes through the skin and is absorbed, producing valuable and lasting results.

MOSCHUS, Musk,—is the dried secretion from the preputial follicles of *Moschus moschiferus*, the Musk-deer, an animal inhabiting the mountainous region of Central Asia. It occurs in irregular, unctuous grains, of a reddish-brown color, peculiar and penetrating odor and bitterish taste, contained in oval sacs about 2 inches in diameter, membranous on one side, hairy on the other. It is soluble in 10 of alcohol, and in 2 of water. Chinese Musk in the pods or sacs is the most valuable, but all varieties are adulterated, the price of the drug

being high. The odor is destroyed by drying, but returns again on the addition of moisture. Trituration with Camphor or Hydrocyanic Acid destroys it. The odorous principle has not been isolated, but is probably a product of decomposition which is constantly being formed. The constituents of Musk are a bitter resinous substance, ammonia, fat, cholesterin, etc. Dose, gr. ij-vj [av. gr. iv.]

Tinctura Moschi, *Tincture of Musk*,—5 per cent. Dose, ℥xx-ʒjss [av. ʒj.]

Musk is a very diffusible stimulant, acting directly on the nervous and circulatory systems, but without much energy. It is also an antispasmodic, and is employed with benefit in general prostration of the system with nervous agitation or irregular muscular action. It has been used with advantage in laryngismus stridulus, insomnia, the collapse of typhoid and typhus fevers, spasmodic affections of the stomach, obstinate hiccough and convulsions of children due to intestinal spasms. The pure Musk is very difficult to obtain, and its high price makes it an extremely expensive medicine, so that it is seldom used except as a perfume.

MYRCIÆ OLEUM, *Oil of Myrcia*, *Oil of Bay* (Unofficial),—is a volatile oil distilled from the leaves of *Myrcia acris*, the Bayberry, a tree of the nat. ord. Myrtaceæ, native of the West Indian Islands. It contains a hydrocarbon and *Eugenic Acid*. Used only as a perfume.

Spiritus Myrciæ, *Spirit of Myrcia*, *Bay Rum* (Unofficial),—contains Oil of Myrcia 16, Oil of Orange-peel 1, Oil of Pimenta 1, Alcohol 1220, Water to 2000.

The Oil of Bay is an agreeable perfume chiefly used in cosmetic preparations. The spirit, known as *Bay-rum*, is used principally as a refreshing perfume, and is thought to relieve headache and faintness, by applications to the forehead or to the nostrils.

MYRISTICA, *Myristica* (*Nutmeg*),—is the kernel of the ripe seed of *Myristica fragrans*, nat. ord. Myristicaceæ, a native of the Banda Islands. Its odor is strongly aromatic; its taste is agreeably aromatic, warm and slightly bitter. Dose, gr. v-xv [av. gr. vijss.]

Macis, *Mace* (Unofficial),—is the arillode (fleshy covering) of the seed of *Myristica fragrans*, the Nutmeg-tree. It occurs in narrow bands about an inch long, branched and lobed, of brownish-orange color, fragrant odor, warm and aromatic taste. It yields a fixed oil by pressure and a volatile oil by distillation, the latter being probably identical with Oil of Nutmeg. Dose, gr. v-xx.

Preparations.

Oleum Myristicæ, *Oil of Nutmeg*,—is the volatile oil, and consists chiefly of a terpene and an oxygenated oil, *Myristicol*. It is colorless or pale-yellow, of hot, spicy taste and neutral reaction, and is soluble in alcohol. Dose, ℥j-v [av. ℥ij.]

Nutmeg is an ingredient of *Acetum Opii*, *Pulvis Aromaticus*, *Tinctura Lavandulæ* Co., and *Trochisci Sodii Bicarbonatis*.

Incompatibles are Mineral Acids, Cinchona infusion, Ferrous Sulphate, Mercuric Chloride, Silver Nitrate.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Nutmeg is an aromatic stomachic of agreeable flavor. In small doses it stimulates the production of gastric juice, promotes digestion, increases appetite, and relieves intestinal spasm and flatulence. In large doses it is powerfully narcotic, acting directly on the cerebrum, and producing stupor and delirium. It is used chiefly for flavoring purposes, and generally in substance grated as required, but has been employed as a carminative, anodyne and astringent in diarrheas and dysentery, also to relieve nausea and vomiting. Strangury is efficiently treated by small doses of powdered nutmeg given several times a

day; and the same remedy is often used in the south of Germany to relieve the uncomfortable feeling experienced after drinking an excessive quantity of new beer. Grated nutmeg is used by women in England and Australia as an abortifacient, often with toxic results. The Volatile Oil is decidedly rubefacient when used externally, and has narcotic powers if used internally in sufficient quantity. It is occasionally employed as an external stimulant in paralysis and chronic rheumatism. Mace is stimulant, carminative and aromatic. It is used solely as a spice or condiment.

MYRRHÆ, *Myrrh*,—is a gum-resin obtained from *Commiphora Myrrha*, an Arabian tree of the nat. ord. Burseraceæ. It occurs in roundish tears, having a waxy fracture, a balsamic odor and a bitter taste. When triturated with water it forms a brownish-yellow emulsion; treated with alcohol it yields a brownish-yellow tincture which turns purple on the addition of nitric acid. It contains *Gum*, 60 per cent.; *Myrrhin*, a resin, 35 per cent.; also *Myrrhol*, $C_{10}H_{11}O$, an oxygenated ethereal oil, 2 per cent. Dose, gr. v-xv [av. gr. vijss.]

Tinctura Myrrhæ, *Tincture of Myrrh*,—20 per cent. Dose, ℥x-xxx [av. ℥xv.]

Myrrh is contained in *Mistura Ferri* Co., *Pil. Aloës et Myrrhæ*, *Pil. Rhei* Co., and *Tinctura Aloës et Myrrhæ*.

Locally applied Myrrh is stimulant and disinfectant to mucous membranes and ulcerated surfaces. Administered in small doses internally it acts as a gastric stimulant, but in large doses it irritates the gastro-intestinal mucous membrane, causing vomiting and purging. It quickens the action of the heart, diminishes bronchial secretion, and is a uterine stimulant and an emmenagogue. Myrrh is used in combination with other drugs, as noted above, for anemia, amenorrhea and bronchial catarrh. It is believed to diminish excessive secretion from the mucous surfaces of the uterus, vagina, bladder and bronchi, also to have an especially beneficial influence on chronic pharyngitis. Locally used the tincture has a good tonic action on diseased mucous surfaces and is applied with benefit to spongy gums, relaxed throat, aphthous patches and unhealthy ulcers, and diluted with water it makes an excellent gargle for ulcerated sore throat. Myrrh has long been employed as an ingredient of dentifrices.

Binz observed that the internal administration of Myrrh produced a leucocytosis in which the white blood-cells were increased to four times their original number. This fact has been made the basis of treatment in severe cases of diphtheria by Stroll, who reports 80 cases so treated with only one death, and has collected nearly 300 cases in which the same treatment was employed with strikingly good results. His prescription has of the tincture 4, glycerin 8, and distilled water to 200 parts, of which ʒj under 2 years of age, ʒij up to 15 years, and ʒiij-iv for adults, every half hour or hour until the symptoms moderate, then every two hours, continued for 48 hours after the membrane disappears.

MYRTI OLEUM, *Oil of Myrtle*, *Myrtol*, (Unofficial),—is a volatile oil distilled from the leaves of *Myrtus communis*, the myrtle, nat. ord. Myrtaceæ, and consists of a mixture of *Pinene*, another hydrocarbon, and *Cineol*; the latter

being identical with eucalyptol, and probably the active medicinal ingredient. Dose, m j-ij , in capsules.

Myrtol is a very active antiseptic and parasiticide. Applied to a raw surface it is sufficiently irritant to excite inflammation, but it does not so affect the unbroken skin. Internally, in small doses, it excites a sense of warmth in the mouth, increases the saliva, and acts as a tonic to the stomach. Full doses are sedative to the nervous system, but large ones act as an irritant. It is eliminated by the lungs and kidneys, acting as an expectorant, an antiseptic and a stimulant to the mucous membranes at the points of elimination. It imparts an odor like that of violets to the urine of the person taking it.

Administered in small doses, Myrtol aids digestion, and is an efficient disinfectant and alterative in bronchorrhœa, fetid bronchitis and gangrene of the lung; and in cystitis and urethritis it acts similarly through the urine on the local mucous membrane. It may be expected to give good results in chronic and capillary bronchitis, whooping-cough and humid asthma. It has rendered good service in hematuria not due to acute congestion, and in passive hemorrhages generally. Locally it has proved curative in favus, herpes, pityriasis and parasitic skin diseases; also in otorrhea, ozena and other foul discharges from ulceration of the mucous membranes. It has been employed successfully against both the round and the thread worm.

Chekan (Unofficial),—the leaves and shoots of *Myrtus Chekan*, nat. ord. Myrtaceæ, a native of Chili. They contain a Volatile Oil resembling that of eucalyptus, also *Chekanine*, a volatile alkaloid, and tannin. Chekan is antiseptic, tonic, expectorant and diuretic; and is chiefly used in catarrh of the mucous membranes, especially, those of the bronchi and the bladder. It has been employed with benefit in cases of phthisis, and in bronchitis with thick, purulent expectoration. The expressed juice diluted with water makes a good lotion for conjunctivitis, and a decoction of the bark is valued as an astringent in dysentery. A fluid extract is marketed, the dose of which is ʒj-ij .

NAPHTHALENUM, Naphthalene, (Naphthalin), C_{10}H_8 ,—is a hydrocarbon obtained from coal-tar, and is formed during the manufacture of ordinary coal gas. Chemically, it is one of the benzene derivatives, being formed by the union of two benzene groups in an overlapping ring (see page 232). When redistilled, it crystallizes in colorless, rhomboid plates, of slightly tarry but strong odor, and burning, aromatic taste; insoluble in water, soluble in 15 of alcohol, very soluble in boiling alcohol, ether, chloroform, carbon disulphide, and fixed or volatile oils. It is seen frequently in the form of moulded blocks, under such names as *Alabastrine* and *Camphylene*, for preserving furs and flannels from moths, and for disinfecting urinals. Dose, gr. j-ij [av. gr. ij], in emulsion, or as a powder with sugar in wafers or capsules.

Derivative.

Beta-Naphthol, Beta-naphthol (Naphthol), $\text{C}_{10}\text{H}_7\text{OH}$,—a phenol occurring in coal-tar, but usually prepared from Naphthalene. It is one of several naphthols, and occurs in colorless, shining, crystalline laminae, or a whitish, crystalline powder, of faint, phenol-like odor, and sharp taste. Soluble in $\frac{1}{2}$ of alcohol, in about 1000 of water, and in 75 of boiling water; very soluble in boiling alcohol, ether, chloroform, olive oil and petrolatum. Used as ointment,

1 to 5 for adults, but for children it should be not over 2 per cent. strength. Dose, gr. ij-vj [av. gr. iv], in cachet or pill.

Unofficial Preparations and Derivatives.

Hydronephthol,—is said to be an impure beta-naphthol. It occurs in glistening, mica ceous scales, freely soluble in alcohol, glycerin, and fixed oils, in 2,000 of cold water, in 100 of hot water, precipitating as the water cools but leaving a saturated solution of 1 in 1,000. A powerful and non-irritating antiseptic and germicide. Dose, gr. j-ij or more, in pills coated with keratin or salol.

Naphthol Camphoratum, Camphorated Naphthol, Naphthol Camphor,—is prepared by heating carefully one part of beta-naphthol with two of camphor; the product being a homogeneous, oily fluid, which is insoluble in water, and decomposes readily on exposure to light and air. Used as a parenchymatous injection, the undiluted fluid being well borne, or in Olive oil, in doses of ʒij-v .

Asaprol,—is calcium beta-naphthol alpha-monosulphonate, and occurs as a white powder soluble in water. It is used as an antipyretic and analgesic in sciatica and rheumatism, also in chronic nephritis. Dose, gr. v-xv .

Betol,—is the salicylate of beta-naphthol ester, occurs in small, white, tasteless crystals, soluble in alcohol and fixed oils, insoluble in water. It is used in rheumatism, cystitis, and intestinal catarrh, also in pencils for gonorrhœa. Dose, gr. ij-vij , as powder, or in pills with glucose.

Benzonaphthol,—is prepared from beta-naphthol by the action of benzoyl chloride, and occurs as a white, tasteless powder, almost insoluble in water. It is used as an intestinal antiseptic and disinfectant in typhoid fever and tropical dysentery. Dose, gr. v-xv .

Epicarin,—a combination of beta-naphthol and creosotic acid, is a non-poisonous parasiticide, which has been used as a 5 to 10 per cent. ointment with Lanolin as a base, for scabies and prurigo with most satisfactory results.

Incompatibles.

Incompatible with *Naphthalene* are: Chromic Trioxide, Phenol, Pyrocatechin, Salol. With *Beta-naphthol* are Antipyrine, Borneol, Camphor, Chlorinated Lime, Exalgin, Ferric Chloride, Menthol, Phenol, Potassium Permanganate, Pyrocatechin, Urethane. With *Asaprol* are Antipyrine, Bicarbonates, Iodides, Quinine, Sulphates.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Naphthalene is destructive to all forms of low life, and hence is antiseptic in a high degree, but must be intimately mixed with the substances upon which it is to act. Internally it is a stimulant expectorant of decided power, and disinfects the contents of the intestinal canal. Being sparingly soluble but little of it is absorbed, and hence it does no injury to the organism. What is taken up by the blood is excreted by the urine, partly unchanged, partly as naphthol and perhaps some as phenol. Beta-naphthol is more easily absorbed and may induce vomiting, hematuria, convulsions and unconsciousness. An ointment containing 2 per cent. applied with friction for scabies to two brothers, aged 6 and 8 years respectively, caused nephritis in both and death in one, the diagnosis of nephritis being verified at the autopsy.

Naphthalene is employed as an antiseptic for the intestinal canal in typhoid fever, diarrhea, both acute and chronic, tuberculous diarrhea, and dysentery. It renders the urine aseptic and may be employed in vesical catarrh. It is used internally for humoral asthma, verminous affections, the chronic pulmonary catarrh of the aged, and chronic bronchitis with copious secretion. It is said to be effective as a teniacide, also as a vermifuge for seat-worms given by in-

jection, gr. xv-ʒss in ʒij of olive oil. Burned in the patient's room it has given excellent results in pertussis, giving force to the belief that the well-known benefit resulting from taking children to gas-works for whooping-cough is due to the naphthalene fumes rather than to those of the gas-tar. Locally, Naphthalene has high value as an antiseptic for indolent ulcers, sloughing wounds, open cancers, and pus cavities. Painted over organic remains it effectually prevents the ravages of insects, and has largely supplanted camphor for protecting woolen clothing from moths.

Beta-naphthol is used in the form of a 2 per cent. soap in prurigo, herpes, ichthyosis and favus, also in a ½ to 5 per cent. alcoholic solution, or as a 10 per cent. ointment, for hyperidrosis, scabies, and eczema, but it is a dangerous and irritant application. Internally it has been employed in typhoid fever, dilatation of the stomach, intestinal dyspepsia, diarrhea and dysentery. Its germicidal rank is probably second to many other agents, but it has value as an internal antiseptic, being nearly free from toxic action on the higher animals in medicinal doses.

Asaprol is a safe internal antiseptic, antipyretic and analgesic. It has been used with benefit in epidemic influenza, rheumatism, sciatica and chronic nephritis, but its most brilliant results have been obtained in atonic dyspepsia, when fermentation alternates with acid eructations. It is not irritant to the intestinal canal, and may be used internally instead of naphthol.

Camphorated Naphthol has been employed for the irrigation of joints, bony cavities, tendinous sheaths, cold abscesses, in the pleural and uterine cavities, and in tuberculosis of the bladder, all these localities seeming to tolerate the undiluted fluid well. In tuberculous adenitis and tuberculosis of the testis, it was used hypodermically in several cases with gratifying results (Reboul).

NITROUS OXIDE, Nitrogen Monoxide, Laughing Gas, N₂O, (Unofficial),—is a colorless and odorless gas of slightly sweetish taste, produced by the distillation of Ammonium Nitrate, and supplied by the manufacturers in condensed form. Inhaled it causes mental excitation, followed by brief general anesthesia, during which the blood pressure is raised, and the face is bloated and cyanosed by venous stasis as in other forms of asphyxia. The anesthetic effect is partly due to its depriving the subject of oxygen, partly to its own inherent cerebral action. It stimulates the vaso-motor centre, has no definite action on the heart, does not affect the motor nerves, and has only a feeble influence on the spinal cord. The after-effects are slight, and usually consist of dizziness and light-headed sensations lasting a few hours. Death occurs by asphyxia from paralysis of respiration.

Nitrous Oxide is the safest of all anesthetics, only nine deaths being recorded as caused by it, though it is administered to more than 750,000 persons yearly. It is applicable to minor operations only, its anesthesia being of brief duration with a rapid return to consciousness. Some operators administer it mixed

with oxygen, in order to lessen the asphyxial symptoms, but this method has been generally abandoned for the pure gas alone, giving oxygen when indicated by the facial expression of the subject. It is contraindicated when there is any impediment to free breathing, also when atheroma or other arterial disease exists on account of the high blood pressure which it produces. It gives rise to erotic sensations which may result in false accusations, hence it should not be administered to women without the presence of a witness. It may be used as a preliminary inhalation before the use of ether, but chloroform should not be inhaled immediately after the gas without giving time for the cyanosis to clear up.

NUX VOMICA, Nux Vomica, (Poison Nut, Quaker Button)—is the dried, ripe seed of *Strychnos Nux-vomica*, a tree of the nat. ord. Loganiaceæ, growing in India, Cochin-China and the neighboring countries, all parts of which are bitter and poisonous. The seeds are flattened and nearly circular, about one inch in diameter, ashy-gray in color, covered with short, satiny hairs, internally translucent, tough and horny, with a large cavity; inodorous, but of intensely bitter taste. They contain the alkaloids *Strychnine* and *Brucine* (see below), in combination with *Igasuric (Strychnic) Acid*, also the glucoside *Loganin*, a yellow coloring matter, a concrete oil, gum, starch, wax, and earthy phosphates. Dose, gr. ss-ʒss [av. gr. j.]

Preparations of Nux Vomica.

Extractum Nucis Vomicae, Extract of Nux Vomica,—should contain 5 per cent. of strychnine. Dose, gr. ¼-½ [av. gr. ¼] up to a maximum in 24 hours of gr. ij.

Fluidextractum Nucis Vomicae, Fluidextract of Nux Vomica,—should contain 1 per cent. of Strychnine. Dose, ʒss-ʒss [av. ʒj.]

Tinctura Nucis Vomicae, Tincture of Nux Vomica,—should contain 1/10 per cent. of strychnine. Dose, ʒv-xv [av. ʒxx.]

Alkaloids and their Salts.

Strychnina, Strychnine, C₂₁H₂₂N₂O₂,—is an alkaloid obtained from Nux Vomica, *Ignatia*, and other plants of the order Loganiaceæ; crystalline, intensely bitter even in 1 to 700,000 solution, of alkaline reaction, soluble in 7 of chloroform, 110 of alcohol, 6700 of water. It is a constituent of *Ferri et Strychninae Citras, Pil. Laxativa Comp., and Syrupus Ferri Quininae et Strychninae Phosphatum*. Dose, gr. 1/100-1/30 [av. gr. 1/4.]

Strychninae Sulphas, Strychnine Sulphate,—crystalline, efflorescent, odorless, of intensely bitter taste, even in 1 to 700,000 solution, neutral reaction, soluble in 50 of water, in 100 of alcohol, and in 2 of boiling water, insoluble in ether. It contains 75 per cent. of Strychnine. Dose, gr. 1/100-1/20 [av. gr. 1/4], but after tolerance is attained much larger doses may be safely used.

Strychninae Nitras, Strychnine Nitrate,—forms colorless needles of a silky lustre and very bitter taste, soluble in 90 parts of cold water, 3 of boiling water, in 70 of alcohol, and in 26 of glycerin, insoluble in ether. It contains 84 per cent. of Strychnine, and is preferred to the sulphate for hypodermic use, being less irritant. Dose, 1/100-1/20 [av. gr. 1/4], or more after tolerance is attained. The Phar. Ger. gives the maximum single dose as gr. 1/8, the daily maximum as gr. 1/4.

Strychninae Arsenis, Strychnine Arsenite (Unofficial),—is soluble in 35 parts of cold water, in 10 of boiling water, also in alcohol, less so in ether. Dose, gr. 1/100-1/30. As it is highly toxic, the initial dose should never exceed the minimum given.

Brucina, Brucine, C₂₃H₂₄N₂O₄ (Unofficial),—occurs in colorless prisms, pearly flakes or masses, bitter, soluble in 850 parts of water and in 1½ of alcohol. It is separated with