In the liver the originally inorganic iron is converted into higher forms and eventually into hemoglobin, ferratin being probably one step in the series. When there is no deficiency of iron in the system the liver slowly yields its store to the blood again, to be carried to the cecum and large intestine, by the epithelium of which it is finally excreted.

The doctrine of Kletzinsky, Bunge and others, concerning the non-absorption of iron, though often shown to be erroneous, is occasionally resuscitated by writers and teachers of medicine. Briefly stated, this doctrine is as follows: That the iron existing in food-stuffs as a constituent of nucleo-albumin is the only source of iron supply to the system for the formation of hemoglobin. That no iron compound administered by the stomach is absorbed, but after conversion to a chloride by the gastric juice the only function of iron so administered is to chemically satisfy the hydrogen sulphide and other sulphur compounds in the intestinal canal, thereby protecting the ingested food-iron from attack by these sulphur compounds and permitting it to enter the system. Against this theory have been urged the facts that no metal replaces iron in the treatment of chlorosis, though others would similarly satisfy the sulphur compounds; that iron is curative in chlorosis when injected hypodermically, and that the sulphide administered so as to reach the intestines unchanged acts as well as other iron preparations. Furthermore, it has been shown that ordinary preparations of iron given internally are absorbed; also that anemia is not necessarily accompanied by intestinal putrefaction; while it has never been demonstrated that hydrogen sulphide is invariably present in the intestinal canal of chlorotic subjects.

Therapeutics.

The chief indication for the internal administration of Iron is anemia, when plethora, hemorrhage or fever exist it is contraindicated. It should always be given after meals, and occasionally suspended for a time, to avoid deranging the stomach. It is generally considered useless to prescribe iron in any form until after constipation has been relieved and a regular action of the bowels established. When the appetite and digestion are improved by Iron it will do the greatest amount of good, many authorities holding that the principal benefit derived from its use, even in anemia, is due to its stimulating action upon digestion and the primary assimilation. The sulphate is one of the most efficient salts and is well used in combination with aloes when any intestinal torpor exists, especially as it increases the cathartic power of the latter drug, economizing it, and conferring upon it a permanence of action, which alone it does not possess. In chlorosis, pseudo-leucocythemia, chorea of anemic girls at the age of puberty, epilepsy and neuralgia of the anemic, amenorrhea and other menstrual disorders of the same class of subjects, and in acute rheumatism of pale, cachectic persons, the chalybeates are generally very efficient remedies, especially the tincture of the chloride. The same preparation is extensively employed in erysipelas and diphtheria with good results, and in albuminuria with chronic disease of the kidneys it is a useful chalybeate diuretic. In many cardiac diseases of the anemic, fatty heart, weak heart, dilatation, and mitral disease, ferruginous preparations are often of signal advantage. In the syphilitic cachexia, chancroid, and sloughing phagedena, the iodide gives good results, particularly when the subject is one of debilitated constitution. In the nocturnal incontinence of children the syrup of the iodide is one of the most efficient remedies. In all chronic affections of the respiratory organs, when hemorrhage is not existing or threatened, the iron, quinine and strychnine phosphate is used with much benefit. In passive hemorrhages, especially when due to anemia, the tincture of the chloride is very effective, and in all active bleeding the solution of the subsulphate locally used is a prompt and efficient hemostatic. A weak solution of the latter preparation (ʒj ad ℥viij), used in the form of spray, is one of the most serviceable astringents in obstinate epistaxis, and in hematemesis the same solution may be swallowed in small quantities at short intervals. In chronic diarrhea and dysentery the solution of the subsulphate is an efficient astringent, and a weak solution of the chloride is used as a rectal injection in tropical dysentery and against thread-worms. The sulphate is much employed as a cheap disinfectant for sewage, its action being to precipitate the proteids, which carry down the bacteria mechanically. The hydroxide is the most effective antidote in arsenical poisoning, as it forms with arsenic trioxide an almost insoluble compound. The solutions used in its preparations should be kept on hand and mixed only when wanted for use. Hemogallol has been used with satisfaction in all anemic conditions, especially those which are part of the suboxidation affections, as Bright's disease and diabetes mellitus; also in anemic cases with feeble digestion, and in children, even the weakest and those of the most tender age.

FICUS, Fig,—is the partly dried fruit of *Ficus Carica*, the fig-tree, nat. ord. Moraceæ, a native of the shores of the Levant, but cultivated in Southern Europe and in other warm countries. Figs contain about 62 per cent. of grape sugar, also gum, fat, etc., and are a constituent of the official Confectio Sennæ.

Figs are demulcent, laxative and nutritious. They are used in their fresh state as an aliment, but if eaten in quantity may produce flatulence, enteralgia and diarrhea. They are chiefly used as an article of diet in habitual constipation, but may be employed as an ingredient of demulcent decoctions, and locally as a poultice to gum-boils.

FŒNICULUM, Fennel,—is the dried fruit of *Fœniculum vulgare*, a European cultivated plant of the nat. ord. Umbelliferæ It contains a volatile oil, which is a constituent of Pulvis Glycyrrhizæ Compositus, and Spiritus Juniperi Compositus. Dose, gr. v–xx [av. gr. xv.]

Oleum Fœniculi, *Oil of Fennel,*—the volatile oil, a light yellow-colored liquid, having the odor of fennel, a warm taste and neutral reaction, soluble in alcohol. Dose, ♏ij–v [av. ♏iij.]

Aqua Fœniculi, *Fennel Water,*—contains 2 parts of the oil in 1000 of distilled water. Dose, ʒj–ℨj [av. ʒiv.]

Fennel is an aromatic stomachic and a mild stimulant. It is chiefly used as an agreeable carminative in flatulence and colic, and as a corrigent to Senna, Rhubarb, and other disagreeable medicines. An infusion is often used as an enema to expel flatus in infants.

FORMALDEHYDE, Formic Aldehyde, *Formyl*, CH_2O,—is a gaseous aldehyde obtained by the oxidation of methyl alcohol. It has a low specific gravity, mixes readily with air, and is soluble in water and in alcohol. It does not affect the color or structure of clothing or other fabrics in common use. The official preparation is—

Liquor Formaldehydi, *Solution of Formaldehyde*,—commercially known as *Formalin*, is an aqueous solution, containing not less than 37 per cent., by weight, of absolute formaldehyde. It is miscible in all proportions with water and alcohol. One part by volume added to 40 of water makes a 1 per cent. solution of formaldehyde. To prevent polymerization it should be mixed with an equal quantity of a saturated solution of boric acid, or a 2 per cent. solution of borax, or with glycerin.

Official Derivative.

Hexamethylenamina, *Hexamethylenamine*, $C_6H_{12}N_4$, commonly known under the trade name *Urotropin*,—is a condensation product obtained by the action of ammonia upon formaldehyde. It occurs in colorless, odorless crystals, readily soluble in water, and in 10 of alcohol, decomposed by diluted sulphuric acid, liberating formaldehyde. Dose, gr. j–x [av. gr. iv], up to ℥j daily, in water or carbonated water.

Unofficial Preparations.

Glyco-formalin,—has of Formaldehyde 30, Glycerin 10, Water 60, the glycerin preventing the polymerization of the gas and the formation of paraform.

Paraform, $C_3H_6O_3$,—is the solid polymeric form of formaldehyde, which it gives off when slowly heated. It occurs as a colorless, crystalline powder, of stable constitution, insoluble in water.

Unofficial Compounds.

Numerous compounds of Formaldehyde with other substances are marketed under various trade names, the most important of which are as follows:—

Amyloform,—is a combination of Formaldehyde with starch, and is used as an antiseptic dusting powder.

Citarin,—is *sodium anhydro-methylene citrate*, a white powder, of pleasant, acidulous taste, freely soluble in water. It liberates formaldehyde in the blood and thereby forms soluble combinations with uric acid. Dose, gr. xv–xxx, 3 or 4 times daily.

Dextroform,—a combination of formaldehyde and dextrin, is soluble in water and in glycerin, and is used as an antiseptic dressing.

Forman,—is a mixture of formaldehyde, menthol, and hydrochloric acid, used by inhalation for acute nasal and laryngeal catarrh.

Glutol,—is prepared by the action of formaldehyde on gelatin, and is used as an antiseptic surgical dressing.

Helmitol,—the *methylene-citronate of hexamethylenamine* (*urotropin*), occurs as a white, crystalline powder, readily decomposed by alkalies, soluble in water up to 7 per cent., and gives off formaldehyde more readily than urotropin. It is used as a urinary disinfectant in doses of gr. xxx, up to ℥j or ℥ij daily.

Ichthoform,—a combination of formaldehyde and ichthyol, is described under the title SULPHUR.

Igazol,—a combination of formaldehyde, paraform, and iodine, is used in Italy by inhalation and also internally in pulmonary tuberculosis.

Tannoform,—a condensation product of formaldehyde and tannic acid, is described on page 70.

Thymoform,—a product of the combination of formaldehyde and thymol, is soluble in alcohol, ether, chloroform, and olive oil; insoluble in water and in glycerin. It is used as an antiseptic dressing.

Incompatibles.

Incompatible with *Formaldehyde* are: Albumin, Alkalies, Ammonia, Bisulphites, Gelatin, Iron preparations, Phenylhydrazine; Salts of Copper, Gold, and Silver, Tannic Acid.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Formaldehyde is powerfully antiseptic and disinfectant, ranking next below Mercuric Chloride as a germicide, and above it in being but slightly toxic to the higher animals. A solution of 1 in 20,000 kills most bacteria if the contact is prolonged, and a 1 per cent. solution destroys all pathogenic spores within an hour. It is probably the most reliable disinfectant for general use, when employed in connection with moist air. It is largely used for the disinfection of instruments, furniture, clothing and rooms; the gas being disengaged by heating the solution or paraform, or by the partial combustion of methyl alcohol in special lamps. To thoroughly disinfect a room, it should be made as air-tight as possible, the gas then introduced through the key-hole of the door, and the room kept closed for ten hours. The amount of the solution required is about five ounces for each 1000 cubic feet of space. Clothing and bed-linen should be unfolded and hung loosely on a line in the room, so that the gas may have free access to the fabrics. As a deodorant it is very efficient, entirely removing the smell of sulphuretted hydrogen, and destroying the peculiar methyl-mercaptan odor of fecal matter.

Formaldehyde is intensely irritant to mucous membranes, a minute quantity in the atmosphere causing violent irritation of the conjunctivæ and the lining of the respiratory tract, with stinging and prickling in the nose and throat, tears, salivation, and catarrh. In concentrated solution it coagulates albumin and gelatin, and applied to the skin it produces a leathery condition which may pass into a localized necrosis without suppuration, leaving the surface with the appearance of a recently healed wound. It is much too irritant to be generally available as a surgical antiseptic, the application of a 1 per cent. solution to an ulcerated surface causing intense and prolonged pain. It is used however by surgeons in tuberculous joints and abscesses, infected wounds, suppurating buboes, and infectious inflammations of mucous membranes. Solutions of 1 per cent. strength are sufficiently strong for most local purposes, and when sprayed above the patient's head by a steam-atomizer for 20 minutes thrice daily have proved highly efficient in whooping-cough and chronic bronchitis. Weaker solutions (½ per cent.) are used as gargles and mouthwashes and for the irrigation of cavities, and stronger ones (2½ per cent.) for psoriasis, lupus and other skin diseases. Solutions of 1 part in 2,000 or 3,000 are recommended for local application in the septic abrasions of the cornea ending in hypopyon ulcers, which form so large a part of ophthalmological work in manufacturing communities.

Internally the aqueous solution produces in animals nausea and vomiting, followed by quick respiration, narcosis and coma, and in the rabbit convulsions and opisthotonos. Small doses raise the blood pressure, but a toxic one depresses the circulation, and acts on the blood, changing the form of the cells, and causing immediate coagulation on exposure, with separation of a dark red serum. The injection of 250 Cc. of a 1 in 2000 solution into the arm produced

in one case bloody and albuminous urine. It causes less severe symptoms when given hypodermically than when taken by the stomach in the same quantity. Large doses may be injected subcutaneously, and though painful will not give rise to systemic effects. A portion of the absorbed gas passes through the tissues unchanged, and is excreted in the urine. It has been used by the stomach to prevent fermentation in chronic gastritis and gastrectasis; also by inhalation and intravenous injection in pulmonary tuberculosis, with doubtful results. The injection of the aqueous solution is said to have proved curative in a case of sarcoma of the naso-pharynx, and applied locally to have caused marked improvement in lupus of several years' standing. The intravenous injection of a 1 to 5,000 solution in puerperal septicemia was followed in one case, Barrow's, by prompt reduction of the temperature from 108° F. to 95°, and eventual recovery, but proved futile in other cases, and has not received professional approbation.

Formaldehyde solutions are used for the hardening and preservation of pathological material and cadavers, but have many disadvantages. The emanations from such preparations are irritant to the hands and the respiratory mucous membrane, and a body injected with formaldehyde is too rigid for purposes of demonstration.

Hexamethylenamine (Urotropin) is decomposed in the organism, formaldehyde being set free and being eliminated in the urine. Ordinary medicinal doses cause no general effects as a rule, but in susceptible persons it may cause gastric and renal irritation, with hematuria, hemoglobinuria, and albuminuria, also diarrhea, abdominal pain, a measly rash, headache, tinnitus aurium, and strangury. It is an excellent urinary and intestinal antiseptic, and possesses considerable power as a solvent of uric acid, the excretion of which it promotes. It is particularly efficient as an alterative and diuretic in the treatment of cystitis, pyelitis, and phosphaturia.

Citarin is indicated in all forms of the uric acid diathesis, including lithemia, gout, rheumatoid arthritis, and renal uratic calculi. It is administered in aqueous solution well diluted, in this form making a pleasant acidulous drink.

FRANGULA, Frangula, (*Buck-thorn*),—is the bark, collected at least one year before being used, of *Rhamnus Frangula*, the alder buckthorn, a European shrub of the nat. ord. Rhamnaceæ. It contains several principles, of which the only important one is *Frangulin*, or *Rhamnoxanthin*, a lemon-yellow, odorless and tasteless glucoside, insoluble in water and but sparingly so in alcohol or ether, and thought to be identical with Cathartin, the active principle of Senna. Another species of the genus Rhamnus is described under the title RHAMNUS PURSHIANA. Dose, gr. x–xxx [av. gr. xv.]

Fluidextractum Frangulæ, *Fluidextract of Frangula.*—Dose, ♏x–xxx [av. ♏xv.]

Frangula-bark when fresh is a violent irritant to the gastro-intestinal tract, producing vomiting, purging, and much pain. The old dried bark is a safe purgative without irritant qualities, and is much used in the constipation of pregnancy, and other conditions requiring purgation. The fluidextract is the best form for administration.

FUCUS VESICULOSUS, Bladder-wrack, *Sea-wrack* (Unofficial),—is a perennial plant of the nat. ord. Algæ, growing on the shores of the Atlantic and Pacific Oceans as a seaweed. It has a flat leaf, with a midrib throughout its length, and small spherical vesicles, filled with air, in the leaf. It contains mucilage and much Soda in saline combination, also Iodine, but less of the latter than other algæ growing in deeper water. A decoction of the fresh plant is the best form for administration.

Fucus Vesiculosus is one of a number of marine plants which are used in various parts of the world as food for man and cattle and as manure. The species under consideration is considered alterative and tonic, and has been employed in goitre, glandular and joint enlargements and psoriasis, but especially to produce absorption of adipose tissue in the obese. An extract is sold under the title "Anti-fat."

GALBANUM (Unofficial),—is a gum-resin obtained from *Ferula galbaniflua*, an Asiatic plant of the nat. ord. Umbelliferæ, and probably from other allied plants. It occurs in minute tears, agglutinated into a hard mass, of balsamic odor and acrid, bitter taste. It contains a *Volatile Oil* isomeric with Turpentine, a Gum, and a mixture of Resins which yield by dry distillation a blue oil and *Umbelliferon*, a tasteless substance in satiny crystals. Dose, gr. x–xx, in pill or emulsion.

Galbanum is stimulant, expectorant and antispasmodic, acting much like Ammonia and Asafetida, and usually given with either of these substances. It is used in chronic bronchitis and catarrh of mucous membranes generally, in amenorrhea and chronic rheumatism.

GAULTHERIA, Wintergreen (Unofficial),—is the leaf of *Gaultheria procumbens*, an American evergreen plant of the nat. ord. Ericaceæ. Its active principle is the *Volatile Oil*, which is official. It also contains Tannic Acid, Arbutin, Ursone, Ericolin, etc.

Oleum Gaultheriæ, *Oil of Gaultheria,*—is the volatile oil, a liquid of peculiar and aromatic odor, sweetish, warm taste, and a slightly acid reaction. It is readily soluble in alcohol, and consists of *Methyl Salicylate* 90 per cent., and *Gaultherilene*, a hydrocarbon, 10 per cent. Dose, ♏v–xxx [av. ♏xv.] It is nearly identical with the Volatile Oil of Betula.

Spiritus Gaultheriæ, *Spirit of Gaultheria,*—has of the oil 5 per cent., dissolved in alcohol. Used for flavoring. Dose, ♏x–℥j [av. ♏xxx.]

Gaultheria is stimulant and slightly astringent. Its chief value is as one of the sources of the oil named after it, which is also found in the sweet birch, and many other plants, and, containing so large a proportion of Methyl Salicylate or Methylsalicylic Acid, is powerfully antiseptic and antipyretic. In large doses it is irritant to the stomach, in one case ℥j having caused death by violent gastritis.

Oil of Gaultheria is used successfully as a substitute for Salicylic Acid in many conditions, especially in rheumatic and gouty disorders. The plant has been used as an emmenagogue and a galactagogue, but its principal employment is in the form of the spirit as an agreeable flavoring agent.

GELSEMIUM, Gelsemium, (*Yellow Jasmine*),—is the dried rhizome and roots of *Gelsemium sempervirens*, a climbing plant of the nat. ord. Loganiaceæ, with showy yellow flowers, which grows in the forests of the southern states, forming festoons from one tree to another. It contains a volatile oil, a resin and two alkaloids, *Gelsemine*, which forms crystalline salts and is only slightly active, and *Gelseminine*, which is amorphous and highly toxic. Dose, gr. ss–ij [av. gr. j.]

Preparations.

Fluidextractum Gelsemii, *Fluidextract of Gelsemium,*—Dose, ♏ss–ij [av. ♏j.]

Tinctura Gelsemii, *Tincture of Gelsemium,*—strength 10 per cent. Dose, ♏v–xv [av. ♏viij.]

Gelsemina, *Gelsemine,* (Unofficial),—as it occurs in commerce is a mixture of the alkaloids in varying proportions, and owes its activity to its contained Gelseminine, of which none could be found in some samples. Dose, gr. $\frac{1}{60}$–$\frac{1}{20}$.

Incompatibles.

Incompatible with *Gelsemium* preparations are: Caustic Alkalies, Tannic Acid and other alkaloidal precipitants (see page 5). Physiologically incompatible are: Morphine, Digitalis, Ammonia, Alcohol, Xanthoxylum fraxineum.

Physiological Action.

Gelsemium is a motor and respiratory depressant, acting on the anterior cornua of the spinal cord and the respiratory centres. Later in its action it depresses sensation. Its symptoms resemble those of Conium very closely, differing therefrom chiefly by indicating a more depressant effect on the general nervous system. In moderate doses it causes languor, slowing of the cardiac rate, enfeebled muscular action, impaired sensibility, drooped eyelids and slightly dilated pupils, with some diaphoresis. In toxic dose, as a teaspoonful of the fluidextract, it produces vertigo, diplopia, drooped eyelids and dilated pupils (paralysis of 3d nerve), labored respiration, slow and feeble heart, dropped jaw, staggering gait, extreme muscular weakness and almost complete anesthesia, profuse diaphoresis, loss of articulation, and death by asphyxia from paralysis of the centres of respiration, consciousness being preserved until CO_2 narcosis sets in. Convulsions, with backward movements, occur in many animals but not in man. Motion is affected before sensibility in warm-blooded animals, sensibility before motion in frogs. It does not irritate the stomach or affect the blood-pressure, though it slows the heart and lowers the body temperature. The effects of a moderate dose pass off in about three hours. Gelseminine is the active principle, being highly toxic and resembling Coniïne in most of its effects. It is decidedly mydriatic when locally applied to the eye, acting probably by paralyzing the oculo-motor nerve terminations. Gelsemine has a feeble strychnine action on frogs, but has no effect on mammals even in large quantity.

Therapeutics.

Gelsemium is indicated in all conditions of exalted nerve function, and contra-indicated whenever there is a weak heart. It is best used in cerebro-spinal meningitis, mania with great motor excitement and persistent insomnia, delirium tremens, many forms of sleeplessness, pneumonia and pleurisy if the heart be strong, coughs of convulsive and spasmodic character, neuralgia of the fifth nerve, remittent fever, after-pains, ovarian neuralgia, dysmenorrhea, irritable bladder of women, and incontinence of urine from spasm of the vesical muscular fibres. In most of these affections the remedy must be pushed to the inducing of some physiological symptoms, but its action should not be carried beyond the production of drooped eyelids, diplopia and muscular debility. It has been used with varying success in intercostal neuralgia, myalgia, sciatica, spasmodic asthma, sick headache, eczema, pruritus and tetanus. Its especial field, however, is in remittent and typho-malarial fevers and cerebro-spinal meningitis. It is not suitable to low fevers and has not sufficient power as a cardiac depressant to be of much use in sthenic forms.

There is much evidence for the claim, made for the alkaloid Gelseminine, of singular efficiency in antagonizing the mental condition occasionally manifested by an unusual degree of dread, in regard to some approaching ordeal, or ordinary trial of life; as, for example, that of a woman concerning her impending confinement, or of a student in reference to his examinations. In very many such cases, the use of the commercial gelsemine, in small doses frequently repeated (gr. $\frac{1}{100}$ ter die), has seemed to remove the state of abnormal fear entirely. Gelseminine is sometimes used as a mydriatic and paralyzer of accommodation, its effects passing off more rapidly than those of atropine.

GENTIANA, Gentian,—is the dried rhizome and roots of *Gentiana lutea*, the yellow gentian, one of a numerous family of plants, nat. ord. Gentianaceæ, growing in the mountainous districts of Europe. An American species, *G. Catesbœi*, blue gentian, is considered nearly equal in value to the official species. It contains an active, bitter glucoside, *Gentopicrin* or *Gentianin*, $C_{20}H_{30}O_{12}$, which is crystalline and soluble in water; also an inert, amorphous body, *Gentianic* or *Gentesic Acid;* gum, considerable sugar, and a trace of volatile oil, but no tannin. Dose, gr. x–xxx [av. gr. xv.]

Preparations.

Extractum Gentianæ, *Extract of Gentian,*—aqueous. Dose, gr. j–v [av. gr. iv.]

Fluidextractum Gentianæ, *Fluidextract of Gentian.* Dose, ♏x–xxx [av. ♏xv.]

Tinctura Gentianæ Composita, *Compound Tincture of Gentian,*—Gentian 10, Bitter Orange Peel 4, Cardamom 1, Alcohol and Water to 100. Dose, ℥ss–ij [av. ℥j.]

Unofficial Preparations.

Infusum Gentianæ Compositum, *Compound Infusion of Gentian,*—contains Gentian 10, Bitter Orange Peel $2\frac{1}{2}$, Coriander $2\frac{1}{2}$, Alcohol 40, Water to 320. Dose, ℥j–ij.

Mistura Gentianæ Alkalina, *Alkaline Mixture of Gentian,*—Acidum Hydrocyan. Dilut. ♏iij, Sodii Bicarb. gr. xv, Infusum Gentianæ Co. to ℥j. One dose.

Mistura Gentianæ et Sennæ, *Mixture of Gentian and Senna,*—Infusum Sennæ ℥iij, Tr. Cardamomi Co. ℥j, Infusum Gentianæ Co. ℥vj. One dose.

Incompatibles.

Incompatible with *Gentian* preparations are: Lead salts, Silver Nitrate. Iron salts are not chemically incompatible, for Gentian contains no tannic acid; but as they darken gentian preparations they are considered esthetically incompatible.

Physiological Action and Therapeutics.

Gentian is a simple bitter without astringency or aroma, its action corresponding to that of Calumba, but it is more apt to disagree with the stomach. In addition, like Cornus, a member of the same class, it has considerable repute as an antiperiodic and febrifuge. Gentian has been considered a valuable tonic throughout Europe from the earliest historical times. It is highly esteemed as a stomachic tonic in dyspepsia connected with the gouty diathesis, in hysteria, jaundice, and convalescence from acute diseases and from malarial fever. The

compound tincture is an excellent vehicle for cod-liver oil, and the compound infusion is a good vehicle for the administration of mineral acids and neutral salts.

GERANIUM, Geranium (*Cranesbill*),—is the rhizome of the indigenous perennial *Geranium maculatum*, nat. ord. Geraniaceæ. Its active constituents are tannic and gallic acids. Dose, gr. v–xxx [av. gr. xv.]

Fluidextractum Geranii, *Fluidextract of Geranium.*—Dose, ♏v–℥ss [av. ♏xv.]

Geranium is an efficient astringent, and its action corresponds with that of Tannic Acid. Having no unpleasant taste, it is a useful agent for infants and others having delicate stomachs, and is a very popular domestic remedy in many parts of the country. It is especially used in diarrheas, dysentery, cholera infantum, hemorrhages, relaxed conditions of mucous membranes, gleet and leucorrhea.

GLYCERINUM, Glycerin, *Glycerol*,—is a liquid obtained by the decomposition of vegetable or animal fats or fixed oils, containing not less than 95 per cent. of absolute glycerol, $C_3H_5(OH)_3$, a triatomic alcohol existing in fats and fixed oils in combination with the fatty acids.

Glycerin is a clear and colorless liquid, of syrupy consistence, hygroscopic, non-drying, odorless, of warm and very sweet taste, neutral reaction, soluble in water and in alcohol, insoluble in ether, chloroform and fixed oils. It dissolves Tannin, Gallic Acid, Salicylic Acid, Bromine, Iodine, and Phenol, and with the aid of heat metallic salts, oxides and alkaloids. With strong Nitric Acid it forms Nitroglycerin, and it reduces Potassium Permanganate, Chromic Trioxide and Chlorinated Lime with great violence. An impurity frequently present in it is *Acrolein*, formed by the use of too high a degree of heat in its manufacture, and which is very acrid and poisonous. Glycerin is a constituent of the 6 Glycerites, Pilulæ Phosphori, Mucilago Tragacanthæ, Massa Hydrargyri, and several fluidextracts. Dose, ℥j–ij, [av. ℥j.] diluted. The official preparations are:—

Suppositoria Glycerini, *Suppositories of Glycerin*,—each suppository contains about ¾ grain of Sodium Carbonate, 3 grains of Stearic Acid, and 46 grains of Glycerin. They are used per rectum in chronic constipation.

Cataplasma Kaolini, *Cataplasm of Kaolin*,—contains of Glycerin 37½ parts by weight, Boric Acid 4½, Thymol 1/20, Methyl Salicylate ⅕, Oil of Peppermint 1/20, Kaolin 57¾, intimately incorporated by the aid of heat to a homogeneous mass. Used as a poultice. This preparation is similar to that sold as *Antiphlogistine* (see below).

Glycerites of Tannic Acid, Starch, Boroglycerin, Hydrastis, Phenol, and of the Phosphates of Iron, Quinine and Strychnine are described under the titles of their principal ingredients.

Unofficial Preparations.

Unna's Paste,—is a mixture of equal parts of Glycerin and Mucilage of Acacia, with which are incorporated various substances, such as zinc oxide, mercuric oxide, etc.

Unna's Paint,—has of Glycerin 10, Gelatin 4, Zinc Oxide 4, and Water 10, incorporated together to form a mixture, which when cold resembles white rubber.

Antiphlogistine,—is the trade name of a preparation very similar to Unna's Paint, and stated by its manufacturers to be "composed of Glycerin, Boric Acid, Salicylic Acid, Iron Carbonate, Peppermint, Gaultheria, Eucalyptus and Iodine, combined with the base de-hydrated Oxide of the Silicate of Alumina and Magnesia; which combination results in a chemical compound possessing antiseptic, anodyne, nutrient and antiphlogistic properties." It is used as a dressing or poultice.

Glykaolin,—is a similar preparation to the preceding, but made by a different manufacturer. It is a compound of Glycerin, Salol, and Aluminum Silicate.

Glycozone,—is described under the title Oxygenium.

Incompatibles.

Incompatible with *Glycerin* are Acids (hot), Chromic Trioxide, Chlorinated Lime, Lead Oxide, Potassium Permanganate, Silver Nitrate.

Physiological Action and Therapeutics.

Glycerin abstracts water from tissues with which it comes in contact, and unless pure is often very irritating to the skin. It is freely absorbed by the cutaneous and mucous surfaces, and is decomposed in the system, passing out as formic and other acids. On the stomach it has no particular action, but in large quantities it is laxative and is said to cause the solution of the red blood corpuscles and hemoglobinuria. The urine of persons using glycerin contains a body which acts like sugar in the copper and fermentation tests, but is not sugar. Glycerin is a good emollient and is considered nutritive by many authorities. It has been used as a substitute for cod-liver oil in wasting diseases, but with little benefit. It has been tried as a remedy in diabetes, but with unsatisfactory results so far as reported, except as a sweetening substitute for sugar in the dietary of those afflicted with that disease. It is said to be fatal to intestinal trichinæ, and to be an efficient internal remedy in acne and flatulence. In chronic constipation excellent results are obtained from rectal enemata of Glycerin, or from the official suppositories thereof. As a vehicle it is used for many drugs, and is a good ingredient of solutions for hypodermic use, promoting the solubility of many alkaloids and acting as an antiseptic. It has distinct but feeble power as a germicide and antiseptic, and is employed to preserve and aid the action of the digestive ferments, Pepsin and Pancreatin, also to prevent the decomposition of vaccine lymph. Locally it is valuable in many cutaneous affections as an emollient and softening agent. In acute coryza it gives relief if applied by a brush or as a spray to the nasal mucous membrane. It is used on cotton to the cervix uteri as a depleting agent, and mixed with an infusion of flaxseed as an enema to relieve tenesmus in acute dysentery. With tincture of Benzoin it is an excellent application to chapped hands or lips and fissured nipples. In the external auditory canal it is usefully employed to soften cerumen, diminish the secretion of pus, deplete the tissues, and keep the surface moist.

Unna's Paint and its imitations, the cataplasm of Kaolin and Antiphlogistine, are very efficient applications for inflammatory conditions of the skin, muscles and joints, also in pneumonia, pleurisy, peritonitis, acute rheumatism, chronic ulcers, sprains, and eczema with induration. The glycerin constituent has a dehydrating effect on the tissues, relieving tension and its consequent pain; and in deep-seated inflammations it causes a superficial hyperemia which decreases the congestion of the affected part.

GLYCYRRHIZA, Glycyrrhiza, *Licorice Root*,—is the dried rhizome and root of *Glycyrrhiza glabra*, and of *G. glandulifera*, nat. ord. Leguminosæ, native in southern Europe and Asia, but largely cultivated in many other parts. It contains a yellow, amorphous glucoside, *Glycyrrhizin*, $C_{24}H_{36}O_9$, also *Glycyrrhizic Acid*, *Asparagin*, sugar, resin, gum, etc. Glycyrrhizin when boiled

with dilute acids yields glucose and a very bitter substance named *Glycyrrhetin.* Dose, gr. x–ʒj [av. gr. xxx.]

Preparations.

Extractum Glycyrrhizæ, *Extract of Glycyrrhiza,*—is the commercial extract of the root, occurring in glossy-black rolls, of sweet, peculiar taste. Not less than 60 per cent. of it should be soluble in cold water. Dose, gr. x–xxx [av. gr. xv.]

Extractum Glycyrrhizæ Purum, *Pure Extract of Glycyrrhiza,*—made with Aqua Ammoniæ, Glycerin and Water, by percolation and evaporation. Dose, indefinite [av. gr. xv.]

Fluidextractum Glycyrrhizæ, *Fluidextract of Glycyrrhiza,*—made with Glycerin, Aqua Ammoniæ and diluted Alcohol. Dose, ♏x–ʒj [av. ♏xxx.]

Mistura Glycyrrhizæ Composita, *Compound Mixture of Glycyrrhiza, (Brown Mixture)*—has of the Pure Extract 3 parts, Syrup 5, Acacia 3, Tr. Opii Camph. 12, Vinum Antimonii 6, Spt. Ætheris Nitrosi 3, and Water to 100. Dose, ʒj–ʒj [av. ʒij.]

Pulvis Glycyrrhizæ Compositus, *Compound Licorice Powder,*—Senna 18, Glycyrrhiza 23½, Oil of Fennel 0.4, Washed Sulphur 8, Sugar 50 parts. Dose, ʒss–ij [av. ʒj.]

Trochisci Glycyrrhizæ et Opii, *Troches of Glycyrrhiza and Opium,*—each has of Extract of Glycyrrhiza gr. ij, Powdered Opium gr. $\frac{1}{12}$, Acacia, Sugar and Oil of Anise. Dose, j–ij every hour.

Elixir Adjuvans, *Adjuvant Elixir,*—has of the Fluidextract of Glycyrrhiza 12, Aromatic Elixir 88, mixed and filtered.

Glycyrrhizinum Ammoniatum, *Ammoniated Glycyrrhizin,*—is very sweet to the taste, readily soluble in water and in alcohol. Dose, gr. j–vj [av. gr. iv.]. Incompatible with it are: Mineral Acids, Alkalies, Metallic salts

Physiological Action and Therapeutics.

Licorice is demulcent and mildly laxative. It has an agreeable taste, and increases the flow of saliva and mucus when slowly chewed or sucked, the increased secretions acting as emollients to the throat. It is used in many pharmaceutical preparations, covering the taste of senna, senega, hyoscyamus, turpentine, ammonium chloride, the bitter sulphates, and to some degree the bitterness of quinine. The powdered extract or root is used as an excipient in pills and troches. The compound mixture is an efficient expectorant, much employed in acute bronchitis and catarrhal laryngitis, but owing its power over cough mainly to the opium contained in it. The compound powder is a gentle laxative, of which senna is the most active ingredient. The troches are used for cough, but must be carefully prescribed for children, as each troche contains gr. $\frac{1}{12}$ of powdered opium.

GOSSYPIUM PURIFICATUM, Purified Cotton,—is the hairs of the seed of *Gossypium herbaceum*, or of other cultivated species of *Gossypium*, nat. ord. Malvaceæ, freed from adhering impurities and deprived of fatty matter. It is insoluble in ordinary solvents, but soluble in an ammoniacal solution of cupric oxide. Cotton-fibre is familiar in appearance to every one, but when examined microscopically it shows as flattened, hollow and twisted bands, spirally striate, and slightly thickened at the edges. It is a modification of Cellulose, $C_{12}H_{10}O_{10}$, and corresponds therewith in all its ordinary chemical properties.

Preparations of the Cotton Plant.

Gossypii Cortex, *Cotton Root Bark,*—thin bands or quilled pieces, brownish-yellow exteriorly, white interiorly, of slightly acrid and astringent taste. Dose, gr. x–ʒj [av. gr. xxx.]

Oleum Gossypii Seminis, *Cotton-seed Oil,*—the fixed oil expressed from the seeds and purified. Is yellow, odorless, of bland taste and neutral reaction, soluble in ether, but slightly soluble in alcohol. Is introduced into the Pharmacopœia for the reason that it constitutes most of the "Olive Oil" sold in foreign-shaped bottles and under foreign-appearing labels. It is used in the official Liniments of Ammonia and Camphor. Dose, ʒj–ʒj [av. ʒiv.]

Pyroxylinum, *Pyroxylin, (Soluble Gun-cotton, Colloxylin)*—is official for the purpose of making Collodium. It is prepared by macerating Cotton in a mixture of Sulphuric and Nitric Acids, washing, draining and drying.

Collodium, *Collodion,*—made by dissolving Pyroxylin 4, in Ether 75 and Alcohol 25.

Collodium Flexile, *Flexible Collodion,*—Collodion 92, Canada Turpentine 5, Castor Oil 3, mixed thoroughly.

Collodium Stypticum, *Styptic Collodion,*—Ether 25, Alcohol 5, Tannic Acid 20, Collodion to 100.

Collodium Cantharidatum, *Cantharidal Collodion, (Blistering Collodion),*—Cantharides 60, Flexible Collodion 85, Chloroform q. s. to 100.

Physiological Action and Therapeutics.

Cotton-root is believed to be an efficient emmenagogue and oxytocic by southern practitioners, also somewhat of a galactagogue, but experiments on pregnant animals have not confirmed this view of its action. The Oil of the seed is very bland and may be applied to all the purposes for which olive oil is used. Cotton itself, when freed from oily matter, is remarkably absorbent of water, and is a good agent for excluding air from injured surfaces. Pyroxylin is highly inflammable, and explosive at 300° F. Collodion is inflammable, and dries rapidly on exposure to the atmosphere by evaporation of its ether, leaving a transparent film of Pyroxylin on the surface to which it has been applied; which film, if the flexible collodion be used, does not contract on drying or readily crack, making it an excellent protective application. Styptic Collodion is a solution of tannin, and an excellent hemostatic. Cantharidal Collodion is a convenient blistering agent, suitable for cases where the patient is inclined to remove a blister if applied in the ordinary way.

Purified Cotton is a valuable agent in surgical practice, being employed as an application in burns and scalds, erysipelas, and articular rheumatism, to exclude the atmosphere, allay pain, and when covered with oiled silk or rubber cloth to keep up local perspiration. It may be phenolated, borated or salicylated, by soaking in the respective solutions, and is then used as an antiseptic dressing for wounds, and ulcers. It is employed by the pharmacist in funnels to filter oils, and for the preparation of the official waters.

Cotton-root bark is much employed by the negroes of the Southern States in decoction as a supposed abortifacient, oxytocic and emmenagogue. It is used in the south for intensifying uterine action in normal labor, also in dysmenorrhea and amenorrhea. A decoction, ʒiv in a quart of water boiled to a pint, is the favorite preparation, administered in wineglassful doses.

Collodion is used as a protective covering for superficial burns, ulcers and wounds, slight cuts, cracked nipples, anal fissures, and erysipelas. For these