

liquid preparations of opium may be given by the mouth in corresponding doses for the same purpose. Severe pain enables the system to resist the action of opium, which in such cases should be repeated at short intervals for effect, regardless of dosage.

Sedative action is obtained by different preparations for various organs. The stomach is best affected by the solution of morphine in effervescing mixtures, the extract in a small pill, or morphine given hypodermically over the epigastrium. The intestines may be influenced by laudanum in an enema of starch, or internally by Dover's powder, pulvis opii, or pil. opii, especially the latter with or without calomel, as an astringent when the bowel must be quieted, as in peritonitis, hernia, and intussusception. The rectum and other pelvic organs are promptly affected by a suppository of the extract of opium, gr. $\frac{1}{4}$, with gr. $\frac{1}{12}$ of the extract of belladonna. The ovaries and the abdominal and pelvic organs generally are markedly susceptible to the analgesic action of codeine in doses of gr. j to gr. ij for an adult in severe pain.

To produce sleep the most efficient preparations are the tinctures, the solution of morphine, pil. opii and Dover's powder, in doses corresponding to the degree of insomnia and restlessness present.

Cough is relieved by the tinctures, and the solution of morphine in small doses with syrup of wild cherry or syrup of tolu; also by codeine in the last-named syrup. *Diaphoresis* is obtained by the use of Dover's powder in either of its forms.

Administration.

Probably no drug in the materia medica is so useful as Opium or has so wide a range of application. At the same time no other drug requires such careful handling, by reason of the many influences which modify its action and uses. Many persons are found with idiosyncrasies in respect to opium, some being easily narcotized, others being remarkably insusceptible to its action, and many suffer from a decided shock after its hypodermic administration, which may even produce alarming symptoms of collapse. In subjects of kidney disease it may accumulate and act more powerfully than expected, and generally it may be said to be *contraindicated* or to be used with great care in alcoholism, congestion of the brain, and advanced disease of the respiratory organs, heart and kidneys. Children bear Opium badly, and for them its proportionate dosage should be much below that for other agents. Morphine should not be given to children below 10 years of age, and never hypodermically to those beneath the age of 15. Opium given to a nursing mother will affect the child, being partly excreted in the milk.

The conjoint administration with opiates, of the spiritus ætheris, spiritus ætheris compositus, or spiritus ætheris nitrosi, an equal part with tinctura opii deodorati, will prevent the nausea often excited by the latter, and correct the drying-up effects of opium, due to its checking secretion. Some of its cerebral effects, as vertigo and mental confusion, are removed by a full

dose of potassium bromide, others are antagonized by quinine, and the general intra-cranial effects of the drug are to some extent opposed by digitalis and by tartar emetic.

Morphine and Atropine are sufficiently antagonistic to each other to make their combination extremely valuable as a therapeutic measure, and their use as mutual antidotes in poisoning by either a most efficient procedure if employed with due precautions, and intelligent consideration of their limitations (see the article on POISONING in Part III). When Morphine is given as a hypnotic or anodyne, Atropine should generally be administered at the same time in the proportion of gr. $\frac{1}{120}$ of the latter to gr. $\frac{1}{4}$ of the former. By this means the anodyne and hypnotic qualities of morphine are increased, while the nausea and depression with the subsequent dyspepsia and constipation due to it are avoided. Moreover, in the doses above mentioned atropine is a cardiac and respiratory stimulant, and will counteract the depressing tendency of morphine on the heart and respiration in subjects who are unduly susceptible to its action.

OXYGENIUM, Oxygen, O. This element is not official though it is extensively used in medicine. Its two combinations with Hydrogen, *Water* H_2O , and *Hydrogen Dioxide* H_2O_2 , are official, also eleven other *Oxides*, namely—those of Arsenum, Calcium, Chromium, Ethyl, Iron, Lead, Magnesium, Manganese, Mercury, Silver and Zinc. It enters into the composition of most of the acids and their salts, many of the organic bases, and all the alkaloids except a few.

Oxygen is the most universally diffused element in nature, forming about one-fifth of the atmosphere, one-third of water, and a great part of the earth and the tissues of plants and animals. It is a colorless, odorless, and tasteless gas, of sp. gr. 1.1057, and can be liquefied by subjection to extreme cold and pressure combined. It was discovered by Priestley in 1774, and given its name, *Oxygen* (acid producer) by Lavoisier in 1778. It may be obtained pure from many of its combinations, but is usually prepared by heating Manganese Dioxide or Potassium Chlorate, or preferably both together. It is furnished by manufacturing chemists in all large cities, compressed in iron cylinders furnished with a rubber bag and mouth-piece by which to administer it.

Ozone, O_3 (Unofficial),—is an allotropic form or condensed condition of Oxygen, three atoms of which are contained in a molecule of the former, instead of two as in the molecule of oxygen. Ozone exists in the atmosphere in the general proportion of 1 part in 10,000, but it is more abundant in the open country and on the ocean than in the air of cities. It is formed when an electric spark is passed through air, being then manifested by its peculiar odor. In the sick-room it may be produced by dissolving in water a mixture of manganese dioxide, potassium permanganate and oxalic acid.

Official Preparations.

Aqua Hydrogenii Dioxidii, Solution of Hydrogen Dioxide, (Solution of Hydrogen Peroxide) commercially known as Peroxide of Hydrogen,—consists of water to which nascent Oxygen has been presented, whereby an additional atom thereof has entered into combination with the hydrogen, producing H_2O_2 . It is officially described as a slightly acid, aqueous

solution of Hydrogen Dioxide, containing when freshly prepared about 3 per cent. of the pure dioxide, corresponding to about 10 volumes of available oxygen. It occurs as a colorless liquid, without odor, slightly acidulous, producing a peculiar sensation and soapy froth in the mouth, and liable to deteriorate by age, heat or protracted agitation. Dose, ℥ss-ij [av. ℥j], diluted with 3 to 4 parts of water.

Aqua, Water, H₂O—is described under its own title.

Oxides of Arsenum, Calcium, Chromium, Iron, Lead, Magnesium, Mercury, Silver and Zinc and the Dioxide of Manganese are described under the titles of their metallic bases.

Unofficial Preparations.

Acetozone, Benzozone, Benzoyl-acetyl Peroxide,—is an unstable compound, which undergoes hydrolysis in the presence of water, its solution containing *Aceto-peracid* (acetyl-hydrogen peroxide) and *Benzo-peracid*, both intensely oxidizing and germicidal bodies. It is marketed in the form of a powder, one-half of which is infusorial earth acting as a diluent and preservative. By adding gr. xxx of the powder to half a gallon of warm, distilled water, shaking, settling, and decanting, the solution is obtained, and this is administered internally in doses of ℥iv, up to ½ gallon in 24 hours. Dose of the powder, gr. iij-v, diluted with sugar of milk, and dispensed in capsule.

Glycozone—is claimed to be a stable compound, resulting from the reaction between chemically pure glycerin and 15 times its volume of ozone; and not a mixture of hydrogen dioxide with glycerin. It is very hygroscopic, and must be kept tightly corked, to prevent deterioration. It is said to act upon diseased tissue in the same manner as Hydrogen Dioxide, but more slowly, and may be used in full strength as an application to wounds or suppurating surfaces, to stimulate healthy granulations, and generally as an antiseptic surgical dressing. It is mixed with water (1 in 10) as a rectal injection; and may be administered internally, in doses of ℥j-ij in a wineglassful of water, in gastric affections, as dyspepsia, pyrosis, ulcer and catarrh of the stomach.

Pyrozone—is the name given by a well-known manufacturer to a concentrated solution of Hydrogen Dioxide in Ether. It is said to contain about 50 per cent. of the dioxide and is a very potent and efficient oxidizer, intended for external use only. It has many applications in the practice of surgeons.

Sanitas—is a proprietary solution for disinfecting purposes, containing Hydrogen Dioxide, and described under TEREBINTHINA.

Incompatibles.

Incompatible with *Hydrogen Dioxide* are: Alkalies, Albumin, Ammonia, Arsenous salts, Balsam of Peru, Charcoal, Chlorides, Chlorine-water, Citrates of alkalies, Ferric salts, Glycerin, Gold salts, Hydrocyanic Acid, Hypophosphites, Iodides, Lime-water, Manganese Dioxide, Mercurous salts, Nitrates, Phenol, Potassium Bromide, Potassium Permanganate, Sulphates, Solution of Chlorinated Soda, Tartrates, Tinctures.

PHYSIOLOGICAL ACTION.

Oxygen is essential to respiration, blood-formation, nutrition and tissue-change, in fact to life itself, and to fully describe its physiological action would involve a complete description of these processes, which would be a treatise on physiology. Applied to the unbroken skin it has no apparent effect, but when applied to a wounded tissue it increases the circulation therein and acts as a stimulant. Inhaled in the pure state (not as air) it causes very little constitutional disturbance. A slight sense of heat is felt in the mouth and may extend along the larynx, trachea and bronchi. The pulse is usually quickened, but it may be lessened in frequency, the appetite is increased, the temperature is slightly raised and the cardiac action is stimulated; a sense of mental exhilaration and a disposition to greater bodily activity are produced, but no constant influence on the excretions has been noticed. In some per-

sons it seems to cause nervous symptoms similar to those produced by nitrous oxide gas (Brunton).

Ozone is a powerful oxidizing and destructive agent. It attacks metals, destroys organic substances and the coagulability of albumin and decomposes blood. It is highly irritant to the tissues, and sets up an acute catarrh of the respiratory mucous membrane if inhaled in quantity. When present in small quantity in the air it is breathed without unpleasant effects and is decidedly soporific (Binz). It is poisonous to low organisms, and is therefore an energetic antiseptic and disinfectant. In animals it sometimes quickens and often slows respiration, and produces excitement followed by exhaustion, sometimes by convulsions and death.

Hydrogen Dioxide, in fresh solution, is one of the most powerful oxidizing agents known, by reason of the facility with which it parts with oxygen to oxidizable substances brought in contact with it. It is consequently a powerful yet non-toxic antiseptic, destroying morbid products and organized ferments to which it is applied. In contact with a suppurating surface it generates a white foam, as the result of its action on the pus. This soon subsides, leaving the subjacent tissue cleansed of all morbid secretions. One part added to 1000 of water containing sewage or infectious microbes is sufficient to destroy the various organisms if allowed to act thereon for 24 hours.

THERAPEUTICS.

Oxygen is efficient as an application to the surface in atonic, scrofulous and syphilitic ulcers, also in cases of senile and other forms of gangrene. Its application to the scalp, by means of a rubber cap fitted to the head, has restored the hair in a case in which it was lost by reason of alopecia areata. Its principal use has been in cases of disease of the respiratory apparatus characterized by dyspnea, as emphysema, bronchial dilatation, phthisis and gangrene of the lungs, also spasmodic asthma, and asphyxia from the inhalation of toxic gases or due to opium and chloroform narcosis. It has been employed with benefit in uremic coma, and in the dyspnea of cardiac disease and that of anemia from loss of blood or from protracted suppuration. It has given good results in diseases characterized by defective oxidation, as gout and diabetes; in the latter affection the sugar sometimes disappears entirely from the urine during its inhalation. It has been used in the treatment of epilepsy and spasm, and is recommended in cholera.

Ozone has been recommended in cases similar to those for which oxygen is used; also in infectious diseases, as diphtheria, in which it is expected to destroy the pathogenic microbes exposed to its influence.

Hydrogen Dioxide in solution has long been employed as a bleaching agent for delicate fabrics, and on the human hair for the production of the "bleached blonde" hue so fashionable lately in certain circles of society. As a cleansing agent for foul wounds, ulcers, sores, and the like, it is highly

efficient; and has been used with great benefit as a gargle or spray to the throat and nasal passages, in quinsy, croup, diphtheria, scarlet fever, ozena, and other morbid conditions of these parts. In diphtheria a 3 per cent. solution as a gargle at short intervals night and day, also given internally, has rivalled antitoxin in results. In colitis with dysentery, lavage of the intestine with a dilute solution thrice daily has proved efficient in cases where other approved measures had failed to make any impression. As a diagnostic agent in determining the presence of pus it is injected into the suspected location, and indicates its contact with pus by causing an immediate swelling of the tissue. If such a swelling be cut into at once no pain is felt, and suppurating buboes have been successfully treated by this method in many cases. Used internally it imparts oxygen to the blood, improves digestion, relieves spasm of the respiratory apparatus, aborts the paroxysms of whooping-cough, and gives relief in the dyspnea of chronic bronchitis. It acts well in non-febrile cases of pulmonary tuberculosis by promoting digestion, palliating cough, and giving increased activity to chalybeate remedies, but is contraindicated in advanced febrile cases, in which it only hastens the fatal termination. It is recommended as a disinfectant of drinking water, as in the small quantity necessary for its effective action (1 in 1,000) it does not impair the taste or other potable qualities.

Acetozone is not toxic to the human organism, and yet it is a powerful germicide. A solution of 1 in 100,000 will kill cholera germs within five minutes and typhoid germs in less than fifteen; while one of 1 in 3,000 destroys all pathogenic organisms within a minute, and their spores after a longer time (Novy). It is not available as an antiseptic, on account of its proneness to break up in the presence of organic substances. As a germicide in the gastro-intestinal canal it has been used with great satisfaction in typhoid fever, dysentery, and Asiatic cholera. In the former disease it was used in 128 cases with a mortality of 8.59 per cent., (Harris), lowering the temperature, shortening the duration of the fever, and lessening the toxic symptoms more than any other treatment. It has been employed locally with satisfaction in gonorrhoea, especially that of the female subject, in puerperal fever, malignant edema, tinea tonsurans, and in accidental and operative wounds characterized by persistent pus formation. Thrown into boiling water it liberates oxygen and is actively deodorant in the atmosphere of a room; having been successfully used in this manner to destroy the odor of malignant variola.

PAREIRA, Pareira,—is the dried root of *Chondrodendron tomentosum*, a climbing, woody vine of the nat. ord. Menispermaceæ, with very large leaves and a grape-like fruit, inhabiting Peru and Brazil. It contains *Pelosine* or *Cissampeline*, an alkaloid identical with the Berberine of *Nectandra* and the Buxine of *Buxus sempervirens* (boxwood).

Fluidextractum Pareiræ, Fluidextract of Pareira.—Dose, ℥x-xlv [av. ℥xxx.]
Infusum Pareiræ, Infusion of Pareira (Unofficial).—1 in 17. Dose, ℥j-ij.

Pareira is diuretic and laxative, stimulating peristalsis and the action of the kidneys. It is eliminated by the kidneys, and passing over the mucous membrane of the genito-urinary tract it acts thereon in a tonic and soothing manner, especially on the bladder. It is particularly useful in chronic cystitis, suppurative kidney diseases, gonorrhoea and gleet, but must be used internally, as when injected locally for these affections it has not proved successful. Formerly Pareira was considered an efficient lithontriptic, and in Brazil it is used as a cure for the bites of poisonous serpents, being employed both internally and locally.

PASSIFLORA INCARNATA, Passion-flower (Unofficial),—is an indigenous plant which is highly esteemed by many American physicians as a calmative, analgesic and hypnotic remedy. It has been administered with satisfactory results in neuralgia, chorea, spasmodic asthma, pertussis, hysteria, dysmenorrhoea, insomnia, infantile and puerperal convulsions and the opium habit. A concentrated tincture is prepared from the whole plant, the dose of which is ℥ss-j every 2 or 3 hours.

PEPO, Pepo,—is the ripe seed of *Cucurbita Pepo* the common Pumpkin, nat. ord. Cucurbitaceæ. The active principle is a resin contained in the endopleuron or envelope immediately surrounding the embryo. It also contains an alkaloid *Cucurbitine*, a fixed oil, starch, sugar, etc. There are no official preparations. Dose, of the resin, gr. xv; of the seeds, ℥ss-jss [av. ℥j], beaten up into an emulsion with sugar and water.

Pumpkin-seed is an efficient agent for the removal of tapeworm, and its use is not followed by unpleasant symptoms. The outer coat of the seed should be removed, and an emulsion then made by trituration with sugar and water. This, if taken on an empty stomach and followed by a brisk cathartic, will generally prove effective. Dr. Squibb maintains that the seeds should not be decorticated, but that husks and all should be swallowed. According to some observers the expressed oil is equally efficient in doses of ℥ss repeated two or three times and followed by a cathartic.

PEPSINUM, Pepsin,—is the name of a hypothetical digestive principle in the gastric juice. As a definite body it is unknown, the various preparations being mere approximations and varying much from each other. It is officially described as a proteolytic ferment or enzyme, obtained from the glandular layer of the fresh stomach of the hog, and capable of digesting not less than 3000 times its own weight of freshly coagulated and disintegrated egg albumin, when tested by the official process.

Pepsin is a fine, white, or yellowish-white, amorphous powder, or thin, pale-yellow, translucent grains or scales, free from any offensive odor; soluble in about 50 of water, more soluble in water acidulated with HCl, insoluble in alcohol, ether or chloroform. It usually has a slightly acid reaction, and may be neutral, but should never be alkaline. Commercial Pepsin is usually obtained from a solution prepared by digesting the mucous membrane scraped from the rennet-bags of sheep or the stomach of the pig in acidulated water for several days. It is then precipitated by sodium chloride (*Scheffer*,) lead acetate (*Boudault*), or by drying the peptones on glass plates (*Beale*). It may also be precipitated by alcohol. By Scheffer's process it occurs as a tough, gray, leathery substance, partly soluble in water, one grain dissolving 3000 grains of albumin in a few days. Jensen's Crystal Pepsin, probably prepared after Beale's method, is in yellowish, translucent scales, soluble in water, and reputed to be many times stronger than any other preparation yet obtained.

Analogous Substances.

Pancreatinum, Pancreatin,—is officially described as a mixture of the enzymes naturally existing in the pancreas of warm-blooded animals, usually

obtained from the fresh pancreas of the hog (*Sus scrofa*), or the ox (*Bos taurus*), and consisting principally of amylopsin, myopsin, trypsin, and steapsin, and proved to be capable of converting not less than 25 times its own weight of starch into substances soluble in water. Dose, gr. iij-xv [av. gr. vijss.]

Ingluvinum, Ingluvin (Unofficial),—is obtained from the gizzard of the domestic fowl, and owes its activity to a peculiar, bitter principle, and not to any ferment corresponding with pepsin. Dose, gr. x-xxx.

Unofficial Preparations.

Pepsinum Saccharatum, Saccharated Pepsin,—is Pepsin \mathfrak{r} , triturated with \mathfrak{q} of Sugar of Milk. One part should digest at least 300 parts of egg-albumin. Dose, gr. v- $\mathfrak{5j}$, shortly after meals.

Liquor Pepsini, Liquid Pepsin,—contains of Saccharated Pepsin 40 parts, Hydrochloric Acid $\mathfrak{12}$, Glycerin 400, Water q. s. ad 1000 parts. Dose, $\mathfrak{5ij}$ -iv.

Every manufacturer of Pepsin has his own preparation and his peculiar name therefor, such as Liquid Pancreopepsine, Lacto-peptine, Gluco-pepsine, Golden Scale Pepsin, Peptogenic Milk Powder, etc. They vary considerably in their properties, but all have the power in some degree of digesting albumin and fibrin.

Lactopeptine,—is claimed to contain Pepsin, Diastase or Ptyalin, Pancreatin, Lactic and Hydrochloric Acids, and that $\mathfrak{5j}$ will digest $\mathfrak{5viiij-x}$ of albumin, fibrin, casein, or gelatin, will emulsionize $\mathfrak{5xvj}$ of cod-liver oil, and convert $\mathfrak{5iv}$ of starch into glucose. A proprietary preparation. Dose, gr. v-xv.

Peptenzyme,—is prepared from the peptic, pancreatic, salivary, Lieberkuhn's and Brunner's glands and the ferment extract of the spleen and liver, slightly benzoated and mixed with sugar of milk and citric acid. It is claimed for it that it contains the active ferments and undeveloped ("mother") enzymes of all the digestive organs or glands, in the same physiological condition as that in which they exist in nature; that it digests food in an acid, an alkaline or a neutral menstruum; and that it will digest all kinds of food. It is best administered before meals. Dose, gr. iij-x.

Liquor Pancreaticus, Pancreatic Solution,—prepared by digesting a finely-chopped pig's pancreas with 4 times its weight of dilute alcohol. It is a nearly clear alcoholic solution, with little taste or smell. Dose, $\mathfrak{5j}$ - $\mathfrak{5ss}$.

Unofficial Vegetable Digestives.

Papain, Papaiva, Papayotin,—is a vegetable ferment obtained from the milky juice of *Carica Papaya*, a S. American fruit-tree of the nat. ord. Papayaceæ. It is soluble in water, but not in alcohol, and has active digestive powers. It is composed essentially of a mixture of vegetable globulin, albumoses and peptone, with which are associated the ferments characteristic of the preparation. It is marketed under the name *Papoid*. Dose, gr. j-iiij. *Papaw Milk* is the milky juice of the fruit, coagulating into two parts, a pulpy mass and a liquid serum. When mixed with alcohol an amorphous powder is precipitated, which when dried forms Papain.

Bromelin,—is an active digestive ferment contained in the fresh juice of *Ananassa Sativa*, the Pineapple. It is more nearly related to trypsin than to pepsin, and is decidedly active in the presence of either acids or alkaline carbonates, but is most energetic in neutral solutions, and is a very constant and powerful digestant of vegetable and animal proteids. It completely dissolves fibrin and meat albumin in a short time, and has digested 1,000 times its own weight of proteids within a few hours. It is destroyed by cooking. Dose of the fresh pineapple juice, $\mathfrak{5ss}$ -j.

Taka-diastase,—is a starch-digesting enzyme obtained from *Eurotium oryzae*, a mould of the aspergillus family which grows upon hydrolized wheat bran. Its digestive power is three times greater than that of the best samples of malt diastase, being capable of converting 300 times its weight of starch into sugar within an hour. It acts in acid, alkaline, or neutral media. Dose, gr. j-v, with or after meals.

Incompatibles.

Incompatible with *Pepsin* are: Alcohol, Alkalies, Tannic Acid, Vegetable decoctions and infusions; many mineral salts precipitate it from solution. With *Pancreatin* are: Acids, Alcohol, Sodium Chloride in excess.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Pepsin is not a solvent but a mixture of ferments, and is a normal constituent of the gastric juice, converting albuminoids (casein, albumin, fibrin, etc.) into peptones for assimilation, with the aid of the lactic and hydrochloric acids associated with it. This it will do out of the body or in cavities as the rectum, if warmth, acidity and moisture are present. Pancreatin, on the other hand, is destroyed by acids and requires an alkaline medium in which to exercise its powers. As the food passes out of the stomach in 2 or 3 hours, Pepsin should be administered within and Pancreatin after that period, to be effective. Pepsin contains proteolytic, milk-curdling, fat-splitting and lactic acid ferments. Pancreatin contains *Amylopsin*, an amylolytic ferment, converting starch into glucose; *Myopsin* and *Trypsin*, proteolytic ferments, converting proteids into peptones in an alkaline medium; *Steapsin*, which splits fats into glycerin and fatty acids; and a milk-curdling ferment.

Dyspepsia in its various forms is the malady for which Pepsin is chiefly employed, but it is also extremely useful in the aepsia of infants, gastralgia, anemia, chlorosis, gastric ulcer and cancer, the diarrhea of infants and the vomiting of pregnancy. It is added to nutritive enemata, the rectum not being a digestive organ, and is injected into the substance of morbid growths which are homologous to the tissues, particularly fatty tumors, for the purpose of arresting their growth and promoting their absorption. It has been injected into the bladder to break down a blood-clot, and has been suggested as an atomized inhalation in diphtheria and croup to digest the membrane without injuring the living tissues.

Pancreatin digests albuminoids and converts starch into sugar and proteids into peptones, also emulsifies fats in the presence of an alkaline solution (Pepsin requiring an acid one). Prolonged contact with mineral acids renders it inert. It is digested by pepsin, and hence probably never passes into the duodenum in its own character. Pancreatin is used to partially digest (peptonize) milk, gruel, soups, and other foods, before their administration in cases of great digestive debility. These peptonized foods may be administered by the stomach or the rectum, and are valuable in intestinal dyspepsia, wasting diseases, and convalescence from acute affections. A teaspoonful of Pancreatin solution taken after the administration of cod-liver oil will prevent the disagreeable eructations which are so offensive to some patients, and will aid the digestion of the oil.

Papain has the power of digesting to a greater or less extent all forms of proteid or albuminous matter, whether coagulated or not. It converts albuminoids into peptones, starch into maltose, and emulsifies fats. It has antiseptic power, and prevents abnormal fermentation in the stomach and intestines. Its digestive power is exercised in either acid, alkaline or neutral media. It acts more rapidly than pepsin and at higher temperatures. It is a rapid solvent of false membranes and intestinal worms; and has been injected into neo-

plasmic tumors, dissolving their tissues in its immediate vicinity, but with much pain and considerable febrile reaction. Papoid has been used as a paste locally in diphtheria, to destroy and remove the false membrane; internally, in gastric and gastro-intestinal catarrh, the diarrhea of infancy and various dyspeptic conditions, with very great success. Its power over both gastric and intestinal indigestion renders it much more useful than either pepsin or pancreatin in cases of doubtful diagnosis, in which it is difficult to decide as to the location of the trouble.

Taka-diasase is used with satisfaction in the so-called amyloseous dyspepsia, in chronic gastritis and gastro-enteritis when the patient is distressed by farinaceous food, in the diarrhea and dysentery of infants, and in cases of diabetes due to pancreatic disease.

Trypsin,—unlike Pepsin, will dissolve mucin, and like pepsin it is inert towards nuclein, horny tissues, and amyloid matter. Used as a spray on diphtheritic membrane it has proved a very efficient solvent. It affects albuminoids even in a slightly acid solution.

Ingluvin,—is particularly useful against vomiting and has been found exceptionally efficient in the vomiting of pregnancy, given in 20-grain doses before meals.

Pineapple Juice,—is one of the most efficient digestive aids at our command and has the advantage of being pleasant to the patient. The author directs the fruit to be cut into slices as required, and the juice to be squeezed out immediately before administration. It has long been used by the natives of South Africa as a remedy for diphtheria and diphtheritic sore throats with unusual success, according to the testimony of competent observers; and has been employed by Dr. Chambers of Calcutta in this disease with marked benefit. He had the patient sip the juice all day at short intervals, or else masticate slices of the fruit and swallow the juice; but as he employed *Papaya* fruit in the same cases it is impossible to give all the credit of his success to the pine-apple.

PETROLATUM, Petrolatum,—is a mixture of hydrocarbons, chiefly of the methane series, obtained from Petroleum, by distilling off the lighter portions and purifying the residue. It is colorless or yellowish, and in the latter case is more or less fluorescent; amorphous, odorless and tasteless, of neutral reaction, insoluble in water, slightly soluble in absolute alcohol, readily soluble in ether, chloroform, petroleum benzin, benzene, carbon disulphide, oil of turpentine, and fixed or volatile oils. The soft variety is known commercially as *Terraline, Cosmoline, Vaseline, Petroleum Ointment*, etc., and is largely prepared from residuums or sediments deposited in tanks containing crude petroleum. Besides Petrolatum itself it is official in the following-named forms,—

Petrolatum Album, White Petrolatum,—a white, unctuous mass, without odor or taste, of about the consistence of an ointment.

Petrolatum Liquidum, Liquid Petrolatum,—a colorless, oily, transparent liquid, without odor or taste, but giving off, when heated, a faint odor of petroleum.

Paraffinum, Paraffin,—a mixture of solid hydrocarbons, a colorless, translucent mass, odorless and tasteless, and slightly greasy to the touch.

Official Analogues.

Benzinum, Petroleum Benzin, a distillate from petroleum, consisting of hydrocarbons, chiefly of the marsh-gas series; a transparent, diffusive, inflammable liquid, soluble in about 6 of alcohol, readily soluble in ether, chloroform, etc., insoluble in water. Its vapor, mixed with air and ignited, explodes violently.

Benzinum Purificatum, Purified Petroleum Benzin,—is a valuable solvent for oils, fats, resins, caoutchouc and some alkaloids, and a vermicide against tape-worm. Dose, 5 to 10 drops, on sugar or in mucilage.

Benzol, Benzol (B. P.),—is a mixture of hydrocarbons obtained from light coal-tar oil and contains about 70 per cent. of *Benzene*, C_6H_6 , and 20 to 30 per cent. of *Toluene*, $C_6H_5.CH_3$. Dose, 5 to 10 drops on sugar, in emulsion or capsules, up to $\bar{3}$ jss daily.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Petrolatum is a valuable protective dressing, and an excellent basis for ointments, having no acidity and no liability to become rancid. It is readily miscible with many active agents, as the alkaloids and phenol compounds, but it does not penetrate the skin so readily as animal fats and fixed oils. Uncombined, it forms an excellent bland application in all irritated conditions and injuries of the skin, and it has been used with benefit alone, or mixed with castor or olive oil, in chronic eczema accompanied by desquamation. Paraffin is employed by sub-cutaneous injection for cosmetic effects on saddle-shaped noses and other superficial deformities.

Benzin taken internally in overdose is known to produce gastro-enteritis, and such a case is reported which terminated fatally. In the ordinary medicinal doses it does not produce either vomiting or diarrhea. Benzin-poisoning may be produced by its inhalation, which is becoming quite a practice among glove-cleaners, and alcoholics have been known to take to inhaling benzin in place of drinking spirits. It has been used with some success externally as a remedy for rheumatic pain, neuralgia, itch, and prurigo; and internally as a vermicide against tapeworm. In pharmacy it has many uses on account of its power as a solvent for oils, fats, resins, caoutchouc and some alkaloids. In the household it is used as a solvent application for removing grease from clothing.

Benzol is a reliable pulmonary antiseptic, and has been successfully used in the treatment of whooping-cough, the vapor being diffused throughout the room, and proximity to a light or fire being avoided. It has made quite a reputation in the treatment of influenza, and has been found effectual in destroying both head and body lice, for which purpose a single application is usually sufficient. It has been given internally for the destruction of trichinae, followed by a brisk laxative; and, mixed with lard, it is used externally in parasitic skin diseases, especially scabies, also in rheumatism and neuralgia. Its vapor inhaled has anesthetic action.

Albolene and **Glymol** are two of the numerous proprietary products of petroleum. They are odorless, do not become rancid, and are employed as bases for ointments and as lubricants. Liquid Albolene is readily diffused in the form of a spray and is a good solvent for drugs intended for application to the naso-pharyngeal mucous membrane.

PHENOL, Phenol, (Carbolic Acid), C_6H_5OH ,—is hydroxy-benzene, obtained either from coal tar by fractional distillation and subsequent purification, or made synthetically. It occurs in colorless, interlaced, needle-shaped crystals,

of characteristic, aromatic odor, deliquescent on exposure to damp air, and acquiring a reddish tint with age and light. When copiously diluted with water it has a sweetish taste, and a slightly burning after-taste. It is soluble in about 15 of water, very soluble in alcohol, ether, chloroform, benzene, glycerin, oils and carbon bisulphide; almost insoluble in benzin. It is melted by gentle heating, and is liquefied by the addition of about 8 per cent. of water. Dose, gr. $\frac{1}{4}$ -ij [av. gr. j], well diluted.

Phenol occurs in castoreum, in the urine of man and herbivorous animals, and in the products of the dry distillation of various organic substances, as resin, bones, wood, and coal. Peculiarities of it are that the addition of about 8 per cent. of water liquefies it, while a further addition of water produces a turbid mixture, until about 15 parts of water to 1 of phenol is reached, when a stable and clear solution is formed. One volume of the liquefied phenol, containing 8 per cent. of water, forms with one volume of Glycerin a clear mixture, which is not rendered turbid by the addition of 3 volumes of water (absence of Creosote and Cresol).

Hitherto described as neutral to litmus paper, Phenol is now officially given a faintly acid reaction. Its claims to be considered an acid are, however, very feeble, as, though it combines with salifiable bases, it is incapable of neutralizing the alkalies, and its combinations are decomposed by the feeblest acids (carbonic, etc.), sometimes, it is asserted, even by water. Chemically, it is considered to be the Hydroxyl (HO) derivative of Benzene (C₆H₆), which would ally it to the alcohols; but as it does not yield the same products on oxidation (yielding finally oxalic instead of acetic acid), it is taken as the type of a class called *phenols*, which are simple HO derivatives of the aromatic hydrocarbons. [For the chemical theory of the Benzene derivatives see the sub-title SUBSTITUTES FOR QUININE, under the title CINCHONA.]

Phenol is converted by concentrated sulphuric acid into Phenol-sulphonic Acid, C₆H₅H.SO₃; and by nitric acid into several substitution products, the most important of which is Picric Acid. The reddish tint which it acquires with age and light, does not impair its properties; but is not accounted for satisfactorily, though supposed to be due to the presence of *Aurin* and *Rosolic Acid*, impurities which form a red compound by the absorption of CO₂ and oxygen.

Phenol coagulates albumin and collodion, Creosote does not.

Official Preparations.

Phenol Liquefactum, *Liquefied Phenol*,—is a liquid composed of not less than 86.4 per cent. by weight of absolute Phenol, and about 13.6 per cent. of water. Dose, ℥ss-ij [av. ℥j.]

Glyceritum Phenolis, *Glycerite of Phenol*,—has of Liquefied Phenol 20, Glycerin 80. Dose, ℥iiij-x [av. ℥v.]

Unguentum Phenolis, *Ointment of Phenol*,—has of Phenol 3, White Petrolatum 97. For external use.

Sodii Phenolsulphonas, *Sodium Phenolsulphonate*, (*Sodium Sulphocarbonate*),—occurs in transparent, rhombic prisms, soluble in 5 of water. Dose, gr. ij-x [av. gr. iv.]

Zinci Phenolsulphonas, *Zinc Phenolsulphonate*,—occurs in transparent, rhombic prisms, soluble in 2 of water. Dose, gr. j-v [av. gr. ij.]

Unofficial Preparations and Compounds.

Aqua Phenolis, *Water of Phenol*,—has of the glycerite of Phenol $\overline{3}$ x, to Water Oj. Dose, $\overline{3}$ j-iv.

Phenol Solutions, for antiseptic surgery, are—

5 per cent. in Water, (℥xxv to the $\overline{3}$), as a wash. Is decidedly irritant.

2½ per cent. in Water, (℥xij to the $\overline{3}$), for sponges, hands, or as a lotion.

5 per cent. or less in Olive Oil, as a special dressing.

Phenol Sodique,—is composed of Phenol, gr. clxxxviiij, Caustic Soda, gr. xxxj, Distilled Water, $\overline{3}$ iv.

Phenol-camphor,—has of Phenol and Camphor, equal parts. A colorless, refractive liquid; soluble in alcohol, ether, chloroform and oils; insoluble in water or glycerin. Used as a local anesthetic, chiefly for toothache; also in the proportion of Phenol 1, Camphor 3, as an application to false membrane in diphtheria, and as subcutaneous and intrapulmonary injections in phthisis. *Campho-phenique* is a similar preparation. (See under CAMPHORA.)

Phenol Iodatum, *Iodized Phenol*,—a mixture of Iodine and crystallized Phenol. (See under IODUM.)

Pheno-resorcin,—is a mixture of Phenol 67 with Resorcin 33 and Water 10, forming a liquid which mixes readily with water. It is supposed to combine the virtues of both its ingredients.

Phenosalyl,—is a clear, syrupy liquid, prepared by fusing together Phenol 9 parts, Salicylic Acid 1, Lactic Acid 2, and Menthol 0.1. It has a pleasant odor, is very soluble in water, and is used in a 1 per cent. solution as an antiseptic application, and in 10 to 30 per cent. solutions as a curative lotion for varicose ulcers and ulcerated gummata. It is said to be superior as a germicide to any one of its ingredients, and to prove much less toxic than the agents usually so employed.

Aseptol,—is the trade name of a 33.3 per cent. solution of *Sozolic* or *Ortho-phenol-sulphonic Acid*, which is formed when Phenol is dissolved in concentrated Sulphuric Acid. Aseptol occurs as a syrupy liquid which crystallizes in small deliquescent needles, decomposes when distilled and is very soluble in water, also in alcohol and in glycerin. It has a faint odor of phenol, and is asserted to be antiseptic but neither poisonous nor irritant, and hence of especial value in abdominal and ophthalmological surgery. It has been recommended for internal use as a substitute for Salicylic Acid, on account of its greater solubility, and has been employed in concentrated solution for the treatment of pharyngitis and diphtheritic laryngitis. Externally it is used so diluted as to contain from 3 to 10 per cent. of the active principle.

Aseptolin,—is a solution containing about 2½ per cent. of absolute Phenol, and 0.02 per cent. of a pilocarpine salt named *Pilocarpine-phenyl-hydroxide*. It is intended for hypodermic use only, in one daily dose of 50 to 250 minims for adults, injected into the abdominal parietes or into the muscles of the back.

Analogues and Derivatives.

Creosotum, *Creosote*,—is a mixture of phenols and phenol derivatives, obtained during the distillation of wood-tar. It is described under its own title.

Resorcinol, *Resorcinol*, (*Resorcin*)—is a diatomic phenol, which is described under its own title.

Acidum Picricum, *Picric Acid*, *Carbazotic Acid*, *Trinitro-phenol*, C₆H₂OH(NO₂)₃, (Unofficial),—is obtained by the action of hot nitric acid on phenol-sulphonic acid, and occurs in yellow scales which are soluble in 75 of water and in 10 of alcohol. Externally it is antiseptic, analgesic, coagulant, and in solution is non-irritant to the tissues, but is too corrosive for internal use. Large doses cause vomiting, anuria, strangury, and yellow staining of the skin and mucous membranes. A saturated aqueous solution is highly recommended as a local application in erysipelas and burns, and is an efficient test for albumin in the urine. *Ammonium Picrate* has been credited with antiperiodic and anthelmintic powers, and is highly praised in pertussis and in exophthalmic goitre, in doses of gr. j-x.

Cresol, *Cresol*, C₆H₄.OH,—is a mixture of the three isomeric Cresols obtained from coal tar, freed from phenol, hydrocarbons, and water; a colorless refractive liquid, soluble in 60 of water, miscible in all proportions with petroleum benzin, benzene, alcohol, ether, and glycerin. Dose, ℥ss-ij [av. ℥j.]

Liquor Cresolis Compositus, *Compound Solution of Cresol*,—has of Cresol 50, Linseed Oil 35, Potassium Hydroxide 8, Water to 100. A local application, used also as a disinfectant and antiseptic.

Creolin, **Lysol**, **Izal**, **Trikresol**, and **Saprol** (*Disinfection Oil*), are unofficial preparations containing cresols, and employed chiefly as antiseptics and disinfectants. **Lysoform** is an unofficial combination of Lysol and Formaldehyde, and is credited with powerful qualities as a bactericide in 5 per cent. solution. **Solutol** and **Solveol** are also unofficial preparations of the same class, both being soluble forms of the insoluble cresol (cresylic acid), the former containing sodium cresylate, the latter sodium cresotate. Solutol is strongly alkaline, and is unsuited to surgical use; Solveol is free from causticity, and is used for dressing wounds, etc., in a ½ per cent. solution, which is said to be more active antiseptically than a 2 per cent. solution of Phenol.

Incompatibles.

Incompatible with *Phenol* are: Acetanilide, Acetphenetidin (Phenacetin), Antipyrine, Albumin, Antiseptin, Borneol, Bromal Hydrate, Bromine water, Butyl-chloral Hydrate, Camphor, Chloralformamide, Chloral Hydrate, Collodion, Diuretin, Ethyl Carbamate (Urethane), Euphorin, Exalgin, Ferric salts, Gelatin in dilute solution, Hydrogen Dioxide, Lead Acetate, Menthol, Methacetin, Naphthol, Nitric Acid, Phenyl Salicylate (Salol), Piperazin, Potassium Permanganate, Pyrocatechin, Pyrogallol, Resorcinol, Sodium Phosphate, Thymol, Terpin Hydrate.