

poison, destroying the mucous membrane of the parts with which it comes in contact, and giving rise to intense pain, diarrhea, convulsions and delirium. Unless speedily rejected or neutralized it causes death from inflammation of the larynx, from the gastro-intestinal lesions, or after some time from stricture of the esophagus. *Liquor Potassii Hydroxidi*, containing over 5 per cent. of the hydroxide, possesses in a degree the same caustic properties, and should never be administered undiluted. It neutralizes the acids in the stomach, and in the blood exists chiefly as the carbonate, being eliminated with the urine which it renders alkaline. If its use be continued too long it impairs the blood, and renders the subject anemic.

Potassium Salts in medicinal doses act chemically on the contents of the stomach, neutralizing its free acids, and disordering digestion if long administered. They increase the saliva, promote oxidation, and stimulate the retrograde metamorphosis of the body, and are therefore waste-producers. In large dose they are cardiac depressants, paralyzant to muscular tissue, poisonous to protoplasm especially nerve tissue, and injurious to the ozonizing function of the blood. The Bicarbonate, taken on an empty stomach, enters the blood unchanged, meets the neutral phosphate of sodium and is decomposed, acid phosphate of sodium being formed which renders the urine more acid. On a full stomach it is decomposed by the acids of the gastric juice, increases the alkalinity of the blood and makes the urine less acid. The salts of potassium with vegetable acids enter the blood in their own form, are there decomposed, forming free CO_2 , and are converted into alkaline carbonates, in which form they are eliminated, alkalinizing the blood and the urine. They are diuretics also, increasing the urinary water and solids, but decreasing the uric acid by causing increased oxidation. The mineral salts are not decomposed in the blood, but are eliminated in their own form, the Nitrate being a most active diuretic, the Chlorate often irritating the kidneys, depressing the heart, causing albuminuria, and impairing the ozonizing function of the blood. In large doses these salts decompose the red blood-corpuscles and paralyze the motor ganglia of the heart. The Chlorate does not part with its oxygen in the system, as formerly believed. The Sulphate is chiefly purgative in its action, but acts harshly, and in overdoses has caused death.

The action of the remaining Potassium salts is described under the titles of their acid and other constituents, to which their effects are chiefly referable.

THERAPEUTICS.

Potassium Hydroxide is used locally to destroy morbid or cicatricial tissue, to cauterize the wounds resulting from bites of animals or stings of insects, to form issues or to open deep-seated abscesses, or to destroy chancres, malignant pustules, nevi, and warts.

Liquor Potassii Hydroxidi is used internally as a free alkali to neutralize excess of acid in the stomach, blood and secretions, and as an antilithic in the

uric acid diathesis, also for acne, boils, and obesity. Locally it is employed to soften the nail in in-growing toe-nail, and diluted to relieve pruritus and to remove scales in various skin-diseases. The Carbonate is diuretic, antacid and antilithic, but is seldom used internally being too irritant, and the Bicarbonate having all its virtues without its objectionable qualities. Locally a solution (\mathfrak{z} j to the \mathfrak{z}) is said to be effectual as a remedy for pruritus vulvæ, and one of half the above strength is used in freckles, sunburn and tan of the epidermis, in moist eczema and the itching of urticaria.

The Bicarbonate is the most frequently used alkaline carbonate. It is employed internally and well diluted for its sedative effect on the stomach to relieve the pain and eructations of gastric dyspepsia, to correct hyperacidity, and in gastric catarrh to render the mucus less viscid and more easily expelled. For its effects after absorption it is used in diabetes, gout and rheumatism, to neutralize free acid in the tissues and thereby economize the alkalies of the blood; in cystitis and gonorrhœa, to correct excessive acidity of the urine and soothe the inflamed surfaces; in gall-stones and jaundice, to lessen duodenal irritation; and in bronchitis and bronchial catarrh, to promote expectoration. Some practitioners rely on it as a febrifuge, and commend it highly in fevers. Locally it is employed as a lotion for acne, acute eczema, and fetid perspiration of the feet and axillæ.

The Acetate and Citrate are good purgatives in doses of \mathfrak{z} ij to \mathfrak{z} iv, and in smaller doses are employed as alkalinizers of the blood and urine and as diuretics. Of the vegetable potassium salts the Acetate is the most certain diuretic, and also promotes the flow of bile, the Bitartrate is the most active cathartic, while the Citrate is the most reliable diaphoretic and the best to alkalinize the urine, it having the least injurious effect on the blood and on the digestion. In lithemia the first and last of these salts are given to promote oxidation, and by keeping the urine alkaline they may reduce small calculi of the uric acid variety. In acute rheumatism and fevers they act as antacids in the blood, as febrifuges by promoting diaphoresis, and as sedatives to the general nervous system. As an agreeable laxative no preparation surpasses the Bitartrate in 2 to 4 drachm doses made into a paste with orange marmalade or any other conserve. It is used as a diuretic in general cardiac dropsy and in acute desquamative nephritis. In cases of acute dysentery with scorbutic symptoms, as seen among miners and sailors, a full purgative dose of this salt (\mathfrak{z} ss or more) has acted most beneficially as a preliminary to other treatment, and in many cases has proven to be the only remedy required. In the acute diarrhea of soldiers it is usually promptly curative. Being an acid salt its internal administration will in many cases acidify an alkaline urine.

Potassium Chlorate is employed locally in solution (\mathfrak{z} ss to the \mathfrak{z}) as a deodorant and detergent wash in inflamed, ulcerated and aphthous conditions of the mouth. On unhealthy mucous membranes it exercises an alterative action for the better, but if long used it will keep up a state of chronic irritation. In

mercurial salivation it is of benefit, and in dilute solution (gr. x to the ℥) is an efficient application to unhealthy sores and ulcers, as a wash for foul sinuses or cavities, and as an injection in chronic affections of the bladder. The powdered salt may be applied to aphthæ, and dusted over epithelioma will alter the action, diminish the pain, check the growth and promote cicatrization. Internally this salt has been administered with the idea that it parts with its oxygen in the system, but it is now acknowledged that it is excreted unchanged. As it may set up congestion and irritation of the kidneys it is highly dangerous in large doses or if used for any length of time, but is constantly administered with benefit in acute tonsillitis, diphtheria, chronic bronchitis, purpura, hematuria, ovarian tumor, pseudo-membranous laryngitis, scarlatina, typhoid fever and chronic cystitis. It is believed to have an almost specific power to limit the pharyngeal inflammations of childhood, and the formation of pus in cervical adenitis of infancy. Advocated half a century ago by Simpson for the treatment of habitual miscarriage, its use for this condition has been revived by Jardine and Remy, who find that it exercises a beneficial influence on the endometrium, and has the power of preserving the life of the fetus and bringing about normal parturition, if its administration is commenced in the third month of pregnancy and continued without interruption until full term. When used internally it should be given in small doses, gr. iij-x, up to gr. xx in 24 hours for an infant, gr. xxx in 24 hours for a child of 2 to 4 years, and ℥iiss for an adult in the same time, and the action of the heart and the kidneys should be carefully watched. It should never be prescribed with potassium iodide lest the poisonous iodate be formed, nor with the syrup of the iodide of iron, lest it liberate iodine and cause severe gastritis. Strong acids and acid sulphates decompose it, and it forms explosive compounds with easily oxidizable substances, as sugar, sulphur, tannin, sodium or potassium hypophosphites, catechu, glycerin, etc. For the combination of Potassium Chlorate with the tincture of the chloride of iron, as a gargle, see under CHLORUM.

The Nitrate has been much employed as a refrigerant diaphoretic and diuretic in febrile and inflammatory affections, especially in inflammation of the trachea and bronchi, pneumonia and rheumatism, but its action is uncertain, and it is now giving place in these disorders to more efficient agents. The Sulphate is used in teaspoonful doses in water as an hepatic stimulant and a mild cathartic, increasing the secretions of the intestinal glandular apparatus. Its action is sometimes harsh, and death has resulted from overdoses. Potassium and Sodium Tartrate is the aperient agent in Seidlitz Powders. In doses of ℥ss-j it is a gentle and cooling laxative, and in drachm doses frequently repeated it is used to render the urine alkaline and as an antilithic.

The therapeutics of the other Potassium Salts are described under the respective titles of their more active bases.

PRUNUM, Prune,—is the partly dried, ripe fruit of *Prunus domestica*, the Plum tree, nat. ord. Rosaceæ, indigenous to Western Asia, but cultivated in most countries of temperate

climate. Prunes contain sugar, pectin, albumin, malic acid and salts. They are a constituent of Confectio Sennæ. The root-bark contains a glucoside *Phloridzin*, which causes glycosuria in animals (see below, under PRUNUS VIRGINIANA).

Prunes are laxative and nutritious, and are freely used as a food and sweetmeat, but in excess may give rise to flatulent colic from the indigestibility of their skins. Stewed prunes is an excellent dish for constipation in children, and may be made more effective by the addition of a little Senna.

PRUNUS VIRGINIANA, Wild Cherry,—is the bark of *Prunus serotina*, a large forest tree of the nat. ord. Rosaceæ, growing in Canada and the United States. On maceration in water it develops a distinct odor of bitter almonds. It contains tannin, gallic acid, resin, starch, etc., also *Amygdalin* and *Emulsin*, which by their mutual reaction in the presence of water, produce *Hydrocyanic Acid* and a *Volatile Oil* resembling that of Bitter Almond. The root-bark contains a glucoside, *Phloridzin*, found also in the same part of the apple, pear and plum trees. Dose of the powdered bark, gr. xx-xlv [av. gr. xxx.]

Preparations.

Fluidextractum Pruni Virginianæ, Fluidextract of Wild Cherry.—Dose, ℥xxx-xl [av. ℥xxx.]

Infusum Pruni Virginianæ, Infusion of Wild Cherry,—4 per cent. Dose, ℥ss-iij [av. ℥ij.] Should be made with cold water.

Syrupus Pruni Virginianæ, Syrup of Wild Cherry,—15 per cent. Dose, ℥ss-jss [av. ℥j.]

Incompatibles.

Incompatibles are as for Tannic Acid and Hydrocyanic Acid (see pages 70 and 74). Hot Water is incompatible in making the preparations, as it destroys the ferment emulsin.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Wild Cherry is an aromatic bitter tonic, increasing appetite, aiding digestion, and thus promoting the constructive metamorphosis. The presence of a volatile oil gives it a local stimulating action on the alimentary canal in common with serpentaria, cascarilla and other members of the same class. Hydrocyanic Acid, being yielded by it in the presence of cold water, imparts a sedative action to its preparations, calming irritation and diminishing nervous excitability. Very large doses reduce the action of the heart.

Phloridzin administered by the mouth or hypodermically causes glycosuria, acetonuria, and a great increase in the nitrogen metabolism. The glycosuria differs from that of true diabetes in the fact that the sugar of the blood is not increased, this agent affecting not the general metabolism of the body, but only the renal epithelium, which it renders more permeable to sugar. It is employed as a test for renal sufficiency.

Wild Cherry preparations are used with benefit in catarrhal conditions of the bronchial mucous membrane, also in the hectic of phthisis and scrofula, with palpitation of the heart and a debilitated stomach; a collection of symptoms often observed in consumptive subjects, for whom it is a very useful palliative. Cough is supposed to be especially amenable to its influence, and hence

it has become a matter of daily routine to prescribe the syrup as an ingredient of cough-mixtures. The infusion is an excellent stomachic tonic, and may be administered with benefit in dyspepsia and in convalescence from acute disease.

PULSATILLA (Unofficial),—is the herb, collected soon after flowering, of *Anemone Pulsatilla* and *Anemone pratensis* (*Pulsatilla nigricans*), the Pasque-flower or Meadow Anemone, small herbal plants of the Ranunculaceæ, to which order Aconite also belongs. They inhabit Europe and Siberia, and have large, purple flowers, which are inodorous and very acrid. Pulsatilla contains an acrid yellow oil, which in the presence of water is gradually changed into *Anemonin*, $C_{10}H_8O_4$, or Pulsatilla camphor, the active principle, and *Anemonic Acid*, a white, crystalline, tasteless and apparently inert substance, which is formed also by the action of alkalis on Anemonin. The herb should be carefully preserved and not kept longer than one year. Dose, gr. j-v.

Anemone patens or *Pulsatilla nuttalliana*, is an inhabitant of the United States, sometimes has whitish-colored flowers, and was formerly one of the official sources of the drug.

Preparations.

A tincture may be prepared according to the pharmacopœial directions for Tincturæ Herbarum Recentium (1 part in 2 of alcohol), the dose of which is $\text{℥} \frac{1}{10}$ — $\text{℥} \text{x}$, several times a day. The imported German homeopathic tincture contains equal parts of the expressed juice and alcohol, and is an efficient preparation; but tinctures or fluidextracts made from the imported dried plant are not trustworthy.

Anemoninum, *Anemonin*, $C_{10}H_8O_4$, (Unofficial),—a volatile, unstable, camphoraceous principle, crystallizable, soluble in chloroform and in hot alcohol, almost insoluble in water and in ether. Dose, gr. $\frac{1}{8}$ — $\frac{1}{2}$ in pill; but much larger doses may be taken without inconvenience, as much as two grains having produced no physiological symptoms in man (Schroff).

Incompatibles.

Incompatible with *Pulsatilla* and *Anemonin* are: Alkalies (caustic), Metallic Salts, Tannic Acid.

PHYSIOLOGICAL ACTION.

Pulsatilla is an active irritant when locally used; the oil vesicates the skin, and the fresh juice produces tingling and burning sensations in a part to which it is applied. It may excite a violent dermatitis, with a vesicular or pustular eruption, and inflammation and even gangrene of the entire limb has followed the application of the bruised root to the calf of the leg for rheumatism. Inhalation of its dust has produced itching of the eyes, colic, vomiting and diarrhea; and swallowing the fresh herb may cause severe irritation of the gastrointestinal mucous membrane. The fresh juice applied to the tongue gives rise to tingling and burning sensations followed by numbness, symptoms very like those caused by Aconite. Internally administered Pulsatilla is diuretic, diaphoretic and emmenagogue, and also acts as a cardiac and vascular sedative, lowering the action of the heart, the arterial tension and the body-temperature. In overdoses it strongly affects the mucous membranes, and produces nausea

and vomiting, slimy diarrhea, bloody urine, profuse and offensive sweats, coryza and cough; also vesicular and pustular eruptions on the skin, peculiar pains in the eyes and dimness of vision. Its primary action is that of a spinal irritant, secondarily it produces exhaustion and paralysis of both motion and sensation. Stupor, coma and convulsions may be caused by a toxic dose, also paralysis of the cord and medulla. Most of these effects have been observed on rabbits, and the pharmacology of the drug is not yet accurately worked out. The homeopathic writers credit it with specific influence on the synovial membranes, the veins, the ears, and the generative apparatus of both sexes.

Anemonin was discovered in 1771 by Störck, and its effects have been studied to some extent on animals. Applied to the conjunctiva it caused slight inflammation, and placed on the human tongue it left a slight burning sensation. When melted, its vapor produced intense inflammation of the eyes and pricking sensations in the tongue followed by numbness and white patches. The symptoms following its internal administration in fatal doses were a slow and feeble pulse, slow respiration, lowered body-temperature, frequent diarrhea, paralysis of first the hind- and then the fore-legs, dyspnea, mydriasis followed by myosis, stupor and death without convulsions. The absence of the latter is thought to be due to a paralyzing action of this principle on the cerebral motor centres, as in poisoning by extract of Pulsatilla convulsions are always present. The autopsies showed congestion and edema of the lungs, also marked hyperemia of the cerebral and spinal membranes, especially in the vicinity of the medulla. The heart walls were relaxed, and its cavities and the great vessels filled with dark and clotted blood, while the blood elsewhere was fluid. The liver, spleen, kidneys and abdominal viscera were found to be healthy.

THERAPEUTICS.

The ancient writers credited different species of Anemone with many medicinal virtues, but the modern use of this drug dates from the time of Baron Störck and his contemporaries (1770-1800) who highly praised the *Pulsatilla nigricans* as a remedy for corneal opacities, cataract, paralysis, rheumatism, amenorrhœa, melancholia, secondary syphilis, old ulcers and scaly skin diseases. Later therapeutists differ widely as to the medicinal value of this drug, some giving it extravagant praise and others finding no efficacy in it. It is quite possible that no effects whatever would be obtained if an old preparation or even a fresh one from the dried herb were employed. It has proved very efficient in acute catarrhal affections of the mucous membranes, especially rhinitis and conjunctivitis, in the early stage of the purulent ophthalmia of children and in gonorrhœal ophthalmia, also in subacute and chronic bronchitis of delicate persons accompanied with profuse mucous expectoration, and in chronic catarrh of the bladder. It is used with benefit in chronic nasal catarrh with a thick though bland discharge, also in acute and subacute inflammation of the middle ear and the lining of the external auditory canal so often seen in chil-

dren, where the membrane is red and swollen, with severe pain, and later on a thin, acrid discharge, which is often bloody and soon becomes puriform. In these affections medium doses (℥v) of the tincture may be given internally every four hours to adults, and a lotion composed of ℥j-ij in ℥vj of warm water may be applied to accessible parts. A similar use of this agent has been of decided benefit in many cutaneous affections, especially eczematous eruptions, syphilides, and indolent ulcers.

In acute and chronic dyspepsia, characterized by gastric catarrh or sub-acute gastritis with a white-coated tongue, no taste or a greasy sensation in the mouth, nausea, flatulence, heart-burn, sick headache, anorexia, depression, and diarrhea, Pulsatilla is a very efficient remedy, given in medium doses, ℥v of the tincture every four hours. It does good service in intestinal catarrhs, shown by passive, mucous diarrhea with little pain, which are frequently seen in the febrile affections of childhood, especially measles, mumps, chicken-pox and remittent fever.

Pulsatilla is generally credited with specific therapeutical action on the generative organs of both sexes. Epididymitis and orchitis have been often controlled and entirely dissipated by its administration in very small doses, a few drops of the tincture in a glass of water, of which ℥j is given every two hours (Piffard, Sturgis). In more than 24 cases of acute uncomplicated epididymitis, doses of two drops of the tincture every two hours gave immediate relief, the patients wearing a suspensory bandage but not being confined to bed (Borcherin). Doses of five drops aggravated this disorder, while those of ℥ $\frac{1}{10}$ every three hours proved curative (Piffard). In functional amenorrhea, in scanty or delayed menstruation, and in suppression thereof from fright or cold, in ovaritis and in simple leucorrhœa with back-pains and nervous depression, it has been found an excellent remedy. Dysmenorrhea has been removed in several cases by two-drop doses of the tincture given thrice daily for several days before the menstrual epoch (Piffard). Extravagant opinions as to its virtues in the puerperal state, and during parturition are promulgated by the homeopaths, and their authorities on materia medica credit this drug with power to rectify false presentations during labor by causing version of the child.

Besides the catarrhal affections of the ocular mucous membrane already mentioned, Pulsatilla has remedial power in certain affections of the eyelids. Its internal administration is said to effectually blight a sty if given early, but will not prevent its recurrence. It is an efficient remedy in recent blepharophthalmia, with profuse lachrymation and meibomian secretion; and it is said to stop twitching of the lids accompanied by photophobia. It has been used with decided benefit in the earache of children and in recent catarrhal deafness, also in acute cerebral and spinal meningitis, eclampsia from various causes, asthma, subacute rheumatism of the small joints, acute rheumatic gout, left-sided clavus, hemicrania and infra-mammary pain. Denian used this drug with benefit in several nervous affections, and concludes that it is a direct seda-

tive of nervous irritability, but only indirectly a sedative to the circulation. Tucker found it especially serviceable in the nervous headache produced by overtaxing the mind. An extract of the root has proved to be an efficient tenia-fuge. Coughs which are loose by day, but dry and tickling in character on lying down at night, are greatly benefited by small doses of the tincture frequently repeated; and Anemonin, in doses of gr. ss-j, has been extremely useful in whooping-cough and coughs of irritative character.

PYRETHRUM, Pellitory,—is the root of *Anacyclus Pyrethrum*, a plant of the nat. ord. Compositæ, native of Northern Africa, but cultivated in Europe. It contains an alkaloid *Pyrethrine*, also inulin, tannin, mucilage, etc., with a brown *Resin* and two fixed oils. Dose, as a masticatory, gr. x-xlv [av. gr. xxx.]

Pyrethrum Roseum, Persian Pellitory (Unofficial),—is indigenous to Western Asia, and resembles Chamomile in appearance. The flower-heads are used in powder to kill insects, 4 grains killing a fly in a vial in 2 or 3 minutes.

Tinctura Pyrethri, Tincture of Pyrethrum,—20 per cent. Not used internally.

Pellitory is an irritant sialogogue. When chewed it causes a pricking sensation in the tongue and fauces, with heat, acidity, pungency and a copious flow of saliva and buccal mucus. Large doses may cause bloody diarrhea, tetanoid spasms, accelerated pulse, and profound stupor. Applied to the skin it acts as a rubefacient, the powder inhaled as a sternutatory. It stimulates the local nerves and vessels of the mouth and salivary glands by direct irritant action, but soon depresses the nerves and blunts their sensibility.

Pellitory is chewed as a masticatory and sialogogue in paralysis of the tongue, rheumatic and neuralgic affections of the head and face, and pain from carious teeth. Its powder has been recommended as a sternutatory in chronic catarrh of the frontal sinuses. As a gargle or lotion (℥ijj to Oj) it is very useful for relaxed uvula and as a mouth-wash. When used for toothache a few drops of the tincture should be inserted into the cavity on cotton or wool. Used as a sialogogue it is an efficient agent to secure the rapid elimination of Iodine from the system in chronic poisoning thereby.

QUASSIA,—is the wood of *Picrasma excelsa*, or of *Quassia amara*, trees of the nat. ord. Simarubaceæ. The former is known commercially as Jamaica quassia, and the latter as Surinam quassia. The wood is turned into cups, which are sold under the name of quassia- or bitter-cups. It contains a bitter principle, *Quassin*, $C_{31}H_{42}O_8$, which is crystalline, soluble in hot alcohol and in chloroform, slowly in cold water, faster in alkaline or acidulated water. Dose of the powdered wood, gr. v-xv [av. gr. vijss.]

Preparations.

Extractum Quassiæ, Extract of Quassia,—aqueous. Dose, gr. j-ijj [av. gr. j.]

Fluidextractum Quassiæ, Fluidextract of Quassia.—Dose, ℥v-xv [av. ℥vijj.]

Tinctura Quassiæ, Tincture of Quassia,—20 per cent. Dose, ℥v-℥j [av. ℥xxx.]

Infusum Quassiæ, Infusion of Quassia (Unofficial),—made with cold water ℥x, Quassia chips ℥j, macerated for $\frac{1}{2}$ hour and strained. Or water poured into a quassia-cup and left standing will give a good infusion. Dose, ℥j-ijj.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Quassia is a simple bitter, having no flavor, but is intensely bitter and less agreeable than either gentian or chiretta. It is fatal to flies and fish, and makes an excellent anthelmintic enema against the thread-worm. A concentrated

preparation is poisonous to rabbits and dogs, and has produced very alarming narcotic symptoms in a four-years-old child. Its action is that of a bitter stomachic tonic, as described under *Calumba*.

The preparations of *Quassia* contain no tannin and hence may be prescribed with salts of Iron. It is employed in atonic dyspepsia with pain after eating, and vomiting or regurgitation of food, also in atonic diarrhea depending on indigestion or an irritable condition of the intestinal mucous membrane. It is useful in convalescence to promote the appetite and digestion, and with sodium bicarbonate in gastric vertigo. It has been used as a feeble antiperiodic, and in hysteria its repulsiveness is an aid to its medicinal action. The strong infusion as an enema is an effective remedy against the thread-worm (*oxyuris vermicularis*).

QUILLAJA, Soap Bark,—is the inner bark of *Quillaja Saponaria*, a tree of the nat. ord. Rosaceæ, indigenous to Peru and Chili. It contains calcium sulphate crystals, also starch and the glucoside *Saponin*, $C_{22}H_{34}O_{18}$, a white, amorphous, sternutatory powder, soluble in water and in dilute alcohol. The official preparations are—

Fluidextractum Quillajæ, *Fluidextract of Quillaja*,—Dose, ℥j–v [av. ℥iiij.]

Tinctura Quillajæ, *Tincture of Quillaja*,—20 per cent. Dose, ℥v–xxx.

Quillaja in powder is sternutatory and causes the water in which it is macerated to froth, making emulsions of oils, and being used instead of soap for washing purposes in various affections of the skin, also to stimulate the growth of the hair in alopecia. Its properties are due to the glucoside *Saponin*, which is found also in *Senega* and a number of other plants, and is a violent irritant of the respiratory passages, a local anesthetic, an antipyretic, a powerful paralyzant of the heart and respiration, and a poison to the voluntary muscles. It has not been made use of in practical medicine.

A decoction of the bark (5 in 200) has been employed in doses of ℥j–ij according to age, as a substitute for *Senega* in the treatment of diseases of the respiratory organs where a pleasant expectorant is indicated. Its expectorant properties are well established, and children take it readily. It does not provoke diarrhea or vomiting, and has a sweetish, agreeable taste.

RESORCINOL, Resorcinol, Metadioxybenzene, $C_6H_4(OH)_2$,—is a diatomic phenol, isomeric with *Pyrocatechin* and *Hydroquinone*, obtained usually by the reaction of fused sodium hydroxide upon sodium metabenzene-disulphonate. It occurs in colorless, needle-shaped crystals, very soluble in water, alcohol, ether, or glycerin. Dose, gr. j–x [av. gr. ij]; as an antipyretic gr. v every 2 hours, or gr. xv–xxx, not repeated.

Unofficial Analogues.

Hydroquinone, Para-dihydroxy-benzene, $C_6H_4(OH)_2$,—isomeric with *Resorcinol*, crystallizes in rhombic, colorless prisms which are slightly soluble in water, readily so in alcohol and in ether. It is obtained from *Arbutin*, a glucoside constituent of *Uva Ursi* and other *Ericaceæ*, also from *Anilin*. It is an efficient antipyretic, without injurious effects so far as observed, but its influence is only temporary. Dose, as an antipyretic, gr. xv–xx, best given in alcohol. Gr. xl have been given without disagreeable effects.

Pyrocatechin, Catechol (Ortho-dihydroxy-benzene),—also isomeric with *Resorcinol*, is one of the acid constituents of coal tar, and is obtained also from wood tar and from kinic acid. It is a fair antipyretic, but its use has been abandoned on account of its by-effects.

Incompatibles.

Incompatible with *Resorcinol* are: *Acetamide*, *Acetanilide*, *Albumin*, *Alkalies*, *Antipyrine*, *Borneol*, *Camphor*, *Euphorin*, *Exalgin*, *Ferric Chloride*, *Menthol*, *Methacetin*, *Potassium Iodide*

in alkaline solution, Spirit of Nitrous Ether, Urethane. With *Hydroquinone* are: Chlorine-water, Chromic Trioxide, Ferric Chloride, Nitric Acid.

PHYSIOLOGICAL ACTION.

Resorcinol resembles *Phenol* in action, but is less toxic. Locally it is irritant and mildly escharotic, and is vesicant to mucous membranes. Used as an ingredient of hair-dye it caused in one case 16 attacks of erysipelas in three years. Like phenol it is a universal poison, and is antiseptic, disinfectant, and parasiticide. Internally it is diaphoretic, antipyretic, depressant to the heart and respiration, and a narcotic poison in sufficient quantity. In doses of 20 to 40 grains it causes sensations of heat, discomfort and oppression, followed by profuse perspiration and languor; if fever be present the temperature of the body is lowered several degrees but rises again after a rigor in from 2 to 4 hours. A dose of 60 grains produced giddiness and violent perspiration, with marked anxiety, and finally collapse and unconsciousness. Larger doses (150 grains) have produced deafness, dizziness, salivation, confused vision, vertigo, unconsciousness, general clonic convulsions and tetanic rigidity of the muscles of the neck, with no decline of temperature in feverless subjects. Toxic doses (gr. xv to each 35 ozs. of weight) cause in animals trembling succeeded by epileptiform convulsions, which increase in severity and then decline; the respiration is quickened and enfeebled, the heart's action becomes rapid, weak, and irregular, and death results from paralysis of respiration, the drug paralyzing the motor tracts in the spinal cord but not affecting the general sensibility. It is eliminated chiefly by the urine which it colors a bluish-violet hue, and with great rapidity, about one hour serving for its excretion.

THERAPEUTICS.

Resorcinol has been employed internally as an antiseptic and an antipyretic, but being unreliable in the latter respect and highly dangerous it is now discredited as an internal remedy, though it has been commended in various gastric and intestinal inflammations. It is a valuable local application in many affections of the skin and mucous membranes. As an application to rodent ulcer, tuberculous and other ulcerations of the larynx, in diphtheria, tonsillitis, pharyngitis, and chronic rhinitis, strong even supersaturated solutions are employed with increasing satisfaction, being highly efficient and quite painless. Applied to the peri-laryngeal mucous membrane, in 0.33 per cent. solution, with an acidulated solution of quinine given internally, it has been very useful in the treatment and prophylaxis of pertussis. A 2 per cent. solution has given satisfaction as a local antiseptic application to wounds, parasitic skin diseases, cystitis, gonorrhœa, anthrax, and syphilitic sores of unhealthy character. As a spray a similar solution is well applied to catarrhal or ulcerative affections of the respiratory passages. It may be applied in undiluted form to chancres, papillomata and carbuncles. A saturated ethereal solution is a good application where the caustic action of the drug is required.

A paste consisting of equal parts of Resorcinol and Zinc Oxide has been applied to the face to promote peeling of the skin in the treatment of acne rosacea. In three or four days the skin becomes like parchment, when the application must be stopped, in order to avoid the cracking of the skin which begins at that stage. A dressing of gelatin, glycerin, zinc oxide and hot water is then applied, covered with cotton wool. In a few more days the dressing comes off, bringing the epidermis with it. Some few dangerous and unfavorable results have followed this method, but a number of very satisfactory cases are reported. Freckles and other superficial spots on the skin may be removed by the same treatment.

Resorcinol exercises a powerful influence on recent cell infiltration, and is very successful in subacute and chronic eczema with much thickening from exudation, also in seborrhea, psoriasis and pityriasis. It is an efficient application in the parasitic skin diseases, as scabies and tinea.

RHAMNUS PURSHIANA, Cascara Sagrada, (Chittam Bark, Sacred Bark),—is the bark of *Rhamnus Purshiana*, the California Buckthorn, a small tree of the nat. ord. Rhamnaceæ, growing on the Pacific Coast of the United States. It contains a *Volatile Oil*, a neutral crystalline substance, several *Resins*, with tannic, malic and oxalic acids. It has been found very serviceable in the treatment of chronic gout and chronic constipation, given in gradually diminished doses. It produces large, soft and painless evacuations, and the bowels are said to act naturally and regularly after its disuse. Dose, gr. x-xxx [av. gr. xv.]

Another species of the same order, *Rhamnus Frangula*, is official under the title FRANGULA, which see.

Extractum Rhamni Purshianæ, Extract of Cascara Sagrada,—Dose, gr. j-vj [av. gr. iv.]

Fluidextractum Rhamni Purshianæ, Fluidextract of Cascara Sagrada,—Dose, ℥x-xxx [av. ℥xv.]

Fluidextractum Rhamni Purshianæ Aromaticum, Aromatic Fluidextract of Cascara Sagrada,—Dose, ℥x-xxx [av. ℥xv.]

Cascara Cordial,—is a trade preparation, intended as a remedy for constipation, dyspepsia and hemorrhoids, and as a pleasant excipient for nauseous and bitter drugs. A similar preparation may be made by combining the fluidextract with the official Elixir Aromaticum in the proportion of ʒj to ʒij, of which the dose is ʒj or more.

RHEUM, Rhubarb,—is the dried rhizome of *Rheum officinale*, *Rheum palmatum*, or probably other species of *Rheum*, nat. ord. Polygonaceæ, grown in China and Thibet, where records of its medicinal use date from 2700 B. C. It contains three closely related anthracene derivatives, *Chrysophan*, yielding Chrysophanic Acid, *Emodin*, and *Rhein*, which are the cathartic principles; also several bitter resins, a variety of tannic acid, calcium oxalate, starch, sugar, pectin, and other plant constituents. The species of rhubarb cultivated in the United States are devoid of cathartic power, but their leaf-stalks are used as a fruit. Dose of the powdered root, as a stomachic gr. j-v; as a purgative, gr. x-xxx [av. gr. xv.]

Preparations.

Extractum Rhei, Extract of Rhubarb.—Dose, gr. j-x [av. gr. iv.]

Fluidextractum Rhei, Fluidextract of Rhubarb.—Dose, ℥x-xxx [av. ℥xv.]

Pilulæ Rhei Compositæ, Compound Pills of Rhubarb,—each pill contains of Rhubarb about 2 grains, Aloes 1½, Myrrh 1, Oil of Peppermint 1⁄10 grain. Dose, j-v pills [av. ij.]

Tinctura Rhei, Tincture of Rhubarb,—has of Rhubarb 20, Cardamom 4, Glycerin 10, Alcohol and Water to 100. Dose, ʒss-ij [av. ʒj.]

Tinctura Rhei Aromatica, Aromatic Tincture of Rhubarb,—has of Rhubarb 20, Cinnamon 4, Cloves 4, Nutmeg 2, Glycerin 10, Alcohol and Water to 100. Dose, ℥x-ʒj [av. ℥xxx.]

Syrupus Rhei, Syrup of Rhubarb,—has of the Fluidextract 10, Spirit of Cinnamon 0.4, Potassium Carbonate 1, Glycerin 5, Water 5, Syrup to 100. Dose, for an infant, ʒj; for older children, ʒij-iv [av. ʒij.]

Syrupus Rhei Aromaticus, Aromatic Syrup of Rhubarb,—has of the Aromatic Tincture 15, Syrup 85. Dose, as the Syrup.

Pulvis Rhei Compositus, Compound Powder of Rhubarb,—has of Rhubarb 25, Magnesia 65, Ginger 10. Dose, a teaspoonful [av. gr. xxx.]

Mistura Rhei et Sodæ, Mixture of Rhubarb and Soda,—has of Sodium Bicarb. 3½, Fluidextract of Rhubarb 1½, Fluidextract of Ipecac ½, Glycerin 35, Spirit of Peppermint 3½, Water to 100. Dose, ʒss-iv [av. ʒj.]

Incompatibles.

Incompatible with *Rhubarb* preparations are: Mineral Acids, Catechu infusion, Cinchona infusion, Galls infusion, Lead Acetate, Lime-water, Mercuric Chloride, Silver Nitrate, Tartar Emetic, Zinc Sulphate.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Rhubarb is classed among the tonic-astringent and resin-bearing purgatives, agents which increase the circulation of the glandular appendages of the intestinal canal and stimulate the muscular layer of the bowel. In small doses (gr. j-v) its action is that of a gastric tonic and an intestinal astringent, the influence of the bitter principle and the rheo-tannic acid probably predominating. In larger doses (gr. xxx-lx) its cathartic action prevails, producing in 6 to 8 hours copious yellow, pultaceous stools, with some griping and considerable hepatic stimulation. After the cathartic principle is expelled, the astringent quality of its tannin asserts itself and constipation is likely to result. The yellow color of the stools is partly due to the rhubarb pigment and partly to excess of bile, the drug having marked cholagogue properties, probably due to its resin Phæoretin. Its pigment stains the milk, urine and sweat, the milk acquiring a bitter taste and purgative properties. The cathartic action of Rhubarb may be obtained from its application locally to ulcers, by being rubbed into the moist skin, or applied to the abdomen as a poultice.

Rhubarb is highly esteemed as a cathartic for children, from the mildness of its action; though occasionally producing quite severe griping, it never inflames the gastro-enteric mucous membrane. The tonic and astringent action following its catharsis makes it a valuable agent in diarrheas due to the presence of irritating matter in the bowel, and to correct atonic indigestion accompanied by diarrhea. For hemorrhoids with constipation its gentle action makes it peculiarly suitable, its astringent after-effect being entirely overcome by 2- to 4-drachm doses of olive oil nightly. It may be combined with a mercurial or with sodium bicarbonate, the latter being supposed to overcome its astringent action and to disguise its taste in some degree. In small doses the tincture is a very efficient stomachic tonic, improving appetite, increasing the flow of the gastric juice, assisting digestion, and promoting the action of the liver