

PART I.
MATERIA MEDICA AND THERAPEUTICS.

ABRUS, Jequirity (Unofficial),—is the seed of *Abrus precatorius*, the Wild Licorice, a plant of the nat. ord. Leguminosæ, indigenous in India, but growing wild in most tropical countries. The seeds are small, hard, of a bright scarlet color, and contain some fixed oil, *Abric Acid*, and two proteid poisons, a paraglobulin and an albumose, the latter of which is named *Abrin*. The root, leaves and branches contain sugar and a principle which closely resembles glycyrrhizin.

Preparation.

Infusum Abri, Infusion of Jequirity (Unofficial),—prepared by macerating three powdered seeds in ʒss of cold water for twelve hours, adding ʒss of boiling water, and filtering when cold. It should be used while fresh, as after two or three days it is worthless, and is found in a short time swarming with bacteria. Another formula contains gr. ix to the ʒ, with gr. iv of Boric Acid to prevent decomposition.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Jequirity seeds, when moistened with water, become highly poisonous. If applied to the conjunctiva, a severe inflammation is set up, with edema and false membrane, ulceration of the cornea, and extension to the lids, face, neck, and submaxillary glands. Inserted into a wound in cattle, they cause death in a few hours. Sidney Martin has shown that the proteid poisons contained in Jequirity seeds are almost identical in their physiological and toxic properties with the similar principles found in snake venom, although less powerful.

Jequirity is used for the purpose of producing a purulent or croupous conjunctivitis, by which to destroy old granulations (trachoma) and pannus. A mild infusion is applied to the eye two or three times a day for two days, followed by weak solutions of Alum or Borax, and repeated after three weeks if necessary. An emulsion of the seeds in water is a useful application to unhealthy ulcers and lupus.

ABSINTHIUM, Wormwood (Unofficial),—the leaves and tops of *Artemisia Absinthium*, a perennial garden herb of the nat. ord. Compositæ, indigenous in Europe, but cultivated in the United States. It contains a volatile oil and a bitter principle, *Absinthin*. Dose, gr. xx–xl, in infusion.

Absinthe, the French liqueur, is an alcoholic solution of the oil, containing also extracts of Anise, Marjoram and Angelica. Its continued use produces various nervous symptoms, morning nausea and vomiting, also a tendency to epileptiform convulsions.

The bitter constituent of Absinthium is stimulant to the digestive organs, but the oil is a narcotic poison. It increases the cardiac action, and produces tremor, stupor, epileptiform convulsions, involuntary evacuations, and stertorous breathing. It is but little used in medicine, only as a stomachic tonic in dyspepsia.

ACACIA, Gum Arabic,—is a gummy exudation from *Acacia Senegal*, a small tree of the nat. ord. Leguminosæ, indigenous in Africa. It occurs in spheroidal tears of various sizes, breaking with a glassy, somewhat iridescent fracture; insoluble in alcohol, but soluble in water, forming a thick and mucilaginous liquid. It consists of *Arabin* or *Arabic Acid*, $C_{12}H_{22}O_{11}$, combined with calcium, potassium and magnesium.

Preparations.

Mucilago Acaciæ, Mucilage of Acacia,—has of Acacia 34, Lime Water 33, Water to 100 parts. It should not be prescribed with tinctures or spirits except in very small quantity. Dose, ʒij–vj [av. ʒiv.]

Syrupus Acaciæ, Syrup of Acacia,—has of Acacia 10 per cent. Should be freshly made. Dose, indefinite.

Acacia enters into the composition of Mistura Amygdalæ, Mistura Glycyrrhizæ Composita, Pulvis Cretæ Compositus, Trochisci Cubebæ, and Trochisci Glycyrrhizæ et Opii.

Incompatibles.

Incompatible with *Acacia* are: Acids (mineral), Alcohol, Ammonia, Ant. et Potas. Tartrate, Borax (unless syrup or glycerin are present), Ether, Ferric Salts (unless excess of acid is present), Lead Subacetate (but not the acetate), Lead-water, Mercuric Chloride (concentrated solution), Ammonium Oxalate (concentrated solution), Potassium Tartrate and Bitartrate, Silicates, Syrup of Squill, Tincture of Guaiac (blue color), Tinctures (alcoholic and ethereal).

Gum Arabic has no activity except the negative one of a demulcent, and is chiefly used in coughs, sore throats, catarrhal inflammation of the stomach and intestines, and irritant poisoning. It is much employed in pharmacy to suspend insoluble powders in mixtures, for which purpose the mucilage is generally used.

ACETANILIDUM, Acetanilide, Antifebrin, C_8H_9NO ,—is a synthetic compound obtained by the interaction of aniline and glacial acetic acid. Chemically it is *Phenyl-acetamide*, the radicle phenyl, C_6H_5 , being substituted for one atom of hydrogen in *Acetamide*, a base obtained by heating ethyl acetate with strong water of ammonia, or by distilling ammonium acetate. The trade name *Antifebrin* is copyrighted, and should be dropped from professional usage.

Acetanilide occurs in colorless, inodorous, glistening, lamellar crystals, of slightly pungent taste, soluble in 200 of cold water, 18 of boiling water, 4 of alcohol, freely in ether and in chloroform. Dose, gr. j–iij (B. P.); average dose, gr. iv (U. S. P.). Death has occurred from 5 grains, and recovery has taken place after a drachm.

Pulvis Acetanilidi Compositus, Compound Acetanilide Powder,—has of Acetanilide 70, Caffeine 10, Sodium Bicarbonate 20. Dose, gr. v–x [av. gr. vijss].

As an antipyretic gr. iij of Acetanilide may be repeated every half hour until the temperature falls, the patient being watched for cyanosis or symptoms of collapse. As an analgesic, gr. vij of Acetanilide will usually be sufficient in cases to which the drug is applicable.

Unofficial Derivatives and Allied Compounds.

Agathin, *Salicyl-aldehyde-a-methyl-phenyl-hydrazone*,—is a synthetic compound, which has been used extensively in Europe as an anti-neuralgic and anti-rheumatic remedy. Dose, gr. v-x, two or three times a day, but from ʒss to ʒjss must be given before any effect is produced.

Ammonol, *Ammoniated Phenylacetamide*,—a proprietary antipyretic and analgesic, claimed to possess unusual stimulating and expectorant properties due to the loosely combined Ammonia in its composition. Beringer concludes that it is merely an admixture of Acetanilide 2 parts, Sodium Bicarbonate 1 and Ammonium Carbonate 1, with a minute quantity of the dye Metanil-yellow. A similar mixture is used at the Philadelphia Hospital under the name *Ammoniated Acetanilide*, which consist of Acetanilide 2½ grains, Sodium Bicarbonate, 1½ grains, Ammonium Carbonate, 1 grain; this for a minimum dose. Dose, of Ammonol or Ammonol Salicylate, gr. v-xx.

Analgen,—a Chinolin derivative; was re-formed by inserting benzoyl instead of the acetyl radicle, and re-christened *Quinalgen*. (See next page.)

Analgesine,—a proprietary preparation, consisting of Acetanilide 60, Ammonium Chloride 20, Citrated Caffeine 10, Sodium Bicarbonate 10. Dose, gr. v-xv.

Anilpyrin,—is a condensation product of Acetanilide 1, and Antipyrine 2 parts, and is more soluble in water and less toxic than acetanilide. Dose, gr. v-viij, thrice daily.

Antikamnia,—is a proprietary preparation widely advertised as an antipyretic and analgesic. Analyses of several samples have been made by different chemists, all of which agree in finding the chief ingredients to be Acetanilide and Sodium Bicarbonate in varying proportions. By some observers Caffeine was detected, also Tartaric Acid, etc. The preparation is formulated by the latest analysis as a mixture of Acetanilide 70, Sodium Bicarbonate 20, and Caffeine 10 per cent. Dose, gr. v-xv, in powder or tablets.

Antikol,—contains Acetanilide 75, Sodium Bicarbonate 17½, Tartaric Acid 7½ per cent (Squibb). Dose, gr. v-xv. Another "*Antikol*" is advertised by its manufacturer to consist of Acetanilide, Quinine Bisulphate, Sodium Bicarbonate, and Caffeine Citrate, the latter in the proportion of 10 per cent. **Antilupin** is a similar preparation.

Antinervin, *Salbromalide (Salicylbromalide)*,—is a mixture of Acetanilide 2, with 1 part each of Salicylic Acid and Ammonium Bromide. It was used with satisfaction as an analgesic and antipyretic during the epidemic of influenza in England in 1891, and has been of benefit in acute rheumatism, and in abnormal excitement of the nervous system, either against neuralgia or as a general nerve sedative. The best way to prescribe it is as an extemporaneous mixture, containing the proper proportions of its ingredients, viz.—Acetanilide 50, Salicylic Acid 25, and Ammonium Bromide 25 per cent., mixed *secundem artem*, and administered in doses of gr. v-xv every two hours until relief is obtained.

Benzanilid is obtained by the action of benzoyl chloride on anilin, is soluble in alcohol, insoluble in water, and is used as an antipyretic for children, in doses of gr. jss-viij, according to age.

Euphorin, *Phenyl-urethane*,—is antipyretic, antirheumatic and analgesic, in doses of gr. ij-viij; and may be used as an antiseptic dusting powder for ulcers and skin diseases.

Exalgin, *Methyl-acetanilide*,—is a crystalline compound allied to Acetanilide, occurring in acicular needles, readily soluble in dilute alcohol, less so in warm water, with difficulty in cold water. Dose, gr. j-v, in wine, or other dilute alcoholic mixture. Alcohol ʒss, and Water ʒj form a permanent solution with gr. xvj of Exalgin. Its name, derived from εἶ, *out of*, ἄλγος, *pain*, denotes its principal therapeutic action. In overdose it is highly dangerous, having produced symptoms resembling those of angina pectoris, also toxic effects resembling those of carbolic acid, with delirium, dyspnea, cyanosis, and renal disturbances. It has been used with most excellent results in neuralgias; also in chorea. In the latter affection daily doses of 3 grains were sufficient.

Exodyne is a mixture of Acetanilide 90, Sodium Salicylate 5, and Sodium Bicarbonate 5. The name (from εἶ, *out of*, ὀδὴν, *pain*) sufficiently states its claims to medicinal virtue. Dose, gr. iij-x.

Febrinol, *Methyl-para-acet-phenetidin*,—so called by its proprietors, is a mixture of Acetanilide and other inert substances, advertised at one-half the price of similar coal-tar preparations.

Malakin, *Salicyl-para-phenetidin*,—is a combination of Phenacetin and Salicylic Acid, and is described under SALICINUM, in this book.

Migranin,—is a double Citrate of Antipyrine and Caffeine, and is described under ANTIPIRYNA, in this book.

Neurodin, *Acetyl-para-oxy-phenyl-urethane*,—an analgesic, antineuralgic and antirheumatic remedy. Its antipyretic action is too sudden for it to be used as a general antipyretic. Its action is uncertain and much inferior to that of phenacetin or antipyrine (Lippi). Dose, gr. v-xxv, but ʒjss has been taken in 24 hours without ill effects.

Phenacetin, **Methacetin** and **Phenocoll**,—are closely allied to Acetanilide, both chemically and medicinally, and are described under the title ACETPHENETIDINUM.

Phenatol,—contains Acetanilide, Sodium Carbonate, Bicarbonate, Chloride, and Sulphate, also Caffeine. Dose, gr. v-x.

Phenolid,—is a mixture of Acetanilide 58, and Sodium Salicylate 43, and competes with the above as a panacea. Dose, gr. v-xv.

Pyretine,—contains Acetanilide, Caffeine, Sodium Bicarbonate and Chalk, in varying proportions. Dose, gr. v-x.

Quinalgen,—is a re-formed and re-named variety of the preparation named Analgen, and is described under the title CHINOLINUM.

Salfene and **Kaputin** are Acetanilide mixtures, the latter being simply powdered Acetanilide colored with some indifferent substance.

Thermodin, *Acetyl-para-ethoxy-phenyl-methane*,—is closely allied to Neurodin (see above), which it resembles in all respects except its smaller dose, gr. v-x.

Incompatibles.

Incompatible with *Acetanilide* are: Amyl Nitrite, Bromine and alkaline Bromides, Hydrated Chloral, Iodides of alkalis, Nitrites, Phenol, Piperazin, Potassium Hydroxide, Pyrocatechin, Resorcin, Sodium Hydroxide, Spirit of Nitrous Ether, Thymol. With *Euphorin* are: Antipyrine, Borneol, Bromal Hydrate, Camphor, Hydrated Chloral, Exalgin, Menthol, Phenol, Pyrocatechin, Resorcin, Salol, Thymol, Urethane. With *Exalgin* are: Bromal Hydrate and the others named under *Euphorin*, also *Euphorin*, *Naphthol*, *Pyrogallol*, *Salicylic Acid*.

PHYSIOLOGICAL ACTION.

Acetanilide is a typical member of the antipyretic group of the aromatic series, commonly called coal-tar derivatives. Its principal action in medicinal doses is antipyretic and analgesic. On the normal temperature it has little effect, but it lowers the temperature in fever by central action on the heat-regulating centre, decreasing heat production and to a less degree increasing heat dissipation. It depresses the heart and the respiration, contracts the arterioles by direct action on their muscular coat, raising the blood-pressure and acting as a hemostatic. It lowers the reflex function of the spinal cord, depresses the sensory nervous system, and is strongly analgesic, is mildly diaphoretic and diuretic, and promotes the excretion of urea and uric acid. A toxic dose is powerfully depressant to the heart, respiration, and blood-pressure, causes profuse sweating, vomiting, cyanosis, chills, convulsions, coma, and paralysis of the motor nerves and the muscles, death occurring by failure of the respiration. Large doses are injurious to the blood, disintegrating its red corpuscles, changing the hemoglobin to methemoglobin, and arresting the movements of the leucocytes. The heart, liver and kidneys of animals poisoned thereby are found in a state of acute fatty degeneration. Skin eruptions of erythematous or urticarial type are frequently produced by it, and it often causes cyanosis

without other toxic symptoms, probably due to the liberation of anilin in the blood-current. Collapse may be produced in some susceptible persons by an ordinary medicinal dose. When given in solution it is absorbed within half an hour, and it is completely eliminated in about 24 hours.

Acetanilide is the principal constituent of the so-called "headache powders" which are sold in drug-stores without prescription to any applicant, and have caused serious toxic effects in many cases. In one instance, investigated by the coroner of Pittsburgh, a single dose of such a preparation was followed by death within 45 minutes. An acetanilide habit is occasionally observed among the victims of this commerce, the subjects presenting blue mucous membranes, a weak and irregular heart, albuminuria, and edema of the feet and ankles, together with the moral depravity characteristic of morphine maniacs.

Locally applied, Acetanilide is feebly irritant, dessicant, hemostatic, somewhat analgesic and antiseptic, but not germicidal. Toxic symptoms have been produced by its external use on extensive burns and other wounded surfaces of large extent.

In its actions as an antipyretic, an analgesic, and a cardiac depressant, Acetanilide has many analogues among the coal-tar derivatives, the most important being Antipyrine, Chinolin, and Phenacetin (Acetphenetidinum), which are described elsewhere in this volume. It is probably the most toxic of those in general use, Antipyrine, Phenacetin and Lactophenin following it in the order stated as to liability to cause collapse. Compared with the action of Antipyrine, the effect of Acetanilide on the body-temperature is manifested more slowly (1 hour against $\frac{1}{2}$ hour), but lasts a longer time (6 against 2 hours). It is markedly diuretic, and somewhat diaphoretic; is a cerebral, muscular and vaso-motor stimulant, and leaves no ill after-effects;—while Antipyrine is powerfully diaphoretic, a cerebral sedative, and produces great depression. Furthermore, Acetanilide frequently produces nearly the same degree of reduction of body-temperature as Antipyrine, with the ingestion of only one-fourth the dose; and, like the latter agent, it has little or no effect on the normal temperature, but its continued use begets tolerance of its action. Its antipyretic effect is however less reliable than that of Antipyrine, and corresponds in degree and in duration to the size of the dose.

THERAPEUTICS.

Acetanilide is chiefly used to reduce pyrexia and to relieve pain. With the former object it has been extensively employed in phthisis, scarlet fever, and the other exanthemata, also in acute rheumatism, bronchitis, influenza, and typhoid fever. In the latter affection it is too depressant for ordinary use, and its continued administration has seemed in several cases to increase the liability to periostitis of the ribs, gangrene of the tissues, and other serious sequelæ, depending probably on impairment of the blood. The antipyretics should be used with great caution, if at all, in fever cases presenting exhaustion or asthenia, especially when accompanied by anemia. The opinion that fever is the ex-

ponent of a defensive action by the organism against toxins, is gaining ground in professional esteem, and tends to restrict the use of antipyretic drugs to cases of hyperpyrexia only, and even in such the cold bath is preferred by many prominent clinicians. The toxic effects of Acetanilide and its congeners are probably due to the liberation in the blood of anilin, which is oxidized into paramidophenol. This change occurring more rapidly from Acetanilide than from the phenetidinum compounds, the latter are safer and have largely replaced it in therapeutics.

As an analgesic Acetanilide is efficiently palliative in headaches and neuralgia, in the pains of locomotor ataxia and those of rheumatic origin, as in sciatica and lumbago. It has been successfully used in epilepsy, to prevent the seizures by modifying reflex excitability. In all cases overdosing should be avoided, both as to quantity and repetition, especially in persons who are strangers to the prescriber, on account of the susceptibility to the poisonous action of the drug which is possessed by many individuals.

Acetanilide is employed as a dry dressing, for its antiseptic and analgesic qualities, in the treatment of chancroids, ulcers, burns, wounds, and other breaches of tissue of small extent, often in mixture with an equal part of boric acid. It frequently proves irritant to tender tissue, exciting sharp and burning pain, instead of the analgesia usually ascribed to it. Added in minute proportion to solutions of salts of the alkaloids for hypodermic use it effectually prevents their decomposition.

ACETPHENETIDINUM, Acetphenetidinum, (Phenacetin), $C_{10}H_{13}NO_2$,—is a phenol derivative (acetparaphenetidin), the product of the acetylation of paramidophenetol. It occurs in white, glistening, crystalline scales, or fine, crystalline powder, odorless and tasteless, soluble in 70 parts of boiling water, in 12 of alcohol, nearly insoluble in water. Dose, gr. v-x, [av. gr. vijss], in powder, tablets or cachets, hourly or every two hours, but larger doses, gr. xv-xx, are frequently administered for analgesis, up to a maximum of 3j in 24 hours.

Unofficial Analogues.

Citrophen, Phenetidinum Citratum,—a white, crystalline powder of acidulous taste, soluble in about 40 of water, and used as an antipyretic and antineuralgic. Dose, gr. viij-xv.

Lactophenin, Lactyl-para-phenetidinum,—is another phenetidinum derivative, containing a lactic acid constituent instead of the acetic acid one of phenacetin. Its action is antipyretic, analgesic, and hypnotic, and it has been recommended as a substitute for phenacetin on account of its greater solubility. It has been used with especial benefit in abdominal typhus (Jaksch); also in acute rheumatism, chorea and locomotor ataxia (Von Roth). Dose, gr. viij-xv or more, up to ʒjss daily, in wafers.

Malakin, Salicyl-para-phenetidinum,—is described under SALICINUM.

Methacetin, Oxy-methyl-acetanilide,—derives its name from its analogy to Phenacetin, from which it differs only in containing a methyl group in place of an ethyl one. It occurs as lustrous, scaly, colorless, odorless crystals; soluble in 12 of hot water, in alcohol, chloroform, glycerin and fatty oils, scarcely soluble in cold water. Methacetin was introduced as an antipyretic for children and feeble persons, and promised at one time to supersede phenacetin. It is well borne, and no malaise, tinnitus, cardiac weakness or exanthem follow its ingestion; but it often gives rise to a violent and exhausting perspiration. Its advantages, over all the

other antipyretics of its class, are its lack of toxic properties and its comparatively ready solubility in water, being five times more soluble than its rival, phenacetin. Dose, gr. iij-v, or more.

Phenocoll Hydrochloride,—is another synthetical antipyretic, closely allied to Phenacetin, both chemically and medicinally, and distinguished by its comparatively free solubility. It is produced by the interaction of Phenetidin and Glycocoll (amido-acetic acid), and occurs as a white, micro-crystalline powder, soluble in about 16 of water, therein forming a neutral solution. Dose, gr. v-xx, 3 or 4 times a day.

Thermol, *Acetyl-salicyl-phenetidin*,—occurs in white, odorless, almost tasteless needles, soluble in alcohol, nearly insoluble in water. It is said to be free from phenyl or aniline constituents and to be devoid of toxic action on the blood or the heart. It is antipyretic, antiseptic, and analgesic, and has been used in typhoid fever, pneumonia, influenza, rheumatism, neuralgia, gout, dysmenorrhea, and nervous headache. Dose, gr. ij-xv.

Incompatibles.

Incompatible with *Acetphenetidin* are: Acids (strong), Alkalies (strong), Chloral Hydrate, Oxidizers, Piperazin, Phenol, Pyrocatechin, Salicylic Acid. With *Phenocoll Hydrochloride* are: Alum, Benzoates, Chloral Hydrate, Cinchona decoction or compound tincture, Mercuric Chloride, Nitric Acid, Nitro-hydrochloric Acid, Piperazin; Potassium Acetate, Bicarbonate, Bromide, Citrate, and Sulphate. With *Methacetin* are: Bromal Hydrate, Chloral Hydrate, Phenol, Pyrocatechin, Resorcin.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

The physiological action of Acetphenetidin is similar to that of Acetanilide. It is one of the safest of the new synthetical antipyretics, yet in sufficiently large doses it is as poisonous as any of its analogues. In one case 22½ grains, taken by a woman within six hours, produced collapse with marked lividity, great dyspnea and restlessness, cold perspiration, and slightly dilated pupils; in another case 120 grains were taken in twelve hours without the production of any symptoms (Wood). A toxic dose causes vomiting, cyanosis, chocolate-colored urine, yellow discoloration of the body, leucocytosis, and death by respiratory paralysis. In medicinal doses it depresses the heart slightly, and does not affect the blood or the respiration. It acts more gradually than other antipyretics, its maximum effect being reached in three or four hours. It reduces fever by lessening heat production and causes perspiration without producing collapse. It is also analgesic and hypnotic, relieving pain and inducing sleep. It has been administered with benefit, in 2-grain doses with ½ grain of citrated caffeine at short intervals, for migraine; also in epidemic influenza, both as a prophylactic and as a remedy. As an antipyretic it is extensively employed in phthisis, peritonitis, polyarthritis, endocarditis, typhus and typhoid fevers; and as an analgesic in vaso-motor neuroses, for the lancinating pains of locomotor ataxia, also in neuralgia and hemicrania. It is highly praised in whooping-cough, rheumatic and other fevers, and though slower in action than antipyrine or acetanilide it is deemed fully as efficient in reducing pyrexia, while usually free from the depressant after-effects of the latter agents. It is strongly commended as a local antiseptic dressing.

Phenocoll Hydrochloride is powerfully antipyretic, acting by causing a great diminution of heat production, without affecting heat dissipation. It is also analgesic and antirheumatic, and is believed to increase nitrogenous elimina-

tion. It is rapidly absorbed and quickly eliminated, imparting a brown color to the urine. In medicinal doses it has no effect on the circulation, and rarely causes gastrointestinal irritation or other disagreeable symptoms, but a very large dose depresses the heart and lowers the blood pressure. It has no injurious effect on the blood corpuscles, and it is one of the safest and most efficient members of its class. It has been used with satisfaction as an antipyretic in hectic, malarial, typhoid and other fevers, also as an analgesic in acute and chronic rheumatism, gout, epidemic influenza and neuralgia.

Citrophen is readily soluble in carbonated water, making a pleasant, acidulous drink. It has been used with benefit as an analgesic in migraine, lumbago, neuralgia, sciatica, and the pains of neurasthenia and chronic morphinism, also in pertussis and influenza.

ACIDUM ACETICUM, Acetic Acid,—is a liquid composed of 36 per cent. of absolute *Acetic Acid*, $\text{HC}_2\text{H}_3\text{O}_2$, and 64 per cent. of water. It is a clear, colorless liquid, of a distinctly vinegar odor, a purely acid taste, and a strongly acid reaction; miscible in all proportions with water or alcohol, and wholly volatilized by heat. It is prepared from wood by destructive distillation and purification. Acetic Acid is also official in two other degrees of concentration, viz.—

Acidum Aceticum Glaciale, *Glacial Acetic Acid*, $\text{HC}_2\text{H}_3\text{O}_2$,—is nearly or quite absolute Acetic Acid, solid below 59° F., above that temperature a colorless liquid. Is strongly escharotic and only used locally.

Acidum Aceticum Dilutum, *Diluted Acetic Acid*,—consist of Acetic Acid 10, Distilled Water 50 parts, contains 6 per cent. of absolute Acetic Acid, and has an sp. gr. of 1.009. It is used in the preparation of the two official Aceta (Vinegars). Dose, ℥xv-℥j [av. ℥xxx.]

Acetum, *Vinegar* ((Unofficial),—is an impure dilute acetic acid, formed by the action of a ferment on a dilute alcoholic liquid, the alcohol being oxidized thereby.

Acetonum, *Acetone (Dimethyl-ketone)* $\text{C}_3\text{H}_8\text{O}$,—a colorless, mobile and volatile liquid, miscible with water, alcohol, etc. It is an excellent solvent for resins, gums, camphor, fats and gun-cotton, and is employed in the manufacture of some oleoresins and of sulphonmethane (sulphonal).

Acetates of Ammonium (solution), Iron (solution), Lead, Morphine, Potassium, Sodium, and Zinc, are official. The Mineral Acids are incompatible with them.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Acetic Acid, like the other vegetable acids, in concentrated form is escharotic and produces gastro-enteritis if swallowed. In dilute form it acts as a refrigerant, diminishing thirst and allaying restlessness. It forms salts in the stomach, thus enters the blood, and is there oxidized, producing carbonic acid and thereby increasing the acidity of the urine. It is also diuretic. Long used, it causes emaciation and poverty of the blood, producing a general scorbutic condition. It is hemostatic and anthelmintic, and the vapor inhaled causes reflex contraction of the vessels and raises the blood-pressure. Investigations into its germicidal powers have given it high rank among germ-destroyers, a solution containing 7 per cent. proving destructive to many pathogenic bacteria

The glacial acid is used as a caustic in many skin affections, as warts, condylomata, etc., and to destroy the parasite in ringworm and pityriasis. It has been employed locally in carcinoma, with the view of dissolving the supposed cancer-cells. The dilute acid is used locally in superficial inflammations of the skin, and may be sponged over the body to check perspiration and reduce the surface temperature in fevers. It is often administered internally to reduce obesity, which it does only by impairing digestion. Locally, it may be employed to arrest slight hemorrhages, as epistaxis; and it is occasionally used by enema for the destruction of ascarides. It is highly praised by Squibb as a solvent for the active principles of drugs, which it extracts completely, so that it may be substituted for alcohol in the preparation of both fluid and solid extracts.

Vinegar was the popular antiseptic during the plague in London in 1666, and Acetic Acid in alcoholic solution, $\mathfrak{m}\text{xx}$ in $\mathfrak{z}\text{iiij}$, is still employed on dressings after operation and for the disinfection of suture materials, as an efficient preventive of infection.

Acidum Trichloraceticum, *Trichloracetic Acid*, $\text{HC}_2\text{Cl}_3\text{O}_2$,—a substitution product from Acetic Acid, but usually prepared by the action of Nitric Acid on Chloral Hydrate in the presence of sunlight. It occurs in colorless, deliquescent crystals, which are readily soluble in water and in alcohol. A powerful antiseptic and caustic, it is used in 2 per cent. solution as a dressing for wounds, and as a lotion and spray in acute coryza. It is used by dentists as an application to the gums in pyorrhea alveolaris, and internally in doses of gr. ss- \mathfrak{j} well diluted, for the gastric catarrh and summer diarrhea of children. It is a test for albumin in urine. Dose, gr. \mathfrak{ij} -v, well diluted.

ACIDUM BORICUM, **Boric Acid**, *Boracic Acid*, H_3BO_3 ,—is a weak acid occurring in transparent, colorless, six-sided plates, of unctuous touch, odorless, of a cooling and slightly bitter taste, soluble in 25 of water, in 15 of alcohol and in 10 of glycerin. Its aqueous solubility is increased by the addition of hydrochloric acid or borax. It is produced from Borax by the action of sulphuric acid; also by the purification of the native acid. Dose, gr. v-xv. [av. gr. vijss.] There are two official Borates, viz.—

Sodii Boras, *Sodium Borate (Borax)*, $\text{Na}_2\text{B}_4\text{O}_7 + 10\text{H}_2\text{O}$,—colorless, transparent prisms, of cooling and sweetish, afterwards alkaline taste, and alkaline reaction, soluble in 16 of water at 59° F., and in 0.5 of boiling water; insoluble in alcohol. Occurs native in ancient lake beds in Death Valley region, California, and various other parts of the world. Dose, gr. v-xxx, [av. gr. vijss.]

Glyceril Borate, *Boroglycerin*,—official in the following preparation,—

Glyceritum Boroglycerini, *Glycerite of Boroglycerin*,—prepared by heating together Boric Acid 310 and Glycerin 460, until reduced to 500 grammes, then adding an equal weight of Glycerin.

Liquor Antisepticus, *Antiseptic Solution*,—contains of Boric Acid 2, Benzoic Acid 0.1, Thymol 0.1, Eucalyptol 0.025, Oil of Peppermint 0.05, Oil of Gaultheria 0.025, Oil of Thyme 0.01, Alcohol 25, Purified Talc 2, Water to 100. Dose, $\mathfrak{z}\text{ss}$ - \mathfrak{ij} , [av. $\mathfrak{z}\mathfrak{j}$.]

Unguentum Acidi Borici, *Ointment of Boric Acid*,—has of Boric Acid 10, Paraffin 10, White Petrolatum 80.

Incompatible with Boric Acid are; Alkaline Hydrates, Earths and Carbonates. *Incompatible* with Borates are: Mineral Acids Alkaloidal Salts, Metallic Salts.

Unofficial Preparations.

Borine,—is a proprietary antiseptic preparation, advertised to be "composed of the active constituents of Benzoin, Wintergreen, Meadowsweet, Golden Rod, Witch Hazel, combined with the stearoptenes of Wild Thyme, Eucalyptus, Peppermint, and Boracic Acid." What the stearopten of Boracic Acid is the advertisers do not say. It is intended chiefly for external use, diluted, 1 part to 1-4 of water; but may be used internally in doses of $\mathfrak{z}\mathfrak{j}$ - \mathfrak{ij} .

Boroglyceridum, *Boroglyceride*,—is a solid chemical compound, prepared by heating together Boric Acid and Glycerin. It is soluble in water, but is generally used in solution with glycerin, as the above official glycerite. It combines readily with Chrysarobin, Phenol, Atropine and Morphine, and is used as a local application in eye diseases and skin affections.

Borolyptol,—is a proprietary preparation intended for use as an antiseptic, both internally and locally. It is said to be composed of Aceto-boro-glyceride 5 per cent., Formaldehyde 2 per cent., together with the active antiseptic constituents of Pinus pumilio, Eucalyptus, Myrrh, Storax, and Benzoin. Dose, $\mathfrak{z}\mathfrak{j}$ - \mathfrak{ij} , as an intestinal antiseptic.

Euthymol and **Euphormol** are similar preparations, advertised as containing Boric Acid, Thymol, Menthol, Oil of Eucalyptus, etc.

Magnesii Boro-citras, *Magnesium Borocitrate*,—prepared extemporaneously thus: \mathfrak{R} . Magnesii Carbonatis $\mathfrak{z}\mathfrak{j}$, Acidi Citrici $\mathfrak{z}\mathfrak{ij}$, Sodii Biborat. $\mathfrak{z}\mathfrak{ij}$, Aquæ Bullientis $\mathfrak{z}\mathfrak{viij}$. A tablespoonful two or three times daily as a solvent of uric acid.

Potassii Tartra-boras, *Potassium Tartraborate*,—is a better solvent of uric acid than the Magnesium salt, and is soluble in 2 parts of cold water. Prepared by heating together Boracic Acid 1, Potassii Bitartras 4, Water 10 parts. Dose, gr. xx, largely diluted with water three or four times a day.

Sodium Tetraborate,—is obtained by heating together equal parts of Boric Acid, Borax and Water. The resulting compound is neutral, and is supposed to be a salt. It was introduced to furnish a more soluble form of Boric Acid, and may be used wherever the latter is indicated, but it has the disadvantage of forming hard crusts upon dressings, which irritate abraded surfaces.

It has long been known that the addition of Borax to Boric Acid in aqueous solution greatly increases the solubility of the acid.

Listerine,—is a proprietary preparation, advertised to be "the essential antiseptic constituent of Thyme, Eucalyptus, Baptisia, Gaultheria and Mentha Arvensis, in combination. Each fluid-drachm also contains two grains of refined and purified Benzoboracic Acid,"—whatever that may be. It is chiefly intended for external use, but may be given internally, in doses of $\mathfrak{z}\mathfrak{j}$ three or more times a day (as indicated), either full strength, or diluted with water, or in combination with other drugs.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.

Boric Acid is feebly germicidal, but in dilute solution (1 in 143) it is antiseptic and stimulant, and has a soothing effect on mucous membranes. In concentrated form it is decidedly irritant, but it is used as a dusting powder, also in lotion and ointment for ulcers, eczema, burns, scalds, pruritus ani, fetid perspirations, wounds, tinea tonsurans and tinea circinata. A saturated solution has been highly recommended as an application in phlegmonous erysipelas, and solutions of gr. v-xx to the ounce are employed as disinfectant and soothing eye-washes in conjunctivitis. It has been found efficient as an internal remedy in cystitis with ammoniacal urine, and a saturated solution as a wash for the bladder has given great relief in the cystitis from spinal disease. Its physiological action is feeble, but poisonous doses have caused lowered temperature, depressed spirits, a feeble pulse, and an erythematous eruption with swelling, followed by exfoliation, and especially affecting the lower extremities.

Sodium Borate has considerable antiseptic power, but is inefficient as a germicide. It aids the solution of boric and benzoic acids, and increases the contractile power of the uterus when given internally. It is used in solution

to remove the epidermis from the skin, and as a sedative lotion in acne, freckles, chloasma, leucorrhea and aphthæ, also to allay itching in urticaria, psoriasis, impetigo, and in pruritus pudendi, scroti et ani. It has been used internally in amenorrhœa, dysmenorrhœa, puerperal fever, and puerperal convulsions, for its supposed specific action on the uterus; and has been found beneficial in epilepsy, though far inferior to potassium bromide in efficacy and far more dangerous in toxic effects. It is apparently of most service in cases where the bromides fail and in those in which the epilepsy is associated with gross organic disease.

When administered in large doses Borax produces certain toxic symptoms to which the term *Borism* is applied. These include intestinal disturbance, nausea, vomiting and anorexia, also dryness of the skin, with redness and even inflammation of the mucous membranes. There is great general weakness, the hair is dry and falls out, and a cutaneous eruption occurs, which may assume the forms of seborrhœic eczema, reddish patches which desquamate like psoriasis, or papules attended with much itching. In severe cases albumin may appear in the urine, and edema of the face and extremities may occur, so that whenever this drug is given in full doses, a careful watch should be kept upon the state of the urine (Féré).

Boroglyceride in aqueous solution (1 to 40), or as the official Glycerite, is an excellent antiseptic, and is used as a lotion in purulent ophthalmia and in the treatment of wounds, also as a local application to diphtheritic membranes. It is an efficient preservative of milk and food against putrefactive changes, and is entirely harmless.

An elegant cosmetic cream may be made by dissolving Boric Acid in Glycerin, and then incorporating it with White Wax and Almond Oil.

ACIDUM FLUORICUM, Fluoric Acid, HF (Unofficial),—is a strong escharotic, acting deeply and leaving a dry and painful slough. The dilute acid (1 in 200) is prepared by acting on fluor spar by Sulphuric Acid, the resulting gas being dissolved in water. Its dose is ℥xx–xxx, well diluted.

Dilute Fluoric Acid has been successfully used as an internal remedy in goitre, and the gas has been inhaled with benefit in laryngeal diphtheria.

Antitussin (Unofficial) is the trade name of an ointment, which contains Difluor-diphenyl 5, Vaseline 10, and Lanolin 85 parts. It has been used with benefit in whooping-cough, by being rubbed into the skin of the chest, back, or abdomen, daily for a week, then every other day; but it may produce local ulceration at the point of application.

ACIDUM GALLICUM, Gallic Acid, $\text{HC}_7\text{H}_5\text{O}_5 \cdot \text{H}_2\text{O}$,—is an organic acid, occurring in long needles and triclinic prisms, having a slightly acid and astringent taste, soluble in 100 of water and in 5 of alcohol at 59° F., and in 3 of boiling water. It is prepared from Tannic Acid or from a paste of powdered galls (see Galla, page 69), by fermenting for six weeks, boiling and reboiling in water, filtering and crystallizing. According to some authorities, the tannic acid of the galls is split up into gallic acid and glucose by fermentation; according to others the glucose is an impurity and the tannic acid is simply converted into two parts of gallic acid, thus— $\text{HC}_{14}\text{H}_9\text{O}_9 + \text{H}_2\text{O} = (\text{HC}_7\text{H}_5\text{O}_5)_2$. Dose, gr. v–xx, [av. gr. xv], in solution, pill or powder.

Acidum Tannicum, Tannic Acid, (Tannin), $\text{HC}_{14}\text{H}_9\text{O}_9$,—is a monobasic organic acid, occurring in light-yellowish scales, of strongly astringent taste and acid reaction, obtained from powdered galls (see Galla below), by exposure for three days in a damp atmosphere, then macerating with ether, pressing, and drying the liquid portion. It is soluble in 1 of water, in 0.6 of alcohol, at 59° F., and in about 1 of glycerin with moderate heat; very soluble in boiling water and in boiling alcohol, almost insoluble in ether, chloroform, benzol or benzin. Dose, gr. j–xx, [av. gr. vijss] in wafer, pill or capsule.

Quercus, White Oak,—is the bark of *Quercus alba*, the white-oak tree, nat. ord. Cupuliferae. It contains a variety of tannin named *Quercitannic Acid*, $\text{C}_{28}\text{H}_{24}\text{O}_{12}$, also *Pectin* and a bitter principle named *Quercin*, but no gallic acid. The only official preparation is the fluidextract, the dose of which is ℥v–xx, [av. ℥xv]. A decoction (℥j to the pint) may be used in doses of ʒss–j.

Galla, Nutgall,—is an excrescence on *Quercus infectoria*, nat. ord. Cupuliferae, caused by the punctures and deposited ova of the insect *Cynips tinctoria*. It occurs as hard, globular bodies, of blackish-gray color, tuberculated on the surface. They contain *Gallic Acid* about 5 per cent., *Tannic Acid* 15 to 75 per cent., and other unimportant constituents. Their sole value is as the source of these two substances, and they are rarely used in their own form medicinally. Dose, gr. v–x, [av. gr. vijss.]

Vegetable Astringents contain some form of Tannic Acid, as *Quercitannic Acid* from Oak-bark, *Rhatania-tannic Acid* in *Rhatany*, etc. The official acid is *Gallotannic Acid*, being that produced from Galls. These astringents depend for their medicinal value upon the Gallic and Tannic Acids contained in them. Such are—

Alnus, Alder Bark.	Granatum, Pomegranate.	Myrica, Wax Myrtle.
Castanea, Chestnut.	Hamamelis, Witch Hazel.	Nymphæa, Pond Lily.
Catechu, Catechu.	Hæmatoxylon, Logwood.	Quercus Alba, Oak Bark.
Diospyros, Persimmon.	Heuchera, Alum Root.	Rosa Gallica, Red Rose.
Galla, Nut Gall.	Kino, Kino.	Rubus, Blackberry.
Geranium, Cranesbill.	Krameria, Rhatany.	Stalice, Marsh Rosemary.

Preparations.

Unguentum Acidi Tannici, Ointment of Tannic Acid,—is a 20 per cent. ointment, made with Glycerin and Ointment.

Trochisci Acidi Tannici, Troches of Tannic Acid,—each troche contains nearly one grain of Tannic Acid.

Glyceritum Acidi Tannici, Glycerite of Tannic Acid,—has a strength of 1 part of Tannic Acid to 4 of Glycerin.

Suppositoria Acidi Tannici, Suppositories of Tannic Acid (Unofficial),—have 1 part of Tannic Acid in 5 of Cacao Butter.

Collodium Stypticum, Styptic Collodion,—has of Tannic Acid 20, Alcohol 5, Ether 25, Collodion to make 100 parts.

Tinctura Gallæ, Tincture of Nutgall,—strength 20 per cent. Dose, ʒss–ij, [av. ʒj.]

Unguentum Gallæ, Nutgall Ointment,—strength 20 per cent.

Allied Substances and Derivatives.

Gallobromol, Dibromogallic Acid, $\text{C}_6\text{Br}_2(\text{OH})_2\text{COOH}$ (Unofficial),—occurs in small white, needle-shaped crystals, soluble in 10 parts of lukewarm water. The solution gradually darkens and after a few days becomes brown. Lepine states its internal action as similar