

ACIDS.

Acidum Lacticum.—*Lactic acid*; *acide lactique*, Fr.; *Milchsäure*, Ger.

PROPERTIES.—It is an acid, sirupy liquid, which contains 75 per cent of absolute lactic acid, and has a pale wine-color. Specific gravity, 1.212. It mixes in all proportions with water, alcohol, and ether.

INCOMPATIBLES AND ANTAGONISTS.—Alkalies and the mineral salts.

SYNERGISTS.—Pepsin, sodium chloride, vegetable acids, chlorhydric acid, etc.

Dose.—Fifteen minims to 3 ss in water before or after meals, according to the conditions present.

PHYSIOLOGICAL ACTION.—As lactic acid is a frequent constituent of the gastric juice, it has undoubtedly an important function in connection with digestion. Used medicinally, it promotes the appetite and facilitates digestion. In large doses (3 j) it gives rise to epigastric pain, flatulence, and loss of appetite. As lactic acid is one of a series of homologous acids, containing butylactic, valerolactic, and leucic acids, it is not improbable that some of these may result from its oxidation when administered in excess. It probably combines with bases and forms lactates, for it displaces not only the volatile but some of the mineral acids from their combinations. Chemical investigations have indeed confirmed this, for, besides free lactic acid, lactates have been found in the gastric juice. It is not known definitely whether free lactic acid occurs in the blood in the healthy state, but it certainly does in some morbid conditions. According to Lehmann, lactates are rapidly converted into carbonates in the blood. Free lactic acid, as was long ago shown by Berzelius, is found in muscular fluid, and has also been detected in the spleen by Scherer. Although it is not always a constituent of normal urine, yet, when the supply of lactates to the blood is considerably beyond the oxidizing power of the blood, it has been found (Lehmann). Scherer has shown also that lactic acid is present in the exudates of puerperal fever.

Lactic acid has the power to dissolve a considerable quantity of freshly-precipitated phosphate of lime.

The suggestion made by Prout, of a relation between an excess of lactic acid in the blood and rheumatic inflammation, received a remarkable confirmation in the experiments of Richardson, who produced endocardial inflammation by injecting lactic acid into the peritoneal cavity of dogs. Further confirmation of this connection has been afforded in the attacks of acute rheumatism which have occurred in subjects of diabetes treated by lactic acid.

THERAPY.—Solutions of lactic acid are of great utility as *solvents of false membrane*. Since the comparative demonstration of solvents

made by Bricheteau and Adrian, it has been employed successfully by Dr. Weber, of Darmstadt, and Dr. Dureau, in *croup*, applied by means of a *pulverisateur* in the strength of thirty to forty drops to the ounce (Waldenburg), and is also advocated by Morell Mackenzie and Lennox Browne. The following is the formula used by Mackenzie at the London Throat Hospital: ℞ Acidi lactici, ʒ ijss; aquæ destil., ʒ x. M. This may be used in a spray-producer, or be applied on a mop to the affected part. It is unquestionably an excellent solvent of the exudation of *diphtheria*, as the author has frequently observed. It may be used also as a gargle when the exudation does not extend beyond the tonsils and the pillars of the fauces. For this purpose sufficient acid may be added to water to give a distinctly sour taste. As the application is free from danger, it may be used as often as every half-hour. When used in the form of spray, care must be had to prevent the acid hurting the eyes.

It is chiefly in *atonic dyspepsia* that lactic acid is employed. In this condition lactic acid is, so to speak, a physiological remedy, for we supply it artificially because the stomach is unequal to the task of producing it. Generally, it is advisable to combine pepsin with it thus: ℞ Liq. pepsinæ, ʒ xij; acidi lactici, ʒ iv. M. A teaspoonful three times a day after meals is a proper dose for an adult. In the *apepsia* of infants, characterized by the presence of undigested aliment in the discharges, this combination is an excellent remedy. If a marked degree of acidity exists, the acid should be omitted, or given before the milk, when it may prevent the excessive production of acid. In *irritative dyspepsia*, when the pain and suffering are due to slow and imperfect digestion, lactic acid will often give great relief, either alone or combined with pepsin. Cases of *acidity* and *heartburn* are often quickly relieved by lactic acid given *before meals*. When the presence of an excess of the *phosphates*, *uric acid*, and *the urates*, and of *oxalate of lime*, in the urine, is due to imperfect digestion and faulty assimilation, as is frequently the case, lactic acid is serviceable. Dr. Deecke advocates the use of lactic acid in *chronic cystitis*, as a means of arresting the ammoniacal decomposition of the urine, a condition in which he holds it to be very effective.

Lactic acid has been used with varying success in the treatment of *diabetes*. The object to be gained is the prevention of sugar formation from the starchy and other elements of the food. Dr. Foster reports some cases apparently decidedly benefited, and Dr. Ogle gives an account of two cases in which no good results were attained. Cases have been lately reported in which the patients were improved by the use of lactic acid, but on the whole the utility of this agent in diabetes must be held to be as yet *sub judice*.

Disappointment in the use of lactic acid is frequently experienced from the poor quality of the drug.

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Mineral Acids.—**ACIDUM SULPHURICUM.**—*Sulphuric Acid.* “A liquid composed of not less than 96 per cent of absolute sulphuric acid. A colorless, oily liquid, inodorous, and having strong acid and corrosive qualities. The specific gravity of sulphuric acid should be not less than 1.840. It is miscible in all proportions with water and alcohol, with the evolution of heat.” (U. S. P.)

The official preparations into which sulphuric acid enters are acidum sulphuricum aromaticum and acidum sulphuricum dilutum.

Acidum Sulphuricum Dilutum.—Diluted sulphuric acid. “Sulphuric acid, 1 part; water, 9 parts. This contains 10 per cent of the official sulphuric acid, and has the specific gravity of 1.067 nearly.” (U. S. P.) Dose, ℥v—℥xxx, and should be well diluted with water when administered.

Acidum Sulphuricum Aromaticum.—Aromatic sulphuric acid, or elixir of vitriol. “Sulphuric acid, 200 parts; tincture of ginger, 45 parts; oil of cinnamon, 1 part; and sufficient alcohol to make 1,000 parts. The specific gravity should be 0.955.” Dose, ℥v—3j, well diluted with water.

Acidum Hydrochloricum.—Hydrochloric, formerly (U. S. Phar., 1870) muriatic acid. “A liquid composed of 31.9 per cent of absolute hydrochloric acid and 61.8 per cent of water. It should have a specific gravity of 1.160. It is a fuming, colorless liquid, of a pungent, suffocating odor, and an intensely acid taste and reaction.” The official preparations into which hydrochloric acid enters are acidum hydrochloricum dilutum, acidum nitrohydrochloricum, and acidum nitrohydrochloricum dilutum.

Acidum Hydrochloricum Dilutum.—Diluted hydrochloric acid. “Hydrochloric acid, 6 parts; distilled water, 13 parts. This mixture contains 10 per cent of absolute hydrochloric acid, and has a specific gravity of 1.049.”

Acidum Nitricum.—Nitric acid. “A colorless, fuming, very caustic and corrosive liquid, of a peculiar, somewhat suffocating odor, and a strongly acid reaction. Specific gravity, 1.420.” The official preparations of nitric acid are acidum nitricum dilutum, acidum nitrohydrochloricum, and acidum nitrohydrochloricum dilutum.

Acidum Nitricum Dilutum.—Diluted nitric acid. “Nitric acid, 1 part; distilled water, 6 parts. This solution should contain 10 per cent of absolute nitric acid, and have a specific gravity of 1.059. Dose, ℥ij—℥x, in sufficient water.

Acidum Nitrohydrochloricum.—Nitrohydrochloric acid, also known as *aqua regia*. Nitric acid, 4 parts; hydrochloric acid, 15 parts. Dose, ℥ij—℥x, well diluted.

Acidum Nitrohydrochloricum Dilutum.—Diluted nitrohydrochloric acid. Nitric acid, 4 parts; hydrochloric acid, 15 parts; distilled water, 76 parts. A colorless, faintly yellow liquid, odorless, or having a faint odor of chlorine, and a very acid taste and reaction. Dose, ℥v—℥xx, in sufficient water.

Acidum Phosphoricum.—Phosphoric acid. “A colorless liquid, odorless and of a strongly acid taste and reaction. Specific gravity, 1.347.” Dose, ℥j—℥x, well diluted.

Acidum Phosphoricum Dilutum.—Phosphoric acid, 20 parts; distilled water, 80 parts. Dose, ℥v—℥xx, in sufficient water.

ANTAGONISTS AND INCOMPATIBLES.—Alkalies and their carbonates, salts of lime and lead.

SYNERGISTS.—Bitters and tonics in general.

PHYSIOLOGICAL ACTIONS.—By assisting digestion and by correcting an abnormal condition of the alimentary mucous membrane, acids directly contribute to the blood-forming process, and indirectly, through the blood, to the construction of tissue, and the bettering, in general, of the bodily condition.

The mineral acids grouped above agree in the general qualities of their actions, but differ in some particulars. They attack the living tissues with great energy, abstract the water, and combine with the potash, soda, and lime bases. In virtue of this affinity for water and this power of combination with bases, they cause destruction of tissue and are called *escharotics*. Some of them are more powerful than others: thus, sulphuric and phosphoric acids penetrate more deeply than the others. Nitric acid stains the skin yellow; sulphuric acid carbonizes or blackens. Hence in cases of accident, or when these acids are used with criminal intent, it is very obvious at a glance which has been taken or given: nitric acid making a yellow stain of the face, lips, and mouth, and sulphuric carbonizing or blackening those parts. In the stomach they produce the same effects. When concentrated, they destroy the mucous membrane of the mouth, epiglottis, œsophagus, and stomach. The systemic effects are

those of the irritant and corrosive poisons. The appropriate remedies are chemical and mechanical: alkalies, magnesia, soda, lime, soap, to neutralize the acid; and eggs, milk, oil, etc., to protect mechanically the tissues. The depression of the powers of life which immediately follows the ingestion of a mineral acid should be treated by opium, nutrient and stimulating enemata, and the intra-venous injection of ammonia.

The mineral acids, when administered in medicinal doses, must on reaching the stomach act in accordance with their chemical position. They will combine with the bases and form salts. Hydrochloric, and to a less degree phosphoric, aid digestion, acting as synergists to pepsin, and contribute to the formation of peptones. Sulphuric unites with bases to form insoluble sulphates, and precipitates the albuminous substances from their solution in the gastric juices; hence this acid, although for a brief period it improves, soon disorders digestion. It is true of all the mineral acids that their long-continued use diminishes the production of acid gastric juice, and in this way after a time they cause the very troubles for the relief of which they were originally administered. An acid solution on one side of an animal membrane, and an alkaline solution on the other, is the condition most favorable to osmosis. Hence the introduction of an acid into the stomach with sufficient frequency and in sufficient quantity must impair the production of acid gastric juice. In practice this is found to be the case. The mineral acids are among the most diffusible substances known, and of these hydrochloric stands at the head. So much of these acids as does not enter into combination in the stomach diffuses quickly into the blood, and the salts which they form by combination with bases follow the laws of diffusion according to their class. The acids, especially the hydrochloric, and next nitric, diminish the alkalinity of the blood, and in this way accomplish all that they are capable of doing as systemic remedies.

THERAPY.—Not much need be said of the use of the mineral acids in affections of the mouth and throat. Formerly they were much employed in the treatment of *mercurial* and other forms of *stomatitis*, *diphtheria*, *aphthæ*, *gangrene*, etc.

In using mineral acids in affections of the mouth, it should not be forgotten that they attack the enamel of the teeth. First, the animal matter adherent to the teeth is dissolved off, when the teeth are said to be "set on edge." The acid should be applied to the affected surface only, and the mouth should afterward be washed out with an alkaline lotion. Pure hydrochloric acid may be applied with a camel's-hair brush or on a bit of soft pine-wood to the gums in cases of sloughing from *mercurial stomatitis*, and to the ulcers of *stomatitis materna*, to *symphilitic mucous patches*, and to those painful ulcers of the mouth which occur periodically in some subjects affected with a peculiar form of in-

digestion. In the case of ulcers having their origin in stomach-disorder, the internal use of hydrochloric, nitric, or nitro-muriatic acid, is often extremely beneficial.

The local use of hydrochloric acid in *diphtheria*, so strongly urged by Bretonneau, is now rarely employed, for it is well known that the diphtheritic exudation will rapidly extend over an inflamed surface produced by the application of the acid, and the destruction of the exudation at one part does not prevent its extension and renewed formation.

Any of the mineral acids administered by the stomach should be well diluted, and to prevent injury to the teeth should be taken through a glass tube or a straw. The mouth should also be rinsed out after swallowing the acid.

The mineral acids are highly useful in certain stomach-diseases. In *atonic dyspepsia* hydrochloric acid should be given after meals, or better, lactic acid. It is highly probable that hydrochloric acid is produced during digestion by the reaction between chloride of sodium and lactic acid. A combination of the acid with pepsin, as already suggested, is preferable in these cases of atonic dyspepsia. When, in consequence of faulty digestion, acetic, lactic, and butyric acids are produced in the stomach from the starchy, saccharine, and fatty constituents of the food, the acids given after meals add to the distress of the patient.

To prevent the *excessive formation of acid*, whether due to the action of the gastric glands, or to abnormal fermentation of the starchy, saccharine, and fatty elements of the food, mineral acids are used with decided advantage, but they must be administered before meals. For this purpose, hydrochloric or phosphoric acid is to be preferred. The excessive production of acid is manifested by *acid eructations*, *pyrosis*, *heartburn*, and *ulcerative stomatitis*.

There is a form of indigestion characterized by eructations of offensive gas, painful digestion, a sallow complexion, and by the appearance of oxalate-of-lime crystals in the urine, and is accompanied by mental despondency. This state of things is relieved by the nitro-muriatic acid; sometimes better by nitric.

The experience of English physicians practicing in India has been favorable to the use of nitro-muriatic acid in *chronic hepatic affections*, and in *dysentery* and *dropsy* of hepatic origin. Acute diseases of the liver, and such chronic affections as *cirrhosis* and *waxy degeneration*, are not as a rule benefited by the mineral acids. *Mucous duodenitis* and *catarrh of the gall-ducts accompanied by jaundice*, and *jaundice of malarial origin*, are forms of hepatic disease in which nitro-muriatic acid is serviceable. With the internal use of the acid should be conjoined the local use to the right hypochondrium of the acid bath. Three ounces of nitro-muriatic acid to a gallon of water is a suitable strength for the topical use in this way. The feet may be placed in the

bath, and the legs, arms, and abdomen may be alternately sponged, when the skin is torpid and its secretion defective. The temperature of the bath should be about 96° Fahr. (Martin). Another mode of making topical application of the acid bath is as follows: "Let a flannel roller of ten or twelve inches wide, and sufficient to encircle the body twice, be soaked in the fluid and then wrung so as to remain only damp. Apply this instantly to the body, covering it with a piece of oiled-silk to avoid damping the dress. It should be worn constantly, but should be changed, soaked, and wrung, morning and evening" (Squire). This is a very effective local application in the hepatic disorders mentioned above as amenable to treatment by the mineral acids, and is serviceable in the first stage of cirrhosis. Dr. Scott, of Bombay, ascribes to the acid bath the power to relieve the pain of hepatic colic, by causing the expulsion of the impacted calculus.

The mineral acids are very effective remedies in the treatment of *summer and colliquative diarrhœa*. Crapulous diarrhœa and dysentery are not benefited by them. The indications for their use are these: painless, watery evacuations, of a light color, alkaline in reaction. Hope's mixture, which contains nitrous acid, has long been used with success in such cases. The formula is as follows: \mathcal{R} Acidi nitrosi, \mathfrak{z} j; tincturæ opii, gtt. xl; aquæ camphoræ, \mathfrak{z} viij. S.: One fourth to be taken every three or four hours. A mixture of this kind may readily be extemporized, in which the relative proportion of the acid and opium may be arranged according to the indications of the case. Sulphuric acid is more decidedly astringent than nitric and muriatic, and is, therefore, as a rule, to be preferred in diarrhœa. Bence Jones places them as regards their actions thus: Hydrochloric more promotes digestion; nitric acid, secretion; and sulphuric, astringency. Nitric and nitrohydrochloric are, according to this view, better suited to stomach and hepatic disorders characterized by deficient secretion, and sulphuric is more appropriate for the relief of a relaxed state of the mucous membrane. A combination of aromatic sulphuric acid with opium is one of the most effective remedies we possess in the treatment of *summer diarrhœa* and *cholera*. Sulphuric acid may also be used with advantage in the treatment of *dysentery*, in combination with sulphate of magnesia. \mathcal{R} Magnesii sulphat., \mathfrak{z} j; acidi sulphur. dil., \mathfrak{z} ij; morphinæ sulph., gr. j; aquæ, \mathfrak{z} iv. M. S.: A tablespoonful every three or four hours. After the action of a saline laxative, Hope's mixture, or an extemporized prescription of a similar kind, may be used. When the mineral acids do not quickly improve the discharges and lessen their frequency, and when they increase the tormina and tenesmus, they should be suspended. In the treatment of cholera, dilute or aromatic sulphuric acid may be given frequently, well diluted, in full doses. Opium can be added at such intervals as may be indicated. MacCormac has found the acid to be a most valuable prophylactic against cholera attacks. It should be ad-

ministered with promptness when the preliminary diarrhœa is threatened.

Mineral acids, especially the muriatic, are very serviceable in *fevers*. They were formerly classed as refrigerants, or cooling medicines, and were supposed to allay thirst and to diminish fever. Although these notions are no longer entertained, the acids are known to render an important service in fevers. They increase secretion of the mucous membrane, and thus relieve the dryness of the tongue and fauces. As in fevers the gastric juice is deficient in acids, digestion is materially aided by their administration. In typhoid fever, the acids restrain somewhat the exhausting diarrhœa, increase the digestive power, and remove or diminish the dryness of the tongue. It is probable that they exert an influence on the composition of the blood, beyond the increased activity which they impart to the primary assimilation. Hydrochloric acid is preferable in the treatment of fevers. It may often be advantageously administered in beef-juice.

In *scarlet fever*, hydrochloric acid is frequently combined with chlorate of potassa (producing euchlorine), but it is better administered alone in this disease. Besides the internal administration of the acid, it is often mixed with water and used as a gargle, or mixed with honey and applied with a brush to the throat. One part of acid to five parts of honey or ten of water is a strong enough solution for this purpose. In the other *eruptive fevers*, hydrochloric acid is serviceable to allay thirst, to increase digestion, and to obviate the tendency to adynamia in these diseases. To children, the dilute hydrochloric acid may be readily administered in lemonade or in sirup of lemons.

There is no doubt of the value of the acids, especially the nitro-muriatic, in the treatment of *constitutional syphilis*. This remedy is not to be compared in efficiency with mercury and iodide of potassium, but in chronic cases saturated, so to speak, with these approved remedies, in which syphilitic patches persistently reappear in the mouth, nitro-muriatic acid often renders important service. It is undoubtedly true that constitutional syphilis has been treated successfully by the acids alone, but a very rigidly abstemious dietary has been enforced in these cases. It has already been shown that the denutrition method is of itself sufficient in some cases to relieve the organism of constitutional infection. How much of the result is to be ascribed to the remedy, and how much to denutrition, is not clear.

Nitric acid has been used with success in the treatment of *intermittent fever* by Hammond, Bailey, and others. In order to obtain a curative effect, it is necessary to give the acid in full doses every four or six hours. This acid is of great service, also, after an arrest of the paroxysms of intermittent by quinine, to remove the hepatic congestion

and the changes in the glandular apparatus of the intestines induced by the fever-movement. It may be advantageously combined with the bitters, or used instead of the aromatic sulphuric acid in the preparation of the official *infusum cinchonæ flavæ*.

The mineral acids have long been used with more or less advantage in the treatment of *phthisis*. Their utility obviously depends on the fact that they supply to the digestive fluids a material in which they are deficient in this disease. As Fenwick has shown, both pepsin and acid occur in quantity much less than normal in the gastric juice of phthisical subjects. The acid best suited for the treatment of the *indigestion of phthisis* is the official *acidum muriaticum dilutum*.

Nitric acid is one of the numerous remedies used in *whooping-cough*. It is frequently successful in shortening the duration of the disease and moderating its violence; but it acts much more beneficially after the subsidence of the catarrhal stage. It should be given well diluted in sweetened water. *Chronic bronchitis* and *hoarseness produced by singing and by simple acute catarrh* are relieved by ten-minim doses of dilute nitric acid.

The mineral acids, especially the hydrochloric, have lately been proposed as remedies for *acute rheumatism*. The unquestionable utility of the tincture of the chloride of iron in rheumatism lends support to this practice. It is highly probable that the mineral acids check the formation of lactic acid in the blood. Whatever may be the nature of the action, good results from the treatment have been reported (Dr. J. James Ridge).

Some of the accidents due to *lead* are prevented, and relieved when they occur, by sulphuric acid. Sulphuric-acid lemonade is used by workmen in lead-factories to prevent lead-poisoning. This is supposed to act by forming the insoluble sulphate of lead. Dilute sulphuric acid is also effective in the treatment of *lead-colic*. The *constipation due to lead* is relieved by a combination of sulphuric acid and sulphate of magnesia, and the *lead-cachexia* is much benefited by a prescription of sulphate of quinine, sulphate of iron, and dilute sulphuric acid. The effects of lead on the nervous system are not removed by sulphuric acid.

Sulphuric acid is sometimes very effective in *uterine hæmorrhage*. It has seemed to the author to be more useful in the case of hæmorrhage due to fibroid or polypus than the flow arising from other causes. Although sometimes prescribed for *pulmonary hæmorrhage*, it is not equal to other remedies. In *intestinal hæmorrhage* sulphuric acid acts directly in part, and is therefore serviceable. In *purpura* it sometimes acts happily.

The aromatic sulphuric acid has long been used to check *profuse sweating*, especially the *sweating of phthisis*. It is certainly service-

able in this condition, but objectionable because of the ill effects of the acid on the function of digestion. If used at all, it should not in any case be long continued.

Nitric and nitro-hydrochloric acids have also been used with advantage in such diseases of the skin as *lepra*, *impetigo*, *acne*, *erythema nodosum*, and others, in which the skin-affection is symptomatic of imperfect digestion and assimilation.

In certain morbid states of the urine, as the *phosphatic diathesis*, *oxaluria*, *alkalinity of the urine from disease of the urinary mucous membrane*, and *phosphatic calculus*, the mineral acids render important service. In chronic cystitis and phosphatic deposits, a very weak solution of nitric acid (gtt. j— $\bar{3}$ j) may be injected with advantage. In using such injections it is to be remembered that the bladder is extremely intolerant, and hence they should be permitted to escape immediately. When *uric acid is in excess* in the urine from faulty digestion and assimilation, nitric acid is often of great service: the excess of uric acid disappears because the foods are more perfectly prepared for admission into the blood.

LOCAL OR TOPICAL USES OF THE MINERAL ACIDS.—Some allusions have been made to the local application of muriatic acid in diseases of the throat and of the acid bath in hepatic affections. It will not be necessary to recapitulate on these points.

Nitric acid is one of the most efficient escharotics for the destruction of specific or unhealthy ulcers. It is the most frequently used caustic for the destruction of *chancreoid*, *sloughing* or *phagedenic chancre*. A glass rod or bit of pine is dipped into the acid and applied, care being taken to penetrate to all the sinuosities of the sore. The surrounding healthy tissue may be protected from injury by the previous application of oil, and, when the acid has sufficiently penetrated, its further action may be arrested by some alkaline wash. A water-dressing, or spirit and water, or dilute tincture of benzoin, or some similar application, may be afterward applied to the sore. Ordinary indurated chancre does not require escharotic applications. *Hospital gangrene*, or a *gangrenous condition* of wounds, injuries, or ulcers, is similarly treated with advantage, and probably no form of caustic is more desirable than nitric acid for these purposes. Ordinary *torpid* and *ill-conditioned ulcers* are improved and put in the way of healing by frequent washing with a weak lotion of nitric acid ($\bar{3}$ j—Oj). The same solution will remove *mucous patches* and *condylomata*, and will often check the bleeding from *hæmorrhoids*.

Nitric acid is one of the means employed for the removal of *hæmorrhoids*. It is not effective, however, against all forms. Large hæmorrhoids are much better treated by the ligature, galvano-caustic loop, or other radical measures. The so-called "strawberry-pile," a small hæmorrhoid of red color, which consists of a congeries of arte-

rial twigs and which bleeds freely, can be effectually destroyed by nitric acid. The pile should be exposed, usually through a speculum, and the strong nitric acid be applied on a pine stick freely, followed by an abundant application of olive-oil to prevent the extension of the escharotic action to the surrounding parts. Small, superficial *nævi* are treated successfully in the same way.

Sulphuric acid penetrates more deeply than nitric, and its escharotic action is not so easily limited; hence, it is not so frequently employed for the destruction of sloughing and ill-conditioned ulcers. It is sometimes used in the form of Ricord's paste to chancres, sloughing or phagedenic. The paste is made by the addition of sufficient charcoal to strong sulphuric acid to give it the proper consistence. This is spread on a piece of muslin of a size equal to the sore, and is allowed to remain on until an eschar is produced, when an ordinary poultice may be applied.

A favorite liniment of Sir Benjamin Brodie for counter-irritation of diseased joints is made by the addition of sulphuric acid to olive-oil (3j of the acid, $\frac{3}{4}$ iv of olive-oil).

A general bath in, or sponging the body with, a solution of nitromuriatic acid—one ounce to a gallon—is very serviceable in the case of cachectic children who present these symptoms: a dry and wrinkled skin, sallow complexion, capricious appetite with a taste for dirt-eating, and whitish, pasty motions. Applying to the surface of the body an acid solution must affect the constitution of the blood, for an acid solution on one side of an animal membrane and an alkaline fluid on the other are the conditions most favorable to osmosis.

Lately, Dr. Lombe Atthill, of Dublin, has called attention to the "use of nitric acid in the treatment of uterine disease." He applies the fuming nitric acid to the interior of the uterine cavity after previous dilatation with sponge or laminaria tents. In order to protect the cervix and cervical canal he introduces an intra-uterine speculum with expansive blades. The cavity is first mopped out and dried with cotton; then a probe, wrapped with cotton, is dipped in fuming nitric acid and applied thoroughly to the mucous membrane. This practice is very effective in the treatment of intra-mural fibroids and fungous granulations, to restrain hæmorrhage, and after the removal of polypi. He almost invariably employs nitric acid in the treatment of granular cervicitis and endo-cervicitis, "with the best results." When decided tenderness of the uterus exists, he advises that this be first removed by suitable measures.

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OILS AND FATS.

Adeps.—Lard. *Saindoux*, Fr.; *Schweineschmalz*, Ger.—Below the temperature of 86° Fahr. a soft solid.

Adeps Benzoinatus.—Benzoinated lard.

Sevum.—Suet. *Suif de mouton*, Fr.; *Schöpsentalg*, Ger. The prepared suet of *ovis aries*.

Oleum Amygdalæ expressum.—Almond-oil. *Huile d'amandes*, Fr.; *Mandelnöl*, Ger. The fixed oil obtained from the kernel of the fruit of the *Amygdalus communis*.

Oleum Theobromæ.—Cacao-butter. *Beurre de cacao*, Fr.; *Cacao-butter*, Ger. The concrete oil of the kernels of the fruit of *Theobroma cacao*.

Oleum Lini.—Flaxseed-oil. *Huile de lin*, Fr.; *Leinöl*, Ger. The fixed oil obtained from *Linum usitatissimum*.

Oleum Olivæ.—Olive or sweet oil. *Huile d'olive*, Fr.; *Olivenöl*, Ger. The fixed oil obtained from the fruit of *Olea Europæa*.

Oleum Gossypii Seminis.—Cotton-seed oil. A fixed oil expressed from the seed of *Gossypium herbaceum*, and subsequently purified. (Used in the preparation of linimentum ammoniæ; linimentum calcis; linimentum camphoræ; linimentum plumbi subacetatis.)

COMPOSITION.—The above-mentioned oils and fats differ in the quantity of olein, stearin, and margarin which they respectively contain, and hence differ in physical qualities. Lard is composed of 38 per cent of stearin and margarin and 62 per cent of olein, and olive-oil of 72 per cent of olein and 28 per cent of margarin. The more solid fats, as suet, contain much stearin. These neutral fats are, chemically, combinations of an acid (stearic, palmitic, margarin, oleic) with a base, glycerin. The olein of linseed-oil appears to differ from ordinary olein by furnishing a different acid—linoleic—when saponified.

Oleum Morrhuæ.—Cod-liver oil. *Huile de morue*, Fr.; *Leberthran*, Ger. The fixed oil obtained from the fresh livers of *Gadus morrhua* and other species of *Gadus*.

COMPOSITION.—Cod-liver oil contains a peculiar principle, *gaduin*, and yields, by distillation with ammonia, *propylamin*. It also differs from the fats and oils above described in containing various biliary