

pharmacopœias, but professional use is now almost entirely restricted to the oil, which is described below. The dose of lavender is 1 to 4 gm. (gr. xv.-lx.) corresponding to about one minim of the oil, though the latter is given in larger doses.

**LAVENDER, OIL OF.** *OLEUM LAVANDULÆ FLORUM* (U. S. P.). Both the oil of the plant and that of the flowers are commercial, and both have been official, though only that here considered is so at present. They are very similar, that of the flowers being only a little finer. The official article is thus described:

"A colorless or yellowish liquid, having the fragrant odor of lavender flowers and a pungent and bitterish taste. Specific gravity 0.885 to 0.897 at 15° C. (59° F.). It is soluble in all proportions in alcohol (distinction from *oil of turpentine*) and in three times its volume of a mixture of three volumes of alcohol and one volume of water (distinction from and absence of *oil of turpentine*); it is also soluble in glacial acetic acid. With an equal volume of carbon disulphide it forms a turbid mixture. The alcoholic solution of the oil is neutral or slightly acid to litmus paper. When heated on a water-bath, in a flask provided with a well-cooled condenser, the oil should yield no distillate having the odor of alcohol."

A number of inferior oils, from other species of lavender, chiefly spike oil, from *L. Spica* Cav., are in the market and are all distinguished by their much higher specific gravity, that of spike oil, the highest, ranging from 0.905 to 0.920.

The active portion of oil of lavender is *linaloyl acetate*, which should constitute about one-third of it.

The dose of lavender oil is ℥i. to v., though it is comparatively little used internally. The official spirit has a strength of five per cent. The compound tincture, or compound spirit, contains, with 8 parts of this oil, 2 of oil of rosemary, 20 of cassia, 10 of nutmeg, 5 of cloves, in a thousand, and is colored with red saunders.

Henry H. Rusby.

**LAXATIVES.**—This term is applied to all substances which gently evacuate the contents of the intestines. Some authors limit its use to those purgatives which, in large doses, produce normal or nearly normal stools, without obvious irritation. Others extend it to all purgatives which operate without causing decided griping. As generally employed at the present time, the term embraces all medicines and articles of food which render the stools softer and more frequent, without causing any notable irritation. Laxatives are frequently termed aperients, lenitives, and ecoprotics.

*Articles of food* which cause bulky and loose stools generally provoke daily intestinal evacuations, and hence are called laxative foods. They all contain notable quantities of indigestible matter, and some of them salts and acids, which are supposed to operate in the same manner as the saline laxatives.

The succulent vegetables and fleshy fruits contain much cellulose, which, for the most part, resists digestion, and hence increases the bulk of the feces, and thus mechanically promotes peristalsis of the large bowel. When they constitute a large part of the diet a daily easy evacuation usually takes place. Many persons, however, cannot eat them in sufficient quantity without suffering from dyspepsia. The most laxative fruits are prunes, figs, pears, peaches, apples, and berries. One or two oranges eaten before breakfast will sometimes cause an evacuation in a few hours.

The most laxative foods are those prepared from the unbolted meal of the cereal grains. Graham bread or brown bread, prepared from unbolted wheat-meal, is generally preferred for continued use, and, when it forms a considerable part of the diet, almost uniformly causes sufficient action of the bowels. Cracked wheat is equally laxative, and is occasionally eaten by persons of costive habit. Oatmeal and Indian-meal are also useful, but are usually less relished than brown bread. Pure bran is sometimes employed as a laxative in quantities of one or two tablespoonfuls daily.

Saccharine articles, such as honey, molasses, and brown sugar, if indulged in freely, usually provoke a daily intestinal evacuation. Sugar of milk, in quantities of from two to four drachms, dissolved in half a pint of warm skim milk, and taken about two hours before breakfast, frequently produces one or two loose stools in a few hours. Some persons procure an easy motion soon after breakfast by drinking a tumbler of cool water immediately after rising.

Generally, laxative foods which cause bulky evacuations increase the appetite. In part this results from the waste of much nutritious matter, which is less completely digested when mixed with a quantity of indigestible cellulose or woody fibre.

*Laxative medicines* are employed in habitual constipation when a laxative diet and other appropriate hygienic measures have failed to cause regular action of the bowels, or when they cannot be adopted. They are generally preferred to stronger purgatives in acute constipation, unless the latter are required to produce effects on the general system.

**Magnesia and Magnesi Carbonas.**—In moderate laxative doses these medicines cause feculent stools in from eight to ten hours. They rarely operate sooner than six hours, and often not before twelve to twenty-four hours. Occasionally their action is attended by some nausea and colic. According to Trousseau, the continued use of magnesia may be followed by irritation of the large intestine, the stools becoming mucous and bloody. Its habitual use has been followed by accumulations of ammonio-magnesian phosphate in the colon, which could be felt through the walls of the abdomen. Such concretions may give rise to obstinate constipation, typhlitis, and perforation of the bowel.

Very small doses of magnesia and its carbonate do not act on the bowels, as they form salts with hydrochloric and lactic acid in the stomach, which are completely absorbed. But when larger quantities are taken than can be thus neutralized in the stomach, the excess passes into the intestines, where it is gradually converted into a bicarbonate, which, on account of its low diffusibility, passes into the lower part of the bowels and excites peristaltic action. One gram of magnesia is capable of absorbing 1,100 c.c. of carbonic acid gas; hence it has been used in cases of meteorism, but has not proved very effectual, partly because carbonic acid gas forms only a part of the intestinal gases, and partly because of the arrested peristalsis.

On account of their antacid property, magnesia and its carbonate are indicated when constipation is associated with an excessive formation of acids in the alimentary canal. By combining with the acids they prevent further irritation, and by hastening peristalsis remove the causes of fermentation.

Magnesia is frequently used in infantile diarrhoea when the stools are green in consequence of an excess of acid. Often the diarrhoea ceases as soon as the stools acquire their normal color.

In all cases in which a very gentle laxative is indicated, as in debilitated adults and feeble children, magnesia or its carbonate may be employed.

The dose of magnesia for adults varies from ʒ ss. to ʒ i., and for children from gr. v. to gr. xx. Of the carbonate about one-fifth more may be given.

Magnesia is ordered in the form of powder or mixture. Heavy magnesia is preferred for powders, and is usually taken in milk or sweetened water.

Mixtures of magnesia gelatinize rapidly, unless they contain about sixteen parts by weight of water and four parts of syrup or glycerin. According to Hager, a mixture consisting of one part by weight of magnesia, ten parts of distilled water, and four parts of glycerin, remains liquid for a long time.

**Liquor Magnesi Citratis and Magnesi Citras Granulatus.**—The solution of citrate of magnesium, and the granulated citrate of magnesium, in moderate doses, act very gently. In the alimentary canal they are converted into the bicarbonate of magnesium in the same manner as calcined magnesia.

The dose of the solution is ʒ iv.-vi.; of the granulated salt, ʒ ij.-iv.

Certain mineral waters containing notable quantities of sulphate and chloride of magnesium, and sulphate of sodium, especially Friedrichshall and Hunyadi János, are frequently employed as laxatives. They usually act gently, producing thin and watery stools, without griping or tenesmus. Generally they move the bowels in a few hours, but numerous exceptions occur. After a time the bowels no longer respond to them, so that even large doses, which at first operate with considerable energy, soon have little or no effect. The minimum laxative dose varies greatly in different persons, but usually from four to eight ounces act gently and promptly. These waters are said to be useful in habitual constipation depending on simple chronic intestinal catarrh, or on nervous atony of the bowels, as found in hypochondriacal, hysterical, and sedentary persons. Their prolonged use in the constipation of feeble and anæmic patients is injurious.

**Potassii et Sodii Tartras.**—In doses of ʒ ij.-iv. the tartrate of potassium and sodium, or Rochelle salt, usually produces one or several loose stools in from three to six hours, without colic or tenesmus. On account of its not disagreeable taste and mild action, it is frequently used in the diseases of children and delicate adults, when an aperient is indicated. It is held to be preferable to other laxatives in cases of constipation attended with a deposition of urates in the urine, or with defective secretion of bile.

Generally it is ordered in the form of powders, each ʒ ij. with a small quantity of sugar and oil of lemon. If ordered in solution, fruit syrups should not be added as flavoring agents, as they are incompatible with the salt. When the stomach is irritable, the salt is usually given in the form of *Puleis effervescens compositus*, or seidlitz powders. These consist of ʒ ij. of tartrate of potassium and sodium and gr. xl. of bicarbonate of sodium, wrapped in a blue paper, and gr. xxxv. of tartaric acid, wrapped in a white paper. The two powders, when taken, are dissolved separately, the former in about four ounces of water, the latter in one ounce. The solutions are then mixed and drunk while effervescing.

**Sulphur.**—Washed and precipitated sulphur, in doses of gr. xx.-lx., act very gently and slowly, producing one or two feculent stools, which usually have a strongly marked odor of sulphureted hydrogen. The laxative action is held to be due to the sulphide of sodium formed in the intestines. Some of the sulphide is decomposed by the carbonic acid gas of the bowels, which causes the evolution of sulphureted hydrogen. As only a part of the sulphur can undergo chemical changes, large doses do not produce brisk purgation. After prolonged use of sulphur a disagreeable odor may be detected in all the secretions.

As a laxative sulphur is held to be useful in cases of piles, fissure of the anus, and stricture of the rectum, because it produces soft, easily moulded stools, which pass from the rectum without irritating the highly sensitive parts. It is often combined with other purgatives, such as magnesia, bitartrate of potassium, and senna, but acts well without such additions. The following formula of Brodie's is highly recommended by Cripps as a mild laxative for internal piles. ℞ Conf. sennæ, ʒ iss.; sulph. precip., ʒ ss.; mel. rose, q. s. M. S.: About a teaspoonful every night. Usually sulphur is ordered in the form of powder, which may be taken in milk, syrup, or molasses. It should not be ordered in liquid mixture, as it soon firmly adheres to the bottom of the phial.

**Oleum Ricini.**—Castor oil in appropriate doses usually acts very gently, producing one or two evacuations in from three to six hours. Large doses act more briskly, and often cause nausea and vomiting, with somnolency and a feeling of weakness. If the oil is rancid, small doses may be followed by such effects.

In the duodenum castor oil is decomposed like other oils, and its ricinoleic acid set free. Some authors hold that this acid irritates the mucous membrane and thus

excites peristaltic action. Others suppose that an acrid substance, insoluble in water, alcohol, ether, and alkalies, and readily decomposed by heat, is the purgative principle. In experiments on isolated parts of the intestines of dogs, Brieger found that the oil caused firm contraction of the bowel without any appearances of hyperæmia.

On account of its gentle, speedy, and certain action, castor oil is often used when constipation occurs in the diseases of children, in pregnant women, after parturition, and in delicate persons. For the same reasons it is generally preferred to other laxatives when evacuation of the contents of the bowels is required in typhoid fever, dysentery, and other inflammatory affections of the intestines or adjacent organs. It is also suitable to cases of diarrhoea caused by the presence of undigested food or other irritating substances.

It is not appropriate in habitual constipation, as its continued use soon causes disorder of the stomach; and it is contraindicated in gastric catarrh.

The only objection to castor oil is its disagreeable taste, due chiefly to its adhesiveness and viscosity. Various methods of disguising it are in use. Its adhesion to the mouth and throat may be prevented by previously rinsing these parts with an alcoholic liquid. It may be rendered less viscid and comparatively tasteless by mixing it with hot bouillon, hot coffee, or milk, or with the foam of ale or beer, or peppermint water and brandy. Its taste is hardly perceptible when it is mixed with an equal quantity of glycerin and a few drops of oil of cinnamon or gaultheria. Sometimes it is administered in capsules, which, of course, are perfectly tasteless. It is said that the oil is not repulsive when rubbed up into a mass with three parts of sugar, or with two parts of compound powder of liquorice. The latter form is adapted only to adults, the former to children. The mass may be divided into large pills which, placed upon the tongue, can be conveniently swallowed with a draught of water. Sometimes the oil is ordered in emulsion with gum arabic: ℞ Olei ricini, ʒ ss.; pulv. acaciæ, ʒ i.; syrupi, ʒ ij.; aq. menth. pip., q. s. ad ʒ ij. M. ft. emuls. In emulsions of castor oil the gum arabic should not exceed in weight one-fourth of the oil, as it is apt to interfere with the laxative action.

The laxative dose of castor oil for adults varies from ʒ i. to ʒ iv., for children from ʒ i. to ʒ ij. Sometimes a dose of from ℥ xx. to ℥ xxx., taken two hours before breakfast, acts gently in a few hours.

**Rheum.**—In some persons as little as from gr. iij. to gr. v. of rhubarb causes a feculent evacuation in from eight to twelve hours. In others as much as gr. x. is necessary for this effect. Doses of gr. x.-xv., if repeated several times, usually cause two or three stools in from five to ten hours, each stool being preceded by some griping. The stools are usually yellow and semi-liquid.

If taken habitually, laxative doses of rhubarb soon fail to act, and finally even large doses may have little effect. There are, however, numerous exceptions to this rule, some persons using it habitually for many years without being under the necessity of materially increasing the dose.

Rhubarb is well adapted to the habitual constipation of persons with feeble digestion. Often laxative doses not only produce a daily evacuation, but also increase the appetite and relieve oppression after meals. In the constipation of persons afflicted with piles, gr. v.-x. taken every night, or as often as needed, act well and frequently give great relief. A daily laxative dose is useful also in the costiveness and hemorrhoidal swellings incident to pregnancy.

Rhubarb is often preferred to other laxatives when constipation occurs during convalescence after acute diseases, or in anæmic, cachectic, very feeble, or very aged patients. In icterus also, a laxative being required, many physicians prefer rhubarb. It is used in some forms of diarrhoea, especially when symptoms of dyspepsia are associated with the looseness of the bowels. In such cases only very small doses are given, and the good

effects depend rather upon the bitter and astringent than upon the purgative principle of the medicine. Laxative doses are required when looseness of the bowels is caused by irritating substances, as in the diarrhoea of children when the discharges are green. In such cases magnesia is often associated with rhubarb in order to neutralize the excess of lactic acid, as in the official *compound powder of rhubarb*.

The dose and mode of administration vary in different cases. In habitual constipation one dose of gr. iij.-x. is usually given in the evening. In acute constipation, such a dose may be administered every three or four hours until the bowels move. In diarrhoea with acid stools, small doses are given several times a day.

Rhubarb is rarely administered in the form of powder on account of its disagreeable taste, which may, however, be somewhat disguised by the addition of an aromatic, especially the official aromatic powder. The official pill of rhubarb, containing gr. ij. of rhubarb and one of soap, is usually preferred in habitual constipation, from one to three pills being taken at bedtime. Some costive persons daily chew a small piece of rhubarb, weighing from gr. v. to gr. x., in order to increase the action of the bowels.

Of the liquid preparations, the wine, the simple tincture, and the aromatic tincture, in appropriate doses, are suitable laxatives for convalescent, feeble, and aged patients, and the syrup and aromatic syrup for children.

*Aloe*.—In doses of gr. ij.-v., aloes usually produces one or two stools in from ten to fifteen hours. Occasionally it acts in six or eight hours, but more frequently its action is delayed beyond sixteen hours. The stools are soft, bulky, and dark. Sometimes they are attended by slight griping and tenesmus. These effects are more marked after larger doses, which also cause the stools to become thinner, but do not act much more speedily than small ones. The persistent use of aloes is sometimes followed by a feeling of weight and fulness in the pelvis, and, it is said, by the development of true hemorrhoids. According to Lewin, delicate young persons and the aged are predisposed to such effects. The slowness of action, and the symptoms of hyperæmia of the rectum, show that aloes influences chiefly the descending colon and rectum. According to the researches of Rutherford, it increases the secretion of bile and renders it more watery.

Aloes does not usually lose its activity when habitually taken, the same dose producing the same laxative effect for many months, and sometimes for years; in some cases the dose may even be gradually diminished. For this reason it is one of the most appropriate laxatives for habitual constipation.

Aloes is held to be preferable to other laxatives when constipation is associated with dyspepsia, hypochondriasis, and biliary derangement, and, in females, with atonic amenorrhœa. The presence of piles, unless they are inflamed, does not contraindicate the use of laxative doses. But aloes should not be employed when active hyperæmia of the large intestine exists, or when there is some disease of the uterus tending to hemorrhage. And though small doses might do no harm in pregnancy, it is better to resort to other laxatives.

On account of its slow action, aloes is usually taken just before or after the last meal, and, as a rule, it acts on the next morning after breakfast. If it act sooner, it should be taken just before retiring.

As aloes is intensely bitter, it is generally ordered in the form of pills, of which five varieties are official. For all ordinary cases of constipation the *pilula aloes*, containing each two grains of aloes and soap, answer well, one pill being given daily. The *pilula aloes et mastiches*, known also as Lady Webster's dinner pills, also contain each gr. ij. of aloes and a little mastic; the latter has no effect. The *pilula aloes et ferri* are adapted to the constipation of anæmic persons. Some authors state that the sulphate of iron in these pills increases the activity of the aloes. The *pilula aloes et myrrha* are held to be suitable to constipation associated with atonic amenorrhœa.

*Resina Podophylli*.—The resin of podophyllum, or po-

dophyllin, as it is commonly called, in doses of gr.  $\frac{1}{4}$  to  $\frac{1}{2}$ , operates slowly, moving the bowels in about eight to twelve hours. Administered in the evening, it usually produces a feculent evacuation next morning after breakfast. Sometimes it causes griping, especially in delicate females. Like aloes, it retains its laxative action for a long time without necessitating an increase of the dose. According to Rutherford and Vignal, podophyllin increases the secretion of bile without altering its composition.

The laxative operation of podophyllin is somewhat uncertain, a dose which acts gently in some persons acting either severely or not at all in some others.

On account of the smallness of its dose, the convenience of its administration, its persistent action in the same dose, and its cholagogue power, podophyllin is much used in various forms of habitual constipation. It is held to be especially adapted to cases of atony or torpor of the muscular layer of the bowel, and to constipation associated with an insufficient secretion of bile. Harley found it very useful in cases of feeble liver, when the insufficient secretion of bile resulted from want of nervous power.

Podophyllin is generally administered in the form of pill. To prevent griping, a small quantity of extract of belladonna or extract of hyoscyamus is incorporated with it, and, when required, some extract of nuxvomica. Podophyllin is sometimes dissolved in alcohol and taken in sweetened water.

The active principle of podophyllum, called podophyllotoxin, has been given to adults in doses of gr.  $\frac{1}{4}$  to  $\frac{1}{2}$ , usually dissolved in alcohol and taken in syrup or sweetened water. Its action is said to be more certain and regular than that of podophyllin. To children it has been given in doses of gr.  $\frac{1}{20}$  to  $\frac{1}{15}$ , according to their age.

*Senna*.—Senna is rarely given alone as a laxative, but frequently in combination with less active purgatives, as in the official *Confectio Sennæ* and the *Pulvis Glycyrrhizæ Compositus*. Having little or no unpleasant taste and acting very gently, the confection of senna is often used to unload the bowels in pregnancy, convalescence, and hemorrhoidal affections. The dose is one or two drachms, which may be conveniently taken at bedtime. The compound powder of liquorice is adapted to the same cases, and is sometimes used in habitual constipation. It is given in doses of half a drachm to one drachm in a small quantity of water, preferably at bedtime.

*Colocynthis*.—The extract and compound extract of colocynth are sometimes employed as laxatives in habitual constipation, the former in doses of gr. ss.-i., the latter in doses of gr. i.-v. Generally they are combined with other laxatives, and with extract of hyoscyamus or extract of belladonna, to prevent griping, as in the following pills: R. Extr. colocynth. comp., gr. iv.; pulv. ipeac., gr. ij.; podophyllin, extr. bellad., aa gr. i. M. ft. pil. No. iv. Sig.: One pill at bedtime.

*Cascara Sagrada*.—This remedy has come into general use as a laxative in habitual constipation. Its prolonged employment in appropriate doses is frequently followed by a return of the normal activity of the large intestine. Usually the fluid extract is given in doses of ℥ x.-xxx. several times daily. R. Extr. rhamni purshianæ fluidi, Syrupi aurantii, Aquæ destillatæ, aa ℥ ss. M. Sig.: One-half to one teaspoonful three times daily before eating. The dose found to be effective should be gradually lessened. In many cases it may be entirely discontinued after a few weeks or months.

*Frangula*.—In doses of ℥ xv.-xxx. the fluid extract of frangula is said to be a mild but uncertain laxative. As it does not quickly lose its activity, it has been recommended for habitual constipation. Samuel Nickles.

**LEAD**.—I. GENERAL MEDICINAL PROPERTIES OF COMPOUNDS OF LEAD.—Absorbed into the system, lead exerts a peculiar influence, developing a unique series of symptoms. The influence is wholly toward deterioration of tissue and perversion of function, and has no application in medicine. Locally, the effects differ among the compounds mainly according to solubility. The insoluble

compounds are soothing and absorbent, like the insoluble salts of bismuth, while the soluble are decidedly astringent, but yet, in proportion to the astringency, are far less irritant than most other astringent metallic salts. The therapeutics of lead salts consist in the application of the insoluble compound (carbonate) as an absorbent and healing dusting powder, and the employment of the soluble salts as metallic astringents in catarrhs, or, in weak solution, as cooling lotions in inflammation or irritation of the skin. In these applications the following points need attention: 1. The carbonate should not be applied too extensively over a raw surface, else, through chemical conversion, enough lead may be absorbed to produce distinct constitutional lead poisoning. 2. No lead compounds should be applied to the eye, for, though excellent for simple irritation or catarrh of the conjunctiva, yet there is the peculiar danger that if a loss of the epithelium of the cornea occur, whether by ulceration or by traumatic abrasion, application of a lead solution will produce an instant, indelible, opaque, white streak over the area of exposed underlying corneal tissue. 3. Lead salts should not be given internally for longer than a very few days, lest constitutional lead poisoning result.

II. THE COMPOUNDS OF LEAD USED IN MEDICINE.—These are the *monoxide*, *carbonate*, *iodide*, *acetate*, *basic acetate*, *nitrate*, and *oleo-palmitate* (lead plaster).

*Lead Monoxide*: PbO. Lead monoxide is the compound so well known as *litharge*. It is official in the United States Pharmacopœia as *Plumbi Oxidum*, Lead Oxide. It is in the form of a heavy yellowish powder or minute scales, insoluble in water or alcohol and without smell or taste. It is not used medicinally under its own form, but is official as being the source, in pharmacy, of the solution of the lead subacetate and of lead plaster.

*Lead Carbonate*:  $PbCO_3 \cdot Pb(OH)_2$ . This salt, the common *white lead* of the paint shops, is official in the United States Pharmacopœia as *Plumbi Carbonas*, Lead Carbonate. It is in the form of a heavy white powder or pulverulent mass, and, like the oxide, is insoluble in water or alcohol and is without odor or taste. As its formula shows, it is a mixture of the normal carbonate and the hydroxide. White lead is used as a dusting powder, as already set forth, or it may be applied mixed to the consistency of paint with linseed oil, or it may be used in ointment, in the shape of the official *Unguentum Plumbi Carbonatis*, Ointment of Lead Carbonate, a mixture of ten per cent. of white lead with benzoated lard. White lead, being so largely used in the arts, is a fruitful source of lead-poisoning.

*Lead Iodide*:  $PbI_2$ . This compound is official in the United States Pharmacopœia as *Plumbi Iodidum*, Lead Iodide. It is in the form of a heavy yellow powder, slightly soluble in cold water and in alcohol, but more readily soluble in boiling water (1 to 200). The claim of lead iodide to medicinal recognition is based upon the theory that the salt will yield the peculiar effects of an iodide along with those of lead. But in practice the medicine seems to amount to little else than a very slightly soluble lead salt, and is little used. It has been given internally in doses of from 0.03 to 0.20 gm. (gr. ss.-iij.). For external application there is an official *Unguentum Plumbi Iodidi*, Ointment of Lead Iodide, consisting of ten parts of the lead salt to ninety of benzoated lard.

*Lead Acetate*:  $Pb(C_2H_3O_2)_2 \cdot 3H_2O$ . Normal lead acetate, the salt well known as *sugar of lead*, is official in the United States Pharmacopœia as *Plumbi Acetas*, Lead Acetate. The salt occurs in colorless, bright prismatic crystals or scales, of a faint vinegar-like odor and a characteristic taste at first sweetish and astringent, and afterward metallic. It dissolves freely in water and fairly in alcohol (1 to 21). It effloresces and absorbs carbon dioxide from the air on exposure. The solutions commonly show a slight turbidity, which, however, is easily removed by the addition of a few drops of acetic acid. Commercial sugar of lead is apt to be contaminated with lead sulphate or carbonate, an impurity which may be suspected if a sample fail to dissolve wholly in water. The salt is decomposed by the alkalis, by acids, by soluble sul-

phates, chlorides, citrates, and tartrates, and by lime water.

Lead acetate is one of the most powerful of the lead salts. In rather weak solution it evinces the combined astringency and soothing influence characteristic of soluble lead compounds, but in strong solution is distinctly irritant, so that the salt is a possible severe irritant poison. Lead acetate may be used externally in solution as an astringent wash, with the caution already given about application to the eye. The strength of lead lotions commonly ranges from the one-half of one to one or two per cent. Internally the salt is a good deal given as an astringent in diarrhoeas, and has also an ancient reputation of being of avail for the arrest of hemorrhage in quarters inaccessible to local measures. This alleged hæmostatic potency is held in high esteem by some, but by others is considered wholly imaginary. By the very conditions of the case this virtue is one impossible to establish or disprove by methods of precision.

Lead acetate is administered in doses of from 0.06 to 0.20 gm. (gr. i.-iij.) every two hours or so, and, when given in diarrhoea, is probably more often than not combined with an opiate.

*Basic Lead Acetate*:  $Pb(C_2H_3O_2)_2 \cdot 2PbO$ . When lead monoxide (litharge) is boiled in a solution of lead acetate it dissolves with the formation of certain basic acetates, the composition of the resulting basic salt depending on the proportion of litharge to sugar of lead in the making. The United States Pharmacopœia avails itself of this reaction, and by taking the ingredients in the proportion of ten of litharge to seventeen of acetate, obtains a solution of basic acetates of which the principal one is the triplumbic acetate of the formula given above. This solution is proportioned so as to be about twenty-five per cent. strength of salts, and is officially entitled *Liquor Plumbi Subacetatis*, Solution of Lead Subacetate, called also *Goulard's Extract*. It is a clear, colorless liquid, of a sweetish, astringent taste, and an alkaline reaction. It is easily distinguishable from a solution of the normal acetate (sugar of lead) by the fact that it produces a dense, white precipitate with a solution of acacia. Solution of subacetate of lead is exceedingly easy of decomposition; even the carbon dioxide of the atmosphere will attack it and render it milky by the formation of the insoluble carbonate of lead. It must therefore be kept in well-stoppered bottles. It is decomposed also by so many other substances, organic and inorganic, that the practical rule is a good one, viz., to combine this solution, in extemporaneous prescribing, only with opiates. The following preparations of the United States Pharmacopœia are made from this solution:

*Ceratum Plumbi Subacetatis*, Cerate of Lead Subacetate; Goulard's Cerate. This cerate consists of twenty per cent. of the above solution mixed with camphor cerate, and is specially directed to be freshly prepared when wanted for use. This is because the preparation rapidly decomposes on keeping, turning yellow and becoming rancid.

*Liquor Plumbi Subacetatis Dilutus*, Dilute Solution of Lead Subacetate; Lead Water. This solution is simply three parts of the foregoing diluted with ninety-seven of distilled water, previously boiled and cooled to deprive it of free carbonic acid. Lead water is of the average strength wanted for actual application of a subacetate of lead solution, and may therefore be prescribed for use without dilution.

These two preparations, derived from the parent solution of the subacetate, are much used as gently astringent, and at the same time soothing applications to sores, excoriations, or inflamed conditions of skin. Lead water is frequently combined with laudanum for the allaying of superficial pains, such as the pain of erysipelas, of a scald, or of a sprain.

*Lead Nitrate*:  $Pb(NO_3)_2$ . The salt is official in the United States Pharmacopœia as *Plumbi Nitrates*, Lead Nitrate. It occurs in octahedral crystals, either colorless and transparent or white and opaque, according to the method of preparation. The crystals are permanent in