

and alcohol. The experiments of Dr. Ostermayer showed that it was devoid of any therapeutic action. No effects were observed that could be attributed either to the acetanilid or to the iodine, nor could either be detected in the urine after its administration. It appears that the iodine destroys the solubility of the compound and that no absorption takes place. *Beaumont Small.*

**IODANTIPYRIN; IODOPYRIN.**— $C_8H_7I(CH_2)_2C_3HN_2O$ . This compound, introduced in 1891 by Dr. Ostermayer, is antipyrin in which one hydrogen atom has been replaced by iodine. It forms in colorless, shining, prismatic needles, not very soluble in cold water or alcohol, but readily soluble in either when hot.

Iodopyrin was supposed to be a soluble combination of the therapeutic properties of antipyrin and iodine, but experience has shown that in the stomach it is decomposed by the hydrochloric acid, and forms antipyrin and iodide of sodium. Its antipyretic effects are those of antipyrin. In typhoid fever, pulmonary phthisis, rheumatic fever, and other febrile conditions, it lowers the temperature rapidly, and lowers the pulse and respiration; at times it produces a free perspiration. The dose is from seven and a half to twenty-two grains. The value of the iodide of sodium is uncertain, as no decided benefit has been traced to it. The iodine may be detected in the urine after fifteen to twenty-two grains have been given. *Beaumont Small.*

**IODIDES.**—I. GENERAL MEDICINAL PROPERTIES OF IODIDES.—Iodides whose basic radicle is sufficiently innocent to permit of the taking of the salt in decided quantity show special and marked physiological and therapeutic powers, unquestionably due to the iodine of their composition. Physiologically, they tend to produce symptoms as of catarrh, affecting sometimes the mucous membranes of the head alone, and sometimes also the gastro-intestinal mucous tract; to bring out an acneiform eruption on the face; and, when given in large doses long continued, to favor emaciation. These derangements, constituting the condition known as *iodism*, present themselves clinically as follows: The subject experiences the general feeling of discomfort preceding feverishness, and soon follow running at the nose and watering of the eyes, with frontal headache and sneezing. In sensitive persons the conjunctiva may be blood-shot, and the circumjacent tissues swollen and oedematous. A salty taste is perceived, and the salivary flow is somewhat freer than usual. From extension of the influence to the lower mucous membranes, there may develop cough; with hoarseness, from irritation of the throat, and epigastric sinking, with nausea, and a watery diarrhoea, with colic, from affection of the gastro-intestinal tract. An eruption, like acne, is apt to break out, first upon the face, where the papules are generally large and indurated, and later upon the trunk or extremities. Sometimes purpuric blotches also appear, or blebs, and sometimes the main eruption is eczematous instead of acneiform. Nervous symptoms are not so very uncommon, of the general type of listlessness and depression, and in one case of long-continued heavy dosage H. C. Wood observed the subject to be "intensely sleepy and stupid," as in the allied condition of bromism. As regards the tendency to emaciation, this certainly is insignificant, even in the very large dosage with iodides of current medical practice; and the alleged atrophy of the mammae or the testicles under the influence of the iodides, if it happens at all, is so exceedingly rare that it may be dismissed from consideration as a possible danger in the use of the medicines. An important point in connection with the phenomena of iodism is the very different susceptibility of different individuals, on the one hand, and of the same individual at different times, on the other. Thus, with some, coryza is developed by doses of only a few centigrams each (between one and two grains), and, with some, the disagreeable symptoms spontaneously subside, even during a continuance of the medication. In persons who are keenly susceptible, the necessary therapeutic dosage may be attained by begin-

ning with very small doses, such as 0.03 gm. (half a grain) of an alkaline iodide, and gradually increasing. Under any circumstances, the taking of copious draughts of fluid during the course of the medication tends to lessen both the frequency and severity of possible iodism doubtless by hastening the elimination of the iodide salt. And even when occurring, the phenomena of iodism are, with rare exceptions, distressing rather than dangerous, and disappear promptly and fully upon discontinuance of the dosing.

The therapeutic power of the iodides resides in a tendency to promote the absorption of inflammatory or hyperplastic products. This influence, however, proves to be of very different degrees of potency in the different circumstances where morbid products develop. It is, in general, most powerful where the parts involved belong to the nervous or the connective-tissue structures, and, in particular where the process is determined by the syphilitic, the rheumatic, or the scrofulous cachexia. Over purely idiopathic hyperplasias or inflammatory products the resolvent power of the iodides, though often decided, and sufficiently so to be exceedingly valuable clinically, yet is distinctly less pronounced. In affections of epithelial structures, the influence of the iodides is perhaps most marked in bronchocele, and much more so in the idiopathic variety than in that belonging to Basedow's disease; next in scrofulous enlargement of the lymphatic glands; and least in enlargement of the spleen and organic disease of the kidney. To develop the full potency of the iodides it is necessary, more often than not, to give large doses, especially in organic disease of the nerve centres, whether syphilitic or idiopathic. In such cases a marked alleviation of symptoms, or, in possible instances, even a cure, may often be wrought by bold exhibition of an iodide, where previous inadequate dosage had failed to produce any effect whatsoever. In brain disease such quantities as from 8 to 24 gm. (3 ij.-vi.) of an alkaline iodide are not unusual daily allowances. Besides the foregoing, iodides have a few special medicinal applications, as follows: In chronic poisoning by mercury or lead, the alkaline iodides, taken internally, tend to determine a reabsorption into the blood, in soluble condition, of such of the mineral as had been fixed in the tissues. Thus elimination of the poison is favored; but thus also acute poisoning may be re-established, if too much of the metallic compound is made to enter the blood at once. Hence, in this particular therapeutics of the iodides, the doses must at the beginning be small, and any increase is to be made gradually and with careful watching of the effects produced.

II. THE IODIDES USED IN MEDICINE.—The iodides official, or entering into the composition of pharmaceutical preparations official in the United States Pharmacopoeia, are, of the heavy metals, the iodides severally of iron, mercury, silver, zinc, and lead; of the metals of the alkalis and the earths, the iodides of potassium, sodium, ammonium, and strontium; and of non-metallic elements, the iodides of arsenic and of sulphur. Of these various iodides, those of the alkali metals and of strontium alone can be given in sufficient dosage to develop the full iodide therapeutic influence. In the other iodides the medicinal effects of the basic radicle practically outshine what can be gotten from the iodine, and such of the list given above as are compounds of heavy metals or of non-metals will therefore be found discussed under the several titles of the basic elements. The group of iodides medicinally important simply as iodides comprises, of the official list, only the potassium, sodium, ammonium, and strontium salts, to whose action alone the foregoing remarks concerning effects and uses apply in full.

**Potassium Iodide, KI.** The salt is official as *Potassii Iodidum*, Potassium Iodide. It occurs in "colorless, transparent, or translucent, cubical crystals (the white, opaque, commercial variety being crystallized from an alkaline solution, and less pure), or a white granular powder, having a peculiar, faint, iodine-like odor, and a pungent, saline, afterward bitter taste. Permanent in dry air, and but slightly deliquescent in moist air. Solu-

ble at 15° C. (59° F.), in 0.75 part of water, and in 18 parts of alcohol; in 0.5 part of boiling water, and in 6 parts of boiling alcohol; also soluble in 2.5 parts of glycerin" (U. S. P.). The salt should be kept in well-stoppered bottles. Potassium iodide is chemically incompatible with metallic mercury and the pharmaceutical preparations containing mercury in that state, and with the oxides, sulphates, and chlorides of the same metal, including mercurammonium chloride ("white precipitate"). In the case of mercuric chloride (corrosive sublimate), however, the chemical incompatibility does not impair the medicinal efficiency or pharmaceutical elegance of a mixture of the two salts in solution; for if, as must be the case in a medicinal prescription, the potassium iodide be in excess, the mercuric iodide forming upon addition of mercuric chloride immediately redissolves through the secondary forming of a double salt. And such solution produces to full degree the medicinal effects of the mercurial. Corrosive sublimate therefore may be prescribed very conveniently in a solution of potassium iodide. Potassium iodide is incompatible with alkaloids, and practically so also with potassium chlorate; for though no reaction occurs at ordinary temperatures when potassium iodide and potassium chlorate alone are mixed, yet upon the addition of a mineral acid iodine is liberated and apparently iodic acid is formed in the solution. And, according to Melsens, the giving to dogs of potassium iodide and chlorate in conjunction leads to speedy, and even possible fatal, poisoning, presumably because of the occurrence of some such reaction as just described.

Potassium iodide is the best known and most used of the alkaline iodides, and is commonly considered the most effective one of the group. Being a salt of potassium, and one given medicinally in large doses, it produces, in addition to the typical effect of the iodides, those peculiar to potassic salts as such. Accordingly, full doses may depress, generally, and in particular, may weaken heart action; may be diuretic, and, if swallowed in strong solution, be decidedly irritant to the stomach. As regards the diuretic effect, upon which much stress is often laid, this occurs to about the same degree as with other potassic salts, such as the citrate or acetate (see Potassium), a degree which, though not very pronounced, yet may lead to valuable clinical results; for the diuresis often will favor the resolvent effect of an iodide, so that, where dropsy is a feature of a case for which an iodide is to be prescribed, the potassic salt is peculiarly the one to be selected. As to the gastric irritation apt to follow large doses of potassium iodide, this is a well-recognized feature of the action of the salt if the same be given in strong solution; but by the simple device of making the solution quite dilute, this and also all other symptoms of iodism are rendered much less likely to occur. According to Seguin,<sup>1</sup> the tendency to stomach derangement is still further lessened by giving the iodide in a slightly alkaline and also effervescent water, such as Vichy, or, where this is not obtainable, in the same quantity of plain water alkalized by a pinch of sodium bicarbonate.

Potassium iodide is absorbed and eliminated rapidly, and is available for all the purposes of the iodides as set forth in the first section of this article. As to dosage, it is rare that any useful effect follows a smaller daily allowance than 1 gm. (gr. xv.); generally, indeed, from two to three times such quantity will be necessary; and very often—notably in organic affections of the central nervous system—the daily quantity must be pushed rapidly to a range between 8 and 24 gm. (3 ij.-vi.), else a valuable, possibly even curative effect will wholly be missed. In all cases the daily allowance should be broken up into at least three doses; and, especially where the quantities are large, the precautions of giving the salt in an abundance of fluid, and also of giving frequent draughts of water during the whole period of the medication, should carefully be observed. For a vehicle, the one described above is decidedly preferable to the syrupy mixtures so often prescribed, and what other medicines may also be indicated in a given case are best administered by them-

selves at different times from the iodide. The United States Pharmacopoeia makes official *Unguentum Potassii Iodidi*, Ointment of Potassium Iodide, containing twelve per cent. of the salt incorporated in benzoated lard. The ointment is designed for the local treatment of surface indurations.

**Sodium Iodide, NaI.** The salt is official as *Sodii Iodidum*, Sodium Iodide. It occurs as "colorless, cubical crystals, or a white, crystalline powder, odorless, and having a saline and slightly bitter taste. In moist air it deliquesces and becomes partially decomposed into sodium carbonate and free iodine, assuming thereby a reddish color. Soluble, at 15° C. (59° F.), in 0.6 part of water, and in about 3 parts of alcohol; in 0.33 part of boiling water, and in 1.4 parts of boiling alcohol" (U. S. P.). The salt should be preserved in well-stoppered bottles.

Sodium iodide bears to the potassium salt the usual relation of a sodic to a potassic chemical brother. It is less depressing, less irritating, and less diuretic, but also, though efficient enough in ordinary cases, is less reliable in those cases that test medicinal potency most severely. The salt is to be given in the same doses as potassium iodide, and with the observance of the same precautions.

**Ammonium Iodide, NH<sub>4</sub>I.** The salt is official as *Ammonii Iodidum*, Ammonium Iodide. It occurs as minute, colorless, cubical crystals, or a white, granular powder, without odor when colorless, but emitting a slight odor of iodine when colored, and having a sharp, saline taste. The salt is very hygroscopic, and soon becomes yellow or yellowish-brown on exposure to the air and light, owing to the loss of ammonia and the elimination of iodine. Soluble at 15° C. (59° F.), in 1 part of water and in 9 parts of alcohol, in 0.5 part of boiling water, and in 3.7 parts of boiling alcohol. When heated on platinum foil, it evolves vapor of iodine and volatilizes completely without melting" (U. S. P.). From the proneness of this salt to deliquesce and to generate free iodine, the Pharmacopoeia enjoins that it be kept in small, well-stoppered bottles, protected from light, and that samples deeply colored be not dispensed until deprived of free iodine by proper treatment.

Ammonium iodide exhibits the usual properties of the iodides, and may be used for the usual purposes. As usual, contrasting ammoniac with potassic salts, the ammoniac is less depressing than the potassic, but is inconvenient because of its readiness to decompose with the objectionable evolution of free iodine. Ammonium iodide is generally prescribed in smaller dosage than the potassic salt, the daily average being from 1 to 2 gm. (gr. xv. to xxx.). It should be given in plenty of fluid, and the solutions should not be kept too long, and while kept should be well protected from light.

**Strontium Iodide, SrI<sub>2</sub>·6H<sub>2</sub>O.** The salt is official as *Strontii Iodidum*, Strontium Iodide. It occurs in "colorless, transparent, hexagonal plates, odorless, and having a bitterish, saline taste. Deliquescent, and colored yellow by exposure to air and light. Soluble in 0.6 part of water at 15° C. (59° F.), and in 0.27 part of boiling water. Also soluble in alcohol and slightly in ether" (U. S. P.). The salt should be kept away from the light, in dark amber-colored, glass-stoppered vials.

Strontium iodide acts like the iodides of the alkalis, but is more slowly absorbed, and is believed to have less tendency than the potassium iodide to irritate the stomach or intestines. It is given in solution, in doses ranging from 0.32 to 1 gm. (gr. v. to xv.). *Edward Curtis.*

<sup>1</sup> E. C. Seguin: Archives of Medicine.

**IODINE.**—Iodine is official in the United States Pharmacopoeia as *Iodum*, Iodine. It is described as "heavy, bluish-black, dry and friable, rhombic plates, having a metallic lustre, a distinctive odor, a sharp and an acrid taste. . . . Iodine imparts a deep-brown, slowly evanescent stain to the skin, and slowly destroys vegetable colors. Soluble in about 5,000 parts of water, and in ten parts of alcohol at 15° C. (59° F.) with a brown color; also freely soluble in ether, and in a solution of



potassium iodide with a brown color, and in chloroform or carbon disulphide with a violet color" (U. S. P.). Iodine volatilizes slowly, even at ordinary temperatures, and, upon heating, melts and is dissipated, without residue, in violet-colored fumes. With starch paste it produces a characteristic dark blue color. Iodine must be kept in glass-stoppered bottles, in a cool place. The commercial sources of iodine, at the present time, are mainly the native beds of sodium nitrate in South America, where sodium iodate occurs in association with the nitrate salt. Some iodine, however, is still prepared from kelp—the ashes of burnt sea-weeds.

Iodine, like its chemical congeners, chlorine and bromine, has an affinity for hydrogen, but its action, because of this affinity, in decomposing compounds containing hydrogen is not so pronounced as in the case of chlorine or of bromine. Probably, mainly because of this affinity for hydrogen, vapor of iodine is deodorant, and iodine solutions applied directly to foul and infectious matter prove both deodorant and disinfectant. Sternberg,<sup>1</sup> experimenting with the micrococcus of gonorrhoeal pus, found iodine to be antiseptic (*i. e.*, inhibiting development) in solutions of the strength of one part to four thousand (one-fortieth per cent.), and permanently germicidal in solutions representing one part to five hundred (one-fifth per cent.)—percentages which, as compared with those of other so-called antiseptics similarly studied, show for iodine a high germicidal potency. As regards the effects of the element upon the living animal system, iodine is locally irritant and even caustic; and taken into the stomach, is readily absorbed and produces constitutional effects similar to those of the alkaline iodides (see *Iodides*). Many consider, indeed, that the greater part of a dose of iodine finds entrance into the blood in the condition of sodium iodide. Others hold that probably some, at least, of the iodine enters into combination with albumin, and is absorbed in the state of the compound so formed. The local effects of iodine, which medically are of more importance than the constitutional, are in detail as follows: Applied to the skin, iodine solutions stain the cuticle a yellowish-brown and excite some tingling, pricking, or, if strong, even smarting. The stain tends spontaneously to disappear, and, if the application has not been too strong, some desquamation of the epidermis is the only physiological after-effect. If, however, a strong solution is used, or if repeated applications are made upon the same spot, the skin may inflame and blister, with the production of a very painful sore, or even may be destroyed. In all cases the healing action following the direct effects of the iodine is rapid and kindly. Upon serous membranes iodine easily induces an active inflammation, which, if the application has not been too severe, is almost certainly of the adhesive character, leading to permanent agglutination of the opposing surfaces. Upon mucous membranes, also, iodine solutions produce considerable irritation, and, if swallowed, may cause dangerous, and even fatal, irritant poisoning. But from the pronounced color and taste of such solutions, accidental or criminal poisoning is unlikely, and iodine is not well enough known as a poison to be selected for purpose of suicide. In case of poisoning, substances containing starch should freely be given as the best antidote, and the symptoms treated upon general medical principles.

An important question is the possibility of absorption of iodine from local surface applications of its solutions. That it can be absorbed by serous surfaces is beyond doubt, since a case has been reported in which fatal poisoning, with constitutional symptoms, followed an injection of an iodine solution into an ovarian cyst. When applied to the unbroken skin, it is possible that, if the solution contain also an alkaline iodide (by whose presence iodine becomes soluble in aqueous fluids), a little iodine may be absorbed; but if a simple alcoholic solution of iodine be employed, theoretical considerations are certainly against the probability of absorption, and, so far as the writer knows, absorption under these circumstances has never been demonstrated by the chemical detection of iodine in the secretions. It is most probable,

therefore, that what therapeutic effects follow from painting the skin with tincture of iodine occur simply as reflexes of the local irritation.

The constitutional effects of iodine are substantially similar to those of the alkaline iodides. The main point of difference is, as might be inferred, that iodine will cause more gastro-intestinal irritation than will the iodides. The alleged occasional atrophy of the breasts or of the testicles following prolonged iodizing, in the case of Swiss *crétins*, is also more commonly averred of administration of iodine than of iodides. As used in America, however, the writer does not know of any authenticated case of such atrophy fairly attributable to iodine. The therapeutic effects of constitutional iodizing are also similar in kind to those obtained by the giving of iodides (see *Iodides*); but, perhaps more from habit than from any demonstrated advantage, iodine is often preferred to iodides for the treatment of scrofulous affections and of goitre.

Therapeutically, iodine is a possible disinfectant and deodorant for privies and drains, but unfortunately is too costly for any use requiring considerable quantities. Applied to the skin, solutions of iodine may be used to destroy life or arrest development of the organisms in parasitic skin disease, such as ringworm, although they are not so powerful for the purpose as mercurials; to set up healthy action in sluggish sores; and, painted in repeated coatings over the sound skin, to operate by ordinary counter-irritation for the allaying of pains or for the resolution of engorgements, reabsorption of hyperplasia, or abatement of chronic and sluggish inflammations in underlying parts. For the purposes of the latter general category, however, iodine is certainly no better than other agents of equal irritant power; and its selection, because of an assumed specific iodine influence, constitutionally, is futile. To serous surfaces iodine solutions are applied in order to excite adhesive inflammation for the purpose of obliterating a serous tract, as, for instance, in cases of hydrocele, or of spina bifida, or of knee-joint effusion, or even in cases of pleurisy with effusion, or of empyema. But in the case of serous cavities of considerable extent and importance, iodine injections, even when the solutions are fairly dilute, are risky, and many cases are on record of undue irritation, of serious constitutional reaction, and even of death, following such procedures. Internally, iodine is given almost exclusively for its constitutional effects, namely, for the determining of healthier nutritive ways in chronic diseases of nutrition, particularly those of so-called strumous character, and in goitre. Because of the gastric irritation it so easily excites, iodine is not so available for full iodizing as are the alkaline iodides. In the treatment of syphilis, rheumatism, organic affections of the central nervous system, etc.—conditions calling for heavy dosage—the iodides are nowadays quite generally, and quite properly, preferred to iodine.

For use, iodine may be dissolved in alcohol, or, by the addition of potassium iodide, in water or glycerin. "Morton's solution," employed by Dr. Morton, of Glasgow, and others, for injection in cases of spina bifida, consists of ten grains of iodine and thirty of potassium iodide to an ounce of glycerin. Of this, from twenty-five to thirty minims have been injected into the sac in the affection in question. In this country the official preparations are almost exclusively employed, and are as follows:

*Tinctura Iodi*, Tincture of Iodine. This preparation is a simple seven-per-cent. alcoholic solution of iodine. It should be kept in well-stoppered bottles. Tincture of iodine is a dark-brown, limpid fluid, of a strong odor and taste of iodine. It stains skin and fabrics a rusty brown, and is strong enough of iodine to blister the skin if repeatedly applied to the same area, to inflame serous surfaces, and, swallowed clear, dangerously to irritate the gastro-intestinal tract. It precipitates with water, from the very feeble solubility of iodine in that fluid. Because of this fact the tincture is not eligible for internal giving, and its use is limited to local application. For the treat-

ment of skin disease, or for counter-irritation, the tincture may be used without dilution, lightly painted upon the part with a camel's-hair brush. If the skin be not too sensitive two coats may be laid on, the second as soon as the first has dried—which result happens in a few seconds, from the speedy evaporation of the alcohol. Such paintings may be renewed in the course of two or three days, but must not be made too often over the same area, else blistering and a painful sore will result. For injection into serous cavities tincture of iodine must be diluted, the degree depending upon the area and importance of the tract to be affected, but ranging from twofold to tenfold. The fluid for the dilution is water, to which, to prevent the precipitation of the iodine, potassium iodide must be added in proportion about equal to sixteen per cent. of the quantity of tincture taken for the mixture. In some cases, as of spina bifida, and even empyema, some practitioners have injected small quantities (from 2 to 4 gm. [ʒi xxx. to lx.]) of undiluted tincture of iodine.

Under the title of *decolorized or colorless tincture of iodine*, preparations are made in various ways, in all of which the addition of water of ammonia to tincture of iodine is an essential feature. Such preparations are indeed colorless, but they are no longer tinctures of iodine in the sense of containing iodine uncombined, since most of the iodine in these solutions exists in combination with the ammonia as ammonium iodide. The preparation of this character of the German Pharmacopœia is compounded of iodine, sodium "hyposulphite," spirit of ammonia, water, and alcohol. The resulting composition is complex, but the essential ingredient is ammonium iodide.

*Liquor Iodii Compositus*, Compound Solution of Iodine; Lugol's Solution. This preparation is a joint aqueous solution of iodine and potassium iodide, containing five per cent. of the element and ten of the salt. It must be kept in glass-stoppered bottles. This solution is dark-colored and stains like the tincture, but, unlike that preparation, does not precipitate on admixture of aqueous fluids. It is intended for internal taking, and is indeed the only preparation of free iodine ordinarily so administered. The dose is about 0.30 gm. (ʒi v.) several times a day, largely diluted with water.

*Unguentum Iodi*, Iodine Ointment. This ointment consists of four per cent. of iodine and one of potassium iodide, smoothly incorporated with benzoated lard. The iodine and iodide are first rubbed with a little water, whereby the iodine is more ready to mix with the lard. Iodine ointment should always be made fresh when wanted, since it suffers spontaneous change upon keeping. It is of a deep-brownish color, stains the skin yellow, and exerts thereupon a moderate iodine effect.

Under the name of *iodized starch* there was formerly official the peculiar substance that results from treating starch with free iodine in the presence of water. The compound so forming is dried, powdered, and put up in glass-stoppered vials. This powder readily yields free iodine, while being itself locally quite bland, and has been used as an internal medicine from which to get the constitutional effects of iodine without local irritation. It has been advised in heaped-teaspoonful doses, given in water gruel several times a day.

*Iodine Trichloride*,  $ICl_3$ , is a compound of the two sister substances iodine and chlorine, possessing properties due to both elements. It occurs in yellow or orange-yellow needles, which fume on exposure to air, melt at 33° C. (91.4° F.) and, on further heating, decompose into iodine monochloride and free chlorine. In contact with organic matter the substance rapidly decomposes, yielding free iodine and chlorine. It is freely soluble in both alcohol and water, and, in an excess of water, again decomposes. Mainly by virtue of its yield of chlorine, iodine trichloride is strongly antiseptic and disinfectant, and may be used for local antiseptic purposes in solution of from one to five per cent. strength. It is not official in the United States Pharmacopœia (1890).

*Iodantifebrin*, or *iodacetanilid*,  $C_8H_7I.NH(C_2H_5O)$ . This compound forms a flaky crystalline powder, melting at 181.5° C., almost insoluble in water, but soluble in

alcohol. Physiologically it appears to be nearly, if not quite, inert, probably because its insolubility in water prevents its absorption. It is not official.

Edward Curtis.

<sup>1</sup> Sternberg: American Jour. of the Med. Sciences, April, 1883, p. 323.

**IODINE TRICHLORIDE**,  $ICl_3$ . A compound introduced by Langenbuch, of iodine and chlorine, made by passing chlorine gas over iodine. A solution may be prepared by dissolving 5.5 parts of iodine in distilled water and passing in chlorine gas as long as it is absorbed. It forms a reddish crystalline powder, hygroscopic, very soluble in water, alcohol, and glycerin, and has a pungent and disagreeable odor. It is a stable compound, and will keep for a long time in powder or in solution; it must be dissolved in distilled water, as any organic matter decomposes it at once. When brought in contact with the pus and secretions of the tissues, it is at once decomposed and its constituents are eliminated. It is a powerful antiseptic and bactericide; a one-per-cent. solution sterilizes cultures of the ordinary pus-producers—staphylococcus and streptococcus.

Belfield (*Medical Record*, vol. xiii., No. 3) has used it extensively in surgical practice. He considers that it combines the valuable properties of iodoform and hydrogen peroxide. It is a more active antiseptic than iodoform, and is more stable than the peroxide, remains longer in contact with the parts, and sterilizes all moist animal tissues as well as pus. Its disadvantages are its caustic properties when used in strong solutions, and its injurious action on instruments and clothing. It must be kept from the light and air. It has been used in various tuberculous diseases and all forms of suppuration, and in all it has proved of decided value. Internally the dose is one-fifth grain; it is also used by hypodermic injection, in one-tenth to one-half-per-cent. solution, and the same solution is used for washing out the bladder, the urethra, and other sensitive mucous membranes. For irrigating wounds, a one- to five-per-cent. solution, either alone or with glycerin, may be employed; for putrid surfaces, a five- to twenty-per-cent. solution in equal parts of water, glycerin, and alcohol. Gauze may also be prepared by medicating with the solution. In eye affections, a one to five thousand solution is used as an ordinary antiseptic wash. *Beaumont Small*.

**IODIPIN** is an addition product of sesame oil and iodine, and appears in two strengths of the latter, viz., ten and twenty-five per cent. It is yellowish with a bland oily taste, the stronger compound being for hypodermic use only. Frieser considers it superior to the iodides, as it is quickly absorbed and slowly excreted, yet does not produce iodism or gastric disturbances. If objection is made to the oily taste it may be given in emulsion, or by rectum or subcutaneously. Its ordinary dose is one teaspoonful. It does not set free its iodine in the stomach, therefore saves this organ from the irritation of free iodine. It is, however, split up and quickly absorbed in the intestines. Sternberg finds the iodine reaction in the saliva in sixty-five minutes after ingestion by persons with normal stomachs; he therefore uses iodipin as a test for the motor function of the stomach. A delay in the reaction would indicate that the motility of the stomach is impaired.

G. Nobl used iodipin by injection in twenty cases of tertiary syphilis with excellent results. Even three ounces (90 c.c.) of the twenty-five-per-cent. compound injected within a short time gave no symptoms of iodism.

W. A. Bastedo.

**IODISM**.—This term has been applied to intoxication brought about by the persistent use of iodine in any form. As a rule the name is not given to acute poisoning, though occasionally latitude is exercised in this direction; as, for example, when iodine poisoning results from external applications such as iodoform which causes a poisoning by decomposition and absorption of the contained iodine.