

and excites inflammation in the delicate structures of this part, inducing pain at the epigastrium, vomiting, diarrhœa, sometimes much collapse, and even death. It should be given soon after a meal, when the mucous membrane is protected by the food contained in the stomach.

When this substance reaches the stomach or intestines, and certainly when it enters the blood, theory would suggest that the iodine would become converted into either an iodide of potassium, or, more probably, of sodium, and that thenceforth, in its career through the body, it would manifest the effects of an iodide. Practically there is much to confirm this view, as the action of iodine is very generally admitted to be identical with that of the iodides on the distant organs of the body. Yet some practical authorities state that in chronic rheumatic arthritis the tincture of iodine is serviceable when iodide of potassium fails. It is certainly difficult to understand how this should be.

Iodine may be used as a deodorizer and disinfectant in contagious diseases by simply suspending a chip-box or saucer containing a few grains over the patient's head.

IODIDE OF POTASSIUM.

This being an extremely soluble salt, and endowed with a very high diffusion-power, it finds a ready entrance into the blood, and as speedy an exit from it with the secretions of the body.

As an external application, it formerly enjoyed more favour than it at present holds. As an ointment, it is often applied to the skin over enlarged glands, or parts thickened with inflammatory products, with the view of restoring the tissues to their natural state. In conjunction with the internal use of iodide of potassium, the ointment, applied to obstinate nodes, hastens their resolution, and it is especially useful when this salt disagrees, causing nausea, diarrhœa, or

great prostration. The ointment is sometimes applied for the itch. The ointment of this salt, or of iodine, is often applied in bronchocele.

According to most authorities, the iodide, probably after its absorption into the blood, produces decided changes in the mucous membrane of the mouth. It causes redness and injection of the lining of the cheek, the throat, soft palate, and of the tongue, and an increased growth and separation of the epithelium covering these parts, and an augmented flow of saliva. These phenomena, however, are certainly often absent after large doses of the medicine, and even in severe iodism. It has a saltish taste.

A large dose proves an irritant to the stomach, and disorders digestion. Some are much more prone to be thus affected than others; and so marked is this difference that even minute medicinal doses sometimes irritate the stomach.

Like the chloride of sodium and chloride of ammonium, this salt increases the production of mucus from the stomach and intestines, as well as from the mucous membrane of other parts of the body. When such a result is desired, we resort to the chloride of ammonium in preference to this salt.

From its great diffusion-power it passes with great rapidity from the stomach into the blood, and very speedily appears in the urine. Only a small proportion, therefore, passes into the intestines, and generally it purges only when taken in very large doses; but it is never employed for this purpose.

Some maintain that when iodide of potassium comes in contact with chloride of sodium, either in the stomach or blood, it changes its base, becoming iodide of sodium. At present we know but little what physical or chemical changes it produces in the blood; nor know we much regarding the organs to which it is carried.

If its administration is continued for a long period, or if the patient manifest great susceptibility to its action, we produce a condition termed iodism.

Many persons can take this drug in very large quantities for an almost indefinite time without the induction of iodism, while others suffer from it even after very small doses.

In iodism, the tissues most frequently and most severely influenced by this drug are the mucous covering of the eyes and lining of the nose, frontal sinus, and mouth, with the skin of the face. Some slight running at the nose is first noticed, with occasional sneezing, and a little frontal headache; these symptoms becoming more marked when the conjunctiva is injected, and the tears flow abundantly. The loose tissues about the orbit become swollen, reddened, and œdematous, and occasionally a peculiar rash appears on the skin of the face. This is at first noticed around the eyes, after which it attacks the nose and its neighbouring parts, and then the chin. The parts in the order here stated are most severely affected by it. The nose is sometimes reddened, especially at the tip, and is rather swollen. The rash does not always present the same appearance. It is often very much like acne, and is always hard, shotty, and indurated, but the papules may be broad and large, and covered with what looks like a half-developed vesicle or pustule. The changes in the mouth have already been mentioned, when speaking of the influence of this medicine on that part. With some persons the stomach is at the same time deranged, although in the author's experience this organ often escapes when the face is affected; on the other hand, the stomach sometimes suffers when the nose and eyes are unaffected. When the stomach is singled out by the iodide, it induces nausea, and a sensation of sinking at the epigastrium, with loss of appetite, and sometimes watery diarrhœa. A grain or even less may thus affect the stomach.

If on the occurrence of iodism the use of the drug is discontinued, the symptoms just described very speedily disappear; and the rash on the face, the running at the eyes, etc., will greatly decline in the course of twenty-four to forty-eight hours,

Iodides, sometimes cause diuresis. In some persons iodides

produce a petechial rash. This rash almost always affects exclusively the leg, rarely extending above the knee, and rarer still to the trunk or upper extremities. It may, at first, take several days to produce this rash, but on continuing the medicine when the spots have disappeared, one dose of five grains may suffice to reproduce the rash in three hours. Sometimes on persisting with the medicine no fresh rash appears, and the old spots die away; while in other cases the rash lasts as long as the medicine is continued. This rash may be the only apparent effect of the iodide, but it is generally accompanied in a variable degree by a few or many of the symptoms of iodism. The salts of iodine differ with respect to the production of this rash; thus in many cases the ammonium salt is most apt to induce it, and the sodium salt the least liable; in other cases where the ammonium and potassium salts produce a large crop of petechiæ, the sodium salt is inoperative. Some persons are equally affected by each of these three preparations. In one case while the ammonium and potassium salts produced numerous petechiæ, the sodium salt failed to do so, but excited on the arms some erythema marginatum. The petechial rash is often preceded by a sensation of heat accompanied by some tenderness. The above facts disprove the assertion that either in the intestines or blood all iodides ultimately become iodide of sodium.

Iodide of potassium sometimes produces distressing depression of mind and body. The patient becomes irritable, dejected, listless, and wretched. Exercise soon produces fatigue and perhaps fainting. The appetite is generally very bad. These symptoms may arise from a very small dose of the medicine, and may occur without coryza or irritation of the stomach. It is important to bear this in mind; otherwise, the cause of the depression being overlooked, the medicine may be persisted in. On discontinuing the drug, these distressing symptoms disappear in one or two days. It now and then exceptionally happens that the symptoms just enumerated cease sometimes in a few days if the medicine is persevered in.

It appears that when the potassium salt is not tolerated, sometimes the ammonium or sodium salt can be borne. Thus, iodide of potassium in ten grain doses administered thrice daily produced so much headache, sneezing, and running at the nose, that it could not be continued, whilst the same dose of iodide of sodium was easily borne causing no headache, and only a little running at the nose.

Some maintain that a full dose of carbonate of ammonia or spirits of ammonia given with the iodide of potassium will obviate these symptoms of iodism. The author has many times put this recommendation to the test, but without any decided results, although it has appeared to him that the ammonia did occasionally somewhat control the iodism.

Ten grains of iodide of potassium taken at bed time often cuts short an acute cold in the head, especially if taken at the onset of the attack. It is much less efficacious if the cold attacks the lungs also and appears to be useless in influenza. In ten-grain doses several times a day it is said to cure that troublesome and obstinate affection, violent paroxysmal sneezing (see arsenic). It is likewise useful in chronic colds in the head.

The iodide is employed in a great variety of diseases. It is largely employed in syphilis, but is not equally efficacious in all its forms. It is most useful in secondary and tertiary syphilis, especially in the tertiary form, where mercury may do harm. When the health is broken, when mercury has been taken without good results, or when the bones are diseased, the iodide of potassium should be employed. Its action is conspicuously beneficial, especially when the disease fixes on the periosteum of the bones or fibrous structure of the softer organs, and forms what are called nodes. Its action on this form of the disease is almost magical. It soon subdues the pain; and if not of long standing the nodes quickly disappear. In the treatment of tubercular syphilitic skin eruptions, Dr. Neligan prefers it to a salt of mercury. It is of very great service when deep-seated and important organs are attacked by syphilis. It has been commended in

syphilitic iritis; but most authorities in this case prefer mercury. The secondary syphilis of children is best treated with mercury; yet the following somewhat rare form of syphilis is better treated with iodine. There is sometimes observed in children a few months or years old a syphilitic thickening of the periosteum, usually attacking the heads of several of the long bones, but sometimes also the shafts. The thickening is first felt around the bones; but as the disease advances the neighbouring soft tissues become infiltrated with a firm exudation, which may increase to such a degree that the implicated part of the limb becomes much swollen, the skin very tense and shining, and a little reddened. The affected parts are very painful. When the disease is seated at the head of the bones, the movement of the joint is not impaired. This disease, if long uncured, leaves permanent thickening and enlargement behind it; and so it sometimes happens that children with syphilitic teeth, and blind from syphilitic iritis, have the heads of several of the long bones considerably enlarged.

Other non-syphilitic periosteal thickenings yield likewise to this remedy.

The iodide of potassium has been recommended in mercurial salivation. The author agrees with those observers who believe that iodide of potassium often aggravates mercurial salivation; and yet the iodide appears sometimes undoubtedly beneficial. As the action of the iodide on the mercury in the system throws much light on this question, we will now shortly discuss it.

The mercury salts, like those of most other metals, form insoluble compounds with albuminous substances. These compounds are very generally soluble in the chlorides, bromides, and iodides of the alkalies, but especially in the iodides. Many metals are deposited from the blood in an insoluble form in the animal structures, and amongst other metals, mercury and lead. Iodide of potassium, by re-dissolving these two metals, brings them again into the circulation, and so re-subjects the system to their influence. But

iodide of potassium will promote the separation of both mercury and lead by the urine, and thus free the system from their pernicious effects. It has been said that iodide of potassium will dissolve mercury compounds of albumen in the body, and bring them back into the circulation; and herein we have the explanation of a well-known property of this salt, namely, that of producing salivation in persons who have previously taken considerable quantities of mercury. If, after taking mercury for some time, a patient had then become salivated, it would naturally be anticipated that iodide of potassium would still further increase the ptyalism, and not check it. In other cases it might happen otherwise; for we have seen that the salt will effect the separation of this metal through the urine. In a case, therefore, where but little mercury has been taken, and for a short time only, but sufficient to produce salivation, the iodide of potassium, by quickly separating the metal from the system, would remove the mercurial symptoms, including the salivation. Should it ultimately prove that the increased elimination is due to the mercury being brought back into the circulation, and so under the influence of the kidneys, and that the iodide does not promote the exit of the metal in any other way, then the iodide must be simply harmful in mercurial salivation.

It has been said that this salt of itself will produce salivation, an effect which has been ascribed to the action of the iodide on the mercury in the way just explained; others hold, even where no mercury has been taken, that the iodide of potassium increases the salivary secretion to a variable amount in different people.

From the unequalled efficacy of iodide of potassium in eliminating lead from the system through the urine, this drug is employed in lead poisoning. Further on, when treating of lead, it will be shown how iodide of potassium, by virtue of its power of eliminating this metal, may prove useful in certain forms of gout.

It is of signal service in bronchocele, when the enlarge-

ment of the thyroid gland is due to hypertrophy, and not to cystic formations, or to other causes. Under the influence of this drug, hypertrophic enlargement often speedily diminishes. Its internal employment is often supplemented by painting the tincture or liniment of iodine over the swelling. Iodide of potassium is used too in other indurations or enlargements of the glands, as of the mamma or testicle though with less advantage than in bronchocele.

The iodides quicken the absorption of inflammatory effusions, such as occurs in pleurisy and in inflammatory thickening of organs. Sciatica and lumbago are sometimes relieved by iodide of potassium; although both, and especially sciatica, even, when the pain is worse at night, not seldom remain unaffected by it.

Chronic rheumatism, chronic rheumatic arthritis, chronic gout, especially the two former affections, are sometimes benefited by iodide of potassium. It should, however, always be borne in mind, that the pains of secondary syphilis, frequently resembling in all respects those of so-called chronic rheumatism, are frequently confounded with and included among the manifold affections termed chronic rheumatism. Some of the so-called cases of rheumatism relieved by iodide of potassium are probably cases of syphilis.

The pains which yield to iodide of potassium are mainly those marked by nocturnal increase of suffering which may be accepted as a strong indication for the employment of this medicine,—an indication holding true, whether the pains are referrible to rheumatism or to some other source. Syphilitic pains, as is well known, are generally worse at night, and so are the pains of many cases of chronic rheumatism, and it is in such cases of rheumatism that iodide of potassium is beneficial.

It is not uncommon to meet with persons, especially men who suffer with a pain in the head, generally throbbing in character, sometimes accompanied with intolerance of light,—a pain which may be felt over the whole head, or, beginning at the back of the neck, and passing over the vertex to

the brow. This pain, worse, or indeed felt only at night, becomes then almost unendurable; and, in the patients' vernacular, is fit to drive them out of their mind. The pain is apt to be increased by alcohol. The pain having passed away, the scalp is left very tender. Whether this form of headache is due to syphilis it is impossible to say, as it does not present its characteristic features. Iodide of potassium in ten-grain doses, repeated three times a day, will generally remove these symptoms.

Iodide of potassium is sometimes singularly useful in peptic and bronchial asthma. Five grains, or more, if needful, three times a day, may be required. Now and then its good effects are not manifested for some time, though possibly in these cases, larger doses would have brought relief sooner. Dr. Hyde Salter whilst admitting the great usefulness of this salt in some instances, is inclined to think that in the majority of cases it is useless. My limited experience leads me to think it more frequently useful than Dr. Salter admits.

Barrenness has yielded to iodide of potassium. It is to be presumed that sterility thus cured was due to syphilis.

It has proved of signal service in certain cases of chronic Bright's disease, even accompanied with considerable dropsy and very scanty urine. In these successful cases the urine considerably increased, the dropsy disappeared, while the general health simultaneously improved. Probably these patients owed their Bright's disease to syphilis.

The iodide has been recommended in tubercular disease and in cancer, but experience has failed to endorse this treatment.

Dr. Balfour recommends iodide of potassium in aneurism in from five to thirty grain doses continued for a considerable time, even twelve months, conjoined with the recumbent posture and a restricted diet. He narrates several cases strikingly confirmatory of this mode of treatment, and Dr. Chuckerbutty supports his statements.

Iodine has been detected in the blood, saliva, and in the milk, in the urine, even in the urine of the sucking child,

whose mother was taking iodide of potassium. Owing to its great diffusion-power, it is probable that it might be detected in all the fluids bathing the tissues or moistening the cavities.

It appears in a few minutes in the urine, and even still earlier in the saliva. The rapidity of its absorption is, of course, influenced by the state of the stomach and vascular system, the absorption occurring more slowly when these are replete. The statements concerning its influence on the various constituents of the urine are so discrepant, and the observations made on the subject so very imperfect, that at present our knowledge in this respect must be considered as untrustworthy. When the administration of this medicine is discontinued, it is rapidly separated from the body, and, even after large doses, soon becomes undetectable in the urine; indeed, every trace of it may vanish in less than twenty-four hours after withholding the drug. It is stated, that it may be detected in the saliva for some days after it has ceased to appear in the urine. This sounds doubtful.

In most diseases, five grains three times a day is generally sufficient. Sometimes, as in rheumatoid arthritis, and in cases of syphilis, no good is obtained until much larger quantities, as ten, fifteen, or even twenty grains are given at a dose.

Large doses of this medicine arrest the rapid sloughing of some syphilitic sores and promote the healing process. Full doses not uncommonly succeed when smaller ones fail.

For the removal of syphilitic nodes from the membranes of the brain, five to ten grains, repeated three times a day, is generally sufficient. The drug, not uncommonly at first, intensifies the pain, then the disease rapidly declines. In no affection does this medicine work such striking results. Iodide of potassium may be conveniently administered in milk.