intestines, whereby the food, before it is digested, is driven from the stomach to the intestines, and thence expelled. This form of diarrhœa is common with children eight to twelve years of age. It may last many months. By a few days' use of arsenic the interval between the meal and the evacuation becomes prolonged, and at the end of a week or ten days the disease gives way. The author always gives the medicine, in a dose of one or two drops, shortly before each meal. (See Opium). Arsenic often proves useful in other chronic forms of diarrhœa, even when due to serious organic disease, as the bowel ulceration of phthisis, etc.

Arsenic has been strongly recommended in cholera; especially in the later stages, when there is much collapse.

Arsenic enters the blood freely, but the effects of this metal on it are unknown. It has been detected not only in this fluid but in most of the organs of the body.

The statements as to the effects of arsenic if taken for a prolonged period are strangely conflicting; yet, although it is impossible at present to reconcile the opposing statements, no doubt both are true.

Some animals, as the horse and sheep, can take considerable quantities of arsenic, not only without harm, but with apparent benefit.

It is now established beyond reasonable doubt that in some parts of lower Austria, as Styria, many of the inhabitants are accustomed to take considerable quantities of arsenic, sometimes as a condiment with their food. It is said they often eat it with cheese. They usually begin with a small dose, once or twice a week, the quantity being gradually increased, until half a grain, or a grain, or even more, is taken at one time. This habit seems to induce no untoward symptoms. Arsenic is eaten for a twofold purpose. The women, and even the men, take it to give clearness to their complexion, and to improve their personal appearance; and it is said to effect these objects. The men more frequently use it to enable them to undergo great exertion without fatigue. They maintain that they can climb mountains and accomplish fatiguing tasks

impossible to compass without it. The experience of most countries is opposed to the Styrian practice; for it is generally found that the long-sustained administration of arsenic fails to induce tolerance of the drug, but, on the contrary, induces most serious consequences. Even in the arsenic-eating countries the habit is not without risk; for it is a general opinion there that many persons fall victims to the drug. It has been supposed that the arsenic is taken in an insoluble form, is not absorbed at all, but passes out with the motions, leaving the system unaffected by it. Dr. Maclagan's investigations effectually dispose of this supposition, for after witnessing the eating of the arsenic by a well-known arsenic eater, and afterwards collecting his urine, he obtained from it a considerable quantity of the poison.

Ordinary experience, however, shows that the long-continued use of arsenic produces serious symptoms, evidenced first in the eyes and stomach. The eyelids become slightly œdematous, the lower before the upper; while usually at the same time, or soon after, slight conjunctivitis occurs with suffusion and smarting of the eyes, and sometimes dimness of sight. The mucous membrane of the nose, mouth, and throat may be reddened and inflamed, giving rise to thirst and dryness of the mouth and throat. In some, the digestion becomes deranged much sooner than in others. The appetite fails, and at the pit of the stomach a sensation of weight or soreness is felt, aggravated each time on taking food or the arsenic. Sometimes the stomach is affected before the eyes. On the appearance of any of these symptoms the drug must be given in smaller quantities, or discontinued. The skin becomes dry and dirty-looking, and a slight "branniness" may be noticed, most marked where the skin is covered with clothes. Eczema or urticaria may arise, or perhaps vesication or mere desquamation with tenderness of the palms of the hands and soles of the feet. Pityriasis and lichen also are said to have been produced by arsenic. So also with aching pains in the head, swelling and inflammation of the joints. Sleep may be much broken, or disturbed by dreams. Still

more serious symptoms arise. The voice becomes rough, and in some cases salivation has taken place. Ulcers may form in the mouth. Nausea, with vomiting and diarrhœa, set in, with slimy and bloody motions, voided with much straining and pain. The hair, and even the nails, sometimes fall off. Cough, with bloody expectoration, may occur. With these serious symptoms the patient wastes away, the skin becomes dry and hot, the pulse frequent, especially at night. Pains in the limbs, tremblings, and even paralysis, set in; till at last the memory fails, sensation is lost, and death soon follows. The susceptibility to arsenic varies; some being speedily affected by two-drop doses of the arsenical solution, while others can take without injury for a considerable time ten to twenty drops. Dr. McCall Anderson states that patients while taking arsenic are liable to bronchitis, and should therefore be cautioned against exposure to cold.

A large dose induces the symptoms of acute poisoning. The arsenic acts as an irritant to the whole digestive canal, exciting in its delicate mucous membrane very active inflammation. The symptoms to be expected from severe inflammation of this tract accordingly occur. But, strange to say, the symptoms following a large poisonous dose are not invariably the same. The symptoms arising from acute inflammation of the digestive canal are most common, and prove fatal in four or five days; but sometimes these symptoms are almost or entirely absent, and instead of the patient running the usual course of arsenical poisoning, profound coma sets in, from which he never wakes, but dies in a few hours, the mucous membrane of the stomach and intestines being free from all inflammation. Sometimes the symptoms are very like those of English cholera. (Guy).

Dr. Blachez describes another form of arsenical poisoning characterised by choleraic symptoms of the intestinal canal, with suppression of urine, cramps, and progressive coldness of the body, convulsions, and localized paralyses especially attacking the extensors.

Even when injected into the blood, or applied to a wound,

arsenic produces its local effects on the digestive canal, being found in the intestines, thus showing that this is one outlet by which the poison is eliminated. When the metal is injected into the blood or absorbed by a wound, the effects on the stomach and intestines are said to be as severe as when it is swallowed. This is perhaps hardly true. It is evident from the foregoing facts that arsenic manifests an especial affinity for the mucous membrane of the intestinal canal.

The *post-mortem* examination in acute poisoning by arsenic shows much inflammation of the stomach, often in patches, in which arsenic powder is visible, imbedded in the thick viscid mucus, and according to Harley the arsenical mischief is most marked at the cardiac end of the stomach. Spots of ecchymosis are sometimes seen, and less commonly ulcerations. Perforation is rare. The æsophagus and intestines may undergo inflammation, often most severe in the rectum. Occasionally the mouth, throat, and even windpipe and bladder, become inflamed. The curious fact has been pointed out, that notwithstanding the existence of symptoms of inflammation, yet sometimes no traces of it are apparent on a *post-mortem* examination. This absence of inflammation cannot be explained by want of time for the arsenic to act; for in cases ending in death yet more rapidly, severe structural changes are to be found. Death may occur in two hours. Ecchymosis is commonly met with under the lining of the cavities of the heart. Like phosphorus it is said to produce extreme fatty degeneration of the liver, heart, kidneys, and other structures even in a few hours. Ether, and even chloroform are said to produce similar effects.

Arsenic, in moderate doses, it is said, gives fulness and increased strength to the pulse. From Harley's observations, it appears, that after death, the heart of an animal poisoned with arsenic sooner ceases to beat than of one destroyed by mechanical means.

Some give arsenic in prostrating acute febrile diseases, with the effect, so they aver, of strengthening the pulse, moistening the skin, and invigorating the patient.

Dr. Bayes recommends arsenic for old or weakly persons with swelled feet; or for old people with a weak acting heart and feeble circulation, who often suffer from breathlessness on exertion.

If we may trust the experience of the inhabitants of Steyermark, the effect of arsenic is to make them long-winded; for under its influence they maintain that they climb heights and undergo greater exertion without distress of breathing.

Arsenic has long been recommended, and is an excellent remedy, in spasmodic diseases of the lungs; it is often useful in asthma, whether dependent on emphysema or not.

Arsenic often gives great relief to a class of emphysematous persons who, on catching cold, are troubled with slight wheezing at the chest, difficulty of breathing, especially on exertion, or at night-time, and are obliged, in consequence, to be partially propped up in bed. When there is very much bronchitis, or when the paroxysms of dyspnœa are very urgent, it appears to be of little service. In this contingency, lobelia or belladonna are better. Arsenic is especially useful in the foregoing cases, where the difficulty of breathing can be connected with the retrocession of a rash, as eczema. The wheezing, with oppressed breathing, which affects some children for months, and even years, is generally much relieved by arsenic.

Arsenic lessens the carbonic acid of respiration.

The beneficial influence of arsenic in certain skin diseases, particularly in the scaly eruptions and in chronic eczema, is universally recognised. Lepra almost always yields to it, and its efficacy over other forms of psoriasis is hardly less marked. Many cases it cures, others it improves, but a few it leaves unbenefited.

Hunt, who has had more experience of this remedy than perhaps any other person, lays down excellent rules for guidance in its employment. He recommends small doses as capable of effecting all that is possible by arsenic, and discountenances the practice of gradually increasing the medicine. If toxical effects arise, he advises, not the discontinuance of the arsenic, but lessening the dose.

Arsenic is hurtful during the inflammatory stages of eruptions.

Children above five years will bear a dose nearly as large as adults; and it is curious that girls often require a larger dose than boys.

The largest dose ever required is five minims, repeated three times a day; but some practitioners give double or even treble this quantity. As a rule it should never be given on an empty stomach.

Arsenic, if mixed with food, does not usually irritate the bowels. In the course of a few days or weeks it will produce an itching or smarting in the conjunctiva, and this membrane will appear slightly inflamed, the lower eyelid becoming a little puffed or swollen at this point. The cutaneous disease will now begin to decline, and the dose must be reduced one-fifth.

Should the conjunctiva continue much inflamed, the dose must be still further reduced, but the conjunctiva should be kept affected throughout the whole course.

If the skin become more inflamed, the course must not be interrupted, but an occasional aperient must be exhibited.

The arsenical treatment must be continued for as many months after the final disappearance of the eruption as it has existed years before.

These rules recommended by Mr. Hunt closely correspond to the advice given by Dr. Graves in his clinical lectures. With two statements made in this "code of regulations" the author's experience does not quite correspond, for he has not found that smarting of the eyes and swelling of the lower lid occur so often as Mr. Hunt implies; nor does he find it necessary to induce these toxic symptoms to insure the beneficial influence of the remedy.

The first influence of the medicine on psoriasis is to make it redder and more inflamed; in fact, to make it look worse than before, a fact, which if not known, would lead to the suspension of the drug just when it commenced to do good; but the remedy being continued, the redness soon declines,

the eruption heals in the centre, leaving in a short time only a slight redness.

Chronic eczema, although perhaps not so amenable to arsenic as psoriasis, is generally benefited by it. It is best suited to the obstinate chronic forms. It sometimes removes the rebellious eczema which infests the vulva, the verge of the anus, and the scrotum.

That troublesome disease pemphigus, as Mr. Hutchinson has shown, may generally be cured by arsenic; and although after a variable interval the eruption is liable to recur, it will again yield to a renewed recourse of the medicine.

Lichen and other obstinate skin affections are not unfrequently benefited by the same remedy.

Few, if any, remedies are so successful in chorea as arsenic. It is true that if there is much anæmia, iron is required; if fever or rheumatism, these must be subdued by appropriate treatment. But, in simple uncomplicated cases of chorea, arsenic is by far the best remedy. Its occasional non-success is sometimes owing to the undue smallness of the dose, and decided improvement often begins simultaneously with a freer administration of the medicine. If the chorea has resisted smaller quantities, children may take four, five or more minims of the solution.

Chorea may depend on various kinds of lesions of different parts of the nervous system, probably affording an explanation of the not unfrequent failure of arsenic.

Dr. Hughes and Dr. Cooper highly praise small doses of arsenic in neuralgia. Dr. Anstie also speaks highly of it in different neuralgias; and in angina pectoris, a disease regarded by him as a neuralgia, he states that it will lessen the severity of the attacks, reducing them in time to mere "tightness of the chest".

Arsenic has been found serviceable in epilepsy. It not unfrequently cures the dull throbbing pain affecting one brow. With the exception of quina, no drug subdues intermittent fever like arsenic. Some with large experience of this disease count arsenic equal, if not superior, to bark. The greater number of observers, however, do not credit arsenic with such preeminent virtues, maintaining that cinchona cures the disease more quickly and more certainly, and that it is especially to be preferred in those malignant forms which, unless at once arrested, speedily destroy life. A concurrence of testimony tends to show that arsenic is most useful in long-standing agues, especially of the quartan type.

Arsenic has lately been extolled in phthisis and tuberculosis. It is said to improve the appetite, increase assimilation, lessen expectoration and cough, and to promote the cicatrization of cavities. It will it is stated reduce the temperature in tuberculosis, and after carefully investigating this subject, I am inclined to believe so; at least I have frequently observed a steady and sustained fall of the thermometer follow the use of arsenic in cases where the undue temperature had continued unchanged for a considerable time, and this I have known happen twice or three times in the same case on reverting to arsenic after it had been discontinued. The decline generally takes place gradually and may begin soon after taking the arsenic, or the fall may be postponed for ten or twelve days. Moreover, children with severe tuberculosis involving lungs, intestines and peritoneum, whom I have considered in a hopeless state, I have seen steadily and slowly improve and ultimately recover under arsenic, and I have witnessed a like result in adults with phthisis especially in the subacute and chronic forms. It must, however, be admitted that this is a very intricate subject, seeing how irregular a course the fever of tuberculosis runs, and how sometimes cases the most desperate recover by means of other treatment or indeed through little or no treatment. Still, I am sure that the action of arsenic in phthisis and tuberculosis is well worthy investigation. I have generally given from two to four minims every two to four hours. In some cases it is ill borne and produces sickness and pain in the stomach and bowels.

Arsenic is often serviceable in rheumatoid arthritis and nodosity of the joints, but the indications for its employment are unknown. The pains of this troublesome affection are sometimes increased, sometimes benefited, by heat. Some cases are worse in summer, others in winter; some are worse during the day, others at night. All these forms arsenic will sometimes cure; yet its action is capricious, for in cases apparently identical, it sometimes fails, and sometimes cures. Its effects are sometimes astonishing. Stiffened joints, for a long time considerably enlarged, become reduced to their natural size, and regain their suppleness. Large doses, given for a considerable time, are necessary, and it must be borne in mind that if improvement does not speedily ensue it must not be concluded that the medicine will fail. Some consider it necessary to produce the toxic effect of arsenic; but in many cases improvement certainly results without pushing the remedy to this extent.

Dr. Simpson employed arsenic in that peculiar affection of the bowels prevalent among women, characterized by the copious discharge of membranous shreds, accompanied by much emaciation, and a long train of neuralgic and other nervous symptoms. This affection occasionally co-exists with dysmenorrhœa, the membranous shreds being discharged both from the bowels and uterus.

Like other metals, arsenic is retained a long time in the body. It is more quickly eliminated than some metals, as lead. Some maintain that arsenic is to be found in the bones as arseniate of lime. This statement is denied by others. It may be detected in the milk.

It is found in the blood chiefly with the red corpuscles. It is separated from the body by the urine, the stomach, and intestines, and, perhaps by the liver. After poisoning with arsenic, the metal is found in the liver in quantities larger than elsewhere. It may be that, like many other metals, it is separated from the body with the bile.

We know nothing of its influence on the composition of the urine. Some experimenters assert that the urea is lessened,

and, as the carbonic acid separated by the lungs is diminished they conclude that arsenic diminishes considerably tissue metamorphosis. Vogel observed hæmato-globulin in the urine of an individual poisoned with arseniuretted hydrogen.

Dr. Garrod maintains that arsenic acid is less irritating to the stomach than arsenious acid.

PHOSPHORUS.

For many years this substance has fallen into disuse, but quite recently, owing to its signal success in neuralgia in the hands of homœopathic practitioners, it has been restored to favour.

In large doses, sufficient to produce acute poisoning, its its effects are most singular. It is an irritant poison, but the symptoms are sometimes delayed for hours or even days. The patient complains of burning in the throat with intense thirst and severe burning pain in the stomach, followed by distention of the abdomen and vomiting; the rejected matters are dark green or black, with the odour of garlic, and are sometimes phosphorescent. There are the usual symptoms of collapse. There is, not unfrequently, jaundice, and suppression of urine; hæmorrhage and purpura often occur. In one case it is reported that the temperature of the rectum was 89° Fah. The *post-mortem* examination shows that the stomach and intestines are commonly inflamed. Most of the tissues are found in a state of advanced fatty degeneration, especially the liver heart and kidneys; the liver presents a very peculiar appearance. The fatty degeneration affects likewise the whole of the arterial system, down to the microscopic arterioles, (Wegner). The effects of chronic phosphorus poisoning are also most singular, and have lately been elaborately worked out on animals by Dr. George Wegner. It has long been known that workmen exposed to the fumes of