

ness is the chief symptom, the delirium being not very boisterous, the dose of tartar emetic must be reduced, and the opium increased.

Graves advises one-fourth to one-half of a grain of the salt every hour or two hours, and to be discontinued when it produces bilious stools. This treatment is very useful in the delirium which usually sets in about the ninth or tenth day of typhus.

The mania and sleeplessness of delirium tremens generally gives way to the same treatment.

Puerperal mania may be treated in the same way, although probably bromide of potassium and chloral give better results.

Tartar emetic given to the extent of producing nausea and vomiting once or twice a day is sometimes useful in chorea. (See sulphate of zinc.) Increasing doses must be given, as the system appears soon to tolerate it. Other remedies, however, are more efficient.

Tartar emetic, in doses of 1-36th to 1-48th of a grain, three or four times a day, may be given with advantage in strumous ophthalmia. Sharp purgation at the commencement of the treatment is highly useful.

In acute poisoning by tartar emetic, violent and continuous vomiting occurs, accompanied with a diarrhoea of bilious and bloody stools. The common symptoms of gastro-enteritis, and sometimes of peritonitis, are present. The prostration is intense, and profound and repeated faintings take place. The respirations and the pulse are said to be reduced both in frequency and in strength; others assert that the pulse is more frequent.

The *post-mortem* appearances are, inflammation of the stomach and intestines, but not often of the gullet. The peritoneum may be, and, according to Harley, the rectum often is, inflamed, and usually some inflammation of the lungs is observable, tending to make it probable that tartar emetic exerts an especial action on these organs.

Applied to a sore or to the broken skin, or injected into

the veins, antimony still excites nausea and vomiting, thus manifesting an especial affinity for the stomach or nervous centres.

In the treatment of poisoning by tartar emetic, the vomiting should be promoted by warm demulcent drinks, while strong tea or coffee, tannin, or decoction of oak bark, should be diligently administered.

The statements concerning the influence of antimony on the urine are conflicting. The probable effect of tartar emetic on this excretion is to lessen the amount of water and chloride of sodium, owing to increased perspiration. Urea is greatly increased, and apparently in proportion to the dose of the antimony. The pigment and uric acid are also increased, but in a less degree.

The golden sulphuret increases all the constituents of the urine, especially the urea, and sulphuric acid (Parkes on Urine.)

Antimony is separated chiefly by the kidneys; some, however, passes with the bile, and perhaps by the intestines. A portion is retained in the body.

PREPARATIONS OF ARSENIC.

Since all arsenic salts produce the same symptoms, it is probable that in the blood they ultimately assume the same form.

Dry arsenious acid produces no changes in the unbroken skin, but in wounds or sores it excites very active inflammation, sufficient, if the application is a strong one, to destroy the tissues for some depth. Arsenious acid has long been used to destroy warts, condylomata, cancerous growths, etc.

It may be applied pure, or mixed in variable quantities with some bland powder, as starch. At times this application has enjoyed a high reputation, whilst at other times it has fallen

into almost complete disuse. It is said that some have fallen victims to this treatment, through the absorption of arsenic in sufficient quantity to destroy life. An untoward result like this can occur only when certain well-known precautions are disregarded. Absorption can be effectually prevented if sufficient arsenic is employed to excite active inflammation; for inflamed tissues lose the power of absorption more or less completely. Produce active inflammation, and the patient is safe; but if, through fear of poisoning, the application is too weak, that is the most efficacious way of doing what it is desired to avoid. Surgeons, experienced in the employment of arsenic, recommend that if the tissues to be destroyed are extensive, the arsenic should be applied to a part only of the surface at a time. When employed to remove large growths like cancer, the skin being unbroken, incisions are first made, and into these the arsenical paste is laid. Deep-seated and active inflammation soon sets in, and the growth dies for a considerable depth. The whole tumour often sloughs away from the healthy tissues,—is enucleated, as it is said,—leaving a clean and healthy sore, which heals without trouble in fifteen to thirty days.

Lupus and other obstinate skin affections may be treated in the same way.

Arsenious acid and powdered acacia, of each an ounce, blended with five fluid drachms of water, form an arsenical mucilage much used by Dr. Marsden to remove epitheliomatous growths. Some of this arsenical mucilage is to be painted over the tumour night and morning, taking great care to limit its employment to the diseased tissues. Each application, covering not more than a square inch, is to be several times repeated, and the separation of the sloughs aided by poulticing.

The following powder may also be used:—Fresh lime, half an ounce; yellow sulphide of arsenic, 20 grains; starch, 180 grains. This powder may be cautiously used as a depilatory. The arsenic should constitute one-fifth or one-sixth part of arsenical powder, so as to insure the excitation

of sufficient inflammation to prevent poisonous absorption.

Liquor Arsenicalis painted over warts is said to cause them to disappear.

Arsenical baths are useful in some forms of rheumatoid arthritis. A bath is made by adding to the water four ounces of common washing soda and twenty grains of arseniate of soda.

Arsenic has a sweetish taste. In moderate doses it apparently neither undergoes nor produces any changes in the mouth. Dentists employ it as an escharotic to destroy the exposed sensitive pulp of decayed teeth, or to destroy the pulp before stopping the tooth. If used to remove pain, the arsenic may be mixed with opium. The pain at first is sometimes aggravated.

The vapour of arsenical cigarettes is drawn into the lungs to prevent and lessen attacks of asthma. Care, of course, must be exercised in their manufacture. Trousseau advised the smoking of cigarettes made of paper "saturated with a solution containing half a drachm or a drachm of arsenite of soda in three drachms of water. Such inhalations, we should suppose, might be mischievous, unless closely watched." (Stillé.)

These cigarettes may be used in chronic phthisis.

Sloughing of the mouth or throat, malignant sores, as cancrum oris, malignant sore throat, and the like, are greatly benefited by arsenic given in medicinal doses. It is also useful in chronic coryza.

A drop of the solution of arsenic three times a day proves often serviceable in certain curious and allied complaints of the respiratory tract. A patient is, perhaps, every day, or even several times a day, seized with an attack of persistent sneezing, accompanied by profuse running from the eyes and nose, and sometimes severe frontal headache. Each attack may last several hours, and the disease may endure for years.

Several days sometimes elapse before an attack occurs,

which is then usually severe, lasting twenty-four hours or even longer. The sneezing is generally accompanied, and sometimes preceded, by itching at a small spot situated inside one or both nostrils, not far from the orifice, but in some cases the itching affects the whole of the inside and outside of the nose, even extending to the face. These attacks are excited by exposure to cold, by dust, and sometimes from unascertainable causes.

We occasionally meet with cases apparently identical to those just described but with this difference—the attack is excited by food, and is most severe after the larger meal, and lasts from twenty to forty minutes. My friend Mr. C. C. Fuller has furnished me with some cases of this kind.

Arsenic is invaluable too in another more developed and severer form of this affection. We not seldom find a patient prone to catch cold, when he is attacked with severe and repeated fits of sneezing, accompanied with profuse clear nasal discharge and severe frontal headache. Each attack, generally worse in the mornings, lasts a few days; but, owing to the great susceptibility to cold, it frequently recurs. Severe itching of the ala of one or both nostrils often forewarns the patient of an approaching attack. A simple irritant like dust may be adequate to excite a paroxysm. Continuing in this form for some time, occasionally for years, the inflammation may extend from the nose along the throat to the lungs, producing sore throat, soon followed by much difficulty of breathing, great wheezing, and free expectoration. The lung affection may last for some weeks. When this severe form has become established, the lungs may be attacked without any preliminary affection of the nose or throat.

Again, among children, we not uncommonly meet with a similar and perhaps identical disease. A child perhaps six months old undergoes a severe attack of bronchitis and thenceforth becomes very prone to catch cold. Then on catching cold, he is seized with frequent and incessant sneezing, lasting a variable time, sometimes a few hours, some-

times three or four days, and resulting in bronchitis, accompanied by much fever, wheezing, and great embarrassment of breathing, severe enough even to compel the patient to sit up in bed. The coryza may sometimes precede the dyspnoea three or four days, the shortness of breath continuing for many days or even weeks after the coryza has ceased. It is, indeed, a form of asthma. The child encounters many attacks in the year, especially during the winter, and may continue liable to them for years, and then perhaps lose them, or they may result in life-long asthma.

These cases appear related on the one hand to bronchitic and dyspeptic asthma, and on the other hand to hay fever. They are allied to the bronchitic form of asthma, being excited by dust, cold, and direct irritants; and through those cases where the paroxysmal coryza is always accompanied by bronchial asthma; and through those cases commencing as paroxysmal coryza, the disease extending and becoming complicated with bronchial asthma. To the dyspeptic forms of asthma this paroxysmal sneezing is related through those cases where the attack is excited by food; and those where the patient, a confirmed asthmatic for many years, then becomes afflicted with paroxysmal coryza induced by food, the asthma at last ceasing, the coryza alone remaining. The following case further illustrates the connection between paroxysmal sneezing and dyspeptic asthma. A child since six months old is subject to attacks, most common in winter, occurring every few months, beginning with not very severe sneezing, lasting from a day to a week, often, but not invariably followed by an attack of bronchitis, with much difficulty of breathing, and fever. Even when free from an attack, the child, after a full meal, suffers from stuffy breathing. In one instance, the disease is limited to part of the fifth nerve, and may extend downwards along the throat and involve the vagus nerve; or *vice versa*, beginning at the vagus it may involve the fifth; and in either case the disease may quit the nerve first affected, an occurrence most common where the attack first affects the fifth nerve. Indeed, in my experience this is

not an unusual way for asthma to begin in children; and as they grow up the coryzal symptoms cease, and ordinary bronchitic asthma alone remains.

On the other hand, these cases of paroxysmal coryza are related to hay asthma, which indeed appears to be the same disease, but owing to the patient's idiosyncrasies the attack is induced only by the pollen of plants; the similarity between these affections being shown by the fact, that in each case the mischief may be limited to the nose, frontal sinuses, and eyes, or extending further, may involve the lungs.

Mr. Blackley, in an admirable paper, shows, that in his own case and some other instances, hay asthma is solely due to the irritant effects of the pollen of plants. He conducted an extensive series of experiments with the pollen of many grasses, cereals, &c., and found that all are capable of exciting an attack, although some kinds of pollen are more active than others. The pollen of poisonous plants is not more virulent than that of harmless plants, indeed, he finds that the pollen of solanaceous plants will excite a slight fit, while the pollen of wheat excites a very severe attack. He clearly shows, in his own person and in some other cases, that ozone, heat, strong sunlight, the volatile principle on which the odour of plants depends, oleo-resins, dust, unless it contains pollen,—and all these agents have been severally considered a cause of hay asthma by other writers,—are powerless to produce a paroxysm. In other cases it appears that one or more kinds of pollen only will produce the attack. Thus, rose-pollen only excites the attack in some patients; and it is said that in America, Roman wormwood is a frequent cause. Hay asthma and the diseases just described are indeed identical, but owing to individual idiosyncrasy, the attack is induced in one person by one irritant and in another by a different irritant. In some cases the attack as we have seen is induced by pollen, in other cases by ipecacuanha or by animal emanations, as from rabbits, cats, horses, &c. Dr. W. Smith, of Preston, narrates a case in which a linseed poultice provoked the symptoms of hay asthma. Simple dust will

occasionally excite these symptoms, and sometimes one kind of dust only is efficient. Thus a middle-aged man, an iron-monger, had suffered from paroxysmal coryza and asthma for two years, the attacks being brought on only by the dust of his shop; but other kinds of dust, as that of a road, failed to affect him, nor did flowers, grasses, &c., nor sun-light excite an attack. This case was singular in this respect that whilst coryza and asthma were excited only by the dust of his shop, yet in certain localities he suffered at night from simple asthma without coryza. Notwithstanding Mr. Blackley's careful and elaborate experiments, I cannot help believing that in some persons sun-light and great heat will bring on an attack without the aid of pollen. Of course it is well known that strong sun-light and great heat will much aggravate the disease produced by pollen. The itching and tingling which generally accompany paroxysmal sneezing, *no matter what their exciting cause*, may affect the whole or any part of the nose. Sometimes they are felt near the orifice, or inside under the bridge. These sensations may extend to the cheek or to the eyes, sometimes only to the inner canthus, or the tingling and itching may also affect the palate or throat. I remember the coryza in one case was accompanied and probably excited by itching of the nose and soft palate, and that iodine inhalations at once removed the coryza and nasal itching, but left unaffected the itching of the palate which at once ceased on the application of a little nitrate of silver.

Arsenic is most serviceable in many of these cases, quickly affording relief in some, but in others requiring ten days or a fortnight to manifest its remedial effect, while in other cases it fails altogether. Where there is fever, aconite, if given early, curtails considerably the course of the attack. Cases that fail to yield to arsenic are sometimes benefited by iodine inhalation, by the administration of iodide of potassium or veratrum viride. The following case of a young woman, 22 years of age, who had suffered for several years with attacks of sneezing like those described, well illustrates the

value of local applications. The fits occurred in the morning, lasted several hours, were accompanied by considerable pain over the forehead, and the sneezing was so violent that she became quite exhausted, and so remained the greater part of the day. She also complained of great itching over the whole of the inside and outside of the nose and part of the face, continuing as long as the sneezing. Her health was failing her, and her hair was growing very thin. Arsenic benefitted her very slightly, while iodine inhalations, the internal administration of *veratrum viride*, *pulsatilla*, iodide of potassium, bromide of potassium, and cod-liver oil were found useless. She was then ordered to use aconite liniment to the outside of the nose and itching part of her face, which immediately subdued the attack, removing both the itching and the sneezing. The attacks of sneezing recurred very slightly, and a fortnight's persistence with the treatment cured them.

The changes which arsenical compounds undergo in the stomach are at present unknown. There is no proof that, like most other metals, it combines with albumen to form an albuminate. From the uniformity in the action of all soluble arsenical compounds, it is probable that either in the stomach or the blood they ultimately become identical in composition.

Metallic arsenic, like the oxide, is poisonous; it is probably first oxidised, and then becomes active. Pure sulphide of the metal is inert, but as it generally contains a not inconsiderable quantity of the oxide, this admixture renders it poisonous.

It has been maintained that the condition of the stomach controls the action of arsenic on the system; for example, if food is present, the medicine becomes absorbed by the lacteals, and through them mixed with the blood, while, if the stomach is empty, the arsenic is absorbed by the veins, and, passing into the liver, is separated with the bile.

In small medicinal doses arsenic excites a sensation of warmth at the epigastrium, and gives rise to a sensation of hunger; indeed, many maintain that arsenic promotes digestion, while increasing appetite, which others as strenuously

deny. Arsenic, as we shall see hereafter, by removing or lessening a morbid condition of the stomach, promotes digestion and appetite.

Few remedies are more useful in certain diseases of the stomach than arsenic. In the so-called irritative dyspepsia, where the tongue is furred, and its papillæ red and prominent a drop of the solution of arsenic, taken shortly before food, will be found of great benefit. Administered in the same manner, it will arrest the distressing vomiting of drunkards with almost unfailling certainty. This vomiting is accompanied by great straining and distress, and usually occurs in the morning before breakfast. Generally very little, and sometimes nothing, is ejected, and then it is called dry vomiting. The vomit is generally intensely bitter and sour, and of a green colour. Arsenic will not only arrest the vomiting, but will often improve the state of the stomach and restore both appetite and digestion.

Arsenic is valuable in chronic ulcer and cancer of the stomach. It allays pain and checks vomiting; the author has seen this metal give relief in chronic ulcer after failure of the commonly used remedies.

Arsenic sometimes removes heartburn and other distressing sensations of the stomach, and is very useful in gastralgia.

In that form of chronic vomiting, when the patient after most meals rejects his food without pain and with scarcely any nausea, the food simply regurgitating into the mouth, small doses of arsenic are serviceable.

It has been recommended in the vomiting of cholera.

The solution of arsenic is always of service in that form of chronic dyspepsia and diarrhœa characterized by the following symptoms:—A sinking at the pit of the stomach, which is relieved by food; but immediately on taking it, nay, even while it is being eaten, an urgent desire seizes the patient to relieve the bowels, which may constrain him to leave the table. The motions are solid, or semi-solid, usually containing lumps of half-digested food. The disease appears to depend on excessive peristaltic action of the stomach and