

the materia medica class, we were cautioned against allowing patients to use calcined magnesia habitually.

It is not often that an opposite error of diagnosis occurs, but the following case is a good illustration:

CASE VII. *Diagnosis of Epithelioma: Revised Diagnosis of Intestinal Atony: Recovery.*—A middle-aged gentleman, of sedentary habits, had for many months suffered from some anomalous symptoms—indigestion, flatulence, occasional vomiting, and obstinate constipation, alternating with looseness, the stools being often simply discoloured mucus. His medical man had ordered some tonic remedies for dyspepsia; but, as he did not improve, he, without telling his regular attendant, consulted a surgeon with whom he was personally acquainted. The surgeon examined him *per rectum*, and told him that he had an epithelial growth far up; that it was out of reach of any operation for its removal; that there was no hope of his recovery; that his progress downwards would be gradual; but that at no distant date he must decide whether he would submit to undergo an operation for the formation of an artificial anus or await his end, which could not be very far off. His medical attendant was unable to acquiesce in this opinion, and, before accepting it, brought him to me. I made a most careful exploration of the rectum, but I could find no growth, stricture, or any kind of obstruction; indeed, the mucous membrane seemed to me more flaccid and folded than usual, and in one of the folds I felt a small piece of hardened faeces, which seemed adherent or retained in the fold. I came to the conclusion that the symptoms arose from atony of the intestinal tube from end to end, with possibly some softening, in parts, of the mucous lining, and specially of the lower end of the colon and rectum. I recommended that he should give up business for two or three months and go to Spa in Belgium, and gave him a letter to my friend Dr. Thomson, indicating my opinion and the treatment I thought would benefit him. The result proved more fortunate than I could have anticipated from the use of the chalybeate waters and the change of climate and diet. My patient came home practically well, and has continued so ever since: that is, for more than two years.

I may here state that many patients with atony and relaxation of the mucous tracts—especially the bladder—whom I have sent to Spa have been, if not absolutely cured, at least greatly improved by the use of the chalybeate waters and baths; but now that Brides-les-Bains, in the Alps of French Savoy, is connected by railway with Chambéry on the great railway to Turin, and is within two hours of Aix-les-Bains, I should be inclined to recommend it, even in preference to Spa. Its advantages are its height above the sea, its warm sunshine during the day, its cool refreshing nights, owing to the crisp air from the neighbourhood of the glaciers, and the great strength of its ferruginous spring at Salins, which contains a large amount of chloride of sodium. Also the presence in the same place of a natural hot saline laxative spring, the use of which in the morning counteracts the tendency to constipation which sometimes follows the use of chalybeate baths, which are usually taken in the afternoon.¹

POISONING BY SARDINES: A TOXIC PTOMAINE.

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On October 23rd, 1892, W. H., a military officer, aged 21 years, whilst apparently in good health, made his breakfast, at 10.30 A.M., off six hot sardines on toast, with coffee. A fresh tin of the fish was opened, and one of the female servants who prepared the breakfast ate one sardine without ill effect. The rest of the tin of sardines came into my possession six days later. W. H. said that the fish tasted nasty. At lunch the same day he complained of feeling unwell, took no meat, but ate some apple tart, and caviare, and drank brandy and soda water. After lunch he retired to the latrine, and vomited. He had supper at 7.30 P.M., and vomited again after retiring to bed. This vomit was reserved for my analysis. He passed a sleepless night. Next morning—the 24th—he was seen for the first time during his illness at 11.15 A.M., by Surgeon-Captain Weston. He was then in bed, wrapped up in rugs, and perspiring. The pulse was weak, the breathing natural; the abdominal walls tense, but the abdomen not enlarged, and there was slight pain in the stomach. He complained of stiffness and feeling of weight in the right leg; but on examination nothing was found to account for this, and the limb was natural in size. Shortly after, at 11.30 A.M., Surgeon-Lieutenant Thomson saw the patient in consultation. A mixture containing ether was prescribed, and one dose was taken. An hour later Surgeon-Captain Weston was hurriedly sent

for, and found the patient moribund. Indeed, he died almost immediately afterwards, and, though artificial respiration and other means of resuscitation were employed for an hour and a half, these were unavailing. It was then noticed that the right thigh and scrotum were œdematous.

The *post-mortem* examination was made next day. During the interval between death and the necropsy, the weather was cool and damp, the temperature of the external air not exceeding 47° F. *Post-mortem* lividity and rigidity were both well marked. The features were so much bloated as to be unrecognisable. Bloody fluid exuded from the nostrils, mouth, and ears. The whole body was emphysematous, except the hands and feet, which appeared blanched by contrast. There were large bullæ on the buttocks. The pectoral muscles were dark, and these and the whole muscular system were emphysematous. The abdomen was tense from gaseous distension. The mucous membrane of the stomach and the rugæ of the intestines were emphysematous. Posteriorly the liver was cavernous and friable, and the organ generally was hyperæmic, as were also the kidneys and the bladder, which latter was distended with gas. The heart and larger blood vessels were empty of blood, and the endocardium was blood-stained. The large intestines were normal, and the lower two or three feet of them contained solid faecal matter. The stomach contained about 4 ounces of semifluid contents.

On October 29th, five days after the death, and four days after the necropsy, I received for analysis the opened tin of sardines, other articles of food, an almost clear watery fluid that had been vomited many hours before death, a portion of the contents of the stomach, the stomach itself, and 2½ ounces of the liver.

The sardines had no unusual appearance, and looked quite fresh; the tin itself was bright and uncorroded. Their odour was peculiar, but not offensive. Some of the fish were intensely toxic; of six white mice, which were fed on them, four died; also a rat; whilst two of the mice and a young cat, fed on two of the fish, were unaffected. One mouse, which had only a small piece of sardine, was extremely ill within an hour, and died in 3½ hours; the rat a young, white, tame animal, was very ill half an hour after eating a piece of a sardine. Two mice appeared to have immunity, for, when fed on portions of fish which had been fatal to other mice, they did not suffer. From four of the fish, weighing 2½ ounces, I extracted, by a modification of Stas's process,¹ an alkaloidal substance, which weighed only 1 milligramme ($\frac{1}{10}$ grain). About two-thirds of this, when injected beneath the skin of the back of a young white rat, caused its death within 4½ hours.

No characteristic pathogenic forms of bacteria were discovered in the sardines. A piece of one of the sardines, which when eaten had caused the death of two mice, was macerated, whilst swarming with ordinary bacteria, in sterilised (by heat) water and placed beneath incisions in the backs of two guinea-pigs, but the animals were unaffected.

These experiments point to poisoning by a toxic ptomaine, and not to the direct action of pathogenic bacteria on the animal organism.

Half an ounce of the stomach contents, containing ordinary forms of bacteria when similarly extracted for alkaloids, yielded 3 milligrammes ($\frac{3}{10}$ grain) of an alkaloidal extract. Of this, about half was injected into the back of a young white rat. The animal died in about twenty-six hours.

Two fluid ounces of the vomited fluid also yielded 3 milligrammes ($\frac{3}{10}$ grain) of alkaloidal ethereal extract. About half of this was injected into a young white rat. Next morning the animal was found dead. A similarly-prepared alkaloidal extract from 2 ounces of the liver had no effect when injected into a young white rat.

The symptoms exhibited by all the animals were similar—great feebleness, loss of muscular power, and retching. These experiments again appear to show that the stomach and ejecta of the deceased man contained a virulently poisonous ptomaine, similar in character to that contained in the sardines.

From the remainder of the three poisonous alkaloidal extracts, when mixed, a minute precipitate was obtained by precipitation with a solution of iodine. This precipitate was washed, dissolved in a solution of sulphurous acid, and on evaporation a portion left microscopic crystalline plates. Another portion of the sulphurous acid solution was evapo-

¹ Brides-les-Bains. See BRITISH MEDICAL JOURNAL, October, 1889, and also Glasgow Medical Journal, December, 1889.

² See Watts's Dict. of Chemistry, new ed., vol. i., p. 120.

rated to dryness and exhausted with absolute alcohol. The alcoholic solution on evaporation deposited microscopic acicular crystals.

A fragment of the putrid liver, swarming with bacterial life, but in which no characteristic pathogenic forms could be detected, was macerated in water previously sterilised by heat, and some of the macerated fluid was inoculated beneath the skin of the flanks of three guinea-pigs. All died within twenty-four hours. Two of the animals exhibited no particular *post-mortem* appearances. The third had much oedema about the site of inoculation, there was fluid in the peritoneal cavity, the spleen was enlarged and much congested, and the intestines were emphysematous. The oedematous fluid from the site of inoculation, the peritoneal fluid, and the spleen juice all abounded in bacilli, similar in appearance to those of malignant oedema. Some were single rods, but many were prolonged into long jointed threads. No spores were seen.

A large, old, grey, wild buck rat was now fed on the remainder of the liver—less than half an ounce. It was found dead in eighteen hours. No bacteria were found in the blood nor in the spleen juice, though this organ was congested. It will be noted that the liver was toxic to a rat, and toxic and capable of producing a malignant oedema in the guinea-pig, but that I failed to obtain from it a toxic alkaloid.

Lastly, a large, old, grey, wild buck rat was fed on a small piece of the putrid stomach of the deceased. It died in about twenty hours. No bacteria were found either in the blood or the spleen juice of this animal after death.

REMARKS.—My evidence given at the inquest on the body of the deceased man, before I had experimented on the guinea-pigs, expresses an opinion which my later experiments have confirmed, and was as follows:—"My experiments show that a poison of the class produced by decomposition of animal matter was contained in some of the fish, and not at all, or not in deadly quantity, in other of the fish, and that the same poison was present in the vomit and stomach of the deceased man."

That a ptomaine and not the direct action of bacteria was the cause of the death of W. H. seems to me clear from the above experiments. Nevertheless, the facts that there was oedema of the thigh of the deceased man, and that his liver was capable of producing malignant oedema in a guinea-pig are curious. I incline to the opinion that the ptomaine was generated before the tinning of the sardines.

My thanks are due to Surgeon-Captain Weston for his care in supplying me with the history of this most interesting case, and, above all, to Dr. Washbourn, without whose aid and advice the investigation must have been more incomplete than it still is.

THE RADICAL CURE OF PROSTATIC OBSTRUCTION BY THE GALVANO-CAUTERY.

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Of the various surgical procedures which have been proposed during the last few years for the relief of prostatic enlargement, most have been directed to the removal of the gland itself or of some portion of it either through a perineal wound or after the bladder has been opened by the suprapubic route. When a considerable amount of enlargement exists, so that a swelling the size of a small egg can very possibly be felt *per rectum*, either with or without the introduction of an instrument into the bladder, such operations as these are not only useful, but are urgently called for. But the conditions which demand them are comparatively rare. In by far the great majority of cases the obstruction to the urinary outflow is produced by some small portion of the prostate gland, overlaid perhaps by a piece of swollen and enlarged mucous membrane. Indeed, the obstacle may be sometimes so slight that it is oftentimes overlooked after death unless it is carefully sought for at the *post-mortem* examination. Even in those cases in which the prostatic obstruction is accompanied by a considerable amount of prostatic hypertrophy, it is very

often the case that the actual cause of the obstruction lies in some tiny portion of the gland, and the large mass which is so obvious when the bladder is opened has played but a small part in obstructing the urinary outflow. It is clear, then, that no operation which does not aim at making more patent the actual orifice of the prostatic urethra is likely to succeed in restoring the patient to natural urination. Some few years back, Mercier, of Paris, attempted the removal of the offending portion of the gland by means of an instrument shaped



Fig. 1.

somewhat like a lithotrite, by means of which he punched out the obstructing portion of the gland. In many instances the results which he obtained were excellent for a few weeks after the operation was performed, but relapse speedily took place, and no permanent benefit ensued. I have myself tried this instrument on several occasions, but success in each instance was but temporary, and in one of them by no means complete even for a time. A short time back the same problem was attacked by Professor Bottini, who has made use of the galvano-cautery, and after numerous experiments both on the living animal and upon dead tissues he has succeeded in constructing an instrument—his "cauterizzatore termo-galvanico"—which is here displayed. (Figs. 1 and 2). In shape it resembles an ordinary lithotrite, or, to be more precise, the instrument of Mercier, and consists of a metal tube which is divided into two compartments by means of a thin septum. By this contrivance a continuous stream of water can be passed through, and thus ensure that it will not become too hot during an operation or inflict any damage on the rest of the urethra.

The galvanic current is conducted to the cautery by means of a wire which is thoroughly insulated, and passes down the inside of the tube, whilst the metal of the instrument is utilised for the return current. The cautery itself consists of a strip of thin platinum, about three-quarters of an inch in length and from one-eighth to a quarter of an inch in breadth, which is laid upon a piece of porcelain. This is sunk in the bend of the instrument, so that it does not stand up from its surface, or in any way impede its introduction into the bladder, or its withdrawal from it. It is so placed that when the beak of the instrument is turned round towards the rectum, the platinum plate rests on the obstructing portion of the prostate gland. Before introducing the instrument, it is of course essential to ascertain that a sufficient current is available to heat the platinum to a dull red heat, by which means the tissues can be destroyed without the occurrence of any serious hæmorrhage.

The period during which the heated instrument is kept in contact with the prostate is, as a rule, only fifty seconds, after which it is carefully withdrawn, and a soft red rubber catheter is introduced into the bladder and retained there for forty-eight hours. Great care is necessary, both in the removal of the one instrument and in the introduction of the other, so as not to displace the eschar which has been produced by the cautery. Bottini himself does not in all cases employ chloroform, as he finds that the operation is by no means a painful one. In my operations, however, the patient has always been anaesthetised, partly in order to avoid pain, and partly for the sake of ensuring that perfect quiet which is so essential to a successful result. So much depends on an accurate adjustment of the instrument, and on bringing the cautery into

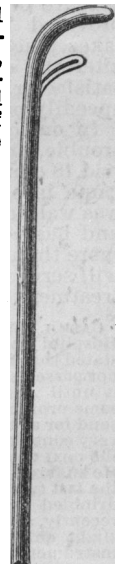


Fig. 2.