Hospital Clinics.

PTOMAINE POISONING—III.*

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Another important result of Bainbridge's work has been to show that the various rat viruses (*B. Danysz*, *B. typhi murium*, etc.) are, bacteriologically, pure or mixed cultures of *B. Gärtner*, *B. Aertrycke*, or *B. paratyphoid β*. The organisms present in the different rat and mouse viruses, as well as certain other organisms, *e.g.* Nocard's psittacosis bacillus, had previously been regarded as closely related to Gärtner's bacillus, but their identity had not been proved. Objection has been raised to regarding the various rat and mouse viruses as identical with the food-poisoning bacilli on the ground that were they identical epidemics would have occurred among those who handled such viruses. This objection is easily met, because the handling of these viruses can be shown to have resulted in some instances in an outbreak of food-poisoning among those who handled them. In this connection the following observation of Shibayama in Japan (quoted by Sacquépée) is of interest: "In a village in the province of Tajamata a quantity of *B. typhi murium*, which was intended for use as a rat poison, was by mistake given to a horse which at the time was in perfectly sound health. The horse became ill the same day and died within a week. The carcase was buried but was subsequently dug up by a number of workmen, who ate the flesh. Within three days thirty-four of those who had eaten some of the horseflesh fell ill and one of them died. The organism was recovered from the meat."

The so-called bacillus of hog cholera is identical with *B. Aertrycke*. This organism appears to be a secondary infection in pigs suffering from hog cholera, the true cause of the disease being one of the invisible, filtrable viruses. The identity of *B. Aertrycke* and *B. suipestifer* does not appear to be disputed, and yet very large numbers of carcases of pigs which have died of hog cholera, many of them presumably being infected with *B. Aertrycke*, are ing is often associated with the consumption of the annually consumed as food, and though food-poison- meat of pigs, yet the number of such epidemics is very small as compared with what might have been expected.

2. Food-poisoning due to *B. botulinus* (Botulism) is a much rarer form of food-poisoning than that just considered. The symptoms are quite different from those produced by the enteritidis bacilli and chiefly affect the nervous system. The incubation period is short (12 to 24 hours) and is generally followed by some feeling of nausea, abdominal pain and constipation, but the characteristic symptoms develop later, resembling closely the symptoms due to poisoning by the vegetable alkaloids, dysphagia, dryness of the mouth, marked dilation of the pupil, paralysis of accommodation, ptosis, etc.

The disease generally lasts some weeks, but may be merely of a few hours' duration. The death-rate is high and varies from 15 to 40 per cent. of those attacked.

The symptoms of botulism are due to poisoning with the toxins of a spore-bearing bacillus, *Bacillus botulinus*, which was discovered by van Ermengen in 1895 in an epidemic of food-poisoning following a banquet at Ellezelles. The organism was isolated from the ham which gave rise to the illness, and also from the spleen and intestinal contents of one of the fatal cases. The *Bacillus botulinus* is a strict anaerobe and gives rise to an extra-cellular toxin chemically analogous to the toxins of diphtheria and tetanus. Botulism is always associated with the consumption of meat which has been preserved, and preserved under anaerobic conditions.

3. Symptoms of food-poisoning sometimes follow the consumption of meat infected with organisms other than those already referred to. The nature of the infection in these cases is not definitely ascertained but would seem to be toxæmia, but whether the substance producing the symptoms is a true bacterial toxin or not is difficult to determine. Of five epidemics of food-poisoning occurring in Newcastle and the neighbourhood during the second six months of last year, three belong to this category. All of them followed the use of tinned meat. In two cases corned beef was the cause and in one case tinned salmon.

On September 15, 1910, six persons partook of corned beef from a newly-opened 7-lb. tin. A few hours (2 to 6½) later they all fell ill and the symptoms were those of a severe gastro-enteritis with collapse. The meat was bacteriologically examined and the only organism recovered was the *Staphylococcus aureus*. The meat was wet, in parts of a greenish appearance, and had a disagreeble odour. All the patients recovered. Other tins of the same brand exposed for sale in the same shop gave rise to no untoward symptoms when eaten by other customers. Ostertag refers to an epidemic of food poisoning investigated by Kuborn at Denis which was considered to be due to the *Staphylococcus aureus*.

In the other epidemic of food-poisoning following the consumption of corned beef, at least nineteen people partook of the beef and all of them suffered from a more or less severe illness. The symptoms were preceded by a short incubation period (1½ to 7 hours) and were of the nature of an acute gastro-enteritis. A proteus was isolated from the meat and was probably the cause of the illness. No deaths occurred. A portion of the meat was examined in London on behalf of the agents for ptomaines, but I am informed that no substances of that nature were present.

The third epidemic concerned five persons, a man, his wife, and his three young children, all of whom ate some tinned salmon. One-half to three-quarters

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of an hour after partaking of the salmon all of them were seized with diarrhœa and vomiting and suffered from severe collapse. The woman, who was pregnant, aborted. All the patients recovered. The salmon is said to have had an "irony" taste which was so unpleasant that very little of it was eaten. The tin was sent to my laboratory, but except for a few flakes of salmon adhering to the edges it was empty. A number of these flakes were, however, examined, and from each of them an organism absolutely indistinguishable from the *pneumococcus* was isolated in pure culture. Three other tins were bought at the same shop and the contents of all proved to be sterile.

A few epidemics of food-poisoning have been recorded in which organisms other than those mentioned above have been believed to be the cause. But enough has been said to show that while in the great majority of cases of food-poisoning the disease is due to a specific infection with organisms of the enteritis group, symptoms of gastro-enteritis may nevertheless follow the consumption of food infected with one or other of several organisms belonging to other groups.

NEUROLOGY.

SOME SPINAL CORD LESIONS.—VI.

COMPRESSION PARAPLEGIA.

COMPRESSION of the spinal cord in the cervical or dorsal regions gives rise to loss of power in the legs, spastic rigidity, and exaggerated reflexes. At the seat of compression the cord is softened, myelitis set up, and degeneration follows in the sensory columns above and in the pyramidal tracts.

The chief causes of compression are: caries of the vertebræ, tumours in the bones, tumours of the meninges, pachymeningitis, meningeal hæmorrhage, aneurysm of the aorta.

The symptoms vary according to the site, the extent, and the cause of the compression. The nerve roots may be compressed as well as the cord.

The onset is gradual, except in the case of hæmorrhage, when it is very sudden. The earliest symptoms are pain in the spine and along the nerves, whose roots are compressed, followed by loss of power and spasticity of the legs. In a small proportion of spinal caries the predisposing cause may be a sudden jump or other movement causing fracture of the diseased bones in a person hitherto regarded as sound, and this leads to an absolutely sudden paraplegia.

In a well-marked case of compression of the mid-dorsal region of the spinal cord the chief symptoms are: loss of power in the legs, rigidity and spasmodic contractions of the muscles of the leg; the arms are not affected except in very rare cases in which the caries involves the lower cervical vertebræ.

There is pain of a burning or neuralgic character in the area of the distribution of the nerves whose nerve roots are directly involved by the caries. A varying degree of anæsthesia exists below the seat of the lesion; in some cases there is very little or no anæsthesia, but in others there is absolute analgesia and anæsthesia of the legs and lower part of the trunk.

The knee-jerks are increased, ankle and patellar clonus are present, and the plantar reflexes are extensor in character, provided the lumbar enlargement remains intact. It should be remembered that if there is complete compression of the lumbar cord the reflexes will be absent.

Bed sores are common. No atrophy of the muscles of the legs occurs except from disuse, when the lumbar enlargement is not affected; but if the tuberculous masses compress the lumbar part of the cord there will be atrophy of the leg muscles simulating peripheral neuritis.

There will be no reaction of degeneration when there is no wasting, but marked R.D. when the lumbar enlargement is destroyed.

There may be involuntary passage of urine and fæces; this impairment of function, as a rule, affects the bladder before the rectum, generally causing retention with overflow. The special senses are not affected.

If the cervical region is compressed, in addition to the above-mentioned symptoms, the arms are paralysed, there is atrophy of the muscles of the hands and arms, and these muscles give the reaction of degeneration. In all cases of paraplegia, associated with pain along the course of the nerve roots and anæsthesia below the seat of the lesion, the vertebræ must be carefully examined for signs of disease.

In spinal caries there may be deformity of the spine, pain on movement, and deep local tenderness, though external deformity is not invariably found; if in the cervical region thickening of the tissues around the spine may be detected. Signs of tuberculous disease in other parts of the body would also be in favour of spinal caries. It is the commonest cause of paraplegia in children.

In malignant disease nodules of growth may be detected attached to the vertebræ or be found in other parts of the body. A man suffering from paraplegia which was considered to be due to new growth developed a nodule in the frontal bone which rapidly increased in size and helped to confirm the diagnosis. The pain is more severe than it is in caries, and the deformity is less. The primary growth may already be known to exist in the stomach, breast, and so on.

Aneurysm of the aorta is a very rare cause of paraplegia from compression of the spinal cord. Pain in the back is very severe at first from erosion of the bones, and later from compression of the nerve roots. If, in addition to signs of compression, there is a local pulsating tumour of the back in a patient who has suffered from syphilis and has been engaged in a laborious occupation, the diagnosis of compression by an aneurysm should not present much difficulty. It may be confirmed by the *x*-rays.