softening. In the nerves, the diphtheritic poison produces a degeneration, which shows itself by an irregularity of the contour of the nerve fibres, and segmentation of the myeline; soon the cylinder-axis divides, the myeline is broken up, and protoplasm becomes abundant. Eventually the myeline is also absorbed. The diphtheritic poison in the medulla oblongata only produces tumefaction of the inferior part, and the cranial nerves remain unaffected.

In the rabbit, the diphtheritic poison produces a primitive myelitis and secondary peripheral neuritis. Diphtheritic paralyzes differ appreciably in man and in the rabbit; in the former they start commonly in the palate, throat, etc., while in the latter they first appear in the hind legs. In man, diphtheria appears to produce two kinds of paralysis; one remaining confined to the mouth, nose, eyes, larynx, and pharynx; while the other becomes generalised, and may involve the whole body, beginning in the legs. It may be surmised, Dr. Crocq concludes, that the first is due to a primary peripheral neuritis; and that the second depends, as in the rabbit, on a primary myelitis, with secondary neuritis.

THE LATE VISITATION OF CHOLERA IN HUNGARY.

BY

DR. EUGÈNE FARKAS (Budapest).

SINCE the last cholera epidemic, which reached Europe in 1892, there have been three distinct outbreaks of the disease in Hungary.

In 1892, early in summer, the Government made strenuous efforts to prevent its importation. The spreading of the disease in Russia, and especially the frightful ravages of the epidemic in Hamburg, have excited the gravest anxiety.

The Hungarian Government has established forty-eight medical stations on the frontiers of Galicia, Bukovina, and Roumania, and travellers and their luggage have been submitted to medical inspection, and restrictions were imposed on the importation of merchandise from infected countries.

Dr. Thorne-Thorne, in the twenty-second annual report of the Local Government Board, wrote the following words:—"We have often seen that when Governments, in their attempts to cope with the risk of imported infection, have drawn lines around their countries . . . call them quarantine or by any other name, and have said as regards cholera, 'Thus far, but no further,' a confidence has been engendered, apathy has taken the place of efficient sanitary administration, and the consequence has been that vigour in quarantine restrictions has nearly always corresponded with laxity in public health administration, and with a high rate of mortality from preventable diseases, often including cholera itself."

We must acknowledge, indeed, that the conti-

mental sanitary authorities have, until recent times, laid much more stress upon the prevention of the importation of the disease than upon measures calculated to produce conditions unfavourable to the spreading of the disease.

The common opinion was very strongly directed in favour of this kind of dealing with the epidemic. The public has not been satisfied even with the most stringent measures of restriction, but it has used decided pressure upon the Government to make the regulations still more severe. At the same time the general sanitary administration was unable to evoke sufficient interest in the people to follow its advice, and a great many of the Governmental regulations concerning general hygienic measures have met with a great obstacle in the unwillingness of the population to change its daily habits.

I am convinced that these are the reasons that the cholera imported into Budapest towards the end of September not only established a footing there, but gained considerable ground in the country, although this part of the year is not the most favourable to the spreading of the epidemic.

The investigations of the medical officer of Budapest, Dr. Gebhardt, tend to establish the opinion that the use of the Danube water was the chief factor in causing the spread of the disease.

From Budapest the epidemic spread down the Danube to its junction with the river Tisza, then it advanced up stream along this river and its tributaries.

To some places in the north of Hungary the disease was carried by workmen returning from Budapest.

The epidemic lasted in Budapest till the 6th of February, the number of the cases being 889, of which 499 died, and in the whole kingdom there occurred 2,231 cases, of which 1,281 were fatal.

The experience of the cholera in 1892 has produced a very marked change in public opinion all over the Continent concerning the precautions against the epidemic. The restrictions adopted in various countries on the Continent have nearly annihilated their commerce, and yet the measures employed proved useless.

The Hungarian Government thought it best to cancel as early as the 4th of November of 1892 a great part of the restrictions, and has allowed the free importation of all merchandise, except such as rags, fruit, etc., even from cholera-infected places.

The marked change in the public opinion relating to the usefulness and necessity of general sanitary measures was not less important. The report of the Central Cholera Commission of the Municipality of Budapest of the year 1892 contains very marked signs of it. When dealing with the measures proposed for the future, the greatest stress is laid not so much upon restrictions as upon the necessity of sanitary measures to remedy the great many nuisances existing in our metropolis.

Efficient sanitary improvements cannot be carried out in a few months, especially in a country where the population is poor and the taxation very heavy. Advance in that direction must naturally be slow.

It cannot, therefore, be wondered at that when in the following year (1893) the cholera has again been imported into Hungary—and this time in June, when during the summer heat the danger of infection is of the greatest—it has again established a footing, and soon spread over a considerable part of the country.

The first case of cholera appeared in 1893, on the 24th of June, in Szatmar-Nemeti. The patient was a vagrant foreigner; it is not known from where he came, most probably from Galicia or Russia, where the epidemic of 1892 was still raging. He was taken into hospital, where he died the following day. Four days later there appeared other cases, and all in a part of the town where the unfiltered water of the river Szamos is used for drinking. In the other part of the town, where public wells are in use, no cases appeared. Therefore it is most probable that the river Szamos became infected, and there were indeed reported other cases from Vicza, a village on the banks of the Szamos, below Szatmar-Nemeti. The epidemic broke out the same time in the county Beregm, on the banks of the river Tisza, below its junction with the river Szamos.

The epidemic soon spread over a considerable part of Hungary on this occasion also, as in the last year, chiefly along the course of the rivers, up and down stream.

The chief difficulty arose from the fact that the inhabitants of the villages along the rivers have been reluctant to discontinue the use of unfiltered river water for drinking purposes. In some places where the authorities have succeeded in bringing into general use filtered or boiled water, as for instance in Szatmar-Nemeti and Szolnok, the occurrence of new cases of cholera has been diminished.

The trade of floating timber, which is carried to a great extent on the river Tisza, contributed considerably to the spreading of the disease. The controlling of this trade is very difficult; the raftsmen—poor and ignorant—live continuously on the river, into which they throw their own refuse. As the cholera had been imported to the county Mavamros, where this trade is very extensive, there appeared soon evidences proving that the raftsmen propagated the infection. The Government has stopped this trade for a time, and the spreading of the epidemic has in consequence shown a very marked decrease.

The cholera epidemic of the year 1893 lasted in Hungary 184 days (from June 24th to December 24th), and the number of the cases was 6,753, of which 3,773 died. Nearly one-fourth of the cases (1,528 with 728 deaths) occurred in the county Mavamros, where the construction of a railway brought together a large number of workmen and

camp-followers. They lived under highly unsanitary circumstances, and formed a focus for the rise and dissemination of the disease.

There was also a very virulent outbreak in Szatmar-Nemeti and in Kolozsvar, which had then a very defective water supply. In Budapest the epidemic was less virulent than last year, thanks to some improvements adopted owing to the panic of the previous year.

It has been said long ago in England that "panic is the parent of sanitation." But the sanitation in England has attained its majority, and no longer requires parental care. It is not yet so in my country, but in the face of the epidemic the people are ready to adopt measures for its prevention.

There can be little doubt that the panic of 1892 had a very great share in combating the outbreak of 1893, which, although commenced in the month of June, has not attained any very dangerous dimensions.

In the years 1893 and 1894 a great many general sanitary works have been carried out. Their usefulness was most apparent in the summer of 1894, when the cholera appeared for the third year in the country.

In the neighbouring province of Galicia the cholera was raging early in the summer, quite close to the Hungarian frontier.

The Government has warned the sanitary authorities of the counties bordering on Galicia of the approaching danger, and called their attention to improving their hygienic conditions. Unfortunately there was very little to expect from these efforts, that part of Hungary being very poor and its population the least civilised.

The sanitary conditions in the county Mavamros were particularly objectionable, owing to the railway works mentioned above.

The Government established stations on the frontiers of Galicia and Bukovina. Travellers crossed in great numbers into Hungary, seeking refuge from the disease ravaging their own country.

The outbreak first appeared in Körösmező on the 30th August, and in Trebusa-Fejérpatak on the 31st of August—villages in the county of Mavamros in the centre of the railway works. The following days there again occurred single cases in Körösmező and Trebusa-Fejérpatak, soon followed by many others all along the line. Here the disease kept its hold till the 14th of December, the number of the cases being 416, of which 230 were fatal.

For months the cholera continued within the frontier of Hungary, and notwithstanding the highly unsanitary condition of the county of Mavamros, our measures proved successful in limiting the spread of the disease within that area.

This success was attained without any restriction of the commerce except those which are prescribed by the convention of Dresde. There was only one measure injurious to the commerce, that is, the

suspension of the trade of floating timber ; but it was very advisable, remembering the experiences of last year. Later on, before the entire cessation of the outbreak, the restriction as to the floating of the timber was removed under an efficient medical supervision.

Our experience of these three cholera epidemics has clearly proved that success can only be hoped for from the general sanitation. Looking at the years 1892, 1893, 1894, we have been most successful in our measures during the last year, when we wasted less money in restrictions and inflicted no damage on the commerce by prohibitory measures, but we have had a great part of our country in a much better sanitary condition than it was in the previous years.

We are still at the beginning of the work ; our sanitary administration has very great tasks to accomplish. There are a great many nuisances still existing in our towns and villages, especially connected with the water supply, of the disposal of refuse, and of the housing of the working classes. But we are already on the good way, and we hope to make a better progress in future.

What we propose for the future is to follow the lessons pointed out by the genius of Sir John Simon thirty years ago, which you in England had the good fortune to appreciate and successfully to carry out. The continental hygienists did not cease for twenty-nine long years to condemn these methods, during which time you have made an admirable progress in sanitation, and the Continent has wasted very much money in useless restrictions ; now all the leading hygienists accept your methods of dealing with the cholera epidemics.

"NOTES ON A RECENT OCCURRENCE OF RABIES AND ON ANTIRABIC INOCULATION."*

BY
CHARLES PORTER, M.D., M.O.H., Stockport.

I PROPOSE to-day to lay before you an account of the circumstances of a recent occurrence of rabies in Stockport, and the subsequent treatment of the bitten persons at the Pasteur Institute, Paris. I will first, however, ask you to briefly advert with me to the fact that, though the spontaneous origin of rabies has been occasionally asserted by imperfectly informed persons, rabies is now well recognized as a zymotic disease, caused by a special virus, and transmissible only from animal to animal, and from animal to man, by the bite of a rabid animal, or artificially by subcutaneous or subdural inoculation. At the same time we know that such a thing as "hysterical hydrophobia" has been observed in highly neurotic individuals who have supposed themselves to be bitten by a mad dog when they have not been bitten at all, and that though they usually

recover not a whit the worse, such patients have been known to die of hysteria by simple exhaustion (Horsley). The special virus referred to is believed by Pasteur to be a micrococcus, and Dowdeswell and Fol have distinctly shown that a micrococcus is present in large quantities in the lesions in the central nervous system, where the virus is in greatest concentration.

Amongst the carnivora, rabies most commonly affects dogs, but cats, foxes, wolves, and jackals not unfrequently become infected, and quite recently a large circus lion contracted the disease in America. Amongst ungulates, the malady has been observed in deer, cows, and horses. Amongst rodents, in the guinea-pig, rabbit, and squirrel, whilst the primates, both monkeys and, unfortunately, also humans are readily susceptible to the disease.

Clinically, two distinct forms of rabies are recognized :—(a) the furious, and (b) the dumb, or paralytic. In dogs, the disease may take either form, the furious being the more prevalent ; in rabbits it is almost invariably paralytic ; in guinea-pigs, usually furious. In man, the convulsive or furious form of the disease almost invariably presents itself, the exceptions being so few, that a witness, who claimed to speak with authority, informed the Select Committee of Lords, in 1887, that he had "gone through the literature of the subject since 1800," that he could "not find a single case of dumb rabies in man," and that the disease had never been known before the employment of Pasteur's intensive method of inoculation. Undoubted records of such cases have, however, been collated by Gamaleia, of Odessa, and by Schäffer, of Buda-Pesth, many of which occurred long before antirabic inoculation was thought of, and Dr. Chantemesse informs me that "paralytic forms of rabies are well known to all the old writers who have studied rabies ; I meet them frequently enough in animals—dogs, for example, and they are not very rare in man." I hope on a future occasion to refer more fully to this subject, but will now pass to the consideration of the symptoms and diagnosis of rabies in dogs.

In dogs, the average period of incubation is fixed at about six weeks by Horsley, Brown, and others, but it is said to vary from eight days (Atkinson) to six or even perhaps twelve months (Fleming). In some cases, at the expiration of this period, very characteristic preliminary symptoms develop, such as dulness, want of appetite, desire to hide, the watching of imaginary objects, frequent snapping, and sometimes strabismus. In other cases, these prodromata are apparently entirely wanting. Dr. Burdon Sanderson tells us that "from the first there is usually a foreshadowing of that most constant symptom of the disease—depraved appetite. Mad dogs devour not only filth and rubbish of every kind with avidity, but even their own excrement, often immediately after it has been passed. Indications of this tendency appear

* A Paper read at the Meeting of the North-Western Branch of the Incorporated Society of Medical Officers of Health on July 12th.