

## REMARKS ON ANTHRACIC VACCINATION AS A PROPHYLACTIC OF SPLENIC FEVER.\*

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THE Editor of the BRITISH MEDICAL JOURNAL has asked me for an expression of opinion on the experiments of vaccination as a prophylactic of splenic fever, performed in Hungary at the request of Baron Kemeny, Minister of Agriculture for that country. These experiments were made by a gentleman belonging to my laboratory, M. Thuillier, whose reports, made to me on his return from Pesth and Kapuvar, are appended. I must here observe that, unfortunately, M. Thuillier only had at his disposal animals of which a certain number were affected with various diseases, and likely to die during the course of the vaccination from the effects of these diseases, without reference to splenic fever. However that may be, I am the first to recognise that these experiments have not been so completely successful as those which were performed in France, and which are now reckoned by dozens. I speak, let it be understood, of the experimental verification of the efficacy of the vaccination by means of final inoculation with highly virulent material. After the return of M. Thuillier to France, I feared that the small difference in the results to which I refer must be attributed to the difference between the race of animals in France and Hungary. Fortunately, my fellow-worker and myself soon discovered that it was not so. Numerous trials made in January and November last clearly showed that the first vaccine employed by M. Thuillier, and which I had myself given to him at the moment of his departure, was, unknown to me, rather weak in reference to a second vaccine, intended to complete the vaccination commenced by the first. This explains how it is that the second vaccine caused the death of some sheep after the second vaccination. It cannot, however, in any way compromise the success of the new method of vaccination.

At the International Medical Congress held last August in London, I stated that 20,000 sheep had already been vaccinated. The figures at the present moment are 130,500 sheep, 19,000 oxen, cows, and horses; in all, 150,000 head. In proportion as we approach the months in which deaths from splenic fever are most considerable, vaccinations increase to an extraordinary extent. I am convinced that, from the month of April to the month of September next, the new method of inoculation will have been brought to bear on more than a million of animals, without reckoning what is done out of France.

I have noted the article of one of the *privat-docents* of the Faculty of Pesth, who made part of the commission on M. Thuillier's experiments. This gentleman has, it appears, many preconceived notions on the subject of microphytic diseases. He has thrown himself into all kinds of speculative considerations on imaginary dangers on the subject of the new method of vaccination. I deplore—without, however, feeling any surprise—the foregone conclusions of the *privat-docent*. All scientific novelties are subject to inconsiderate criticism. In the present case, this only troubles me with regard to the injury it may inflict on agriculture and on stock-raising in Hungary. It would be disastrous if it were to have the result of retarding the application of vaccination for the prophylaxis of splenic fever in a country where such a remedy is so much required.

### REPORT ON ANTHRACIC VACCINATION AT BUDA-PESTH. BY M. L. THUILLIER.

Experiments have been made in the establishment of the Veterinary Institute at Buda-Pesth, under the auspices of Baron de Kemeny, the Hungarian Minister of Agriculture and Industry, and under the superintendence of a commission nominated by his Excellency, and composed of nine members: Dr. Tormay, President, Director of the Veterinary Institute; Dr. Azary, Secretary, Professor of the Institute; Dr. Thanhoffer, Dr. Czako, Dr. Liebermann, Professors of the Institute; Dr. Fodor, Professor of Hygiene to the Faculty of Medicine; Dr. Korányi, Professor of Therapeutics; Dr. Plosz, Professor of Chemistry; and Dr. Rózsahegy, Privat-Docent of the Faculty.

\* M. Pasteur, for reasons explained in his address at the International Medical Congress, employs the term "vaccination" for anthracic inoculation.

Sixty sheep, and ten animals belonging to the bovine genus, were set apart for these experiments. They were divided in the following manner:—thirty Hungarian sheep, thirty Merino sheep, three Hungarian oxen, three Hungarian cows, three Hungarian calves, one young buffalo. These animals were bought at the city market two and three days before the first inoculation. Some of the sheep were more or less weakly animals. They were divided in the following manner:—fifteen Hungarian sheep and fifteen Merino sheep intended to be inoculated; thirteen of each species by recent cultivated material, containing only filaments and no spores; two of each species by less recent cultures brought from Paris, and only containing spores; two cows, one ox, and two calves intended to be vaccinated by recent cultures; fifteen Hungarian and fifteen Merino sheep, two oxen, one cow, one Hungarian calf, and the young buffalo were reserved as test-animals (*temoins*). The whole of the sheep were placed together in a building destined for glandered horses; the cattle were lodged in stables at the Institute.

The first vaccinal inoculation was performed at midday on September 23rd, 1881. The four sheep were inoculated by spores of a culture dating from August 10th, 1881. All the inoculated animals tolerated the vaccinal fever which followed this inoculation very well. On the morning of October 2nd—that is to say, nine days after the inoculation—one of the thirteen sheep inoculated by recent cultures was found dead. The superintending commission made a necropsy, and declared the sheep to have died of catarrhal pneumonia. The second inoculation was performed on October 15th, at midday. The four sheep inoculated on September 23rd by spores were again inoculated on that day by a culture of the second vaccine, dating from June 25th, 1881, likewise containing spores only. The inoculated animals bore very well the vaccinal fever which resulted from this second dose of virus. On this occasion, also, one of the Merino sheep inoculated by recent culture died. It was found dead on the morning of the 8th. In this case, likewise, necropsy showed that death was not a consequence of the inoculation. The superintending committee declared that the sheep had died of catarrh of the stomach. The inoculation of the non-diluted virus took place on October 17th. The superintending committee having expressed a desire to reserve some sheep for ulterior researches, only twenty-five sheep of each lot were inoculated. Each lot comprised thirteen Hungarian and twelve Merino sheep. All the larger animals were inoculated with the virulent material. The two inoculated Hungarian and the Merino sheep which were reserved had been vaccinated by recent cultures.

On the morning of the 19th, fourteen of the test (*temoins*) sheep were found dead; on the 20th, four more succumbed, and five others died on the succeeding days. Thus, out of the twenty-five test sheep (*temoins*), twenty-three died. The clinical symptoms, the cadaveric lesions, the presence of bacteria in the blood, showed the cause of death in all the victims to be anthrax. However, one cachectic sheep which died with symptoms of splenic fever, did not show, at the necropsy made by the commission, any of the naked-eye or microscopic characteristics of that disease. On the morning of the 26th, one of the Hungarian sheep vaccinated by recent culture was found dead. The commission made a necropsy, and declared the cause of death to be cachexia induced by *distoma hepaticum*. Amongst the cattle, no fever nor any morbid appearance whatever supervened amongst those which were vaccinated. In the test series, the temperature rose two or three degrees. There was a little depression, but no want of appetite.

These experiments have fully verified the harmlessness and the efficacy of vaccination. The experiment made on the series of sheep vaccinated by culture of old date brought from Paris in closed tubs showed that the virus may be transported under these conditions for any distance without losing its valuable qualities.

### REPORT ON INOCULATION AT KAPUVAR.

The Buda-Pesth experiment was repeated at Kapuvar on one hundred sheep and twenty oxen. Fifty sheep and fourteen oxen were vaccinated; fifty sheep and six oxen were reserved as test animals (*temoins*) of the virulent inoculation. After the second vaccination, six sheep died; after the virulent inoculation, fifty-nine sheep and one test cow (*temoins*) died. The surviving sheep and three out of the five surviving cows were very seriously ill. One vaccinated sheep died, the other sheep and oxen inoculated were not affected. Twenty-six sheep out of a flock ravaged by anthrax were also inoculated. Between the first and second vaccinal inoculation, two of these sheep died, one of the remainder of the flock died. After the second inoculation, ten of the inoculated sheep died; nine have since died. It is not known whether there have been any subsequent deaths from anthrax in the remainder of the non-vaccinated flock.