

alone, and in some instances to clear up what would otherwise be extremely obscure cases. On account of the frequency of disease of the urinary apparatus, and the injurious influence such disease exerts on the entire organism, it is desirable that the urine should be examined in all animals which have to be tested for general soundness and usefulness, and also in cases of disease where disturbance of other organs has been excluded. (*Berliner Tierärztl. Wochens.*, 22nd May, 1904, p. 398.)

---

### A CASE OF BLACK-QUARTER IN A THREE-DAYS-OLD CALF.

By L. STREBEL, Junr.

OF thirty-three cattle on a certain farm in V——, twenty-eight had been protected against black-quarter in the spring of 1903, five being omitted because they were still too young. On the 5th November 1903, one of the uninoculated animals, a nine months old bull calf, died from black-quarter, as shown by *post-mortem* examination.

The prescribed disinfection was at once carried out. On the 7th November the four other young animals were inoculated for the first time.

On the evening of the 8th November, a cow in an entirely separate stable gave birth to a well-developed and apparently quite healthy calf. On the 11th November this calf died. Being called by the owner to make a *post-mortem* examination, Strebel discovered most clearly marked macroscopical lesions of black-quarter.

A bacteriological examination in the pathological laboratory at Freiburg proved the existence of black-quarter bacilli.

Strebel recounts the case because to his knowledge no case of black-quarter in so young a calf (only three days old) has for long been published. (*Schweizer—Archiv f. Tierheilk*, XLVI. Band, 2 Heft, page 86).

---

### TWO CASES OF RECOVERY FROM EXPERIMENTAL RABIES IN THE DOG.

By MM. REMLINGER and MUSTAPHA EFFENDI.

IN no other disease, perhaps, is the prognosis less hopeful than in rabies.

In the laboratory it sometimes happens that a dog inoculated with the virus of rabies by trepanation escapes infection. Such an animal is regarded as having been protected by a previous attack, a view first suggested by M. Pasteur, but so far as the authors are aware the process of recovery from rabies has never been observed with absolute certainty, and has never yet been realised under laboratory conditions; hence the interest of the two following cases.

CASE I.—On the 7th November 1903, a full-grown, dark yellow, ownerless dog was injected in the jugular vein with 5 cc. of a milky emulsion of fixed virus previously passed through fine muslin. No special symptoms were noted until the 21st November, when the animal showed restlessness and considerable excitement. It wandered backwards and forwards in its cage, although during the previous days it had remained lying down. The appetite, previously good, had diminished.

On the 22nd November excitement was less, but the hind limbs showed signs of paresis, appetite was completely lost, the eyes appeared haggard, and there was a little froth about the lips.

On the 23rd November the condition was aggravated. The animal lay continuously, and if forced to rise it rolled about and fell again immediately. Touching the animal or making any sudden noise caused convulsive attacks, which were particularly marked when dogs in the neighbourhood barked.

By the 24th November all excitement had disappeared. The hind limbs were completely paralysed, the animal lay on its outstretched fore limbs; it had not lost consciousness. If spoken to it moved its tail and slightly lifted its head. *Dyspnœa*.

On the 25th November the paralysis had extended to the muscles of the neck, the animal could no longer lift its head, which it rested on the ground, hind and front limbs completely paralysed, respiration feeble, consciousness lost; the animal appeared likely to live only a few hours.

26th November. Condition stationary; respiratory movements were so little marked that the animal sometimes appeared dead.

27th November. The observers were surprised to note that not only was the animal living, but it had sensibly improved. It had recovered consciousness, and when spoken to it moved its tail.

28th November. Continued improvement, the head could be lifted slightly; being unable to use its paws, the animal when called tried to approach by dragging itself along the floor on its arms. It could not eat, but tried to grasp fragments of bread placed within its reach.

29th November. Very marked improvement. The animal made several movements with its front and hind paws; when called it partly raised its body. It masticated and swallowed pieces of bread placed within its mouth.

1st December. Improvement continued. The dog used its paws better. It grasped fragments of bread by itself and ate them without assistance.

2nd December. When called for feeding it made an effort, rose on its legs, rolled about, fell down, rose again, rolled about afresh, and repeated this a certain number of times. Appetite increased.

3rd December. The animal was found standing up in its cage, propped against the bars to avoid falling. If forced to leave its position it rolled about and fell down, but rose again with much less difficulty than on the previous day.

On the following day the improvement steadily continued. The hind limbs still showed paresis, and the gait remained staggering for some time, but by the 10th or 15th December the animal could be regarded as completely cured. The only signs of disease were poor condition and perhaps some loss of visual acuteness.

Given the above-described symptoms, and remembering that they occurred some fourteen days after an intravenous inoculation of fixed virus, it seems impossible to attribute them to anything but an attack of rabies. Nevertheless, it proved impossible to obtain froth from the mouth during the attack, to inoculate an animal sensitive to the disease. To confirm their diagnosis the authors therefore sought to discover if the serum had assumed anti-rabic powers, and if the animal itself had acquired immunity.

On 14th December the dog was bled. On the 16th the serum was emulsified with fixed virus. Virus and serum were left in contact for twenty-four hours, after which the serum was separated. The virus was diluted with sterilised water, and two rabbits were inoculated under the *dura mater*. One of these died of paralytic rabies on the 31st December, the other on the 1st January. In these animals therefore death had been postponed for a period of four and five days respectively.

On the 5th January the dog was trephined and inoculated with a large dose

of fixed virus. No morbid symptoms followed. Two months later it was still alive and perfectly well.

As a control the authors inoculated, in the anterior chamber of the eye, a dog which one month previously had received by the jugular vein 10 cc. of rabic emulsion and had shown no morbid symptoms whatever as a consequence. This animal died of rabies three weeks later. It follows that the fact of not having shown rabies after trephining should not be attributed to the inoculation of virus into the jugular, but, on the contrary, to the action of the disease process which followed. The rabic character of the latter is thus proved.

The authors describe a second case in which an ownerless dog received 8 cc. of a milky emulsion of fixed virus in the jugular vein. The first symptoms, viz., loss of appetite and slight paresis of the hind limbs, were noted on the 10th December, twelve days after inoculation. The subsequent course of the disease was very similar to that in the case already detailed. The animal appeared completely to recover, except in so far as its bodily condition and vision were concerned.

26th December. The animal was bled.

28th December. The serum was mixed with fixed virus.

29th December. A rabbit was inoculated under the dura mater with the virus which had been freed from the serum and diluted with sterilised water. This rabbit was attacked on the 10th January, thirteen days after inoculation, and died on the 13th January, that is, fifteen days after inoculation. In this case death was postponed for five days longer than in the case of the control animal.

On the 5th January the dog was trephined and inoculated with a large dose of fixed virus. No morbid symptoms. Two months later it was still alive and in excellent health. The control animal kept under similar conditions had contracted rabies.

The authors noted that in the second dog the disease was much less marked than in the first. The two cases therefore represent a gradual transition between those cases where inoculation of rabic virus into the jugular vein produces no effect (four times in ten in this series of experiments) and those on the contrary where it produces death after an attack of classic rabies (four times in ten as before). A modified attack of rabies often confers immunity against so severe a test as inoculation under the dura mater, the serum of a dog immunised in this way possessing anti-rabic properties. These facts suggest the possibility of vaccinating dogs against rabies by way of the jugular vein as practised by Krasnitski.

The authors' observations, however, only partially confirm the experiments of that writer, who regards intravenous injections of rabic virus as harmless, provided the emulsion be filtered, diluted, and injected slowly. The difference in the results obtained is probably connected with the degree of concentration of the emulsion.

The foregoing facts should direct attention to a second point. If experimental rabies is susceptible of cure, the same is undoubtedly true of clinical rabies. In that case a person bitten by an affected animal cannot certainly feel safe, as has hitherto been supposed, even although the animal remain alive eight to ten days after the accident. The survival of the dog is not an absolute criterion. The dog may fatally inoculate a human being with rabies whilst itself surviving. A very searching veterinary examination should therefore be made, and in all doubtful cases the Pasteur treatment should be carried out. (*Annales de l'Institut Pasteur*, 25th April 1904, page 241).

---