

ON THE GERM OF A COMMUNICABLE DISEASE  
DERIVED FROM A DOG, ALLEGED TO  
HAVE DIED OF RABIES, WHICH  
RETAINS RABIES CHARACTERS.<sup>1</sup>

By RICHARD MOLLENHAUER, M. D.

SINCE an epizootic among dogs, claimed to have been rabies, was reported to exist in and around the County of Essex, in New Jersey, I have had several opportunities to witness or to verify experiments performed to test the legitimacy of that claim, and of certain statements which were made in connection with it.

I believe it is no longer necessary to criticize and expose the fallacy of the crude attempts to demonstrate rabies by introducing a fragment of brain tissue from a suspected animal under the dura mater in a trephined dog, the said fragment having been cadaveric from 24 to 48 hours. There seems to be little question that so much of Pasteur's statistics as was derived from a study of the so-called Newark epidemic, is regarded by all, who are familiar with its history, as based on erroneous information.

In the course of my inquiries into the clinical and anatomical aspects of germ diseases, it occurred to me, that if the various forms of intense and attenuated virus employed by Pasteur were devoid of organisms demonstrable by our present methods of research, that we should be compelled to assume the existence of such organisms, or excluding them, to assume the infinite reproductive power of protozoines.

I had seen one human case, alleged to have been one of rabies, and as an enthusiastic and able bacteriological inves-

---

<sup>1</sup> Presented to the American Neurological Association in Philadelphia, June, 1890.

tigator found (?) and cultivated (?) the rabies microbe, notwithstanding his having had the specimen sent him in thin sections soaked in a solution of corrosive sublimate, whereas, neither microscopically nor by inoculation had I been able to obtain a convincing result from the *same material*, in a relatively *fresh* condition and untampered with, and as Fol is now generally regarded to have been misled in detecting similar features, I concluded to submit the whole question to as critical a test as circumstances permitted. As a result I may announce that the evidence I have of an existence in dogs of a disease resembling traditional rabies, is sufficient to justify my presenting it, —though there may be many gaps in the chain of evidence.

John C. Dancer, veterinary surgeon, at Orange, N. J., at considerable personal sacrifice, brought to the veterinary infirmary of Prof. James Hamill, D. V. S., a large spaniel.

The gentleman named, is one of the leading clinical experts in canine pathology ; he had seen one case many years before in the same neighborhood, presenting the same symptoms, and was in possession of good evidence of a fatal epizootic among dogs on an adjoining piece of ground. His opinion was thus expressed : " If this is not rabies, I know not how to class it." The dog was in a condition which may be described as intermediate to strychnine-tetanus and epileptic status. On his death, two dogs were inoculated—one by skull trephination, the other hypodermically—with the medulla emulsified with bouillon, under aseptic conditions.

The latter was alive and well up to May 21st, when he was utilized for another experiment. The former went raving mad—no other words can describe his condition—on the seventh day, and died on the ninth day. The little animal dashed at everything and anything, bit and snapped at all objects within, and many out of his reach. On the seventh and eighth days he was absolutely fearless in his rage ; on the ninth day, he exhibited momentary obedience, or rather, was cowed by the lash, to break out again in fury after a few seconds. Like the first dog, he wished to drink,

and greedily lapped up fluids, but could not swallow them.

From this dog's parotid gland, from the œdematous tissue under the neck and jaw, from his blood, from his cortex cerebri and from his oblongata, cultures were made in bouillon-gelatine, and on potato, which yielded exactly the same results in both dogs, and from each of the organs named. After long and repeated efforts I succeeded in eliminating what I then thought were accidental contaminations, and retained two micro-organisms of which I have found *one* in every dog whom I succeeded in rendering rabid.

It would lead me too far, to detail the numerous failures which attended my experiments, until the last series, to be spoken of, had been reached. With the obtaining of a good series of oblique tubes filled with canine blood-serum, the bacillus of which I shall have to speak, first showed a healthy growth, and developed spores. It was the substitution of this material for that which had been used previously, which led me to anticipate that the disease here treated of, may yet be conveyed hypodermically.

Like most pathogenic germs, it possesses no great vitality, except in specially favorable soils. I am not committed to the view that we have to deal with a rabies as it is described by veterinary authorities. The character of the germ is such that it may turn out to be rather a facultative, than a pathogenic parasite. Be that as it may, the view of the freshly expressed parotid juice, swarming with these bacilli a few hours after death, in fact at the first moment of examination, gives rise to an anxious appreciation of the danger incurred from the bite of an animal, whose salivary glands contain such material. In connection with this reflection, I would refer to an older experience with a pathological saliva.

In the earliest series of experiments referred to, a spitz-dog having been trephined, and dying in convulsions, subsequently attributed to the meningitis which was found *post-mortem*—and to produce which had been the intention—some saliva was obtained and injected into a healthy dog, through the trephined skull. He died in 36 hours; and

from his case on, carried through seven generations, the parenchymatous fluids of successive dogs proved progressively more fatal, the last one dying in 8 hours after hypodermic inoculation.

I, unfortunately, at this time, was not prepared for extended bacteriological experiments, and owing to the absence of control inoculations, am unable to decide, even hypothetically, whether a ptomaine or a living germ had been a fatal agent of such unprecedented rapidity. The clinical symptoms and the gross anatomical appearances corresponded altogether to those found with death from rattle-snake bites.

When Spitzka demonstrated that the so-called characteristic symptoms of rabies could be produced by artificially provoked meningitis, he corrected an error so puerile that one almost hesitates to acknowledge that his laborious demonstrations were necessary to expose so glaring a fallacy.

My experiments, however, show that aseptic *cerebral* inoculations with a specific material, invariably kills in a period of from 6 1-2 to 9 1-2 days, and usually fails to kill when injected hypodermically (every part tried); yet no cerebral lesion competent to produce death, in fact no lesion, aside from the cerebral puncture can be found. One stubborn fact remains, and that is the great difference between cerebral and hypodermic inoculation with the same material.

How far cerebral inoculation may yet be regarded as a fallacious method, I am not now prepared to decide, nor even to surmise further than as regards the culture soil peculiarities of the brain.

The germ is a bacillus whose various growth-stages present a uniform type. In its adult period, it is usually found in chains typically made up of four, rarely of three, somewhat more frequently of two, and exceptionally of five links.

In artificial nutritive media the bacilli are much smaller than when found in the recently killed animal (examined in a hanging drop).

When first liberated from the spore, movements are seen sufficiently active, carry the bacillus after its "four link stage" over half the field given by a Leitz 1-12 immersion, in two hours, and in extra-organismal media, such movements continue feebly for twenty-four hours longer.

One end of the short chain, the one which is formed by the best developed link, is usually in advance and appears to be most active in motion. The other end of the link—particularly in specimens bred extra-organismal—is less bulky, more pointed, and bent slightly at its free end. The diagram will render clearer<sup>2</sup> than any description can, the relations and transitions of the phases found.

The various bacterial findings reported by European and American observers, have not stood the test of criticism; of one of them I have positive assurances convincing to my mind that not a mere error of observation but one of the crudest imaginable, can alone excuse the publications of a spurious discovery. Among the investigators who had devoted their labors to the discovery of the rabies germ, are some of the most competent bacteriologists. It is inconceivable that this germ could have been present in their specimens, undetected by them. From this and from other facts detailed in the full article, I deem it probable that rabic manifestations are symptoms of various diseases affecting the dog, some of which we know not the active agent of. And the surmise seems allowable that even a facultative parasite: the bacillus herein described if developed in stable soil, and accidentally taken up and propagated in the dog, may cause a disorder clinically undistinguishable from the rabies of veterinarians. The important practical outcome is that this large, easily identified and characteristic bacillus swarms in the parotid gland of the infected animal. There can be no doubt, if this chain of reasoning be sound, that under circumstances favoring its propagation, this germ may be introduced through the bite of the dog, and when successfully introduced, prove as invariably fatal as the traditional view regards true rabies.

---

<sup>2</sup> Owing to the great clearness of the microscopic picture, and the probability of obtaining good and clear micro-photographic pictures, their delineation is postponed.