

Domestic animals, on the other hand, appear to readily suffer from diphtheria, which they can communicate to human beings. In this respect I find cats the greatest sinners. That these animals will succumb to the disease has been shown by Klein experimentally. What actually occurs in Nature is well illustrated by the following case given by Klein:—"A little boy had a fatal attack of diphtheria. On the first day he vomited, and the cat licked up the vomit on the floor. In a few days (and after the death of the boy) the cat was noticed to be ill, and her sufferings became so severe and similar to those of the boy that her owner destroyed her. During the early part of its illness this cat was let out into the back-yard, and a few days later the cat of a neighbour who lived a few doors off was noticed to be ill. This cat had also been in the back-yard at night. The second cat recovered, being carefully nursed by four little girls, all of whom developed diphtheria. There was no other known source of infection to which these girls had been exposed except the cat."

Diphtheria bacilli have also been found in dogs.

I have already shown that milk may contain diphtheria bacilli, and we naturally inquire whether the source of contamination may not be the cow itself. This has been shown to be the case, but it must be of very rare occurrence. Dean and Todd showed that diphtheria bacilli were found in ulcers occurring on the teats of two cows, whose milk also contained virulent diphtheria bacilli; in fact, a small outbreak of diphtheria occurred amongst those who drank this milk unboiled. The two observers isolated diphtheria bacilli from the teats, from the milk, and from the throats of those attacked, and were able to show that in all probability the bacilli in all three situations were derived from a common stock. They were able to inoculate other cows with material obtained from the ulcers, when ulcers appeared on the teats of the latter cows also. They, however, failed to recover diphtheria bacilli from these lesions or from the milk of these latter animals; neither did an injection of antitoxin prevent the ulceration. Consequently, it seems probable that the diphtheria bacilli were not responsible for the disease in the first cows, but that they occurred as an impurity, secondary to some other micro-organisms which produced the ulceration. However, the interest lies in the fact that diphtheria bacilli have definitely been isolated from sores on the teats of cows, and that some of these bacilli found their way into the milk. Pigeons and fowls have been held to suffer from diphtheria, and to be capable of transmitting this disease to men. Pigeons suffer from "gapes" and fowls from "roup," both diseases resembling human diphtheria, in that a membrane is formed about the air-passages. In pigeons, "gapes" is due to the *Bacillus Columbarum* of Löffler, which is harmless as regards men. McFadyean has shown in fowls that "roup" is due

to a nematode worm, with which diphtheria-like organisms may be associated, but that these are non-pathogenic. However, it was thought that there might be two diseases occurring among fowls characterised by similar membranes in each case. The one disease, true "roup," was supposed to be of frequent occurrence, and harmless as regards men, while the other, pathogenic as regards the human race, and rarely seen, was due to the presence of virulent diphtheria bacilli. That diphtheria might be so conveyed was supported by such facts as the following:—

Dr. Turner, Medical Officer of Health for the Colony of the Cape of Good Hope, found that human diphtheria followed the spread of the fowls' disease up a river valley. He further thought he had conveyed diphtheria from men to fowls, and he pointed out that the birds suffer from paralysis in some cases after the supposed "roup."

Hope Robson found a fowl afflicted nigh unto death with a throat complaint near a case of human diphtheria. This fowl made a rapid recovery after receiving an injection of 2,000 units of anti-diphtheritic serum, although, it is true, swabs from the throat gave a negative result as regarded diphtheria bacilli. Dr. Dutt gives an instance of a lady who fell a victim to diphtheria after a visit to a farm where some of the fowls had a throat complaint, when she had the rashness to actually kiss one of them.

During the epidemic at Goole, to which I have already referred, it was found that the people were very fond of keeping fowls and rabbits in their back-yards. Dr. Cammidge was so fortunate as to detect diphtheria bacilli in one specimen rabbit taken from this source.

The horse, too, is capable of developing rhinitis with a discharge containing virulent diphtheria bacilli, as was shown by Cobbett, who thoroughly tested the cultural peculiarities and virulence of organisms obtained from this source by Dr. Farmer. The daughter of the owner was suffering from diphtheria, and the condition of the horse was brought to light while efforts were being made to trace the source of infection.

To the above list we must add inanimate objects, which have been found a fruitful source for spreading the infection. Thus slates, pencils, penholders, and any object which has been near the mouth of an infected person, such as cups, spoons, &c., have frequently been observed to convey the infection. Here is an example cited by Cobbett:—"A boy, the day before he was taken ill with diphtheria, spent the evening with some neighbours. Four of the latter were examined, and diphtheria bacilli found in two boys, but not in a baby and a girl. On inquiry it was discovered that the original boy and the two others had played at parlour cricket, and each had taken it in turn to score with the same pencil, which often, doubtless, found its way into their mouths."

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