

7. DO OTHER WILD ANIMALS HARBOUR RABIES?

The Burgherville Case, January, 1929.

On the night of the 2nd January, 1929, a young girl, aged 13, and her mother, who were visiting relatives in Burgherville, a small village 26 miles from De Aar, Cape, were sleeping outside the house when the girl was bitten or scratched on the neck by some wild animal. Her screams woke the other members of the family who followed the animal and found it fighting with the dog. The animal was killed and proved to be a *genet cat* ("muskejaatkat," *Genetta felina*).

The scratches on the girl's neck were slight and soon healed. She and her mother left a few days after the encounter with the wild cat, for their home in the Jacobsdal district. Some time later the girl developed symptoms of rabies and she died on the 28th January. A post-mortem was held and the brain submitted for examination; although rather decomposed, Negri bodies could be demonstrated at the Medical Research Institute, Johannesburg, and one of the sub-inoculated animals died of rabies and showed numerous Negri bodies in its brain.

The dog subsequently showed somewhat suspicious symptoms and was destroyed, but Negri bodies could not be demonstrated in its brain.

In this case then *the infection was evidently derived from a genet cat.*

A case somewhat similar to the one just described, is related by Cluver (1927). A farmer with his wife and child, 3½ years old, were sleeping on the stoep on a farm in the Vryburg district, Cape, when the father heard a rustling noise in the child's cot. The mother also woke and tried to push the animal away when she was bitten in the finger. The father then found that the animal had its teeth embedded in the child's throat. He had considerable difficulty in removing the animal, and in so doing was scratched and bitten in both hands. The wild cat was killed and thrown away; there seemed to be no doubt that it was a genet cat which is quite common in that area.

The child became ill about a month after this event and died after showing symptoms which may be regarded as typical for rabies (although the diagnosis was not confirmed). The parents were treated with vaccine and remained healthy.

Cluver made extensive enquiries and found that there was a general belief amongst both natives and Europeans in the Vryburg and Mafeking districts "that a fatal madness follows bites by mad wild cats." Numerous tales were told, some going back twenty years, of wild cats (which ordinarily are shy animals) going mad and then approaching and attacking human beings and domestic animals. One farmer told Dr. Cluver of an ox of his which had been attacked by a wild cat and then, six weeks later, went "stark, staring mad" and chased the owner up a tree.

The Burgherville case, in which the diagnosis of rabies was actually proved, would seem to add additional probability to all these tales.

We may conclude *that the genet cat (Genetta felina) may also carry the infection.*

8. PECULIAR FEATURES OF THE DISEASE IN SOUTH AFRICA.

The most remarkable feature about the present outbreak of Rabies in South Africa is the fact that, in nature, it seems to be confined to wild animals. So far the infection has been diagnosed in the yellow mongoose and the genet cat; and there is no suspicion at present that other wild animals are infected.

The two animals mentioned belong to the same family of the *Carnivora* (Family *Viverridae*) and have a fairly wide distribution in South Africa. Of the two, the yellow mongoose is by far the commoner and can be found in many parts of the country. It is particularly numerous in the highveld of the Transvaal and Free State.

Why the rabies infection should be confined to these two species, it is impossible to say at present. In other parts of the world rabies has also been diagnosed in wild animals, but these belonged almost without exception to the dog family (*Canidae*)—wolves, foxes, etc.*

In all those countries the infection of wild animals is considered to be a rarity, the disease confining itself almost exclusively to dogs, with occasional cases in human beings or domestic animals when these are bitten by rabid dogs.

In South Africa no case of rabies has so far been observed in a fox, although this animal is common enough in many parts of the country. But what is far more remarkable is that *the disease has not spread amongst the dogs*. Everything seems to be favourable for such a spread.

In the first place we know that there is a large dog population and that a large percentage of them, especially in native areas, are practically ownerless and roam about at will. If, therefore, the disease were conveyed from a meercat to such a dog there would be every reason to expect a rapid spread through the country.

It is impossible to argue that the dog is not susceptible to the infection of the meercat. Recent experiments have shown that dogs can readily be infected by subdural injections of meercat brain, and that they die of typical rabies. And the Dealesville case, quoted above, has proved beyond doubt that dogs can get infected in nature. Hence the explanation which was advanced at one time for the absence of the disease from our dog population, namely that the virus had become modified through many generations of meercats and was no longer infective for dogs, cannot be accepted.

It should further be borne in mind that *the infection in meercats appears to be fairly widespread* and that, therefore, there are many points of contact, over a large portion of the country, between dogs and infected meercats. *The infected area*, as far as our present knowledge goes, is roughly triangular, and extends from the eastern Transvaal (Ermelo, Middelburg) to Bechuanaland (Vryburg) in the west, and to the northern Cape (De Aar) in the south. The area probably embraces the whole of the Free State.

* Recently Stanhope (1928) referred to the question of wild animal infection in Malaya. He says: "I do not think that the jungle animals are very important as a means of spread or as a reservoir of the infection. The smaller ones, the musang and the wild cats, may operate as such to some extent, but not to any important degree." He then proceeds to quote a case of a musang (*Paradoxurus hermaphroditus*, a member of the family *Viverridae*) having been found rabid, but he does not state whether the diagnosis was confirmed by laboratory tests.

In this area there have been quite a number of cases of rabies during the last few years. In the present paper only a few have been mentioned, to illustrate special points.

In East and West Africa, where rabies in dogs has not been uncommon, it was thought that the disease was different from the European form, in that human beings were less susceptible to the bite of rabid dogs. However, in recent years several cases have been reported in human beings, and it is now generally assumed that there is no essential difference between the forms of the disease in the two continents. In South Africa, as stated before, human beings have been very susceptible to rabies, and in the majority of cases, the disease has taken a rapid and fatal course.

Another view which has been advanced to account for the absence of rabies among the dog population, is that *we are not dealing with true rabies* at all. However, there is very little to be said for this view. The symptoms which have been observed in human beings, dogs and laboratory animals, have been typical for the disease. And the microscopical examination of the brain has revealed the same inclusion bodies as in the European disease. *All experimental data collected so far indicate that the disease is true rabies.*

In this connection reference may be made to the peculiar outbreak of "rabies" in the Province of Santa Catharina, Southern Brazil (1908-1918) where cattle and horses were affected, but no dogs or human beings, and where the infection was ultimately traced to *bats*. In this case the solution of the mystery, according to Kraus, Gerlach and Schweinburg (1926) lies in the fact that the disease was not rabies (although the symptoms produced in small laboratory animals were typical of the disease, and "Negri bodies" were found on microscopical examination), but "pseudo-rabies" (*paralysis bulbaris infectiosa*).

A similar explanation cannot be advanced for the South African problem. Up to the present no satisfactory solution has been found; all that can be said is that, as regards its method of spread in nature, the disease does not behave like true rabies.

9. AGE AND ORIGIN OF THE INFECTION.

We cannot say *how long the infection has been present among the wild carnivores* in South Africa. Mention was made above of cases of rabies in human beings since 1916. But it is likely that the disease was present before then.

In the Wolmaransstad case, mentioned above, the mother of one of the boys who died, told Mr. Goodall that she immediately became alarmed when her son told her that he had been bitten by a meercat, because she "remembered a friend of hers who had died with exactly the same symptoms after being bitten by a tame meercat eighteen years ago."

In the Vryburg district too the belief that madness would follow the bite of a genet cat, has been prevalent for many years.

From the wide distribution of the infection at the present time, it may also be deduced that the disease has been present for a considerable period. But in regard to its *origin* we can only speculate.

That the present infection stands in any relation to the Port Elizabeth outbreak of 1893, seems extremely unlikely. It is far more likely, but by no means certain, that there may be a connection

with the outbreak in Rhodesia in 1902-1913. We have seen that cases of rabies actually occurred in wild animals during that outbreak; but why the disease should have persisted in wild animals and should have spread in these to the Union, whereas it came to a complete stop in the dog population, must remain an unsolved mystery. In Rhodesia no cases of rabies, such as those described by Cluver or in this paper, have been observed in recent years; and this fact would also speak against the view that the present infection in the Union sprang from the Rhodesian outbreak.

Reference may be made here to a few cases of rabies which recently occurred in Northern Rhodesia. The Chief Veterinary Officer of that territory states: "There are in Northern Rhodesia very considerable numbers of wild dogs and hyenas, and it is my opinion that these animals constitute the reservoir of the disease. Dogs belonging to natives in the more remote regions come into contact and fight with these wild animals and thus become infected" (official minute dated 17th June, 1929). Other territories further north in Africa seem to have rabies in an enzootic form.

There is, of course, a possibility that the infection in the meercats and genet cats has been present in South Africa as an enzootic disease, perhaps, for centuries. But the fact that all authentic cases of rabies have occurred during the last twelve years or so, would speak against this assumption.

On the whole, it seems rather probable that the present infection is of comparatively recent origin and that it is spreading. Almost as many cases have been reported during the past 6 or 8 months as during the previous 6 or 8 years. The greater number may be partly due to the greater vigilance of the officers concerned, but, apart from that, the disease seems to be on the increase.

10. CONTROL OF THE DISEASE.

If the disease is spreading, as has just been suggested, the outlook for the future would seem to be grave. It would appear to be all the more grave since the infection is present in wild animals which cannot be controlled at all and can only be exterminated with great difficulty.

However, as long as the disease does not show a greater tendency to spread from wild carnivore to dog and from dog to dog, than it does at present, the danger would not seem to be very great. All that seems necessary in order to protect the human population is to warn everybody of the danger of being bitten by a meercat or a genet cat.

At the same time measures should be undertaken to kill the yellow mongoose and the genet cat in the infected areas. Such measures are now under contemplation and will be given a trial.

A reduction in the number of dogs is a further safeguard that is being applied. Ownerless dogs must be destroyed and the registration of dogs strictly enforced.

In view of the present position in regard to rabies in South Africa the question arises whether the *importation of dogs* from all countries where the disease is present, should still be prohibited. If we have the disease in the country why be so particular about the

borders? Would it make much difference if a case of rabies should be introduced? The answer to the latter question is that it may make a very great difference and that there is therefore no intention of slackening the restrictions at the border or at the ports.

It has been seen that the present infection shows no tendency to spread among the dogs of the country. On the other hand, there is no reason to believe that, if a case of rabies should be introduced from Europe and the disease should break out, say, in Capetown, it would not spread in the same way as it would in Europe or as it did in Port Elizabeth in 1893.

Whatever the explanation may be for the present comparatively dormant position of the disease, whether we are dealing with a modified form of rabies or not, the fact remains that the danger to the human population is slight. It is a relatively simple matter to avoid being bitten by a meercat, even under rural conditions; but it would be a far more difficult matter to protect the inhabitants if the disease gained a foothold in the dog population, especially in the big urban centres.

Our policy, therefore, will be to enforce rigidly the exclusion of dogs from countries where rabies exists and to apply in South Africa all measures by which the infection in the wild carnivores can be reduced and, if possible, eliminated.

SUMMARY.

1. In 1892 rabies was introduced into South Africa and spread in and around Port Elizabeth. It was eradicated in less than a year, and, since then, until quite recently, the Union of South Africa was considered free of the disease.

2. Southern Rhodesia was infected with rabies from 1902 to 1913, but no cases have been recorded since the latter year.

3. Since 1916 a number of cases have been observed in human beings in the Union of South Africa, which, clinically, appeared to be typical rabies. In none of these cases could the diagnosis be confirmed by microscopical examination or biological tests.

4. In November, 1928, two further cases occurred in boys who had been bitten by a yellow mongoose ("rooi meerkat," *Cynictus penicillata*). The diagnosis of rabies was confirmed by an examination of the brains of the boys.

5. Rabies was also diagnosed in yellow mongoose caught on the veld, and which appeared to be sick.

6. Cases are recorded of a dog and an ox which contracted rabies, apparently as the result of being bitten by infected yellow mongooses.

7. Rabies has further been diagnosed in a genet cat ("Muskejaatkat," *Genetta felina*); and cases are recorded of human beings becoming infected with rabies after being bitten (or scratched) by this animal.

8. There is no evidence at present to show that other wild animals in South Africa, besides the two mentioned, harbour the rabies infection.

9. The infected area appears to stretch from the eastern Transvaal to Bechuanaland (Vryburg) in the west and the northern Cape (De Aar) in the south. The area probably embraces the whole of the Orange Free State.

10. The most remarkable feature about the disease in South Africa is the fact that it has not spread among the dog population.

11. The question arises whether we are dealing with true rabies or not.

Points in favour of the view that it is true rabies are:—

- (a) The susceptibility of human beings, dogs and laboratory animals.
- (b) The symptoms observed in these.
- (c) The presence of typical Negri bodies in the brain.

Points against the view that it is true rabies are:—

- (a) The fact that in nature it has been confined to wild carnivores (of the family *Viverridae*).
- (b) That it has shown no tendency to spread among the dogs.

12. Apparently the infection has become somewhat modified during its sojourn in the wild carnivores.

13. The origin of the present infection is unknown, neither is it certain how long the disease has been present in South Africa. Certain facts seem to indicate that the infection is of comparatively recent origin and that it is spreading.

14. The control of the disease in South Africa presents unusual difficulties. The eradication of the yellow mongoose and the genet cat is practically impossible. Their numbers should, however, be reduced. In the infected areas the number of dogs should also be restricted and all ownerless dogs destroyed.

15. In view of the comparatively dormant state of the disease in South Africa, it is desirable to continue to prohibit the importation of dogs from countries where rabies exists.

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Paper No. 34.

RABIES IN BURMA.

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IN connection with the introduction of animals from the East (Asia) into the African territories the question of rabies has to be considered.

While in Burma during the last 18 months, I had an opportunity of noting the rabies position there and my object in presenting this note to the Conference is to illustrate the consequence of almost total absence of control measures in this disease.

In the East where artificial methods of sanitation are in many cases still very rudimentary, nature provides her own means of disposal of waste material by calling to her aid vultures, crows and pariah dogs and a rough estimate of the inefficiency of the sanitary measures in any Eastern town may be obtained by noting the number of animals and bird scavengers present.

The question of sanitation has a very direct effect on rabies control for so long as there is an available food supply pariah dogs will continue to exist and to maintain their numbers and any drastic measures for the diminution of their numbers would have disadvantages from the point of view of Town and Village sanitation.

Stray pariah dogs are destroyed at frequent intervals in Cantonment areas by the Military authorities and in towns where Municipal Councils or their equivalent exist.

In all other areas destruction of dogs can only be done, even on private grounds, with the consent of the local (police) authorities. The Burman on account of his religious views will not willingly take life in any form, and until the rabid animal becomes a menace