

For the future, therefore, only vaccine will be prepared, and for the ensuing year arrangements have been made for meeting all requirements.

MISCELLANEOUS INVESTIGATIONS.

(J) GOUW-ZIEKTE.

At repeated intervals during 1904-1906, Mr. Walker, Government Veterinary Surgeon at Ermelo, reported the appearance of a disease which was playing havoc amongst sheep in the New Scotland area. This disease is described under the name of gouw-ziekte (a quick sickness), and is so called from the fact that the animal is not noticed to be ill, or if so only for a very short time previous to death. Similar reports of individual cases were received from various parts of the Transvaal, including Pretoria, but I am under the impression that in these instances probably a number of different ailments are classified under this name; the fact remains, however, that a real epidemic occurs amongst various flocks after their introduction to certain farms in the New Scotland area. Mr. Walker made a thorough investigation on several farms, more especially on the farm of Mr. Dell, Mount Denny, where he carried out a series of post-mortem examinations, without coming to any definite conclusion as to the seat of the pathological lesions. Mr. Walker forwarded specimens of blood from various sheep which had died of the disease, for the purpose of inoculation experiments at the Laboratory. In all cases the microscopical examinations of the blood preparations gave negative results; the blood was injected, and care was taken to select sheep of various ages, sexes, breeds, conditions, etc., and in no case did a reaction follow, so that we may draw the conclusion that either the disease is not an inoculable one or that the virus had become inert during transmission from Ermelo to Pretoria. The former supposition, however, seems to be correct, since Mr. Walker himself inoculated some sheep with fresh blood, without obtaining any result. Arrangements were also made to obtain food from the stomachs of some of the dead animals, and the dry material was administered to sheep in the Laboratory—again with negative results.

At the request of Mr. Walker, who visited Pretoria for the purpose of furnishing us with details of the serious character of the epidemic, Mr. Gray and myself decided to make an investigation *in loco*. We were unfortunate, however, during our visit not to see any dead animals, but we obtained some good information, which led us to believe that we had to deal with a specific disease. Apparently healthy animals, which are feeding up to the last minute, are suddenly seized by a fit, jump, and drop dead on the ground. On one farm in 1905 the disease killed 100 sheep; on a second farm 60, on a third 30, and on several other farms a good many, the exact number not being known. It was noticed that in one instance the sheep commenced to die after they had been introduced to low-lying farms, and the mortality continued for three weeks after their removal to another place, when the disease died out. Principally ewes, heavy in lamb, were attacked, and out of 160 animals only four wethers and two rams died, but this may be due to the percentage of females as compared with the number of wethers and rams. Another remarkable fact is that the herd in which 100 died was chiefly composed of crossed Persian-Africanders; on the other hand, the herd in which the mortality amounted to 60 was mostly composed of crossed Africander-Merinos. On one farm 16 oxen were reported to have died from the same disease, but unfortunately no diagnosis was made, as the Government Veterinary Surgeon happened to be on leave. We searched for poisonous plants, but failed to find any, although from the information gathered, we do not consider that such plants are the cause of the mortality, but that gouw-ziekte is a specific

disease, and this conception is confirmed by the fact that sheep continue to die up to three weeks after removal to another place, thus suggesting that three weeks represents the average incubation period of gouw-ziekte.

In view of the heavy mortality due to gouw-ziekte, arrangements were made for the establishment of an experimental camp in the infected area, and Mr. Dodd was detailed to be in charge. It was intended that a thorough bacteriological examination should be carried out, and I hoped that the results would enable us to successfully combat the disease, but unfortunately at the very last moment Mr. Dodd contracted enteric, and, as I could not spare another official, the experiment had to be abandoned.

I hope that during the ensuing year, however, this investigation will be commenced.

(K) STIFF SICKNESS, OR THE THREE DAYS' SICKNESS.

At the beginning of the year Mr. Gray, our Principal Veterinary Surgeon, received information from Rhodesia to the effect that a new disease was noticed in that country, attacking cattle, and causing an illness characterised by a temporary paralysis and a fever, both of which passed off in about three days' time. Blood preparations were forwarded to us by Government Veterinary Surgeon Edmonds, of Rhodesia, from various cases which had come under his observation, and were examined at this Laboratory with negative results. Soon afterwards reports came to hand detailing similar outbreaks in the Transvaal, and microscopical examinations were again without result. About February, 1907, the sickness was noticed in the neighbourhood of Pretoria, and also appeared amongst our cattle at Onderstepoort, when we were able to examine several cases. Our observations are to the effect that the disease commences with a high fever, reaching as high as 105 F.; the animal ceases feeding and ruminating; there is a slight dripping from the mouth, grinding of the teeth, and injection of the mucous membranes of the eyes. The characteristic of the disease, however, is stiffness, which attacks one or more legs simultaneously or alternately. The animal lags whilst grazing and finally lays down; once on the ground it experiences great difficulty in rising again, and, judging from its position—which resembles that assumed by a horse suffering from laminitis—all movements appear to be accompanied with acute pain. In other cases assistance, or blows, fail to enable the animal to stand, but in every instance all these symptoms disappear after about three or four days. In some animals a slight "blowing-up" was noticed (tympanitis); some shewed constipation before recovery was complete. Only one opportunity occurred of making a post-mortem examination, and this was on a cow which died near Pretoria. This was an aged beast, which at the same time was suffering from a chronic pericarditis of a traumatic nature, but not sufficient to cause death, so that the complication with stiff sickness must be accounted responsible. In the post-mortem examination the inter-muscular tissue, especially of the loins and of the hindquarters, were infiltrated with serous fluid. The cause of the disease could not be ascertained by microscopical examination or by culture, but advantage was taken of the outbreak at Onderstepoort and a sick animal was tapped. The defibrinated blood was brought to the Laboratory—where the disease has not ever appeared—and 20 c.c. were injected into a young heifer on the 24th February, 1907. After an incubation time of three days a reaction ensued, the temperature reaching as high as 105 F., and continuing for about eight days. During this period the animal shewed the typical characteristic of stiffness, just as described, but as usual the symptoms suddenly disappeared. Saliva from the Onderstepoort animal was also collected by saturating cotton wool, and

subsequently rubbed on to the gums of another heifer, without any result. It may, therefore, be concluded that stiff sickness is an inoculable blood disease. With regard to its spread, observations to hand shew that almost in every instance no direct communication occurred between sick and healthy animals previous to the infection of the latter, so that pure contagion can be excluded. Our assumption is that the infection must pass through the air, and we can hardly believe that the micro-organism itself can do so, but that it will probably require a carrier, as is the case in other diseases. Taking into consideration the extremely wet season, with the enormous increase of mosquitos and other flying insects, it is quite possible that one of these may be the cause of the propagation.

In the Transvaal fortunately stiff sickness was quite of an ephemeral nature, and did not cause any serious damage.

(L) INTERNAL PARASITES.

In the train of the heavy rainfalls experienced last year an unusual mortality occurred amongst small stock—apart from blue tongue—due to internal parasites. Enquiries reached us from many parts of the Transvaal, pointing out the unusual increase of wire-worms (*strongylus contortus*), and asking for advice, and in several cases specimens and carcasses were forwarded for examination. Besides these worms, *oesophagostoma columbianum* were present to a large extent, and the intestines of some sheep were studded with an abnormal number of parasitic nodules.

Internal parasites undoubtedly play an important rôle as the cause of debility and death amongst small stock, and the moist conditions of the soil during the past year were naturally extremely favourable for their increase.

I am convinced that an increase of small stock will be attended with a corresponding increase of internal parasites, and, in order to ensure the success of this class of stock breeding, it will be necessary to undertake a thorough investigation into the life cycle of each individual class of parasites.

This will only be possible by experimenting on scientific lines, and a man with a zoological training will be required to undertake the study at this Laboratory under my instructions. On the Estimates for 1908–1909, therefore, I shall apply for the appointment of a duly qualified assistant.

MICROSCOPICAL AND PATHOLOGICAL ANATOMICAL EXAMINATIONS.

With regard to the microscopical and pathological examinations performed at the Laboratory during the last year, the total number of examinations amounted to 1,597: an increase of 486 on 1905–1906. The negative results amounted to 983, and as in previous years the bulk of the examinations were in connection with the "Proclaimed Diseases of Animals Act," East Coast fever in particular. I wish to refer you to my last annual report for the explanations of the various results.

This increase shews the growing confidence of farmers in the work of this Division, and as far as my experience is concerned, I can safely say that no mistake has yet been made in a diagnosis.

It is noteworthy to mention, that amongst the negative results, two are included which were obtained from smears forwarded by natives in the Zoutpansberg district, said to be from cattle, but the examination proved the blood to be that of a bird. An investigation was made by the South African Constabulary, but without being able to prove any wilfulness on the part of the natives, although undoubtedly it was a trick played on us.