
A Case of Naturally Contracted Tuberculosis in a Goat in South Africa.

By P. J. J. Fourie, M.R.C.V.S., Research Officer, Onderstepoort.

A Case of Naturally Contracted Tuberculosis in a Goat in South Africa.

By P. J. J. FOURIE, M.R.C.V.S., Research Officer, Onderstepoort.

HUTYRA and Marek (1) give the following figures of tuberculous animals condemned in the abattoirs of the German Empire during the year 1910:—

Cattle.	Calves.	Hogs.	Sheep.	Goats.	Dogs. 1904.	Horses.
23.42 %	34 %	2.93 %	14 %	.62 %	.86 %	.2 %

The authors state that cattle and swine are most susceptible and that buffalo, horses, sheep, goats, dogs, and cats acquire tuberculosis only rarely in spite of their frequent exposure to diseased cattle and human beings. They state further that, “contrary to the general belief, tuberculosis among goats may at times reach considerable proportions (in the Province of Oldenburg for instance, in 1906, 20.7 per cent. were found tuberculous on post mortem inspection).”

Joest (2) states that tuberculosis occurs rarely in sheep, but more frequently in goats than in sheep.

Both these authors quote only the bovine type of bacillus as the cause of tuberculosis in sheep and goats.

Recently A. S. Griffith (3) studied two cases of tuberculosis in sheep, from which he isolated the avian type of tubercle bacillus.

This author suggests that of the larger mammals the sheep is the most susceptible to the avian tubercle bacillus. Two goats were inoculated with subcultures and generalized tuberculosis developed in 108 and 117 days respectively.

I have not been able to find any recorded cases of tuberculosis in South African goats.

The goat which forms the subject of this paper was bred at Onderstepoort and was a year old. It was running with some other goats in a small fenced paddock. Separated from this paddock by a passage 2 yards wide is a similar paddock in which were 12 cattle, many of which showed clinical symptoms of advanced tuberculosis. At post mortem this goat was for the first time recognized to be tuberculous.

Macroscopically lesions are present in the pharyngeal, the bronchial and mediastinal lymphatic glands. These on section are seen to be almost entirely converted into a yellowish grey, caseous and granular substance. On microscopic examination only small portions of the glandular tissue are still recognized, the rest of the gland is structureless and in places calcification is present, especially towards the centre of the lesion: at the periphery of the lesion epithelioid cells and characteristic giant cells are seen. Nodules which contain a caseous granular substance are present on the pleura.

The lungs are the chief seat of the disease. They are increased in size. The surface is uneven. On palpation nodules are detected, but fairly large portions of the lungs are uniformly solid. On section there are found irregularly scattered throughout the substance of

the lung, nodules which vary in size, from tiny specks just visible to the naked eye, to nodules 2 cm. in diameter. These contain a caseous granular substance. Cavities are also present. Plate I.

Microscopically.

In the younger foci there is commencing necrosis in the centre of the nodules which otherwise consist of epithelioid cells and infrequent langhans giant cells.

In the older nodules, some of which are very large, necrosis (caseation) is very extensive, showing the presence of comparatively small areas with calcification. Surrounding this central necrotic mass is tuberculous granulation tissue, consisting of epithelioid cells, giant cells, fibroblasts and in places well-formed fibrous tissue. See plate II, fig. 1.

Some of the larger bronchi are markedly altered. There is complete desquamation of the bronchial epithelium and the only portions of the bronchial wall that can still be recognized are the cartilages and portions of the muscularis mucosae. See plate II, fig. 2. The bronchial lumen is completely filled with exudate, consisting of catarrhal cells and numerous neutrophiles. The peribronchial tissues are in places markedly infiltrated with round cells and in places epithelioid cells are present.

The rest of the lung is involved in an acute inflammatory process. The pulmonary capillaries are markedly distended with blood. Many alveoli are filled with structureless homogeneous pink staining (with eosin) substance, others contain in addition red cells and fibrin and others again are packed with neutrophiles, but round cells are also infrequently present. See plate II, fig. 3.

In the substance of the spleen are two nodules .75 cm. in diameter, which on microscopic examination are seen to consist of central structureless areas (caseation) with epithelioid cells and giant cells at their periphery.

Two nodules are present in the cortex of the one kidney, microscopically these show necrosis and typical tuberculous granulation tissue.

The myocard similarly contains a nodule 1 cm. in diameter showing necrosis centrally with typical tuberculosis granulation tissue.

These lesions may be summarised as follows: Tuberculous granulomata pleura; tuberculous bronchitis; caseous tuberculous pneumonia; acute galatinous tuberculous pneumonia; tuberculous granuloma—spleen—with caseation and calcification; tuberculous granuloma—kidney with caseation and calcification; tuberculous granuloma—myocard, with caseation and calcification.

Dr. Robinson of the Veterinary Research Division, Onderstepoort, isolated the bovine type of bacillus from the lesions.

Discussion.

The probability is that this goat was infected from the tuberculous cattle which were running in the neighbouring paddock. Infection probably took place by ingestion, although in a young animal like this, one would expect to find lesions in the mesenteric lymphatic glands as well as in the pharyngeal glands.

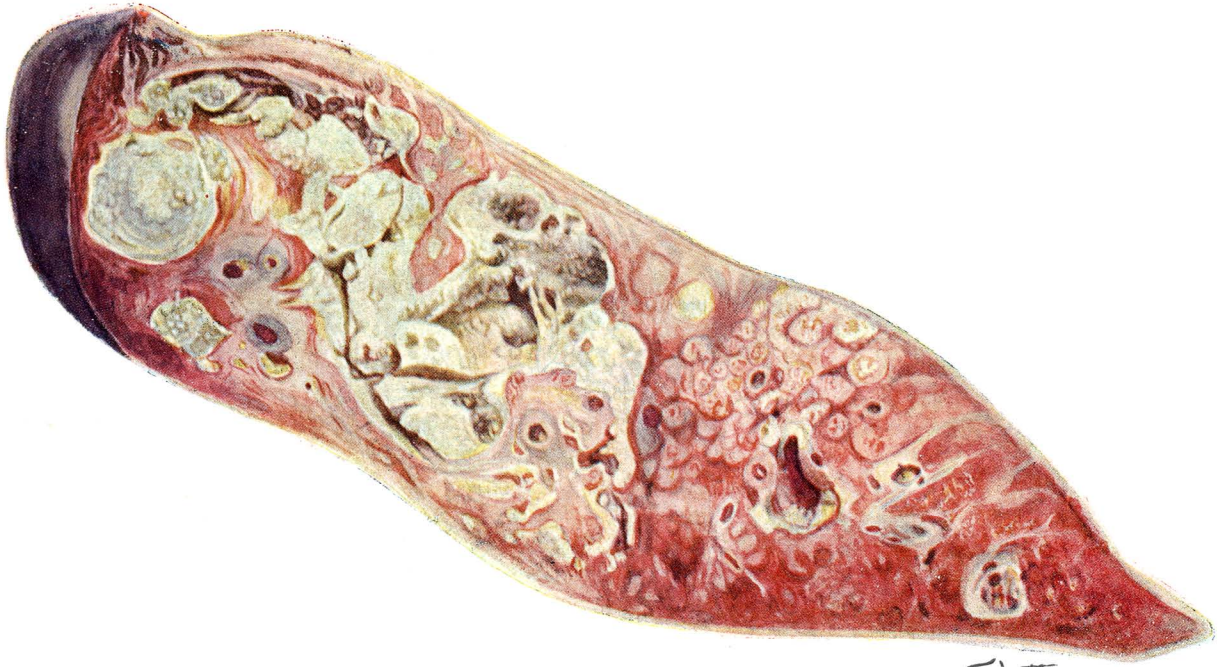
If all the goats were equally exposed to infection, then it seems that goats are not very susceptible to tuberculosis, because it was only

the one goat that developed the disease, or if the infective material that gained access to the goat paddock was only moderate in amount, this particular goat may have had a marked susceptibility to the disease.

It is, however, possible that this goat may accidentally have had access to the narrow passage between the two paddocks. The paddocks themselves contain no vegetation whatsoever, but in the passage separating them is grass, etc. The animals in the paddocks often try to graze on this grass through the fence. In this way an animal with open pulmonary lesions may infect the passage. The organisms taken in with the food passed through the pharyngeal and other lymphatic glands and were carried to the lungs in the blood or the lymph stream. The lesions developed here as a caseous pneumonia. Those organisms that were carried to the bronchial walls, developed nodules, with subsequently a tuberculous bronchitis, from here infection spread endobronchially and set up an acute gelatinous tuberculous pneumonia, which killed the animal. Organisms carried in the blood stream produced the lesions in the heart, the kidney and the spleen.

LITERATURE.

- (1) Hutyra and Marek: "Special Pathology and Therapeutics of the Diseases of the Domesticated Animals," Vol. I.
- (2) Ernst Joest: "Spezielle Pathologische Anatomie der Haustiere."
- (3) A. S. Griffith: "Tuberculosis of the Sheep," *Journal of Comparative Pathology and Therapeutics*, Vol. XXXVIII, No. 3, 30/9/25.



Letty

Tuberculosis, (Goat.)

PLATE I.

[P. J. J. Fourie.]

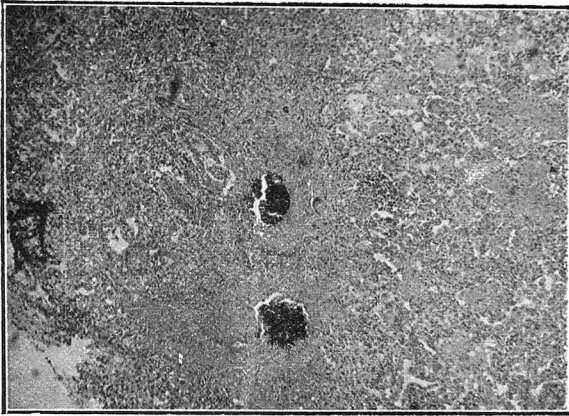


FIG. 1.—Caseous tuberculous pneumonia with calcification.

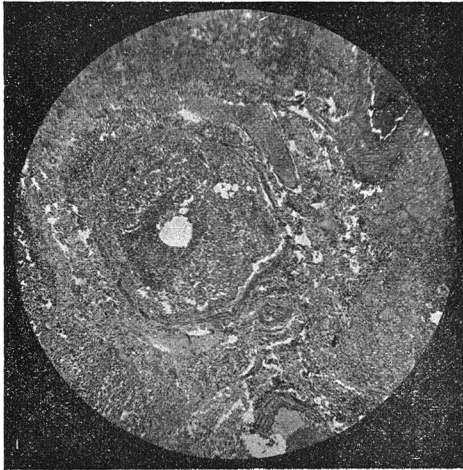
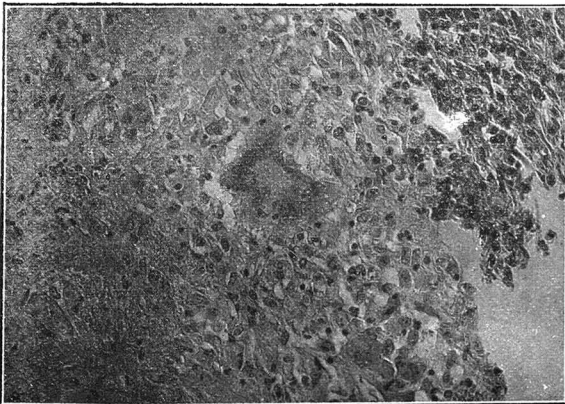


FIG. 2.—Tuberculous bronchitis.



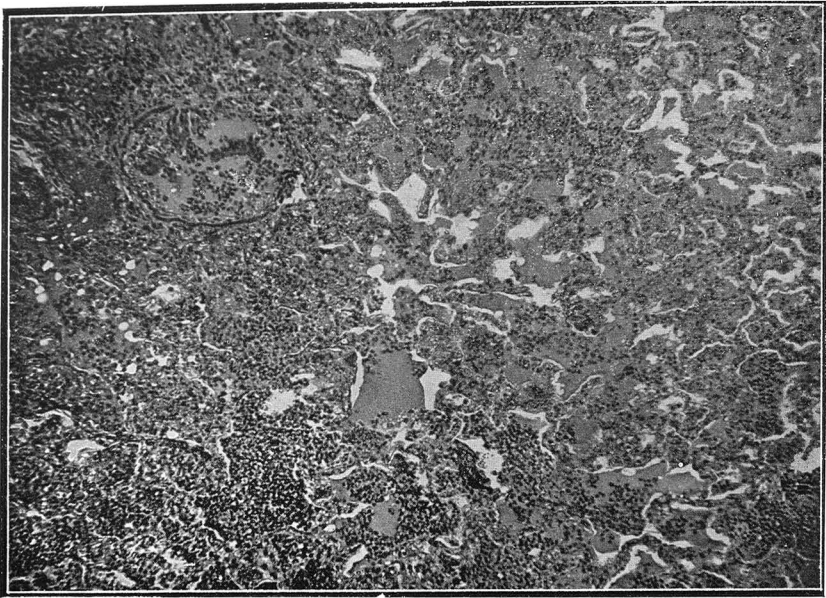


FIG. 1.—Acute pneumonia.

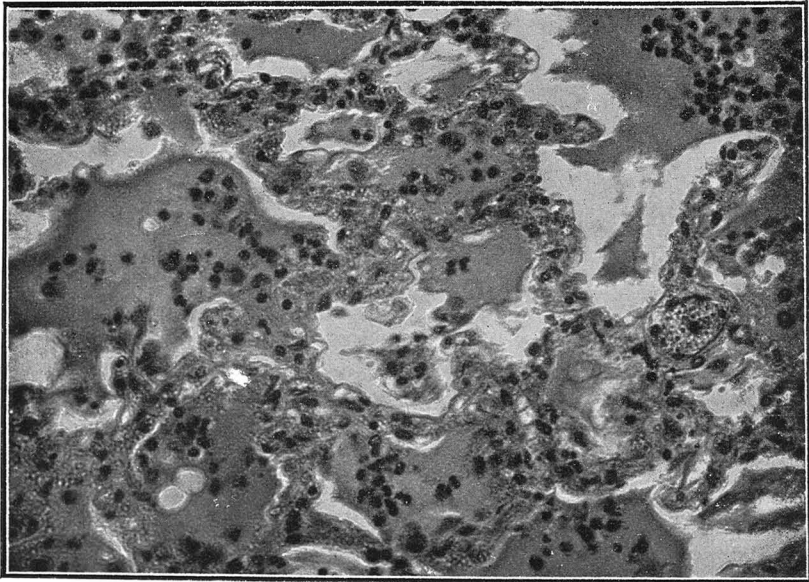


FIG. 2.—As above, higher magnification.