tion of commencing inflammation. As milking removes the streptococci and their toxins, as well as the leucocytes and the antitoxins, it prolongs the course of the disease, and renders the clinical symptoms less marked, until the affected quarter gradually loses its function. (Rühm, Wochens. f. Tierheirl. u. Viehz., 52 Jahrg., No. 7; ex. Berl. Tierärztl. Wochens., 1908, p. 902.)

ANTHRAX IN THE PIG.

AN article by Carl, of Karlsruhe, in No. 38 of the Deutsche Tierärztlle Wochenschrift induced Bongert to describe a case of anthrax discovered when examining a pig’s carcase at the slaughter-house, inasmuch as the appearances seem to corroborate Carl’s views. A short account of this case of anthrax in a pig is contained in the summary report of the work of Bongert’s laboratory. On the 11th February 1908 Bongert received for examination the internal organs of a pig which had been slaughtered on account of jaundice, and was to be sold at the Freibank. The body of the animal appeared to be fairly well nourished. The subserous, subcutaneous, and intermuscular fat was, however, of a deep yellow tint. In addition the following changes were noted in the internal organs:

The mucous membrane of the large intestine, and especially of the cæcum, exhibited large numbers of round, smooth, whitish, shiny areas, varying in size from a sixpence to half-a-crown. They were sharply defined, and projected above the general level of the neighbouring mucous membrane. On section these centres, which involved all the tissues as far as the serosa, exhibited a firm connective-tissue structure. The wall of the bowel was somewhat thickened at these spots, which appeared unquestionably to have resulted from a former attack of swine-fever. No part of the entire intestine, from the mouth to the rectum, or any of the intestinal lymphatic glands showed any inflammatory appearance. The appearance of the liver and the spleen also suggested the diagnosis—chronic swine-fever. The liver was markedly swollen throughout, contained little blood, and was firm and hard. The interacinar connective-tissue septa, which in swine are always distinctly marked, were in this case broader than usual, and the acini, with their dark brownish-red centres, appeared more prominent than usual. The liver seemed swollen, and, on account of the marked increase in the interstitial connective tissue, was of a greyish-brown colour. The spleen was only slightly enlarged, and the pulp had not undergone softening, but contained discrete, firm centres, varying in size from a grain of linseed to a hazel nut, which at spots were collected together to form larger lesions. These centres were distinctly differentiated from the surrounding tissues, and on section appeared relatively dry and dull. The smaller and more recent centres were blackish-red, the larger brownish to greyish-red, and even grey in tint.

The kidneys, lungs, and heart showed no sign of disease; and Bongert, taking into consideration the typical changes in the intestine and the lesions in the liver and spleen, regarded the condition as swine-fever. He considered the centres in the spleen to be the results of swine-fever infarcts, and continued his examination in order to detect the presence of the B. suippestifer in these infarcts. To his surprise he discovered great numbers of anthrax bacilli, which, like those described by Carl, exhibited morphological deviations from the normal. Some appeared as longish, thin rods, without capsules and without transverse divisions. They were curved, resembling the lash of a whip, and sometimes lay side by side with empty capsules and rods which showed vacuoles and other evidences of degeneration. Individual rods, how-
ever, exhibiting all the morphological peculiarities of the anthrax bacilli could still be found.

All these organisms stained well with an old solution of Löffler's methylene blue, and gave Heim's anthrax reaction very distinctly.

Although Bongert was convinced of the identity of the organisms, yet, in view of the unusual character of the case, he also carried out cultures and inoculations to remove any possible doubt. On agar plates he obtained typical anthrax colonies, while mice inoculated with material from the infarcts died within twenty-four to thirty-six hours, and smear preparations from their spleen and blood showed great quantities of anthrax bacilli.

When making the first microscopical examination on the day of receiving the body it became evident that anthrax bacilli were only present in considerable numbers in the infarcts of the spleen, and that in the neighbouring unchanged spleen tissue it was impossible to detect them microscopically. The infection of the spleen was, therefore, strictly localised and was not a disease of the spleen in toto, as is generally the case.

This irregular distribution of the anthrax bacilli in the spleen, coupled with the results of careful bacteriological examination of the other organs, especially of the lymph glands, suggested to Bongert the path by which the anthrax bacilli had entered the system. The bacteriological examination of the spleen had made it clear that anthrax bacilli were either absent from, or only very sparingly present in, the blood and in the other organs. It appeared, however, possible that anthrax bacilli might be present in greater numbers at the point of entry, which was believed to be the intestinal tract. Bongert, however, at this stage once more lays stress on the fact that not the slightest trace of inflammatory swelling or reddening of the mucous membrane of the pharynx and larynx, or of inflammatory oedema of the neighbouring soft tissues of the throat, or of the local lymph glands, could be detected. Swelling of the throat, which is usually described as so common a symptom of anthrax in swine, was entirely absent, just as in Carl's three cases. In contradistinction, however, to Carl's cases, there was in this instance no acute inflammatory appearances in the stomach or intestine. No external injury, which might have served as a point of entry for the anthrax organism, could be found.

A bacteriological examination of the internal organs by means of plate cultures gave the following results:

1. On plates infected from the spleen infarcts, innumerable colonies.
2. On plates prepared from the unchanged spleen tissue, six colonies.
3. On plates prepared with blood from the axillary vein, three colonies. (These plates were prepared with 1 cc. of blood. Two plates prepared with 5 cc. remained sterile).
4. On plates prepared from the liver, one colony.
5. On plates prepared from the kidney, no anthrax colony, but several colonies of cocci.
6. On plates prepared from the submaxillary gland and the intestinal lymphatic glands, no anthrax colony.
7. On plates prepared from the tonsils, no anthrax colony, but several colonies of foreign organisms.

The bacteriological examination therefore showed that anthrax organisms were only present in large numbers in the spleen infarcts, and were extremely rare in the blood and in the other organs. It is highly probable that anthrax organisms were constantly being washed away from the centres in the liver into the general circulation, but these do not appear to have produced either anthrax septicemia or localisations in other organs. It is, however, remarkable that anthrax bacilli could not be detected in the lymph glands at the point of apparent inoculation. It would appear that infection occurred through the bowel, and possibly that the bowel, lesion, produced in the first
place by an attack of swine-fever, had facilitated the entrance of the anthrax organisms. The facts as a whole, however, show that swine, without apparently suffering from anthrax, or indeed appearing to suffer in any way, may harbour anthrax bacilli.

Bongert considers that, like Carl's cases, his own should be regarded as due to a special and hitherto unknown form of anthrax in swine. More careful examination of infarcts in the spleen of slaughtered pigs will show whether his view is correct; at any rate, the correspondence in results between Carl's and Bongert's cases shows that infarct formation in the spleen of swine is deserving of more careful consideration than it has hitherto received. (Bongert, Deutsche Tierärztl. Wochens., 1908, p. 703.)

THE TREATMENT OF DIARRHŒA IN CALVES.

The tuberculosis enquiry which has been going on for several years in the Veterinary Institute of the University of Leipzig rendered it necessary to keep a large number of young calves, usually less than two months of age, at the Institute. These animals were partly obtained from large estates in the neighbourhood of Leipzig, partly from the Leipzig slaughter-houses, and were tested with tuberculin in the Veterinary Institute. Those which reacted were sold for slaughter; those which resisted were reserved for experiment, and were fed at first with boiled milk, and afterwards with boiled skimmed milk and suitable meal, etc. Despite careful treatment the animals generally lost weight for some time after purchase. Many of them at first showed slight diarrhœa, which, however, soon disappeared under treatment with red wine, opium, or tannalbin. More recently such slight cases of diarrhœa have been treated with tannothymol with very good results.

About the end of January 1908 four six-weeks-old calves were purchased. A few days after removal to the Institute stables they showed extremely severe diarrhœa, which resisted every method of treatment. The rectal temperature was only moderately high (39.5° to 40.3° C.), but was accompanied by extreme depression. Two died within five to six days; one survived for ten days, but then succumbed to heart failure; only one recovered. The post mortem examination showed swelling and redness of the mucous membrane throughout the bowel, and in one case of the omasum, with parenchymatous degeneration of the liver, kidneys, and heart muscle. The bacterium coli could be cultivated from the blood and from the spleen.

The stable was thoroughly cleansed and disinfected, and about the middle of February two fresh eight-weeks-old calves were installed by way of experiment. As these remained healthy, another two were added at the end of a week. These latter calves had been obtained from a large farm on which, as Dr Eber afterwards found, almost all the calves were suffering from diarrhœa. The calves, which had been brought a long distance by rail in cold weather, showed a certain amount of diarrhœa on arrival, and this rapidly increased in severity, so that, in spite of the greatest care, both animals died at the end of ten and twelve days respectively after being received. The clinical symptoms and pathological changes were similar to those shown by the animals previously examined. Although the two calves previously bought had as far as possible been isolated from the last two, they also began to show signs of diarrhœa, which, though at first trifling, soon became so severe as to threaten a fatal result.

At this juncture Dr Eber betook himself of a method which is occasionally used in cases of cholera in man. One of the two calves, which was lying almost lifeless, was lifted, and about 2 litres of warm, sterilised, physio-