

tic potash and after further centrifugalization the deposit examined under the microscope after staining with carbolized fuchsin. This deposit showed rather rare minute diplococcus forms with a slight halo round them, similar in all respects to those recognized in the tissues.

A series of slide preparations were made from the various pipettes direct, fixed in the usual method and stained with carbol fuchsin, which was warmed until definite vapor was given off, then washed with water just cool enough to bear the hand in it, and mounted. As a result, the characteristic diplococcus form was found in the preparations made from the liver, lymph from the mesentery, the ascitic fluid, the heart blood, the left kidney and the mesenteric glands; they were not found in the pleural cavity, the bile or the pericardial fluid.

Next, using a fair amount of the fluid out of each pipette, I allowed this to flow over the surface of slanting glycerinated agar tubes, my experience with the Pictou cattle disease having shown me, that while the fluid in the pipettes could show numerous diplococci, apparently the majority of those are dead, and only a few remain alive. By this means, in twenty-four hours I obtained fairly frequent growths in tubes from the spleen and left kidney, and rare growths in the mesenteric glands and heart blood. Four colonies only appeared upon the tube prepared from the liver, and two from the ascitic fluid and these latter did not show clearly till the expiration of forty-eight hours.

Subcultures made again directly upon the glycerinated agar surface showed a fine rather thin growth at first of minute discrete colonies; later these ran together into thin waxy lines which upon the expiration of four or five days assumed a faint yellowish tinge. Other tubes were made directly from the pipettes of the kidney and spleen into beef broth. This upon the following day

showed a faint turbidity, which, just as in the case of the Pictou cattle disease, if anything, lessened with further growth, while a whitish deposit formed at the bottom. Since then, using the remaining pipettes, I have obtained a great number of broth cultures, the growth being much more free upon this medium than upon the agar, and further, yielding forms which are more characteristic and less liable to cause confusion; for the micro-organism is most remarkable in its characters.

Grown upon broth, in twenty-four hours it is present in the form of minute diplococci surrounded with a faint halo or capsule. Often these tend to be arranged in irregular chains in which the separate appearance of the dots are not quite regularly arranged, the long axis joining the two dots not of necessity coinciding with the long axis of the chain.

Grown upon glycerinated agar, the appearance is most puzzling, and although I had similar experience when working out the character of the micro-organism of the Pictou cattle disease, these agar cultures have given me a week of profound anxiety, until within the last twenty-four hours I have solved the problem. A twenty-four hour culture at 37° upon glycerinated agar, reveals minute forms which upon careful staining with fuchsin, not too deep, are clearly forms of diplococci. One gets every transition from the frank diplococcus form through one in which only very careful focussing shows that the somewhat oval bacterium has at either pole a deeper stained mass, to forms in which the polar staining cannot be made out so that one appears to deal with true short bacilli. Add to this, a certain number of oval forms can be seen still smaller than the diplococcus, in which the distinction between the two ends cannot be made out.

In forty-eight hours, and still more in seventy-two hours, the same cul-