the plates made directly from the water the germs are counted and their general appearance noted after twenty-four, forty-eight, and seventy-two hours. In the meantime the chemical analysis is completed, and under favorable circumstances the report can be made three days after the water has been received; a week furnishes all the time required in any case. The germs taken from the plates can then be studied at leisure.

In this manner 160 samples of drinking water have been examined. Of this number, twentyfour were supposed to be causing at the time typhoid fever. In all of these, with the exception of three, toxicogenic germs have been found. I will now give a short description of each of these micro-organisms :

Bacillus A.: This is a short, motile bacillus, which does not liquefy gelatin, and which forms a white, raised, moist growth on potatoes. It forms no gas, takes the ordinary stains fairly, and gives a positive result with Gram's method. Of six full-grown rabbits, each inoculated by the injection of sixty drops of a twenty-four hour culture in beef-tea into the abdominal cavity, all died. Two rabbits which were given subcutaneously twenty drops each of this culture were not affected. Of fifty rats which were given twenty drops of this culture by injection into the abdominal cavity, all died. Two rats which were inoculated subcutaneously died after ten days. Of eight guinea-pigs inoculated in the abdominal cavity, all died; and a like result followed the subcutaneous inoculation of the animals.

Cultures of this germ were tested along with similar cultures of bacterium coli commune, and the former appeared to be slightly more pathogenic with rats and guinea-pigs, and less so with rabbits than the latter.

In every case of death after inoculation with this germ, plate cultures were made from the spleen, liver, and kidney, and in many instances from the blood of the heart, and without exception the plates showed abundant growths; therefore, this germ not only produces death, but is capable of living in the rat for ten days.

The *post mortem* appearances vary with the time which elapses between the inoculation and death. In cases dying within twenty-four hours the intestines are, as a rule, slightly reddened; the liver, spleen, and kidneys engorged; and the

heart has invariably been found in diastole. In cases which survive for several days there may be ulceration of the intestine; the spleen and kidney are enlarged, and the liver dark. In a few instances, all of which, strangely enough, have followed subcutaneous inoculation on the back, a marked peritonitis has been found after death. The same fact has been observed with bacillus B. In no instance has suppuration resulted from an inoculation.

In the majority of samples of drinking-water in which I have found bacillus A, no other organism has developed on the plates. In other words, the water is a pure culture of this germ. It may be of interest to say something about the cases of typhoid fever which were supposed to be due to the waters containing this germ.

Of the cases of typhoid fever supposed to be due to one of these waters I had personal knowledge. First, a girl of sixteen was attacked, and I was called in attendance. I inquired concerning the drinking water, and was told that the hydrant water only was used. I could not believe that this water was the cause of the fever. but ordered that all water used in the house should be boiled. I was asked if the disease was contagious, and replied in the negative; but having in consideration the comfort of my patient, advised that two young brothers and a girl visiting at the house should be kept away from the sick room. Within eight or ten days one of the brothers came down with the fever, and we learned that the visitor, who had gone to Cincinnati, was suffering from the same disease. Of course, the mother now claimed that the disease was contagious. Believing that there must be some local cause, I examined the house throughout, but without satisfaction. A little later, a young man rooming in the house was attacked. By this time the first patient, who had been continuously delirious for three weeks, had When asked about having become rational. used any other than the hydrant water, she stated that she always used the cistern water to clean her teeth, and had also used it in a nasal douche, and in spraying her throat. The brother and the student also remembered that they had occasionally drank the cistern water.

The examination of the water was immediately undertaken, and it was found to be exceedingly bad chemically, and in number and kind of