CONCLUSIONS.

(1) The fungus *Saprolegnia ferax* is not the cause of the salmon disease.

(2) The disease is due to the invasion of the tissues of the fish by a special bacillus (*Bacillus salmonis pestis*).

(3) The bacillus gains access through abrasion or ulceration of the skin, and the disease is apparently not contracted when the skin of the fish is in a healthy state.

(4) *Bacillus salmonis pestis* can be transmitted from dead diseased fish to other dead fish in the same water.

(5) *Bacillus salmonis pestis* can be transmitted from dead fish to living fish in the same water, and since dead fish are a suitable nidus for the growth of the bacillus, it is obviously desirable to have all dead fish removed from the river immediately they are observed, and burned, as by simply burying, the germ is left in a condition to be again carried into the stream.

(6) The fact that the bacillus grows profusely when placed in a freezing mixture of ice and salt, while a temperature of 37°C. soon destroys it, shows that the cold season is more favourable to its growth.

(7) Fish akin to salmon are more susceptible to the disease than others, as rainbow trout, river trout, and sea trout when attacked succumbed in from two to four days, while dace and gold-fish died in about 18 and 35 days, respectively.

(8) *Bacillus salmonis pestis* grows well in sea water, whereas *Saprolegnia* does not grow at all; therefore a diseased salmon entering the sea, and returning to the river apparently free from fungus, cannot be said to be free from the disease.

GOLD-FISH EXPERIMENT.

Late in November a number of gold-fish were purchased and placed in a large tank in one of our laboratories. The change of water resulted in a few dying, so to avoid any errors due to management we kept them for a month before inoculation. They were then removed from the aquarium and two fish were placed in each of eight large museum jars, and kept thus for another week. The water was changed every third day, and the fish fed every alternate day.

The inoculation was carried out in the following manner: The fish was taken out with the hand and the top of the head and part of one side near the gills gently rubbed with sandpaper until there was a slight effusion of blood, and this abraded area was then rubbed with a platinum oese of 3 mm. charged with material taken from a 24-hour-old agar slope culture. A separate piece of sandpaper was used for each fish. Several loopsful of the culture were added to the water of each jar.

In this way organisms A1, A2, A3, A4, B1, B2, C1, D1, E1, F1, G1 were inoculated in duplicate, and four fish were rubbed with sandpaper but not inoculated. The fish were observed daily, and the inoculated water was changed on the third day.

The control fish rubbed with sandpaper and not inoculated are still alive, and of the inoculated fish one in each of the jars inoculated with A, A2, B2, C1, and D1, died 22, 30, 34, 27, 4 days after inoculation.

Bacteriological examination was made of these fish, but in no case was I able to obtain from the dead fish the organism which was inoculated. Evidently these organisms were non-pathogenic to gold-fish. One fish in each of the jars from which the dead fish were taken remains alive, and, at the time of writing (May 10) appear quite normal. Of course there is the possibility that some of the organisms isolated might be pathogenic for salmon and not for gold-fish.

Patterson states with reference to his *B. salmonis pestis* that:—

> "Dace inoculated with this bacillus died as the result of inoculation in from two to seven days. Dace, river trout, sea trout and gold fish inoculated