a disastrous effect upon the fish as to produce sluggishness and death in the short period of time mentioned by the officer of the hatchery and by Dr. Huntsman, and it therefore seemed important to make a thorough examination of the diseased fish to see if there were other factors producing disease, and to ascertain if the fungus *Saprolegnia*, was a primary or a secondary invader. Unfortunately such investigation was hampered by the fact that no live salmon were available for inoculation, and the only means of ascertaining the pathogenicity of the organisms isolated was to attempt to infect the common gold fish.

During the course of this examination I obtained a publication of the Fishery Board of Scotland entitled "The Life-history of Salmon in Fresh water, Glasgow, 1898," containing a paper by J. Hume Patterson, Assistant Bacteriologist of the Corporation of Glasgow, on "The Cause of Salmon Diseases", and I am indebted to this paper for the methods which were subsequently used for the inoculation of the live gold fish.

Before the gold fish could be inoculated it was necessary to work out in some detail the various organisms which were isolated from the salmon. The principal biological and cultural characteristics of those were as follows:—

A. 1.

A medium sized bacillus with rounded ends, occasionally bent, which occurs singly and sometimes in short chains. Actively motile, stains well with methylene blue, and is gram negative.

Gelatine Plates:—

24 hours, colonies just visible to the naked eye.

48 hours, colonies 2 mm. in diameter, round, with a liquefying centre saucer-shaped. Centre of the colony dense with a mass of deposited bacteria.

With $\frac{1}{6}$ objective edges of the colony seemed slightly fimbriate, and the mass within the centre might be seen moving.

3 days, colonies had grown to between 5 and 9 mm. in diameter, but with similar appearance to that at 48 hours.

4 days, geletine completely liquefied.

Gelatine Stick:—

Growth is best at the top. Line of puncture filiform.

24 hours, Liquefaction begins, extending to the sides of tube and about 2 mm. in depth.

48 hours, growth uniform, line of puncture a cloudy area 10 mm. in diameter with small outgrowths into gelatine forming a cloudy cylinder. At the surface liquefaction is stratiform to a depth of 4 mm.

3 days, the growth has increased, stratified liquefaction extended to a depth of 7 mm. and the cloudy area looks like a saccate cylinder.

8 days, liquefaction to a depth of 8 mm.

10 days, there is a distinct dark stratum underneath the liquefied area.

13 days, very slight increase.

Beef Peptone Agar, 48 hours:—

Colonies 1 - 2 mm. diameter, round, raised, entire edge, glistening white appearance. With the $\frac{1}{6}$ objective the edges were entire, colonies dense, and grandular with a narrow clear margin.

3 days, colonies 2 - 5 mm. diameter, round, more massive and dense, convex, whitish to light brown in centre.