

I am still corresponding with the Solway Fishery, Scotland, as to a supply of ova there.

The Government are again greatly indebted to Sir James Maitland for his invaluable assistance. As soon as the Tay District Board had filled their own hatcheries, they permitted their superintendents and men to take ova for us, and Sir James immediately sent his own men there to help. I am glad to tell you that about 180,000 ova have now arrived at Howietoun Fishery, where Sir James will take care of them until shipment. By a fortunate accident he had thirty empty boxes at the Howietoun hatching-house, most of which were to have been filled on the very day that the Tay District Board gave their permission. Sir James has been experimenting in freezing fresh ova directly after impregnation, and they remained bright and clear until thawing. Thereupon he proposed to me an experiment in freezing eggs dry in the London refrigerators; and I have placed a quantity in the refrigerators at the docks for the purpose. This will help to solve the problem of how far ova will stand the cold of the refrigerators on board ship.

In Mr. Cholmondeley-Pennell's book on fishing, just published in the Duke of Beaufort's Badminton Library Series, he says he is not sanguine of success with ova placed in ocean-steamers' refrigerators, as in that temperature he thinks the eggs are likely to perish.

You may perhaps have seen that, in the very interesting report of the Tasmanian Fisheries Department for 1885, Mr. Saville-Kent speaks of having two hundred young salmon in a vigorous condition of development, from ova imported by the steamer "Yeoman," and of proposing to keep them until they reach the smelt condition and are ready to descend to the sea, when he will gradually acclimatize them in the salt-water-tanks of his hatcheries, preserving them there if possible until they are ready for migrating back to the rivers for spawning. Mr. Saville-Kent adds that, if this experiment succeeds, a breeding-stock of salmon might be permanently retained, and the necessity of importing further supplies of ova from England cease. I was struck, however, by another paragraph in the same report, where he says that "his practical acquaintance with the acclimatized salmonidæ in the lakes and rivers of Tasmania had further confirmed his opinion that no true salmon had as yet been established." At the same time he says that the prospect was more promising than at any time previously, as the safe transport of ova by the steamer "Yeoman" had resulted in the production of over thirty-five thousand healthy fry.

As the Swiss and Bavarian ova that I am sending will all be "eyed," I may remark that Mr. Kent says that out of a total of 150,000 salmon ova originally shipped, the most successful results were found in the portion which had been placed in a private hatchery, and approached there to the "eyed" condition; and that, as out of 10,000 of this series almost every egg hatched out, he had recommended the Salmon Commissioners to import only "eyed" ova in future.

2. *Lobster and Crab.*

The information I gave you in my letter of the 18th November (No. 1,418) has been confirmed by further investigations made by Her Majesty's Inspector of Fisheries. Mr. Berrington still thinks that the only way of introducing lobsters is to send out live fish; and that if these succeed, crabs might then be attempted. You are, no doubt, aware that the Tasmanian Government are now taking steps in a very thorough way to bring out live lobsters, with complete arrangements for tanks and so forth on the voyage. Temperature is a material point, and ought not to be below from 50° to 55°: at the Brighton Aquarium it is kept at about 52° or 53°. No ice or ice-water must be introduced into the salt water in the tank, as a very small admixture of fresh water (even so little as is produced by rain) would kill the fish. A contrivance would also have to be arranged in the shape of a "fiddle" at the bottom of the tank, to prevent injury from the motion of the ship.

Lobsters must be fed on fish, though (unlike crabs) they will eat it when tainted; but a quantity of recently-caught fish for food should be taken out in the ship's refrigerator. They will also eat dried fish, some of the salt being first washed out. The salt water in the tank must be renewed occasionally by sea-water at the right temperature.

Mr. Berrington was good enough to ask Mr. Lawler, who has charge of the fish at the Brighton Aquarium, and who is in communication with Mr. Saville-Kent about sending lobsters and crabs to Tasmania, whether he would undertake the arrangements for sending lobsters to New Zealand, if you decided to incur the expense. Mr. Lawler has been in charge of the fish at the Aquarium for fifteen years, and has hatched both lobster and herring there, and has also experimented for three years on herring ova. As soon as I can I shall go down to the Aquarium and see him.

3. *Herring.*

I have had a long consultation with Professor Cossar Ewart about the best steps to take for the introduction of the herring; and we now see our way to a series of careful experiments still under consideration.

We shall get a supply of ova in a particular bay on the west coast of Scotland in February and March; and, as it has now been ascertained that the hatching can be delayed for forty to forty-five days, we shall take care that the ova are procured at a time to fit in with the despatch of the ocean-steamers. There will not be much difficulty in this, as millions of herring come to that particular bay for spawning, and ova can be got in plenty on almost any day that the weather permits.

It fortunately happens that Professor Ewart will be able to give his personal attention to the work at that time; and he is very glad to do so. He will presently draw up complete instructions for the guidance of those whom you may appoint to receive the ova on the arrival of the steamers, so that the best chance may be afforded of success; and as soon as we have settled these instructions I will take care to let you know. In the meantime, may I ask you to ascertain how far any hatcheries to which herring ova may be sent are from a quiet sheltered bay, where a well-boat could be stationed without fear of being much knocked about, even by the tides.

The Hon. the Colonial Secretary, Wellington.

I have, &c.,
F. D. BELL.