1886.

NEW ZEALAND.

THE INTRODUCTION OF FISH-OVA

(FURTHER CORRESPONDENCE RELATING TO).

Presented to both Houses of the General Assembly by Command of His Excellency.

No. 1.

The Honorary Secretary, Wellington and Wairarapa Acclimatization Society, to the Hon. the Colonial Treasurer.

Sir,— Wellington, 28th May, 1886.

Referring to my former letter of 25th March, I have the honour to send you the following additional information respecting case No. 86 of salmon-ova, handed by the Government to the Wellington and Wairarapa Acclimatization Society, out of their shipment by the "Ionic:" Dead ova picked out on unpacking case, 3,150; subsequently, 4,148; fry hatched out, 9,050: total, 16,348. After deducting 607 alevins, dead since hatching, and 130 deformed fish, there should be about 8,323 fry alive at the ponds. The preceding return is approximate, as most of such returns really are. It would do more harm than good to knock the fry about counting them. We intend to liberate a number in the upper waters of the Hutt and Manawatu Rivers, reserving a few in one of the races at the Masterton fish-ponds till they are a year old.

I have, &c.,

Alex. J. Rutherfurd,

The Hon. Sir Julius Vogel, K.C.M.G., &c. Hon. Secretary.

No. 2.

Mr. A. Johnson to the Hon. the Colonial Secretary.

Sir,— Troutdale Farm, Opawa, Christchurch, 8th June, 1886.

I beg to convey my thanks for the 1,000 ova kindly allotted me by the Government. As I have had the opportunity of seeing the ova and packing arrangements of most of the shipments that have been imported during the last twenty years, have also had out more than thirteen importations entirely at my own expense and under so many different modes of packing, and have spent a lifetime in fish-cultural pursuits, probably the following remarks, with a view to greater success in future importations, may be acceptable.

Judging from the appearance of the 1,000 eggs, the packing arrangements leave little room for improvement, being nearly equal to a large portion of an American salmon-ova shipment which only showed 1 per cent. of bad eggs.

The unusually small size of the eggs would have created doubt whether they were really salmon had they not been forwarded as such from so eminent a fish-culturist as Sir J. Maitland, the eggs being only half the size of those obtained from my three- and four-years-old tame-reared salmon. Another remarkable fact was the large number of deformed fish, being upwards of a hundred out of 700 hatched. These drawbacks, however, only appear applicable to a portion of the boxes, as the Manager of the Dunedin Society informs me "that out of the 20,000 received by them there is a comparatively large percentage of good eggs, and that they were hatching much better and stronger than the lot brought out by Mr. Farr in the 'Kaikoura' last year."

From the annual report of the Dunedin Society it appears that instead of 198,000, as claimed to have been brought out by Mr. Farr, 25,505 would be a more correct number, costing £707 of public money; whilst this "Ionic" shipment of 200,000, according to the estimates, cost only £200. I trust, therefore, the Government will see fit to convey their high appreciation to those rendering such good services, which have contributed to the most successful large importation of English salmon-ova, and that, too, at a very moderate expense.

As I have received from Sir J. Maitland's establishment on previous occasions salmon-trout, Loch Leven trout, and Scotch burn trout, I propose communicating to him some experiences respecting packing, tending to make his present success even greater in future attempts.

I consider the most important point on our side to be the treatment of the ova from the opening of the ice-house till it is placed in the hatching-boxes; it is during that time that the greatest mischief has been done, and, although not perceptible at the time, the constitution of the fish is

weakened and ruined. The loss from this cause out of the "Ionic" shipment may be estimated at least at 30 per cent. In the event of any future shipments by the Government, I shall be willing to furnish suggestions on this point calculated to insure the hatching-out of a larger percentage of eggs and healthier and stronger fish.

An offer of a quantity of ova, delivered free of expense in London, has been made me by a salmon-proprietor. Possibly, this liberal offer of Lieutenant-Colonel Masefield may be utilized by the Government, as it would be inexpedient for a private individual like myself to incur heavy expense in large ova-importations, when a society liberally endowed with public money, as the Canterbury Acclimatization Society, uses that money and power to compete with, obstruct, and injure private enterprise in fish-cultural pursuits, but more especially in the carrying-out of what may be considered one of the most important experiments of the age, the acclimatization of salmon in New Zealand waters.

I have, &c.,

The Hon. the Colonial Secretary. A. JOHNSON.

No. 3.

The SECRETARY, Lake District Acclimatization Society, to the Hon. the COLONIAL SECRETARY.

(Telegram.) Queenstown, 17th June, 1886.

ABOUT fourteen thousand salmon-fry hatched out of ova per "Ionic" in Lake District Society.

R. B. MATHIAS,
Secretary, Lake District Acclimatization Society.

No. 4.

The CURATOR, Southland Acclimatization Society, to the SECRETARY, Marine Department.

(Telegram.) Invercargill, 18th June, 1886.

NUMBER of alevins hatched, 14th April, 12,656; number of deaths since, 3,576; number of fish now in boxes, 9,083. Nearly all fish particularly strong and healthy. Will send you detailed account of operations as soon as they are completed. ARCHIBALD CAMPBELL.

No. 5.

The AGENT-GENERAL to the Hon. the COLONIAL TREASURER.

SIR,— 7 Westminster Chambers, London, S.W., 19th May, 1886.

I beg to acknowledge the receipt of your letters of the 12th March, No. 247, and 8th April, No. 526, relating to the ova I sent out in the "Ionic," and I also beg to offer you my hearty thanks for the manner in which you have been pleased to refer to the exertions of Sir James Maitland and myself.

Salmon-ova.—The remarks you make on the method of packing and other points will receive the most careful attention of Sir James Maitland before any further shipment is made; and the account you give of the ova in the refrigerator shows that we must dismiss the idea of being able to send out any in that way. I should be very glad if you would send me a telegram on receiving this letter, to say whether we are to go on with a shipment next season. The earlier that steps are taken, especially for Scottish and Rhine ova, the more likely we are to get a large quantity at a small cost; and the experience we have now gained insures that the cost will be trifling.

Herring-ova.—I am very glad to be able to tell you that, after very careful experiments, Professor Ewart is confident of being able to overcome the difficulties that caused the failure of our experiment in the "Ruapehu." I transmit herewith copy of a letter I have just received from him, describing clearly how he proposes to insure success next time; and you will see that if the arrangements are left to him a sum of from £150 to £200 would cover the expense of determining the best methods to be employed, and of the appliances required for the transit of the ova. I trust that you may be able to give your consent to the renewal of the experiment, and I should be very glad if you would be pleased to send me a telegram for our guidance when you receive this letter.

I have, &c.,

The Hon. the Colonial Treasurer, Wellington. F. D. BELL.

Enclosure.

Professor J. COSSAR EWART to the AGENT-GENERAL.

DEAR SIR FRANCIS,— University, Edinburgh, 14th May, 1886.

I delayed writing until I was able to learn, by a series of preliminary experiments, what was required in order to render the transportation of the herring-ova more possible.

Mr. Jamieson had nothing to add to his report, previously considered—*i.e.*, he confirms the statement that it was impossible to obtain a supply of cold sea-water, owing to all the pipes (the reserve-pipe, as well as the coil) freezing in the refrigerator. He suggests some improvements, which had already occurred to me, in the corks for the hatching and other jars, in order to prevent leakage.

After seeing Jamieson, on my return from London, I made arrangements for several weeks' work at the Rothesay Marine Station. From this work I have just returned, feeling satisfied that all the difficulties are likely to be easily overcome. With the help of several assistants, I soon satisfied myself that it was hopeless to attempt carrying the water, as previously arranged on board

the "Ruapehu," through a freezing-chamber, and that it was equally hopeless to use salt along with the ice around the salt-water supply-pipe. When a mixture containing 5 of ice to 1 of salt was used, the water in the supply-pipe became ice when the circulation was stopped for two minutes.

Recognizing (1) that "the temperature of a mixture of ice and water remains constant till either all the ice melts or all the water freezes," and (2) that "a given quantity of ice in melting is sufficient to reduce the temperature of 144 times its weight of water by 1° Fahr., or to reduce the temperature of once its own weight by 144° Fahr.," I gave up the rule of thumb for the scientific method, and began experiments with pure ice. As the result of these preliminary experiments I find: (1.) That it is possible to reduce the temperature of the sea-water without the remotest chance of freezing it by passing it through a small tank or cask containing trays filled with ice. The water can be reduced in this way without any difficulty to 32° Fahr. For hatching purposes I anticipate fresh-water ice will do as well as sea-water ice. (2.) That by means of a "well" containing a freezing-mixture, the sea-water can, without danger of freezing, be reduced easily to about 40° Fahr. before it is passed over the ice in the cask. I believe that little over six tons of ice would be required during the voyage; for 3cwt. of ice would reduce 720 gallons of water from 40° to 32° Fahr., and less than 720 gallons would suffice per day. So encouraging are these and other results that I venture to suggest that we should continue the work.

I have already incurred, for assistance and apparatus—without which, of course, progress was impossible—some outlay; but I think, if the whole arrangements are left to me, a sum of from £150 to £200 ought to cover all the expenses for determining the best methods to be employed, and for providing the necessary additional tanks and hatching-appliances required for transit.

Regretting the delay in writing. I have, &c.,

The Agent-General for New Zealand. J. C. Ewart.

No. 6.

The Agent-General to the Hon. the Colonial Treasurer.

Sir,— 7, Westminster Chambers, London, S.W., 28th May, 1886.

I sent a copy of your letter of the 8th April on the salmon-ova to Sir James Maitland, and I now beg permission to transmit copy of a letter I have received from him touching on the various points to which you had called our attention. You will read Sir James's letter with much interest, especially if you propose that our experiment shall be repeated in the coming season.

I have, &c.,

The Hon. the Colonial Treasurer, Wellington. F. D. Bell.

Enclosure.

Sir J. R. G. Maitland to the Agent-General.

My dear Sir Francis,— Stirling, N.B., 25th May, 1886.

I have yours of the 24th, kindly enclosing Sir Julius Vogel's despatch of the 8th April, with which I am very much interested, and it entirely bears out my anticipations.

We can now rely upon salmon-ova placed in a chamber such as was constructed on the "Ionic;" and, if the eggs were a week older when packed, there is no reason why every egg should not arrive alive. The fertilization was not, I consider, good; but all unfertilized eggs had been removed during packing, which would make it seem almost perfect. "The thick, heavy coating of moss" is necessary and harmless. In the first place the eggs are transferred to the moss, and the moss, with the eggs on it, lifted into the tray, thus avoiding all handling; and, when it is remembered that in both the consignments of salmon-ova we sent the ova was packed before the eye was coloured, it is quite clear the American packing—which is only possible with much farther advanced ova—would have killed every egg. I get plenty of eggs over from America, and my experience is very much against their mode of packing. Sir Julius is right as to the drip of the ice killing eggs; but it is the wet, and not the moss, that suffocates them. In the chamber on board ship there will be no drip, as the temperature should be so low that the ice in the boxes melts slowly. The moss probably gets wet after it leaves the ship; but a small handful of sawdust thrown over the ice in the ice-tray when the box is taken from the ice-chamber will obviate all danger. The thick felt of moss has a very important duty to perform—viz., to absorb the carbonic acid given off by the ova. This it does best when merely damp—not wet. The pad also prevents the eggs from shifting; and, if the eggs are bunched together and near the point of hatching, they invariably suffocate each other. Lastly, they do not seem to have realized over the water that the pads of moss can, by bending up the four corners, be removed from the trays, eggs and all, and the eggs transferred on to a piece of muslin by merely covering the pad and then inverting it—an operation requiring little time and trouble, and absolutely harmless to the ova. I am very glad we put the trout-ova in the refrigerating-chamber. Those dozen ova which did not turn opaque would be the only unfertilized ova in the lot. Dr. Francis Day kindly undertook a set of experiments with frozen ova, which appeared in the *Field*. He tells me that cold will cause decomposition of the blood. I have frozen ova in air, and afterwards hatched them; but I probably did not carry the freezing far enough to affect more than the shell. I thought of the thermometer; but did not suggest it on purpose, as I considered that the less the chamber was opened for inspection the better for the ova; that the minimum temperature was, from the construction of the chamber, 33° Fahr.; and that the maximum and daily temperatures could be easily deduced in the ova-boxes themselves from the frequency with which their ice-trays require replenishing. I have, &c.,

Sir F. Dillon Bell, K.C.M.G. J. R. G. Maitland.

No. 7.

Sir J. R. G. MAITLAND to the Hon. the COMMISSIONER of TRADE and CUSTOMS.

SIR,— Stirling, N.B., 28th May, 1886.

I have the honour to acknowledge your letter of the 8th April, and to express my gratification that the shipment of salmon-ova has arrived in such good order. May I be permitted to state how largely this is due to the construction of the ice-chamber, to which Sir Francis Dillon Bell gave great personal attention. Will you have the kindness to convey to the Government my thanks for the high honour they have done me, and the great gratification I shall always feel in assisting in any way in my power the development of the fisheries of New Zealand?

I have, &c.,
J. R. G. MAITLAND.

Sir Julius Vogel, K.C.M.G.,
Government Buildings, Wellington.

No. 8.

The MINISTER having charge of the MARINE DEPARTMENT to the AGENT-GENERAL.

(Telegram.) Wellington, 13th July, 1886.

SALMON-ova, herring-ova: Repeat shipments.

No. 9.

The MINISTER having charge of the MARINE DEPARTMENT to the AGENT-GENERAL.

SIR,— Marine Department, Wellington, 16th July, 1886.

I have the honour to acknowledge the receipt of your letter, No. 602, of the 19th May last, addressed to the Hon. the Colonial Treasurer, and I have read with much interest Professor Cossar Ewart's report on the herring-ova experiment. You will have learnt, by telegram sent to you on the 13th instant, that you are authorized to send out shipments, both of herring- and salmon-ova next season. The boxes which contained the salmon-ova forwarded by the steamer "Ionic" will be returned to you by direct steamer at an early date.

I shall feel obliged if you will be kind enough to address letters relating to fish-ova to me in future, as the matter has been transferred to the Marine Department, and I shall be glad to receive a copy of full instructions as to the manner of dealing with the herring-ova on its arrival in the colony in time to enable the necessary preparations to be made to receive it.

I have, &c.,
W. J. M. LARNACH,
Minister of Marine.

The Agent-General for New Zealand,
7, Westminster Chambers, London, S.W.

No. 10.

The HONORARY SECRETARY, Otago Acclimatization Society, to the Hon. the PREMIER.

SIR,— Otago Acclimatization Society, Dunedin, 21st June, 1886.

A copy of the Order Paper of the 11th June has been forwarded to me, in which (No. 9) Mr. Beetham is to ask whether the Government will, during next season, endeavour to obtain a supply of American *Salmonidæ*. I need not point out that all the species mentioned would be, apart from all other considerations, valuable additions to our food-supply, and all are fish likely to be eminently suited to our waters. I am certain that all the acclimatization societies will join with us in urging upon the Government the advisability of getting these fish introduced. Our society is now in a position to offer you every facility for hatching the ova and rearing the young fish, as we have now accommodation for over half a million of eggs, and could, on short notice, increase our accommodation five-fold. I therefore take the liberty of soliciting your influence to have the endeavour made.

I have, &c.,
JAMES WILKIE,
Honorary Secretary.

The Hon. Sir R. Stout, Wellington.

No. 11.

The SECRETARY, Marine Department, to the HONORARY SECRETARY, Otago Acclimatization Society.

SIR,— Marine Department, Wellington, 19th July, 1886.

With reference to your letter of the 21st ultimo, addressed to the Hon. Sir R. Stout, I have the honour, by direction of the Minister having charge of this department, to inform you that the Government has asked the United States Commissioner of Fish and Fisheries if he can be so good as to forward to the colony during the ensuing season a supply of the ova of the whitefish *(Coregonus clupeiformis)*, land-locked salmon *(Salmo sebago)*, brook-trout *(Salvelinus fontinalis)*, and Californian trout *(Salmo irideus)*.

I have, &c.,
WILLIAM SEED.

The Hon. Secretary, Otago Acclimatization Society, Dunedin.

No. 12.

The MINISTER having charge of the MARINE DEPARTMENT to the Hon. SPENCER F. BAIRD.

SIR,— Marine Department, Wellington, 16th July, 1886.

In continuation of previous correspondence on the subject of fish-ova, I would again trespass on your kindness by asking if you could be so good as to forward to this colony during the ensuing season a supply of ova of the whitefish *(Coregonus clupeiformis)*, the land-locked salmon *(Salmo sebago)*, the brook-trout *(Salvelinus fontinalis)*, and the Californian trout *(Salmo irideus)*.

In case that you should be able to comply with this request, I have arranged for them to be received by the Acting Resident Agent for the New Zealand Government at San Francisco, and I should feel obliged if you could give such instructions as to its treatment on the voyage as, from your great experience in such matters, you may consider advisable or necessary.

I should be glad if you would draw on me on account of any expenses that you may be put to in connection with any ova that you may send. I have, &c.,

W. J. M. LARNACH,
Minister of Marine.

The Hon. Spencer F. Baird, Commissioner of Fish and Fisheries, Washington, D.C., United States of America.

No. 13.

The SECRETARY, Marine Department, to the SECRETARY, Post Office and Telegraph Department.

(Memorandum.) Marine Department, Wellington, 16th July, 1886.

A LETTER has been addressed to Professor Baird, United States Commissioner of Fish and Fisheries, Washington, D.C., asking for a further supply of fish-ova, and he has been informed that the Acting Resident Agent for the New Zealand Government at San Francisco will receive it. I should feel obliged if you would instruct the Agent to receive such ova, and carry out implicitly any instructions that may be given. It would be advisable to have a special chamber built in the ice-house, so that the ova could be kept clear of the meat, &c., and care should be taken to see that the chamber is kept well supplied with ice, that the ova is kept off the deck, and that there are proper drainage-outlets provided.

The Secretary, Post and Telegraph Department, Wellington. WILLIAM SEED.

No. 14.

The SECRETARY, Post Office and Telegraph Department, to the SECRETARY, Marine Department.

(Memorandum.) General Post Office, Wellington, 17th July, 1886.

BY the outgoing Fr'isco mail, closing to-morrow, I have instructed the Acting Resident Agent, San Francisco, to receive the supply of fish-ova, and to carry out any instructions given him by the Commissioner of Fish and Fisheries, Washington.

The Secretary, Marine Department, Wellington. W. GRAY.

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