

fish are alive and well, and have already visibly increased in size, and, although all anxiety as to future unseen losses is not entirely set at rest, the experiment may be regarded thus far as a success. A small proportion of eggs yet remain unhatched.

## No 8.

*Re Whitefish.*

Mr. A. M. JOHNSON to the Hon. the COLONIAL SECRETARY.

SIR,—

Trout Dale Farm, Opawa, Christchurch, 4th May, 1880.

I regret I cannot continue to report the same satisfactory progress as in my previous communication. After seven weeks of the time of hatching, the numbers continued to visibly diminish daily, in spite of every care and precaution, till the total number left cannot now be as many hundreds as they were thousands; those fish liberated in ponds full of crustaceæ and insect life appearing to share the same fate as the ones in deep and protected races, and, although there are still ample left for propagating purposes, the general result is by no means so good as the splendid condition in which the ova arrived would lead one to expect. Great preparations had been made and considerable expense incurred to facilitate success, yet, in practice, the arrangements were not all found to be exactly adapted to the peculiar requirements of these delicate fish, which are so small when hatched, and disappear so suddenly without leaving a vestige; that, had it not been for the many experiments carefully carried out as regards difference of temperature, depth of water, food, and other circumstances, I might be under the pleasant delusion that I was still the happy possessor of many thousands, or that the losses were entirely due to the high temperature, or the equally erroneous impression that the fish were of too delicate a nature to be ever successfully acclimatized to the New Zealand waters. The partial success attained may be briefly summarized as due to those arrangements, which have enabled the following plans to be efficiently carried out—namely, removal of the young fish as soon as hatched, into water at least 2 feet deep, and at a temperature not exceeding 58°; shade from the hot sun and protection from enemies, whose name is legion, the least suspected and most destructive of which may be considered the water spiders; regular feeding, blood being the best artificial food and microscopical insects the best natural food.

I have, &amp;c.,

A. M. JOHNSON.

The Hon. the Colonial Secretary.

## No. 9.

Mr. W. ARTHUR to the Hon. the COLONIAL SECRETARY.

SIR,—

Otago Acclimatization Society, Dunedin, 15th April, 1880.

I have the honor now to send you Mr. Dean's detailed report on the hatching-out of the American whitefish ova at Lake Wakatipu.

In doing so I may say that I sent specimens of Wakatipu Lake water, of Rowell's Spring water (in which our hatching-boxes were), and of Opoho Creek water, where our Dunedin hatching-boxes are, to Dr. Black, Professor of Chemistry in the Otago College, for analysis. Dr. Black has kindly sent me the result, which is—

			Organic Matter.		Hardness.
			Gr. per gal.		Deg.
Lake Wakatipu	...	...	0.5	...	3.1
Rowell's Spring	...	...	1.1	...	7.1
Opoho Creek	...	...	2.3	...	3.6

I do not know the analysis of the lake water whence these ova were taken; but Dr. Black reports that there is less salt in the Wakatipu water than in any he has ever examined. Rowell's Spring is harder than the Wakatipu water; but the other experiments were made in the Lake water, and in both cases the fish died. I am hopeful, however, that the ova and young fish turned out into Lake Wakatipu, by finding their way to the cooler and more sheltered water at the bottom of the lake, will yet come to maturity and propagate.

I have, &amp;c.,

W. ARTHUR,

Honorary Secretary.

The Hon. the Colonial Secretary, Wellington.

## Enclosure in No. 9.

REPORT by Mr. DEAN of his disposal of the Whitefish Ova recently received in New Zealand.

4th February, 1880.

IN accordance with your request, I beg to furnish you with the particulars regarding the late shipment of whitefish ova.

On 16th January I started for the Bluff, expecting to find the "Hinemoa" there the next morning, but she did not put in an appearance until the 19th, when the ova were brought on to Invercargill by special train, and thence to Kingston by ordinary train. On our way up the lake by steamer we removed the ice from the boxes containing the ova, in order to allow the temperature to rise gradually to that of the lake. The latter, on applying the thermometer, proved to be as high as 56°. On opening the boxes at Queenstown, the ova in the trays packed with moss were in good condition, but those in the trays composed of calico alone, without any moss, were completely useless. By 6 p.m. the ova were all placed in the hatching-boxes, the temperature being 50°. A few young fish hatched out while being removed from the trays. 8 p.m.: Temperature down to 49°.

January 20th, 6 a.m.—Temperature of water 48°. The fish hatched last night all dead, some