

made at the Government workshops, and furnished to responsible parties. This would facilitate the hatching process.

Second, inasmuch as this is a valuable patent, and as Mr. Clark generously donates it through me to the colony, I have to request that you will take steps to preserve his proprietary interest. This can be easily done not alone in New Zealand, but in Australia, and I think it is as small a return as the colony can give to this gentlemen. A short Act, if requisite, could be passed, and upon proper representations I have no doubt the neighbouring colonies would adopt any suggestion you might make. As a pure matter of equity, I think this should not be lost sight of. I have not written to Mr. Clark on the subject, but shall in due course.

You will pardon these suggestions, which I conceive to be necessary under the circumstances.

The Hon. J. Macandrew.

I have, &c.,

ROBT. J. CREIGHTON.

Enclosure in No. 44.

Mr. F. N. CLARK to Mr. R. J. CREIGHTON.

United States Commission, Fish and Fisheries,

Northville, Michigan, 27th August, 1879.

AGREEABLY to my promise in a former letter, I herewith transmit to you my plans and ideas in regard to the hatching and care of young whitefish (*coregonus albus*). You will find, accompanying this letter, a model of my patent hatching-box and nursery-trough, which I think absolutely necessary in the hatching of this fish. My practical hatching-box is filled with trays 9 inches by 12 inches, and everything proportionately large. The nursery-trough in my house is 20 inches wide by 25 feet long, with a depth of water of 2 feet. You will find, with the nursery-trough it will hold from three to four million fish without any escapes. The fish will do well in this trough for at least ten days, but my plan is to commence shipping as soon as the eggs commence hatching, and continue until all are disposed of: the fish are running into the trough, and we are taking out all of the time for a period of three to four weeks. The eggs should be placed on the trays not more than one deep if there is plenty of room in the hatching-boxes, but will bear two deep if necessary.

The eggs should be looked over once a day, being careful to remove all dead eggs, and washing the eggs when necessary to clean them from sediment: to wash them, take a hold of tray at each end and gently work them up and down. When the fish commence hatching they will work down the hatching-trough into the nursery-trough, but I should advise the removal of the trays once a day, emptying the eggs, fish, and shells into a pan; then turn the fish and shells off into the first compartment of nursery-trough, when you will find the most of the shells will settle, and the fish will work down to the last. What shells do not settle in the first compartment will find the bottom in the next; thus you will find the fish all in the last compartment, free and clean from shells and sediment, where they should be dipped from when shipping. In pouring the fish off from the pan, you will find the eggs in bottom of pan, which should be carefully placed back on the trays. I have in my hatching-house a trough for placing the trays when removed from hatching-box for looking them over. This trough runs the same length of hatching-trough, is only 1½ inches in depth, just water enough to keep the eggs under water.

In reference to hatching the eggs at the lake or lakes where you wish to plant them it is, of course, better, everything else being equal; but I think, with eggs going the distance from here to New Zealand, the sooner they can be placed in the hatching-boxes the better. I should advise having a hatching-house as near the point where your steamer first touches as you can. With good water you can transport the young fish in cans for eight or ten days if there can be water procured on the route of a low temperature, or ice; temperature of water should not be above 50°. I transport whitefish about 1,500 to 2,000 to the gallon of water.

I send you by this mail a short essay on the whitefish, written by my father, the late N. W. Clark, which may give you some additional light on the subject, also description of the box from the *Scientific Manufacturer*, of June 15th, 1874, which describes the box. You will also find, in the report of U.S. Commission of Fish and Fisheries of 1872-73, a description of letters patent of the box.

I advise the use of this box, not for any pecuniary benefit it may be to me, but for the success of your Government in hatching the whitefish.

The box is now largely used by States and private parties, and one of the largest hatching-houses in the United States is built on this plan, (the State of Ohio, at Toledo.)

The model I send you is for you or your Government, and I send it thus early hoping your Government may adopt it this season, before the eggs are sent. Any right I may have in the box I freely give to your Government the use of.

About the prairie chickens: I am sorry to say we have none here; the nearest point is Chicago. However, I will write to dealers there, and see what I can do for you.

The eggs for your Government, as well as for Mr. Craig, will be forwarded some time in December. I will inform you by letter later. I feel greatly obliged to Mr. Craig for his order of whitefish; also receive my thanks for the work you have done for me in getting this order.

I will take great care in shipping the eggs, and shall get instruction from the Superintendent of Express as to their agents and messengers.

The order for yourself I do not understand whether to be 10,000 or 40,000. I shall, however, take the liberty of donating the latter number to you.

Hoping the views I have written you, with what I have sent in printed form, may help you and your Government,

R. J. Creighton, Esq., San Francisco.

I have, &c.,

FRANK N. CLARK.

Any further questions you may wish to ask will be cheerfully answered.

Sub-Enclosure to Enclosure in No. 44.

[Extract from "Scientific Manufacturer," Chicago and Detroit, 15th June, 1874.]

IMPROVEMENT IN FISH-HATCHING APPARATUS.

THE re-stocking of the rivers and lakes of the country with valuable fish is a matter of so much importance that it has not only attracted the attention of the public, but has caused the enactment of laws and