1880.

NEW ZEALAND.

FISH-BREEDING ESTABLISHMENT IN THE COLONY

(CORRESPONDENCE RESPECTING THE MAINTENANCE OF A PERMANENT).

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

No. 1.

The CHAIRMAN, Southland Salmon Commissioners, to the Hon. the COLONIAL SECRETARY.

SIR,— Dun Alister, Wyndham, 27th February, 1880.

I have the honor to inform you that at a late meeting of the Southland Salmon Commissioners the following resolutions were agreed to: (1.) "That the Commissioners are unanimously of opinion that a further importation of the ova from England is required in order satisfactorily to establish them in the rivers of the colony;" and (2.) "That the Commissioners trust that the Government will continue its operations, and maintain a permanent fish-breeding establishment, until the rivers are stocked, on the present site of the ponds, if that can be retained on reasonable terms—by lease or by purchase; but, if not, in either way on some other suitable place, for the selection and acquiring of which the Commissioners request authority from the Government."

In a former letter to you I had the honor to submit some reasons in favour of the continuance of its fish-breeding operations by the Government, and have now, in support of those resolutions, some further observations to make for the consideration of the Government.

The general progress of the science of fish-culture is extending widely through the world. In various countries the Governments have established fish-breeding places to stock the rivers and keep up a supply of this valuable article of food, and in others, as in England and France, private enterprise has been both active and successful in the same direction.

A very instructive report by the Canadian Fish Commissioners (of 1877) has lately been reviewed in an Edinburgh newspaper, of which I enclose a slip, and from which a few particulars may be quoted. The report says that nearly every State in the American Union is now aiding the work of fish-culture by public grants and the appointment of Fishery Commissioners A pleasant rivalry exists among the several States as to which will be the most successful in stocking rivers and supplying a food so generally and highly prized. The Canadians appreciate the benefits that will accrue to fisheries by artificially breeding salmon, trout, and other fish. The Canadian Government had seven fish-breeding establishments in 1877, which were maintained at a cost in that year of £5,000. Mr. Wilmot, the superintendent of these establishments, reports that the number of vitalized eggs in them in 1877 amounted to 36,694,000, which, added to the number of salmon distributed in various rivers in former years, amounting to 28,515,000, make a grand total of salmon eggs and fry, up to the end of 1877, of 59,209,000. In the spring of 1877 he says there were distributed from these places—Fry of *Salmo salar*, 5,451,000; fry of Californian salmon (*Quinnat*), 7,000; fry of speckled trout, 99,000; fry of whitefish, 7,000,000. The eggs laid down in autumn, 1877, were—*Salmo salar*, 6,004,000; Californian salmon, 40,000; salmon-trout, 1,000,000; speckled trout, 150,000; whitefish, 23,500,000. The whitefish, it is said, are bred so extensively to supply the great falling-off in the take in Lakes Ontario and Erie. On the Fraser River, where it might have been supposed the supply would never have been exhausted, the unrestricted slaughter of salmon has created alarm, as it is seriously affecting the extensive export trade in salmon, and the people have applied to the Canadian Government for a grant to erect a salmon-breeding establishment on a large scale on the Fraser River.

Now, seeing the supply of salmon in the American rivers, especially in those falling into the North Pacific, where their numbers were astonishingly great, is falling off so seriously that it is considered necessary to have recourse to artifical breeding in order to avert their extermination, how much more indispensable it is in this colony, where we have as yet had no proof that the imported salmon have bred in our rivers, to continue our fish-breeding operations until our rivers are fully stocked: indeed, the argument goes further, and points to the establishment of permanent breeding-places as auxiliaries to the natural operations in maintaining a full stock of fish in our rivers; and we may also gather the further lesson that, when we have naturalized this source of wealth, we should secure its permanence by protecting the fish against capture at improper seasons or by improper means. And the cost of such breeding-places need not be great: after a suitable site was obtained, buildings erected, and ponds formed, the salary of curator would be the chief item of annual cost. Salmon ova could be now obtained from England at a far less cost than the colony has heretofore paid

for them. I have seen an estimate from a gentleman in England, who has been most successful in sending trout-ova to a southern colony: he thinks salmon ova could be delivered on board one of the large Australian steamers at from £3 10s. to £4 10s. per thousand, with a guarantee that not less than 80 per cent. were vitalized.

The Commissioners' expression of opinion in favour of English salmon (*S. Salar*) is supported by the very marked preference given by the Canadian Commissioners to the *Salmo salar* over the Californian salmon, although, if the merits of the latter were considered to entitle them to receive equal attention with the former, an abundant supply of Californian ova could be easily obtained.

I have the honor to suggest that the Government should refer to the Canadian Fisheries Commissioners' report. It no doubt contains much valuable information.

I have, &c.,
J. A. R. Menzies,
Chairman, Southland Salmon Commissioners.

The Hon. the Colonial Secretary, Wellington.

Enclosure in No. 1.

Fish-culture in Canada.

The advantages which may be derived from the artificial breeding of salmon and trout have been generally recognized for a good many years past, and establishments have been fitted up for the purpose of fish-hatching in various parts of the country. The terrible risks which the young fry, bred in the natural way in our rivers, run from their numerous enemies are, in a great measure, avoided by the artificial method, and we can succeed in rearing smolts from at least three-fourths of the vitalized eggs placed in the breeding-troughs, whereas, if these eggs had been exposed to the dangers of the river, probably at least three-fourths of the fry produced from them would never have reached the smolt stage. There seems little reason to doubt that the productiveness of the Tay has been increased by the smolts from the Stormontfield Ponds, and that the late successful season on Lochleven was in some measure owing to the number of young trout-fry put into it by Sir James R. S. Maitland, who has established extensive and admirably managed breeding-houses and fish-ponds at Craigend, near Stirling. The Canadians, however, seem to appreciate much more strongly than we do the great benefits which may accrue to the fisheries by breeding salmon, trout, and various other fish by artificial means; for we find, from the elaborate report by the Commissioner of Fisheries for the year ending December, 1877, and its various appendices, that the Canadian Government has seven breeding establishments in the different provinces of the Dominion, upon which about £5,000 was expended during the fiscal year ended 30th June, 1877. It has likewise a staff of 601 fishery officers of various grades, and a steamer for the protection of the fisheries in the River and Gulf of St. Lawrence.

The fish-breeding establishments in the Dominion of Canada are at Tadoussac, Gaspé, and Retisgouche, in the Province of Quebec; at Bedford-Basin, in the Province of Nova Scotia; at Miramichi, in the Province of New Brunswick; and at Sandwich and Newcastle, in the Province of Ontario. Mr. Wilmot, the superintendent of these establishments, informs us, in his interesting and valuable report, that the number of vitalized eggs contained in them in 1877 amounted to no less a number than 36,694,000, to which may be added the number of salmon-fry distributed to different rivers and waters from them in former years, amounting to 28,515,000, making a grand total of eggs and fry up the end of 1877 of 59,209,000. In the spring of 1877 5,451,000 fry of the *Salmo salar* were distributed from these establishments; 7,000 fry of the Californian salmon; 99,000 of the fry of the speckled trout; and no fewer than 7,000,000 of the fry of the whitefish (*Corregonus albus*). Besides this, the number of eggs laid down in the autumn of 1877 was as follows: *Salmo salar*, 6,004,000; Californian salmon, 40,000; salmon-trout, 1,000,000; speckled trout, 150,000; whitefish, 23,500,000. This whitefish, we are told, is being bred so extensively in order to supply the great falling-off in its take in Lake Ontario and Lake Erie. The Californian Salmon (*Salmo quinnat*), which Sir Samuel Wilson has succeeded in introducing into Australia, and which, we believe, has also been introduced into New Zealand, has been successfully acclimatized in some of the Canadian streams and lakes connected with the Atlantic. It was first brought across the continent from the Pacific coast in 1873. In July, 1877, several of these salmon were netted in Lake Ontario, near the estuary of Wilmot's Creek. Mr. Wilmot makes the following remarks with regard to the way in which these salmon thrive in fresh water, which will scarcely meet with the approval of those who consider that a residence in the salt water, for at least part of each year, is essential to the proper growth and development of the salmon: "These salmon," he says, "give interesting data for the naturalist and the study of physiology. They furthermore practically prove statements hitherto advanced by myself, that the salmon of the sea can be acclimatized and made natives of the fresh-water lakes, and that it is not indispensably necessary for salmon to go to the salt water; large bodies of either fresh or salt water, with an abundant supply of food, is all that is requisite to give them growth and reproducing powers; and that the procreative qualities of the male salmon are usually developed at an earlier stage than the female, the former invariably commencing their migration up the rivers for spawning purposes one year in advance of the latter: hence the indisputable fact of grilse taken in the rivers being always males."

There seems to be at present no annual close time applicable to the rivers in British Columbia, which in 1877 yielded about three and a half millions of pounds of tinned and pickled salmon; and there appears a possibility that wasteful and improvident modes of fishing may exhaust the resources of even these richly-stocked waters. We are glad to see, therefore, that Mr. Wilmot, in his report on the Government breeding establishments, strongly recommends the institution of an annual close time, and its stringent enforcement in British Columbia. The following are his remarks on the subject, and on fish-culture generally: "The general progress of the science of fish-culture is extending very

widely throughout the world. On the Continent of America the interest is, perhaps, greater than elsewhere. Nearly every State in the adjoining Republic is now aiding the work by public grants, and by the appointment of Fishery Commissioners, &c. Very pleasant rivalry exists among the several States as to which shall be most successful in redeeming the waters from previous barrenness, and supplying their populations with an edible food which is so generally prized by the people for its delicacy and wholesomeness. Nor is the Dominion of Canada behind in advancing this important industry of propagating fish by artificial means. This is evidenced by the many establishments now in full operation, which, for numbers, capacity, and completeness, are not equalled in any other country. This desire to increase and multiply a valuable article of food and commerce is further evinced in the efforts which are being put forth by one of the most distant provinces of this Dominion, where hitherto it had been considered, from the vast number of salmon that migrated up its rivers, that the supply could never be exhausted. With the unlimited demand, and the very great efforts that have been put forth to supply it, the unrestricted slaughter of the salmon in the Fraser River, in British Columbia, is creating considerable alarm, as it is seriously affecting the extensive traffic in this source of wealth. This feeling has caused a public expression to be given by the people of New Westminster for an application to the Dominion Government for a grant to erect a salmon-breeding establishment upon a large scale on the Fraser River. This application will no doubt be laid before your department, and will receive that consideration which its importance demands. A suggestion is, however, here offered—that, whilst heartily acquiescing in the wish of the inhabitants of British Columbia in having a salmon-breeding establishment to assist in retaining the stock of fish that at present exists there, it is of equal necessity also that a policy for the preservation and protection of fish, by setting aside close seasons for their natural reproduction, should be stringently enforced."

No. 2.

The CHAIRMAN, Southland Salmon Commissioners, to the Hon. the COLONIAL SECRETARY.

SIR,— Dun Alister, Wyndham, 9th January, 1880.

I have the honor to acknowledge the receipt last week of your letter of 11th December, informing me that the salary of Curator of the Southland Salmon Ponds will be paid for the present financial year, but it is not probable that it will be possible to include it in the estimates for any further period. I have also received to-day a telegram from Mr. Cooper, inquiring whether a lease for the land upon which the ponds are situated has been completed.

The question of the continued maintenance of the ponds being thus opened up, it may be convenient to refer to their past history and management for a few years. About twelve or thirteen years ago the Southland Acclimatization Society acquired a lease of this land; then, at a considerable expense, formed these ponds; sent to Tasmania and obtained ova of salmon, trout, and brown trout; reared them successfully; subsequently obtained a further supply of ova from the same source and with similar results. The Society was most anxious to naturalize salmon, but, having no adequate funds, it sought to obtain a tract of land as an endowment the sale of which would enable it to endeavour to obtain salmon ova from the mother-country. The Provincial Council of Southland was applied to, but difficulties arose which obstructed any grant from that quarter. Then an endowment of 2,000 acres was obtained for this purpose by the Act of 1869. The administration of this land was vested in trustees. The Society gave the use of the ponds, and for a time bore a part of the expense, but gradually the management came entirely under the control of the trustees. Their proceedings were fully reported when, in 1876, this fund was exhausted. Then the Superintendent of Otago, Mr. Macandrew—who, sharing in the desire to naturalize the British salmon, had always given his hearty co-operation—and the Provincial Government continued the attempt to introduce salmon, aided from time to time by votes of the General Assembly. Part of the ova were on each occasion sent to the Southland ponds, the trustees agreeing to continue their management. After the provinces were superseded the General Government repeatedly obtained and sent to the Southland ponds ova of the *Salmo salar* from the United Kingdom, and of the Californian salmon from the United States, appointing five gentlemen to act as Commissioners in the management. In 1876 the Society made over the ponds to the Government, which thereafter sent thither to be reared most of the ova it imported. In the following year the Commissioners learned that the lease of the ground had expired, and, receiving the sanction of the Government to obtain a fresh lease, they gave instructions to have one prepared; but some uncertainties about the legal tenure caused a long delay, and when the difficulty was solved the owner became involved in the ruin that extended from that of the City of Glasgow Bank, the result being that no lease has been completed.

I am now informed that the property will shortly be offered for sale, and an opportunity thus offered to acquire in fee-simple the section on which the ponds have been formed.

The ponds are in excellent order, having been cleaned out and lined the summer before last. Some repairs are required on the houses, and the breeding-boxes require renewal, the cost of which, together with repairs to the fence, would, by the estimate of the Curator, be fully covered by a sum of £25. Even now the ponds, &c., are in good working order, and the above small outlay will place all the accommodation in the most efficient state.

If the Government desires to secure beyond a doubt the naturalization of *Salmo salar*, it may be requisite to make one or two further importations of ova, in which case, or, in event of fish-breeding from any imported ova, it has at its command the services of an officer whose experience as Curator for the last twelve years specially qualifies him to conduct the management, and breeding-houses and rearing-ponds altered and improved from time to time, as defects became disclosed and remedied.

The importance of the interest, and its high prospective value when established, may be inferred from reading the reports of the large sums realized by the annual leasings of the salmon fishings in the Scottish rivers, and of the large exports of preserved salmon from California. The Government has now under its control all the appliances necessary to foster this nascent source of future wealth, and

it requires no protective duties to encourage it. Perhaps a moderate outlay in establishing these fish in some rivers would not be applied in a manner better calculated to be highly reproductive (see note). When it can be shown that some of the rivers in the South are fairly stocked, further importations may be discontinued, for the ova can be easily obtained in such rivers, and, when reared in the ponds, the fry hatched from them can be sent to other rivers.

The Government has a direct interest in promoting this desirable result, for, as, through the operation of the rule of the Survey Department to reserve one chain of land along the banks of the larger rivers, it is the greatest riparian owner in the South, it will have a prospect of deriving considerable rents from the leasing of the fishings—a profit subject to little deductions, for the fish will find their own food, and the lessees will look after their protection.

I trust the Government will not decide upon discontinuing its efforts without due consideration. If they are to be continued, it would be advisable to buy the section above referred to.

I have, &c.,
J. A. R. MENZIES,
Chairman, Southland Salmon Commissioners.

The Hon. the Colonial Secretary.

Note.—The English Commission reported that in 1863 "The Tay furnished 800,000 lb. of salmon, which was equal, in amount of food, to 18,000 sheep, and thrice their value, in that year." "Seven hundred net-fishermen were employed on the Tay, whose wages amounted to £9,000; and the rents of four rivers—Tay, Spey, Dee, and Don—were about £40,000."

By Authority: GEORGE DIDSBURY, Government Printer, Wellington.—1880.

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