

70.—REPORT ON PLANTING CANADIAN OYSTERS NEAR THE ISLAND OF AARBØE, IN THE LITTLE BELT, NOVEMBER 6, 1884.*

By Prof. KARL MÖBIUS.

On the 17th of April, 1883, at a public meeting of the German Fishery Association, I read a paper on the transplanting of oysters, which induced the board of directors to order some American oysters from the northernmost points where they are found; and, if possible, they were to be from beds situated in the mouths of rivers, where the oysters had been accustomed to water of less saltness than on the coasts of the open sea. Instruments for testing the saltness of these waters were, during the summer of 1883, sent to the Canadian Government by G. von Bunsen, of Kiel, second director of the association. Various reports on the physical conditions under which the Canadian oysters live were received from Canadian officials, and further aid was promised, so that we could hope, through the assistance of Canadian fishery officials, to obtain the desired kind of oysters for our important experiment.

About this time Carl Rumpff, member of the chamber of deputies of the Prussian Parliament, was informed of the plans of the Fishery Association, and offered to use his knowledge of North America, and his American business connections in furthering these plans. In reply to inquiries, persons who possessed a thorough knowledge of the Canadian oyster fisheries suggested that the oysters be sent to Europe not in spring, but late in autumn, when an evenly cool temperature might be looked for. We therefore looked for their arrival in October or November, 1884. We were notified of their shipment by telegram, and on November 3, 17 barrels of oysters arrived at Bremerhaven by the Bremen steamer Werra. Mr. Rumpff was there in person to receive them, and on November 5 brought them to Hadersleben, by way of Hamburg.

As Mr. Rumpff had advised me by telegram that he had started with the oysters, I met him at Neumünster at 4 p. m. on November 5. At 7 p. m. we passed Flensburg, where we were joined by Mr. Hinkelmann, superintendent of fisheries of the district in which the oysters were to be planted. At 10 p. m. we reached Hadersleben, where we were met by A. Jensen, who was to forward the oysters to their destination. By the kind assistance of railway and custom-house officials he succeeded in transferring the 17 barrels of oysters, by 8 a. m. of November 6, to the steamer for Aarøesund, where we soon joined him.

* "Bericht über die Auslegung kanadischer Auster bei der Insel Aarbø, im Kleinen Belt, am 6. November 1884." From Circular No. 8, 1884, of the German Fishery Association, Berlin, December 2, 1884. Translated from the German by HERMAN JACOBSON.

When all the barrels had been placed on the deck of the small steamer we had one of them opened, and were rejoiced to find only a few dead oysters on the top; the lower layers were all firmly closed and emitted no odor. Although removed from their native element, they had successfully stood a journey of almost twenty days, and there was every prospect that when again placed in the sea they would thrive. After a sail of two hours we reached Aarøesund, where fishermen well acquainted with the locality, aided by the crew of the revenue-cutter stationed at Aarøesund, took the oysters to those places where they were to be planted under our directions. The weather was favorable. We first selected a place southeast of Aarøe, where the bottom was tolerably firm and with only a few aquatic plants here and there. Before planting 11 barrels of oysters, a boat-load of broken bricks and tiles was dumped into the water, in order to provide suitable objects to which the young oysters might adhere. The other 6 barrels were planted northwest of Aarøe, near the coast of Sleswick.

With the purpose of ascertaining the entire number of oysters, we had the contents of one barrel counted. It contained 800 oysters, and we have therefore planted about 13,000. While the oysters were being thrown into the water the ship was placed at anchor, but from time to time a little more of the chain was paid out, so that we slowly moved a little towards the east-northeast. We had a map of the Little Belt, and the places where we planted the oysters were properly marked, so that they can be found at any time without difficulty. None of the places where our Canadian oysters were planted were the same where Engineer Meyer in 1880 planted smaller American oysters.

As one barrel after the other was opened and emptied we were rejoiced to find that at most only 5 per cent. of the oysters were dead. Those which were alive kept their shells as firmly closed as if they had been taken from the water only a few days before. Some which were opened were found to be entirely free from any disagreeable flavor and tasted as fresh as if they had left the bed very recently. The North American oysters which I tasted at the Fishery Exhibitions of Berlin and London did not have as fine a flavor as these Canadian oysters. They had not been washed before packing, for their shells were covered with yellow mud. Besides this mud from the oyster-beds there were found in the barrels many shells of *Crepidula fornicata* L., a snail which is frequently found on the oysters of the Gulf of Saint Lawrence, as stated by A. A. Gould in his work, *Invertebrates of Massachusetts*, Mollusca, 2d ed., 1870, p. 202.

After we had consigned the oysters to the sea, and requested the crew of the revenue-cutter to see to it that they were not disturbed, we returned to Hadersleben in the afternoon, and in the evening had a conference with several persons who had aided us or were to aid us in the future. Early on November 7 we left Hadersleben, happy in the thought that the second attempt to plant North American oysters on

the east coast of Sleswick had been made on a thoroughly sound basis, and that healthy oysters had been planted. We must now wait patiently and see whether these oysters will not only live for a period of years in the saltiest portion of the German waters of the Baltic, but also grow, propagate, and produce a numerous offspring which will form regular beds.

If our most sanguine expectations are realized, that is, if the oysters, which undoubtedly have reached the period of sexual maturity, during the coming summer produce spawn, and if this spawn adheres to shells of the mother oysters, to tiles and bricks or other objects on the bottom of the Little Belt, and if by autumn the young oysters have reached a size such that they can easily be found, our experiment has not yet been brought to an end. The first Baltic offspring of our Canadian oysters must grow up, must reach sexual maturity, and must in turn produce offspring, and such an event can hardly be looked for before the summer of 1887 or 1888. We therefore have to wait at least three or four years before our experiment, which begins under the most favorable circumstances, will show whether the Canadian oyster will permanently thrive in the Baltic.

In conclusion I will add a few remarks as to the origin of these oysters and their transportation to Bremerhaven (the data have been kindly furnished by Mr. Rumpff), and on some of their zoological qualities.

The oysters planted by us were almost evenly divided between two varieties of the American oyster, namely, the round and the long variety, which by some conchologists are considered as two different species. The round variety is known in natural history as *Ostrea virginiana* Lister, and the long variety as *Ostrea canadensis* Brugière, or *Ostrea borealis* Lamarck. From measurements made by me it appeared that most of the shells of the round oysters (*Ostrea virginiana*) planted by us were from 80 to 100 millimeters long, from 60 to 70 millimeters broad, and from 25 to 35 millimeters thick; while most of the shells of the long variety (*Ostrea canadensis*) were from 120 to 200 millimeters long, from 50 to 70 millimeters broad, and from 20 to 37 millimeters thick. If the annual growth of the Canadian oysters progresses at the same rate as that of the Sleswick oysters, I estimate most of the oysters planted near Aarøe to be from six to twelve years old.

The long oysters had been taken from beds 18 feet deep at the mouth of the Saint Lawrence River, and the round ones at the same depth from beds in the open Gulf of Saint Lawrence. Ten barrels were filled with each of these two varieties, and by the most rapid transit, by way of Quebec and Portland, conveyed to New York, where they arrived on October 24. As the barrels were received in a somewhat damaged condition, the oysters were taken out and during the night packed by skilled persons in a better and firmer manner, so that the round oysters only filled 9 and the long ones 8 barrels. They were taken on board the Werra on October 25, and arrived in Bremerhaven on November 3.

It is owing to Mr. Rumpff that the oysters were conveyed from the mouth of the Saint Lawrence River to the Little Belt in excellent condition and in the comparatively short time of twenty days. I desire nothing more earnestly than that his disinterested efforts may be crowned with complete success, and that the Canadian oysters may thrive in the waters of the Baltic.

71.—NOTE ON THE CULTURE OF AMERICAN SALMON IN FRANCE.*

By C. RAVERET-WATTEL.

On his return from a scientific mission to Tunis, Prof. Valéry-Mayet said: "Several American salmon have during the last year been caught in the river Hérault and the river Aude, although I had not placed any in the last-mentioned river. This year some more have been caught in the river Aude, but I have not been informed of similar catches in the river Hérault. The Aude is really more favorable for the development of salmon than the Hérault. Like the river Garonne, which is so rich in salmon, it rises in the Pyrenees, and for three-fourths of its course has an oceanic climate, like the Garonne."

The secretary called attention to the transmission of eggs of the *Salmo quinnat*, the young fry of which were placed in the Hérault, where, however, none of them were found again, while some have been caught in the Aude. He thinks that it would be interesting to renew this attempt to introduce salmon in watercourses, limiting these attempts, however, to the ordinary kind (*Salmo salar*).

If the Society should share this opinion, would it not be necessary to decide at the present time what should be done when the time arrives to make this experiment? In his opinion it would be best to place the young fry not near the mouths of these rivers, as has been the practice hitherto, but rather near their sources, with the view to come nearer to the conditions of natural reproduction.

The eggs might be sent at the opportune moment for subjecting them to the process of incubation, by having an arrangement with Valéry-Mayet, professor at the Agricultural School of Montpellier, whose zealous and intelligent aid is entirely devoted to the Acclimatization Society. Prof. Valéry-Mayet should be written to now, asking him to state on what conditions he could receive an instalment of eggs with the view to their incubation and the placing of the young fry in the river Aude.

Mr. Grisard, in this connection, recalled the fact that bull-frogs which had escaped from the Acclimatization Garden had successfully propagated their species in the marshes of the Bois de Boulogne, where at this day they may be found.

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