

69.—A VERDICT AGAINST ARTIFICIAL FISH-CULTURE, AND AN ANSWER THERETO.*

[From "*Deutsche Fischerei-Zeitung*," Vol. VI, No. 15, Stettin, April 10, 1883.]

Professor Malmgren, inspector of the Finland fisheries, at the request of the Imperial Senate of Finland presented a memorial on the 20th January last to the Agricultural Commission of that body, as to the advisability of introducing artificial fish-culture in Finland, and, more especially, whether the method followed at the piscicultural establishment of Nikolsk, situated in the Government of Nowgorod, could be applied in Finland. A German translation of this memorial, printed by J. Simeli's Heirs at Helsingfors, has been sent to us. It is a remarkable document, principally because it is the first instance in the literature on fisheries of an author almost entirely denying the results of fish-culture, at least as carried on at present. Dr. Malmgren speaks freely, and without the slightest reserve, what he thinks. He has no praise to bestow, but says in other words that, as far as his experience and his information go, the results of fish-culture almost amount to nothing. His advice is, therefore, not to introduce in Finland such useless and expensive establishments, as they do not pay. Is he right? That is the question. Following his instructions, the professor first of all visited the remote establishment of Nikolsk. He there found a vast and expensive establishment for hatching millions of eggs, whilst the annual production of 100,000 to 200,000 eggs was no more than is produced by a second-rate German establishment; 100,000 to 200,000 roubles have been lost; the founder—once a wealthy man—has become a pauper, his successor became a bankrupt, and now the Government has taken the establishment, which is under the superintendence of a learned gentleman. The thing did not work, it does not work now, and it never will work. The men who founded the establishment were mere theorists who had no practical knowledge of nature. The spawning fish had to be brought a distance of 350 wersts [233 miles]; there is plenty of water in the neighborhood, but none which is suitable for the young fish. The young fry of trout and *Coregonus (maränen)* have been placed in lakes, in large numbers, just as with us; but they only became food for other fish; hardly any were caught again. No wonder: out of 100,000 embryos nature sometimes allows a few to reach maturity, but very often she does not let any reach that point, for she cannot provide the food necessary for so many mouths. The theorists never thought of this. Of what use are sterlets in a lake, or lake *Coregonus* in a river? Propagation is not to be thought of under the circumstances. Occasionally fish of some new kind were made to flourish in a lake, but not

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by placing in it young fry, but grown fish. Smelts were placed in a lake, where these fish had heretofore not been found; they flourished and increased wonderfully, but since that time the number of bleaks and other fish has been diminished, the yield of the fisheries has not been increased by a single pound, and no progress has been made; a certain proof, says the professor, of the great truth which for so long a time we have preached in vain, that a body of water cannot produce any more fish than the quantity of suitable food contained in it entitles it to. The superintendent of the Nikolsk establishment confessed to Professor Malmgren that a few hundred trout and *Coregonus* in the ponds of the establishment were the only visible result of its 25 years' existence; and that all these fish, if brought into the St. Petersburg market, would not fetch enough money to pay the expenses of the Nikolsk establishment for one year.

If we were to judge fish-culture from this establishment, we would most assuredly do better to shiver our hatching-pots into atoms, to use the wood-work of our hatching-houses as fuel in our bake-ovens, and simply leave fish and fish-culture alone. The professor, however, does not base his unfavorable opinion of fish-culture only on the above-mentioned Russian failures, but also on experience gathered by him in countries having a far higher civilization than Russia; and it must be granted that he has drawn his information from numerous sources, and that he has critically sifted all the material he could lay hold of and used it in such a manner as to serve his preconceived opinion. He refers to several articles in our journal, according to which—in spite of all reports to the contrary showing an increase of salmon in consequence of the placing of young fry in open waters—the number of salmon had materially decreased. The professor does not state, however, that in many other articles contained in our journal we have given favorable reports, and that at no time we have denied the vitality and usefulness of fish-culture, if properly managed, whilst he condemns it entirely. In reviewing the efforts made by various countries, the professor does not arrive at any more favorable result. Among the rest, the efforts made by us in Germany, especially those of the German Fishery Association, appear to him entirely futile; and as to the reports of the German Fishery Association, he regards them as rose-colored and unreliable. Truly a harsh and discouraging opinion, if the professor is right. But, fortunately, matters are not quite as bad as he makes out. Exaggerated hopes have doubtless often been based on mere accidental occurrences, and people have begun to exult too soon; doubtless, those incalculable figures which nature uses in her arithmetic of the birth and death of aquatic animals have more or less been left out of the account by many of our pisciculturists; and life and death in the water has, theoretically, been forgotten; very probably the outlay of labor and money will, even at the present time, hardly correspond to the results; but all this does not justify us in deprecating the efforts made by our Fishery Associa-

tion, and in giving up all hope of a favorable result for the future. The aristocratic and learned members of the Berlin committee are probably not all practical men in every respect; all they could do was to give a more general impetus to fish-culture; and whenever the carrying out of their theories, especially the placing of young fish, was not based on a thoughtful and persevering observation of nature and her laws, the results could, of course, not be very great. At the same time it cannot be denied—and in this respect the professor's information has been defective—that wherever practical men have taken the matter in hand, as in Schleswig-Holstein, where people go slow but sure, and without making a great noise about their achievements, highly favorable and unquestionable results have to be chronicled. The strong impetus which has been given by the committee of the German Fishery Association has most assuredly been beneficial. Results will come in time, and, as more practical experience has been gained, people will only make efforts when they are tolerably sure of success, and theoretical experiments, which lead to nothing, will be abandoned. Thousands of young fish will not be placed in waters which have the full quota of fish to which their quantity of food entitles them, unless the number of fish has previously been considerably diminished by fishing. Expensive young fish will not be placed in waters where, during the first few weeks, they must be destroyed by other fish; but the young fish will, for a year at least, be assigned some water where they are protected from their enemies, and where they will live till they have reached a sufficient age to be beyond many of the dangers which threaten them in their infancy. Young fish will only be placed in waters where, according to reliable calculations, observations, and experience, they will grow and flourish. The young fish needed will be raised artificially, and an income will be secured thereby; the results will come at last. We should endeavor to learn and gather new experience as we go on. No one will ever cease to learn—neither the committee, nor we, nor Professor Malmgren. And in order to learn this wholesome truth, a lack of recognition and a harsh criticism are what we need. We are confident that, in spite of many mistakes made by the committee (especially in the matter of legislation), and in spite of future mistakes which doubtless will be made, the self-sacrificing and disinterested activity of the committee will ultimately prove a benefit to our German fisheries. It is not only Germany which is thus severely criticised in the professor's report, but, in his opinion, fish-culture has been absolutely without results in France, Austria, Norway, and Sweden. Only as regards America and England, the professor confines himself to a statement of what has been done, without saying anything about the results, probably because unfavorable reports have reached him from these countries.

Professor Malmgren's pamphlet will—unless treated with silent contempt—make a considerable stir in Germany and Austria, and any country which has numerous hatcheries. Even at this early stage of

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the controversy we are enabled to communicate the following letter addressed to Professor Malmgren, by R. Eckardt, of Lübbiuchen :

My best thanks for your pamphlet. I fully subscribe to everything you say relative to the establishment of Government hatcheries, but I take the liberty to call your attention to another kind of Government action, which for ten years—so far, unfortunately, in vain—I have striven after: the institution of scientific stations in connection with private piscicultural establishments. There is in Europe at the present time but a single institution of this kind—the one at Naples, conducted by Professor Dohrn (only, however, for maritime purposes)—which renders great service to science, but probably would be only of small financial benefit to us. If in the various countries of Europe, differing from each other with regard to climate, we had such scientific stations for the inland waters, their scientific investigations would have a great practical result. One of the first and principal conditions of success is the practical management of affairs, which should be able to furnish the necessary material for scientific observations, and which, hand in hand with science, knows how to practically utilize, for new results and discoveries, all the achievements of science. A vast field like fish-culture cannot be properly and advantageously worked by either science or practice by itself, but needs their combined efforts.

Artificial hatching is particularly important for fish which spawn in summer, and will, if managed practically and rationally, be productive of good results in our, as to climate, favorably located waters, and our pond-culture will derive great benefit therefrom, principally with regard to carp, tench, bream, pike, etc. I can here record results which will compete with those obtained in other countries, but which simply lack the benefits of scientific investigation, which would make progress easier. Fish-culture is a vast field, which needs the scientific observations of years, to be properly studied, and be made profitable for practical life and the wants of man. When, in 1878, I asked Professor Pagenstecher, of the Heidelberg University, what was the reason why the mayfish carried so many spoiled eggs, he replied that he would be exceedingly glad to investigate this matter, but unfortunately he did not have the necessary material. This I procured for him at once, but so far, at least, I have not received an answer to my inquiry. If the German Government were to apply the sum annually required for the support of the Hüningen establishment—25,000 marks [\$5,950]—which is of no practical benefit to the establishment of one scientific station here, on my estates, the entire civilized world would be greatly benefited thereby, and scientists would soon take a greater interest in the matter. My establishment raises various kinds of fresh-water fish, and has a lake area of 400 hectares; it is not subsidized by the Government, but stands, so

to speak, on its own feet; and in spite of many expensive experiments and improvements it has been successful, and its usefulness is capable of still further extension. There is no doubt that we shall also see financial successes, for the achievement of which, however, scientific investigation will be absolutely required. As the result of all my observations I can state, from firm conviction, that the quantity of fish in any body of water suited to fish culture, can be enormously increased by stocking it with fish-spawn in due proportion to the peculiar qualities of such water, and this should not be left to accident, if any benefit is to be obtained therefrom. Every fisherman here knows this, as all of them practically carry out this idea. These people have to buy the fish-spawn, and often have to transport it a considerable distance with great difficulty, but they shun neither expense nor trouble in order that they may in later years derive a certain benefit; and they thus stock the lakes which they have bought, or which they rent—not to mention the ponds, with regard to which this mode of procedure is under stood.

If the stock of migrating salmon in the rivers cannot be controlled, this is a circumstance which will render it difficult to prove anything with absolute certainty; but we have, as is shown by the appearance of enormous quantities of salmon in the Weser and Elbe during the last years, obtained results which can be traced to nothing but the artificial stocking of the waters with young fry. It is impossible to state, in exact figures, the number of salmon annually caught near Hameln during the last twenty years, or the number of salmon annually caught near Bremen during the last three years; but the rent of the Hameln salmon-fisheries, which previous to 1862 was 900 marks [\$214.20] per annum, had in 1877 increased to 15,000 marks [\$3570], and has, as far as I know, increased still more. In the autumn of 1881 so many salmon were caught near Bremen that they sold at 50 and 60 pfennig [11 and 12 cents] per pound. This must, certainly, be considered a favorable result of the artificial stocking of the waters. Unfortunately we do not know what is done in this direction in the Netherlands. The river Oder is no longer adapted to stocking with salmon on a large scale. Artificial fish-culture and the artificial stocking of the waters with salmon and salmonoids has been accompanied by excellent results in Holstein and along the eastern coast of Germany; and the same applies to trout, and to the raising of carp in ponds. At the present time a single carp-raiser brings an entire car-load of carp to Berlin every week; and he also proposes to supply the Berlin market with large quantities of trout and sea-trout. These are assuredly favorable results of fish-culture which cannot be argued away. It is of course impossible for me to state whether such a stocking of waters with fish would pay in Finland, with whose waters I am not acquainted; but as long as I have obtained favorable results, even without the hope of a reward, as in Finland, in stocking my waters with the spawn of *Coregonus* and bream I should think that, if intelligent men would take the matter in hand in Finland, which, to judge from

the map, has a superabundance of lakes and rivers, greater results than hitherto could be obtained. Even if the fish did not fetch a very high price at home, they could be exported, if not fresh, at least smoked salted, or frozen.

If France, with whose circumstances I am but imperfectly acquainted, cannot show any great results of fish-culture, although it has been carried on here for a longer period than in any other country, this certainly must be owing to the methods which are followed. If anything is to be accomplished in fish-culture, practice must go hand in hand with science. As far as my superficial knowledge goes, the professors wanted to manage everything in France; but this will not do. What are needed are men of practical experience, who devote themselves to fish-culture intelligently and with some degree of enthusiasm.

I would recommend that if somewhere in Finland you have an intelligent landed proprietor, in some suitable locality, a private piscicultural establishment be started on his estates, and that you aid such a man, whenever he needs aid, with the light of your knowledge. Even if the immediate profit should be but small, it may increase in time. At any rate it will pay to go to all this trouble; whilst this cannot be said of a Government establishment.

64.—AN OPINION REGARDING THE ANSWER OF R. ECKARDT TO PROFESSOR MALMGREN.*

By CHAMBERLAIN von POLENZ.

Mr. Eckardt proves, by striking figures, that Dr. Malmgren is wrong, when, in his pamphlet, he says: "Germany's efforts in fish-culture, and more especially those made by the German Fishery Association, have led to no results whatever, and the reports of the committee of that association are highly colored and unreliable." In the course of his remarks Mr. Eckardt condemns all Government piscicultural establishment, in general, and that of Hünigen in particular, saying, among other things: "The Imperial piscicultural establishment at Hünigen is of no practical use whatever."

When Mr. Eckardt, a leader in matters pertaining to fish-culture, publicly pronounces such an anathema, it appears desirable for many people who take an interest in fish-culture that Mr. Eckardt should give the reasons for his view more in detail than he has done in the article referred to, in No. 15 of the *Fischerei-Zeitung*.

Stimulated by the example of the Hünigen establishment I have, since 1853, given close personal attention to fish-culture, and have with great interest followed the development of the Hünigen establishment from year to year, and have thereby gained the conviction that that

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