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78.—HATCHING AMERICAN FISH AT SOUTH KENSINGTON, AND THEIR INTRODUCTION TO ENGLISH WATERS.**By HENRY FENNELL.**

[From Land and Water, May 2, 1885.]

Thanks to the liberality of the Commission of Fish and Fisheries of the United States, visitors to the Inventions Exhibition at South Kensington have the opportunity for a few weeks of watching the hatching out of the ova of various kinds of fish which have been sent across the Atlantic to the council of the National Fish Culture Association, under whose direction the aquarium attached to the exhibition buildings has been for the last two years. Not long ago it appeared highly probable that by May 4 the breeding-troughs would be tenantless. The different consignments of eggs which had been sent from time to time had hatched out so quickly and the fry had grown so rapidly that it was found necessary to remove the latter to more suitable quarters for the rearing of the fish. Within the last few weeks, however, fresh consignments of ova have arrived, and for some time to come the troughs will contain a fine collection of eggs, representing fish hitherto unknown in English waters.

Among the eggs forwarded from time to time by the American Government are those of the lake-trout (*Salvelinus namaycush*), the rainbow-trout (*Salmo irideus*), the Atlantic or Penobscot salmon, the land-locked or Schoodic salmon (*Salmo salar* subsp. *sebago*), the quinnat salmon, the whitefish (*Coregonus clupeiformis*), and the brook-trout (*Salvelinus fontinalis*).

Referring in inverted order to the fish mentioned above, the American brook-trout is the only one of which we have had any experience as to the practicability of introducing it to our home waters; and it must be said that so far little or no success has followed the attempts to acclimatize this pretty-looking and, I believe, gamy fish. For many years past thousands of fry have been turned in from time to time to various waters, and the result may be said to be comparatively nothing. *Fontinalis* of good size are, indeed, occasionally taken here and there, but not in sufficient numbers to give evidence that they have really been established. Mr. J. T. Mann, who for several consecutive years took great pains to introduce the *fontinalis* into his fishery in Hampshire, tells me the results were most unsatisfactory. So far as he was concerned, he benefited little by the experiment. The fish appeared to have wandered up stream above his water, where some were taken, but not in any great

numbers. From others I have heard the same story, viz, the *fontinalis*, although apparently a fish suitable to our streams, appears for some reason or other not to multiply therein.

The whitefish, the eggs of which have hatched out very quickly at South Kensington, is a great commercial fish in America. They are very prolific spawners, and with the aid of artificial culture a vast amount of these fish are annually reared in the United States. Mr. Silk, the intelligent pisciculturist to the Marquis of Exeter, whose frequent journeys to America and Canada give him exceptional opportunities of studying the many questions connected with the fisheries of those countries, tells me that an extensive trade is carried on in salting these fish, which in that condition find a ready sale throughout the States. They frequent deep lakes, spawning on the shallow shores, where they lay their ova in vast quantities. Mr. Clark, of the United States Commission, has lately been making some interesting experiments in rearing whitefish in confinement, with the aid of artificial feeding. The experiments have been carried on at the Northville hatchery, where he placed in confinement 1,200 which had been hatched on March 12. In September 276 were alive and in good condition, and many of them had grown as much as 6 inches in length. They were fed exclusively on liver. The Marquis of Lorne has taken a great interest in the introduction of this fish to our English, Irish, and Scotch lakes, and at his suggestion a large consignment of eggs was lately received at South Kensington.

The fry produced from the first batch of eggs, which arrived at the aquarium some time ago, have been distributed in various places. The Marquis of Exeter turned in a vast number to his large pond at Burleigh Park, where it is to be hoped they will escape the ravages of the older inhabitants. A baby whitefish seems to be a very tempting morsel for other fish. They may, perhaps, hide themselves away among the weeds, out of harm's way, and perhaps by and by we shall hear of their establishment at Burleigh. Two batches of whitefish fry have been sent to the MacLaine of Lochbuy, with a view to stocking his waters in the Isle of Mull. The first batch, unfortunately, were all dead before they reached their destination. The other lot left London the other day, and I have not yet heard how they bore the journey. A number of the whitefish fry have been sent down to the Fish Culture Association's fishery at Delaford Park, where, under the direction of the energetic secretary, Mr. Oldham Chambers, a series of ponds have been made for rearing purposes; and I understand that the fish, which are fed on liver, are flourishing, having grown considerably since they left South Kensington. A number of fry of the other American fish have also been placed in the ponds, and are said to be doing remarkably well.

The above-mentioned fish, with one exception, as I have said, are unknown in English waters, and I think warm thanks are due to Prof.

Spencer F. Baird, the Commissioner of American Fisheries, for the great trouble he has taken and the great liberality he has shown in sending over such varied consignments of fish-eggs. They arrived in splendid condition, a fact which does high credit to those to whom the packing of the eggs was intrusted. I must make one exception as to the condition of the eggs when they arrived. This refers to a box containing ova of the rainbow-trout, which reached London last Saturday. A number of these were dead on arrival, and others have been dying off during the last few days; but I hope some hundreds will be hatched out.

The hatching and rearing of these fish will be watched with great interest; but I think the question should be closely considered as to whether the introduction of any of the above-named would really be an advantage to our home waters. It may be that in some places where the fisheries at present are of little account they would thrive and multiply, but I think that strict caution should be observed in introducing these foreigners to our salmon and trout streams, and that we must not be too sanguine of good results accruing therefrom. The cross-breeding of fish should not be done at hap-hazard, and experiments ought to be carried on with due discrimination. If we can improve on our own salmon and trout (speaking generally), well and good; but I doubt it.

79.—AN ATTEMPT TO IMPREGNATE ARTIFICIALLY THE EGGS OF
ACIPENSER STELLATUS.*

By N. BORODIN.

In 1869 Mr. Owsjanikoff, member of the Russian Academy, made the first attempt to impregnate artificially the roe of the sterlet, which at the same time was the first attempt at the artificial impregnation of ganoids, which for a long time had baffled all experiments. It was, therefore, to be hoped that success would also accompany similar experiments with larger varieties of the *Acipenser*, such as *Acipenser stellatus*, *A. güldenstädtii*, and *A. huso*, which form the objects of extensive fisheries in the Caspian Sea and the rivers flowing into it. Experiments must prove this, however, and these are of special interest, because on them would depend the practical application of fish-culture to these kinds of fish. Thus far these experiments have not been made. It is true that Max von dem Borne, in his "*Fischzucht*," states that the American fish-culturists Seth Green and Marks, in 1875, made experiments with the roe of *Acipenser sturio* in Hudson's Bay; but the description of

* "*Ein Versuch künstlicher Befruchtung des Rogens des Sternhäusen.*" From the *Deutsche Fischerei-Zeitung*, vol. viii, No. 14, Stettin, April 7, 1885. Translated from the German by HERMAN JACOBSON.