

INQUIRIES CONCERNING THE PROPAGATION OF AMERICAN SMELT AND SHAD, AND NOTES ON THE FISHERIES OF THE WASH IN ENGLAND.

By CHARLES W. HARDING, Inspector of Fisheries in the Wash.

[Letter to Prof. S. F. Baird.]

I am requested by the corporation of King's Lynn to report upon what I consider the best method of restocking the river Ouse with smelts and other anadromous fish, and shall feel greatly obliged if you will give me the following information:

I see by the printed reports of the United States Commission of Fish and Fisheries (which you were kind enough to send me in 1880), that the smelt is there called *Osmerus mordax* and *Osmerus viridescens*. The English or *sparling* being called *Osmerus eperlanus*—the word "sparling" is a local name for the smelt. Is the American smelt the same as the English smelt?

I see by the report of the Commissioner of Fisheries of Maryland, January, 1877, that the attempts at artificial propagation of smelts were unsuccessful. I have not been able to obtain any subsequent reports to see if it has since been so.

Smelts spawn in this river (Ouse) from April to the beginning of June, and I am anxious to know if it is possible to obtain the ova either from the fish direct, or from the spawning-ground, and hatch it out in gauze trays or troughs, and whether fresh water will do, or is it necessary to have the water partly salt.

I also observe in your reports that the shad is largely hatched artificially for the American rivers, the method of hatching being explained in detail. Smelts are indigenous to this river, and I am of opinion that the artificial propagation of them in large quantities would be beneficial to the fisheries. May I ask if the shad (which I was informed by Mr. Fred. Mather, at Berlin last year, was different from the English shad) would be the most desirable fish to cultivate in these waters, or would you recommend another anadromous fish?

The river Ouse is about 500 feet wide at its entrance into the Wash, running between the counties of Norfolk and Lincolnshire. The main stream is about 156 miles in length, draining an area of about 2,890 square miles, with a tidal flow of about 40 miles from its outfall. The Wash, into which the Ouse empties itself, is, as you doubtless know, an arm of the North Sea, or German Ocean, on the east coast of England, about 16 miles long by 10 miles (an average width). The saltness of the Wash water, or rather the specific gravity, is 1026½ at high water. The average (specific gravity) at the mouth of the Ouse, at high water, is about 1010 hydrometer; distilled water being 1000.

In the Wash, about fifty years ago, were enormous oyster beds; one extending nearly the whole length of the Wash and continuing outside about 50 miles. One bed in particular, which was discovered about forty years ago, being (as the fishermen state) a fathom and a half deep, with nothing but oysters. Now everything is changed; the oysters on these beds are nearly exhausted, there not having been a fall of spat for a great number of years, owing, I believe, to the low temperature of the summers, the temperature of the last twelve years not having exceeded 62° Fahr., generally under 59°, of the waters of the Wash.

The Wash is, or should be, the natural nursery for shrimps, soles, flounders, and other flat fish, but owing to the incessant practice of catching shrimps all the year round with small-meshed trawls, the mesh being barely capable (when strained) of letting a wire through, this fishery is at a very low ebb.

KING'S LYNN, ENGLAND,
April 21, 1882.

DISEASE AMONG THE SALMON OF MANY RIVERS IN ENGLAND AND WALES.*

By S. WALPOLE AND PROF. T. H. HUXLEY.

We desire to draw attention to the remarkable outbreak of a disease among the salmon of many rivers. The disease was noticed originally in the autumn and spring of 1877 in two rivers, the Esk and the Nith, which flow into the Solway Firth. It soon spread to the Eden and other adjoining rivers. In the spring of 1879 it was observed in the Tweed, when it rapidly became very serious, and in 1880, when a commission was appointed to investigate it, it had extended to the Nith, the Annan the Esk, the Eden, the Cree, and the Dee, all flowing into the Solway Firth; to the Doon and the Ayr in Ayrshire; to the Derwent in Cumberland, the Lune in Lancashire, and to the Tweed. Since then the disease has broken out in the Seiont, the Ogwen, and the Conway in North Wales, and in the Tay and North Esk in Scotland.

We have very little doubt that the disease, which first excited attention in 1877, had existed, at any rate in a sporadic form, for many years. It was stated in evidence before the late commission that Dr. Crosbie, formerly surgeon to the Challenger expedition, carefully investigated a case of the disease so long ago as in 1852. His observations will be found in the Commissioners' Report, p. 44. Other witnesses similarly

* Reprinted from a pamphlet entitled: Twenty-first Annual Report | of the | Inspectors of Fisheries (England | and Wales.) | (For the year 1881.) | Presented to both Houses of Parliament by command of Her Majesty. | London: | Printed by George E. Eyre and William Spottiswoode, | Printers to the Queen's Most Excellent Majesty. | For Her Majesty's Stationery Office. | 1882. |