

THE ARTIFICIAL PRODUCTION OF FISH

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The Artificial Production of Fish by Piscarius

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PISCARIUS

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By PISCARIUS, *pondiv.*

THIRD EDITION.



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THE

ARTIFICIAL PRODUCTION OF FISH.

THE object of this pamphlet is to make known the means by which fish of all descriptions may be multiplied in rivers to an almost incalculable extent. The principle employed is not new in theory: but it is only within the last few years that any practical application of it on an extensive scale has taken place. This application has been made in France, and with success so complete and extraordinary as to be almost incredible. Our hope is, that it will be adopted on a grand scale in this country also. In Great Britain and Ireland there are rivers and streams, lakes and canals, innumerable; and they may be made to yield annually millions on millions of fish: we say millions, and say it on good authority.

It has been remarked, that the man who makes two blades of corn grow where only one grew before is a benefactor of humanity. If this be true, and true it is, we respectfully submit that our tiny volume is worthy of the attention of the legislator, the country gentleman, and the clergyman,—for it shows how an immense addition may be made to the people's food with scarcely any expense. To persons engaged in the fishing trade in rivers, and to professed anglers, it will, we conceive, recommend itself.

I.

The manner in which most fish propagate their species is of course well known to all readers.

"No sooner," in the words of a most distinguished naturalist, "does the sun of spring begin to spread its vivifying warmth, and no sooner does its renovating and irresistible influence penetrate to the depths of the waters," than a peculiar organ develops and increases in male fish. This organ, which is double, and which extends itself in the superior part of the abdomen, almost equalling it in length, has received the name of *milt*. The milt is the seminal or fecundating liquor. It grows gradually during several months; and then softens, or so to speak, melts or ripens, as spawning time approaches. When discharged from the fish it is of a milky colour.

When the milt begins to form in the male, the ovaries of the female begin to fill with eggs, which however are almost imperceptible. These organs are two in number in the greater part of fish, but only one in the others. Confined in a membrane, they occupy in the abdomen a place analogous to that which the milt occupies in males, and are nearly equal to it in length. The eggs they contain increase in proportion as the milt becomes tumified.

As the eggs grow they cause pain and become very burdensome to the female; until at length she is obliged to relieve herself of their weight and volume. This she does by pressing her belly against pebbles, or any other hard substance at the bottom of the water. The eggs flow from her by the anus. She previously prepares a sort of hole to receive them.

Then comes the male, and by a like pressure he relieves himself of the milt, which flows also from the anus on to the eggs, and fecundates them. The fish

afterwards cover up the eggs with sand or pebbles, or leave them, and in due time the eggs become transformed into fish.

II.

The quantity of eggs which the female fish of all sorts deposit is very considerable; of some it is truly prodigious. The carp, for example, produces about a quarter of a million at a time; the perch a great many more; the trout seven or eight hundred; the salmon several hundred; the sturgeon between six and seven millions; and the pike a vast number. A very small portion of milt suffices to give life to a large quantity of eggs. It would therefore appear that nothing in the world ought to be more abundant than fish of all descriptions.

But only a very small portion indeed of the eggs come to maturity; some naturalists calculate that not one in a hundred do so. Of the rest no inconsiderable portion are devoured by other fish. The males of some species, and indeed the females too, also eat their own eggs; and a great quantity are destroyed by getting mixed with mud and dirt.

III.

It certainly seems strange that man, who has done so many wonderful things,—who has, so to speak, scaled the heavens, to learn the movements of suns and planets,—who has plunged deep into the earth for mineral treasures,—who has turned many a mournful morass, and dreary forest, and barren waste, into fruitful corn-fields or abundant pasturages,—who has made the tremendous agent, electricity itself, docile to his will,—it is strange that he, with his vast ingenuity, should never have be-thought him of taking measures for preserving the eggs

of fish, and thereby secure to himself, in all climates and at all seasons, an abundant supply of wholesome food.

Still stranger perhaps is it to find, that though he has taken immense pains to discover the secrets of nature, even in matters of mere scientific, or, if we may so say, idle curiosity, centuries passed away before it occurred to him that he might do with fish what he has done for animals, and birds, and plants,—assist and control, and improve, the operations of nature; that is to say, that, instead of leaving the female to deposit her eggs and the male his milt, and then abandon them, he might cause the female to discharge her burden, and the male his fecundating liquor, where he pleased; that he might assist them in the operation; and that for so doing he might obtain a living fish from almost every egg.

But the strangest thing of all undoubtedly is, that when he *did* learn that he could produce fish as well as the fish themselves—when scientific naturalists discovered that by casting some of the male's milt on the female's eggs fish would be brought forth, as surely as if the operation had been done by the parents in the bed of a river—it never struck him that herein was the means of increasing, a million and a million fold, the production of his lakes and rivers and streams, and reservoirs and ponds—of making, in a word, the waters as fruitful, in their way, as the land is of corn and grain.

The ancient Greeks and Romans, who paid extraordinary attention to the breeding of fish, may, to be sure, have known something of all this; but if they did, their knowledge did not descend to us, and is therefore to us as though it had never existed.

As to the means of protecting the eggs of fish from the accidents of the waters, or the voracity of its occupants, none of incontestable efficiency are described in books or known in practice; and the proof of this is,

that in France and Germany, England and Scotland, and indeed in every part of Europe, there have of late years been general complaints of the gradual yet rapid decline in the supply of various sorts of fish, not only in rivers, but on the coasts*.

With respect to what we will call the artificial production of fish—*i. e.* the taking by man of the female's eggs, and the fecundation of them by means of the male's milt, applied by him—the first idea of it was conceived no further back than in 1758. It is, we believe, to Count Von Golstein, a German naturalist, that the scientific world is indebted for this grand conception; as also for the first experiments which proved its truth. Having taken a female trout about to spawn, he pressed out her eggs, and then pressed on to them the milt of a male. After a certain number of days, he had the satisfaction of seeing young fish produced, which grew and flourished. Another German naturalist, Jacobi by name, made, a few years later, a similar experiment, with a like result; and, going a step further, he actually caused the milt to breed fish from the eggs of a *dead* female. In Italy, Spallanzani successfully experimented in a similar manner on the spawn of toads, and of certain descriptions of fish. At a later period, experiments were made with success on the eggs of salmon in Scotland by Dr. Knox, Mr. Shaw, and one or two others. And here in England the same sort of thing has been done.

But as we have already intimated, it never entered

* Macculloch mentions that in France the annual supply of fresh-water fish before 1789 was 1,200,000. It fell some years back to 700,000, and has diminished since. The decline in our own rivers is well known: and this very year we have had alarming accounts from Scotland of the falling off in salmon. The yield of salt-water fish on the English, Scotch, Dutch, and French coasts is also far from what it was.