

182.—ON APPARATUS FOR COLLECTING OYSTER SPAT.

By JOHN A. RYDER.

[From a letter to Mr. R. M. Bache.]

The sowing of shells upon the firm bottom for the fixation of spat has been the most successful method in the United States, and is now extensively practiced in the vicinity of New Haven. When the bottom is thickly covered with ooze I should counsel the use of brush stuck into the bottom, with the branched tops projecting upward into the water—or palisades of brush might be placed in such places together with garlands of oyster shells, with holes punched through them and strung on galvanized wire, and the whole supported on the brush or stakes to keep them from being buried in the mud on the bottom. Mud and sediment is of all the enemies of the oyster the very worst, especially to the young fry and spat, millions of millions of which are annually smothered and killed by it.

The detachment of the young oyster or spat from the cultch or collectors, would, I think, hardly be profitable in this country, nor do I think it at all necessary if old oyster shells are used for collectors. The shells with the adherent spat can be readily transported and sown entire, as they do not interfere with each other at all. In some cases, of course, too many young oysters are attached to one shell. In such cases it would be an advantage if some very cheap and detachable coating could be put over the shells, which could be flaked off and broken so as not to destroy the individual young. As many as one hundred oysters will sometimes stick to one valve of a clam or oyster. Then, of course, many of them will be crowded to death by the growth of others around them.

The method of sowing shells for the purpose of getting "seed" is now profitably carried on at New Haven, spat being worth 60 to 80 cents per bushel when only as large as a dime and still adherent to the old shells, which are allowed to go into the measure together with the young.

It would be worth while for some ingenious American to experiment upon the manufacture of some kind of cheap cultch for catching a set of spat, to be distributed over the bottom in the same way as shells are. The disengagement of the spat from roofing-slate is readily effected if the slates are first coated with a mixture of lime and sand which has been allowed to set thoroughly before the slates are put out into the water in nests. The "nests" are simply the series of slates as supported in a simple wooden frame to keep them off the bottom and out of the mud. In this case the coating of mortar, with the adherent spat, can easily be removed without injury to the latter.

WOOD'S HOLL, MASS., *September 21, 1883.*

REPLY BY MR. R. M. BACHE.

I agree entirely with the opinion that the practice of coating surfaces, unless the coating could be very cheaply executed, would not be profitable in this country. Obviously, the difference between this country and other countries generally, in this respect, is the same as that which in this country precludes the close culture obtaining in Europe and elsewhere in the cultivation of land. But that admitted, it still remains the fact, which Mr. Ryder concedes, that if some surface could be found or cheaply manufactured from which spat could easily be detached, a great desideratum would be supplied. I have been much impressed with this throughout my observation of this shore.

I do not find that the spat has any substance or surface of predilection. I find it uniformly distributed on twigs, bark, tin, shells, bricks, stones, &c. On all these it is closely adherent; so much so as to be inseparable without mechanical force sufficient to break the shells of the smaller animals. Thus the embryo, having run the gauntlet of currents, predatory animals, mud, sand, &c., and having reached a certain point of development, which would seem to secure a fair chance of existence to maturity, is really still engaged in as severe a struggle for existence as at first, for germ crowds upon germ, so as often to make an incrustation of two or three layers from the same season's spawning. This is inevitable; but, in considering the question from a commercial point of view, what does not seem to be inevitable is that such multitudes of spat should be destroyed in the attempt to procure seed. The destruction is as nothing compared with that from nature's action, but these animals of which I am speaking are in the merchant's hands to be utilized, and in utilizing them he destroys myriads. Putting out of the question the mere loss of individuals, this represents lost labor.

It is, then, most important that spat caught should be available, and I see in none of the surfaces adopted one which combines efficiency and cheapness. The question of the shape of the surface seems not to have attracted much attention, but it is an important factor in the problem. However, that apart, for we are concerned at present more particularly with detachability as derived from character of surface as distinct from its form, and although its character (as in the roughness of stones) is directly related to indetachability, I confine myself to fragility of surface. If, then, there can be no objection to pitch (see page 33, part 2, of the "Practical Guide," &c., by Felix Fraïche) on account of its aromatic principle, I should suppose that it would be what is required to produce fragility of surface combined with economy of preparation. At ordinary temperatures pitch makes a very brittle film, and at moderate temperatures it softens under water; even in the summer it would be brittle; in the sun it would be softish. Put on it the highest temperature convenient, so as to have the slightest film, dipped or brushed, it

would make a cheap, durable, and either fragile or soft surface.* If I have an opportunity next spring, as I expect to have, to try it, I will do so, and report the result to you as soon as the spat is large enough to make removal desirable. Comparison can then be made with removal from surfaces otherwise prepared, or natural.

GREEN CREEK, CAPE MAY COUNTY, N. J., *September 30, 1883.*

183.—TRAPPING KINGFISHERS, RODENTS, AND OTHER ENEMIES OF TROUT.

By DIRECTOR HAACK.†

The question whether large central fish-cultural establishments or numerous small ones, if possible located close to the waters which are to be stocked with fish, should be aimed at has been answered so decidedly in favor of the latter that it will hardly be necessary for me to discuss this question. I will here only cite some illustrations from my own practice, in order to give a clearer idea of the danger of concentrating large masses of fish within a comparatively small space.

It is well known that the French administration of the Huningen establishment did not devote much attention to the raising of the finer kind of food-fish, or, for that matter, of other fish, its activity mainly consisting in shipping impregnated eggs. I suppose that all are fully aware how extensively fish-eggs were shipped, and in what a liberal manner the French administration distributed entirely free the products of its establishment far and near.

When I took charge of this establishment thirteen years ago it was one of my first objects to give some attention to the raising of the finer kinds of food fish, it being my aim to transform the Huningen fish-cultural establishment into an institution where fish-culturists might study the treatment of the finer kinds of food-fish from the egg to the salable fish. One of my first steps was to construct a ditch about 1 kilometer (about 1,100 yards) in length for raising trout; this ditch, imitating as near as possible a natural trout-brook, was to receive the young trout as soon as the umbilical sac had been almost consumed. In the very first year I met with good success, as I was able to take from this ditch in autumn several thousand finely-developed trout. During the second year the result was still more favorable, because I had greatly improved the ditch. This ditch receives its water from a small trout-brook, the Augraben; the fish were invariably placed in it some time before the umbilical sac had been entirely absorbed.

* The cost of pitching surfaces and detaching spat afterwards will probably be too expensive in practice, in view of the fact that sowing shells can be so cheaply done.—
J. A. RYDER.

† *Central-Fischzuchtanstalten oder zahlreiche Kleinere Anstalten?* From Circular No. 4, 4, 1884, of the German Fishery Association, Berlin, June 30, 1884. Translated from the German by HERMAN JACOBSON.