

to procure and send me samples of plankton taken above oyster-beds and of young spat. The plankton was not successful, but the spat were satisfactory. Comparing them with some of my own from eastern Canada, I find they agree in every respect.

The full-grown larva of the Atlantic oyster was first discovered and described by the writer in 1904. Its external features, size, shape, asymmetry, high umhos, internal structure, foot, gills, and many other organs were then comprehended for the first time in the history of the subject. At the same time the other phases of the life of the larva—viz., the place and time at which it is to be found and the manner in which it may be obtained, as well as the bearing up the subject of oyster-culture—were referred to. These have all been further elaborated in my later works, so that it would now be possible to write a more complete and comprehensive account of the life-history of the oyster than has ever hitherto been presented.

The Pacific oyster agrees in all essential features with the Atlantic species. All lines of research—embryology, anatomy and physiology, environment, culture—have been investigated by the writer and have received equal attention. Before 1911 there was nothing known of it but its external features and its distribution, and these only very imperfectly. All the rest has been written by myself.

The final application of the knowledge gained from both species, so far as oyster-culture is concerned, centres in the intelligent use of cultch, or, to be still more precise, in the proper time to plant cultch. This point, although insisted on in several of my earlier works, has not yet received the attention that is its due. It takes a long time for most scientific facts, principles, or methods to filter down among the masses.

In the northern part of British Columbia I met a man working in a salmon-cannery who told me he had formerly been employed by an oyster company at Whitstable, England, and that he knew "all about the oyster." So insistent was he in repeating the statement that I ventured to ask: "Perhaps you won't mind telling me how long it takes an oyster-egg to become a spat?" He was somewhat staggered, but replied: "Oh, I don't know anything about that."

At Willapa Harbour (Shoalwater Bay), Washington, in talking to a culturist from the East, I was asked a similar question, and upon its being answered he appeared bewildered, and said: "Well, that is very different from what we have always heard."

A seed-oyster producer of New York, after having written many times, called on me. In discussing the points about which he was particularly interested he became frank in expressing his views—one of which was that "The professors have never done anything for oyster-culture and do not attack the problems that occur at the great oyster centres." I did not waste time to disillusion him. Any man in a receptive mood and seeking for information should be helped, but one so badly informed and decided in his views is beyond hope. I might have answered: "On the contrary, zoologists have done nearly everything that has been done; oyster fishermen, growers, and handlers would never have got the information; Brooks, Nelson, and others have certainly worked at the best centres; but it is not necessary to even do this; where nature unassisted produces a lavish supply there is little credit to be taken by the culturist; if good results can be obtained in poor centres it is a sure proof of the value of the method."

When I first went to Crescent and a notice of my purpose had got into the papers I was bombarded with letters asking for "private tips." These were not from oyster-culturists and I did not answer them. I am not concerned with greedy money-grabbers who are looking for unfair advantages. I care only for the subject—the gaining of correct information, the improvement of the industry, the furnishing of a larger food-supply. I write for the masses; it is their privilege to make use of or to reject my methods.

From the observation that small oysters are sometimes found attached to hard objects in the water of shallow bays and estuaries it is but a short step to the putting-out of cultch for the purpose of collecting spat. There is little use of planting cultch in autumn, winter, or early spring—it does not catch spat then. There has grown up a practice among oyster-culturists of putting out cultch at certain times in much the same way as farmers plant seeds or sow grain at certain times. Seeds planted too soon might rot before the proper conditions for their germination arrived, while if planted too late the growth might not reach maturity before the cold weather interfered. In the case of the oyster the egg and succeeding stages (which correspond to the seeds of plants) are not matured and extruded into the water until the warm weather arrives. If they were under the control of man he would no doubt make mistakes and bring about spawning at wrong times, but fortunately they are under the control of natural forces. That which is under the control of man is the power of putting out cultch at the proper time to accommodate the developing oyster. If cultch is put out too soon it is liable to sink into the soft substratum, to become covered with sediment, to be overgrown with plant or animal colonies, and to become coated with an organic slime. To such an extent may one or more of such processes take place that the available exposed surface is much restricted and the efficacy