

SESSIONAL PAPER No. 38b

2. That the relative numerical value of these year-classes exhibits great fluctuations from year to year.

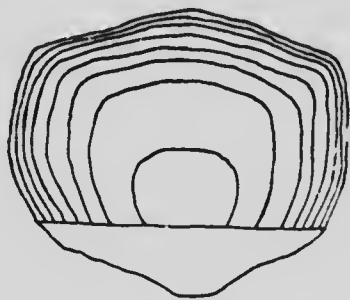


Fig. 12. A scale of a specimen of *Pomolobus pseudoharengus* (WILSON); taken off Port Credit, Lake Ontario, in the Fall 1913. The scale is drawn in the same magnification as the normal scales of fig. 11.

These discoveries resulted from the endeavour to subject the stock of these important fishes to a similar examination, and to such a survey as that universally adopted for the study of the human population (the vital statistics of a population). In a lecture delivered at the meeting of the International Council for the Study of the Sea, 1907, I endeavoured to formulate the programme for this work in the following words: "In all expositions of the science of vital statistics,¹ there are three prominent features which attract our chief consideration: (1) birth-rate; (2) age, distribution; (3) migration. It is customary to study these questions by the help of what are called representation statistics. A certain number of individuals are selected who are supposed to stand for the mass of the people, and attention is directed to them. We ascertain from this source their average length of life, their wanderings, their increase or decrease, and whether sickness, war, disaster, or emigration plays any appreciable part in reducing the population. It seems at first sight a bold suggestion to propose studying the fish supply on lines like these. A population can be counted, but who knows how many fishes are in the sea? And yet, it appears to me a project big with possibility, to regard the discoveries of fishery research from a standpoint similar to that which has been adopted in the science of vital statistics."

The methods and plan for investigating the stock of fishes along lines like these will best be understood by the consideration of examples of what has been accomplished already. Before I try to describe the first few investigations of the stock of herring from the Canadian waters, I will in spite of the risk of being obliged largely to repeat my previous publications, first give a short review of some of the results obtained through the study of the herring fisheries of Norway. I have previously described these fisheries in the following way: The herring fishery is carried on along the whole of the Norwegian coast, in the fjords, among the islands, and in the open sea off the shore. The fishermen use nets and seines, stake-nets which are anchored along the bottom or to floats, and drift-nets, which are fastened together in a chain, and drift with the boat or vessel at night. The seines cut off the shoals, either along the shore (shore-seines) or at some little distance from land (purse-seines). The nets used take only certain sizes of fish, according to the width of mesh, and nets with many different sizes of mesh are therefore employed, having regard to the kind of fish expected to be caught. The seines are of fine mesh, and can frequently take all herrings down to 7 or 8 cm. in length. It is very rarely, however, that all sizes of herring are found in one and the same haul. This is due to the fact that the different sizes of fish move in separate shoals, apart from one another. There are thus many

¹ See my paper quoted above.