

certainly have habits somewhat similar to those of our common crayfish (*Palinurus lalandii*). The females keep mostly under cover in rocky ground, no doubt as a protection for the eggs, which they carry under the abdomen; while the males wander about, frequently in considerable numbers. Male crayfish are often encountered on the march, and are then taken in great numbers. When lobsters are met with it will probably be in numbers and not singly, unless they are taken in suitable traps or lobster-pots.

*European Crabs.*—These were turned out in the sea not long after their introduction into New Zealand. These crabs cannot stand low temperatures, and in European waters they always leave the coast before winter, to find in deeper waters temperatures that are higher and more uniform than prevail inshore. The deaths which occurred among the imported crabs during the winter of 1913 were probably due to the lowered temperatures of the ponds at the hatchery. The majority of the survivors were therefore liberated, and, in addition, over thirty million ova were set free. No reports of these have ever been received, but the probabilities of their ultimate rediscovery are no doubt as great as in the case of the lobsters.

*Pilchards and Sprats.*—For considerable time past the possibility of developing a fishery of the pilchards and sprats which are found on the coast has presented itself to our minds, but it was felt that the available knowledge as to the occurrence of all native Clupeids, or members of the herring family, was very fragmentary. It was therefore felt desirable that the staff of the hatchery should make this subject a special line of work, and in August last instructions were issued to Messrs. Adams, Young, and Broadley to endeavour to obtain all possible information as to the occurrence, migrations, and life-histories of these species of fish. A herring-net, imported some years ago by the late Mr. Sullivan, was secured, and the launch has frequently been out trawling on the coast from Papanui Inlet to Blueskin Bay. Dredging was also carried on at a depth of 60 fathoms, about nine miles east of Otago Heads. Up to the present the results, as far as the Clupeids are concerned, have been disappointing. In his annual report to the Board Mr. Adams states that "So far we have not seen any number of these fish that were at a safe distance off the shore, so as to allow the trawl to be worked. Sprats were reported to be in vast numbers off The Nuggets during the latter part of January, but so far only small shoals of these fish have been seen at Cape Saunders, where they usually make their first appearance in these waters. Since January the stomachs of numbers of fish have been examined, but none contained sprats. I have always found that when the sprats are on the surface of the water they are trying to escape from the barracouta, which are attacking them. Through the summer, whale-feed has been very plentiful, and it would appear as though the barracouta are satisfied with this kind of food, as the stomachs of not only the barracouta, but also groper, kingfish, ling, and cod, contain little else but whale-feed. Our own experience with the blue cod we have in the ponds is that they prefer whale-feed to any other feed. Sprats are usually in quantity in these waters until the end of June, so we have yet time to prove whether surface trawling is the best method to secure large numbers of these small fish."

This fishery may yet prove to be of great value to New Zealand. On the 14th December of last year an interesting letter was received by the chairman from Messrs. Angus Watson and Co. (Limited), of Newcastle-upon-Tyne, dated the 24th October, in which they say:—

"As you perhaps know, there is a large industry carried on in Norway at present in the packing of fish which is locally known as "brisling," but which is really a member of the *Clupea sprattus* family, the character of the fish being influenced by the local characteristics. For some time it has been evident that the supplies of this fish were not adequate to meet the requirements of the trade, and we have been looking for another source of supply. I have been informed on more than one occasion that large quantities of a similar fish are found in the New Zealand bays or fiords, but I have never been able to get any authentic information on this subject, and very often casual observers regard supplies as important which from an industrial point of view are really unimportant. It would be very helpful to me to know whether, in fact, the *Clupea sprattus* is common to the New Zealand waters, and, if so, whether the fish are found all round your coast, or only at certain points, or at certain seasons of the year. If you can easily obtain the following information for me, I would greatly value it:—

"(1.) Are large quantities of the fish available, and, if so, do adequate facilities at present exist for catching them?

"(2.) Are the supplies seasonal or periodic, and, if not, is the fish in better condition at some periods of the year than at others?

"(3.) To what size do the fish commonly grow, stating the average length in inches from snout to tail?

"(4.) Would adequate supplies of women workpeople be available if a packing industry were established in New Zealand, and what would be the average daily wage paid to such people?

"(5.) If the fish is available, would it be possible for you to send me a small quantity packed in salt or in spirits, so that I could examine the size and general condition of the fish?

"I would hesitate to trouble you in this matter had I not felt that the industry was one which would be immensely valuable to New Zealand if it could be developed."

This letter was forwarded to you for your information and consideration. By the return mail, on the 16th December, the chairman replied at length to Messrs. A. Watson and Co., stating that there was little accurate information on the subject at present, but that investigations were being made. Question 5 was, of course, answered in the negative.

In acknowledging this communication Messrs. A. Watson and Co. wrote again on the 5th February, and stated, *inter alia*,—