

ATLANTIC SALMON.

For the trapping of Atlantic salmon for the supply of ova to the Te Anau Hatchery the usual rack was constructed in the Upokororo River and being completed on the 10th of March was entered by the first salmon on the following day. The numbers of fish taken each month during the season were as follows :—

	Males.	Females.	Totals.
March	23	14	37
April	59	58	117
May	63	95	158
June	40	62	102
July	29	52	81
August	5	7	12
September (1st to 2nd) ..	..	1	1
	219	289	508

The hatchery was supplied, to the full extent of its accommodation, with 422,000 ova, which were obtained from 156 female parent fish. Seventy-eight females escaped from the pen when an exceptionally heavy flood came over the stockade, and 133 were liberated above the rack to proceed to their natural spawning-places. The river was frequently in spate, but only one big flood, in which the river rose nearly a foot above the highest level that had been recorded for many years, caused any serious damage to the rack-structure or loss of fish.

The fry produced were particularly healthy and vigorous, and, with practically no loss during incubation, the output was estimated at not less than 422,000. The majority of the parent fish were unusually small, some being no more than 2 lb. and about half of them under 4 lb. The largest fish were among the latest of the run. 36,000 fry were liberated in the Eglinton River and the rest at various places in the Upokororo River and its tributary creeks.

The building and most of the accessories of the Hatchery at Te Anau are now in a very dilapidated condition and the question of their renewal is one that calls for early attention. There is much to be said in favour of a well-built permanent establishment of such dimensions that full use could be made of the available supply of spring-water, that is of particularly good quality for hatchery purposes.

SCIENTIFIC INVESTIGATION.

In the report on fisheries for the year 1927–28 a section under this heading appeared, for the first time, in which was briefly recorded the progress made in our understanding of the biological basis of fishery problems; and, since fishes are living organisms, every fishery problem has a biological basis, the fundamental factors of which must be understood before the problem can be elucidated or appreciated. The modest efforts that were being made in this direction were held up by lack of funds during the years of financial depression, and for the last four years this section has been missing from the fisheries report. It now reappears, with a fair prospect of becoming increasingly substantial and useful; at least that is the hope of the writer.

MARINE FISHERIES.

The fishery departments of most countries both pursue and encourage other institutions to pursue the study of marine biology, of which the natural history of food-fishes constitutes a part. They do so because it is recognized that an understanding of the nature of the many factors, both physical and organic, that pertain to the environment of fishes is necessary before one can have a complete understanding of the fishes themselves.

Science as applied to the art of fish conservation consists mainly of the study of the factors that may be classed as favourable or inimical as they affect the existence of any particular species of useful fish. Common experience has shown that, so far as our commercial New Zealand fishes are concerned, they were more abundant in the earlier days—even so recently as under twenty years ago—than they are to-day, and that fishery operations are the new factors that have come into play to account for the reduction. The systematic or scientific study of the effects of the human factor upon fish-life is therefore an important part of fishery investigation; and fishery statistics are the means whereby this line of investigation is carried on. But having, by statistical or other methods, reached the conclusion that a certain fishery is in need of regulation—which usually implies restrictions—the question arises as to the most suitable form of restriction to apply. The most suitable form is what will give the greatest help to the fish with the least hindrance or loss to the fishermen. It is here that a more purely biological understanding of the conditions is necessary, among which may be mentioned such matters as when and where the fish spawn, how long it takes them to mature, the size at which they mature, the rate of growth, and the rate of survival of the several generations that constitute the bulk of the stock. It is only on the basis of some knowledge of these matters that intelligent control of fishery operations can be attempted. With no immediate prospect of pursuing fishery research on an extensive scale, it is on these lines that our inquiries should be directed, and on these lines, with the understanding assistance of members of the fishing industry, it is possible to make