

distinct and purely marine species, and are separately shown in these statistics. In Germany not only is the eel fishery pursued on a considerable scale in the tidal waters of the great rivers and in the inland rivers and lakes, but there is also a considerable import trade. A paragraph in the *Canadian Fisherman* for June, 1927, contains the announcement that a firm in Hamburg wished to get in touch with Canadian exporters who could supply large quantities of frozen eels in boxes weighing about 100 lb. The same journal for November, 1933, gives the quantity of eels taken commercially in 1932 by the fishermen of Quebec, Ontario, and the three maritime provinces as totalling 21,476 cwt., and states that they are marketable in the fresh and frozen forms, exports to Germany aggregating 8,349 cwt., and to the United States 3,768 cwt. for the year 1932. Live eels are also exported from Canada to Germany and Holland, but there is a greater volume of trade in frozen eels.

The possibilities of developing a permanent trade in New Zealand eels depend on availability and suitability of supplies, on the cost of proper treatment and transport, and on the prices obtainable. With regard to availability of supplies, it would appear that nature has favoured us with bountiful stocks in many localities, but there are certain places and certain seasons when the maximum quantities may be caught with the minimum of effort, though in any case the provision of catching-devices—nets or traps—must be on a scale commensurate with the quantities to be handled. Line-fishing for eels is not so likely to be a profitable commercial pursuit. The most favourable time for catching quantities of eels is in autumn, when the adult fish are migrating from the fresh waters to proceed to their ocean spawning-grounds. This is when the great eel fisheries of the Maoris have been carried on for many generations. Highly interesting accounts of the details of the *modus operandi* and the remarkable sociological aspects of these fisheries in the life of the Maori may be found in papers by Elsdon Best, Hamilton, and others.\*

A brief account of eel-fishing operations observed towards the end of March, 1931, may throw some light on certain practical points. The fishing was conducted by local Maoris at the lower end of Lake Onoke (lower Wairarapa Lake). The site of the traps was a short distance above the point at which there is an outflow to the sea when the lake is open. They were hauled just before daybreak. On this occasion the catches were relatively small on account of the brightness of the moon during the night, but rather more than three large sackfuls were obtained.

In this late summer and autumn fishery in the lower Wairarapa there are four distinct classes of eels which run at their own proper time, with a certain amount of overlapping. The first run appears at about the end of February and consists of the smallest class. A belated specimen of this class was obtained and was  $17\frac{1}{2}$  in. long. The Maori name for these eels is *hau*. They are dark above and white or silvery on the underside. They are very firm and hard in condition, and are the most highly esteemed for eating. Examination of the specimen taken showed that the *hau* is the male of *Anguilla australis*. The sex organ at this stage is quite conspicuous and easily recognized. The species was identified by the typical rounded patch of teeth in the middle of the roof of the mouth and by the short dorsal fin.

The next run, which begins in March, consists of eels termed *paranui*. An average specimen measured 32 in. This is the female of *Anguilla australis*, as was identified by teeth and fin proportions. It is not so dark as the male on the back and has copper or bronze tints on its sides. The underside is whitish but more mottled than in the *hau*. The ovaries are very conspicuous but the eggs are minute, though they could be clearly distinguished with the aid of a lens. These organs have always been regarded by the local fishers, both Maori and pakeha, as consisting of fat. These fish are very much more slimy and are softer in the flesh than the *hau* eels. I was told that the name *paranui* means "plenty of slime."

About the end of March there arrives a run of a different kind of eel, which is called *riko* by the Natives. An average specimen measured  $22\frac{1}{2}$  in. in length. These are the males of *Anguilla aucklandii*. The species was identified by the elongated patch of teeth on the roof of the mouth and by the longer dorsal fin. The sex organs were similar to those seen in the *hau* eels, and, as in the case of the males of *Anguilla australis*, these fish are firmer, more silvery in coloration, and less slimy than the females.

The last class of eels to run are the *kokoputuna* which appear later in April or at the beginning of May. One early-running specimen of this class was taken at the time of my visit. It proved, as expected, to be a female *Anguilla aucklandii*, the species being identified by teeth and length of dorsal fin. The ovaries are very much in evidence and at about the same stage of development as in the *paranui* examined.

The Maori names may be only local and probably, as is frequently the case, are different in other districts. The point of interest is the occurrence of the definite migration of each sex of the two species and the opportunity it affords to take four different classes of eel, each with its distinctive character from the gastronomic point of view.

The eels taken on this occasion consisted mainly of *riko*, but there was also a considerable number of *paranui*. Only three belated *hau* eels were taken, and, as above mentioned, one early-running *kokoputuna*.

The above-mentioned facts are given to afford some basis or background for a discussion of the possibilities of developing fresh-water eel fisheries in New Zealand. From time to time various tentative efforts have been made by private individuals, and at least one company has been formed for the purpose of utilizing the eel for commerce, but these essays have not been carried beyond the preliminary trials. There must, therefore, have been difficulties and impediments to success which would need to be overcome before an established trade could be developed. As is usual in business enterprises, some of these undertakings have been carried out with as much secrecy as possible. In

\* See, for instance, Elsdon Best: "Food Products of Tuhoeland," "Trans. N.Z. Inst.," Vol. 35 (1903), and A. Hamilton: "Fishing and Sea-foods of the Ancient Maori," Bull. No. 2, Dominion Museum, Wellington, N.Z. (1908).