

gradually more numerous and larger, till we reach the ventral line, where they become very large and well raised, possessing in the posterior half a small hook turned backwards.

POSTSCRIPT, 22nd December, 1877.—The following account taken from a New Zealand newspaper about the middle of July, 1877, shows that another specimen of *Regalecus* has been washed ashore on the west coast of this island. From the short description in that paragraph it appears that the fish in question is either a specimen of *Regalecus pacificus*, or at least belongs to a nearly allied species, the main difference being that the first portion of the dorsal fin in the west coast specimen has ten spines instead of nine as in the former. It is also interesting to observe that each of the two strong ventral rays was two feet long, but no data are given from which we can conclude that they were intact:—"An extraordinary fish was picked up on the Little Waimangaroa beach, Karamea District, by Mr. Alexander McDonald, on Tuesday last, of which the following description is furnished by the Westport Times:—Length, 14 feet 4 inches; girth, 2 feet 7 inches; one dorsal fin extending from head to tail; from the top of the head there extended ten feelers, each one foot in length, and two similar appendages, about two feet in length, grew underneath the jaw, resembling in appearance the feelers of a lobster; on each side of the head there was one small fin, and the gills of the fish resemble those of a turbot; the body was of a bright silvery hue and covered with fine scales, the shape of the body being more flat than round; the eyes resembled those of a cod-fish. When found it had only recently been stranded, as it was not quite dead. This is probably some large species of frost-fish."

ART. XXXII.—*On the Habits of the New Zealand Grayling.*

By J. RUTLAND.

[Read before the Otago Institute, 5th June, 1877.]

HEARING that very little is positively known of the habits of the New Zealand grayling, I have collected information from various quarters, which, together with the results of my own observations, I now communicate.

My attention was first directed to the grayling in 1853. Being then resident in the Waimea (Nelson) I was informed that during the winter months large numbers of these fish came into a small brook which ran close to my house. This brook, about thirty feet wide, after draining part of the flat bush land of Waimea South, emptied itself into the Waiti, a tributary

of the Waimea river. Except where it passed through large swamps in the bush it consisted of a series of deep pools and shallow rapids, and was everywhere overshadowed either by the forest trees or with flax and *Veronica* bushes. In June I saw the first grayling; they came in shoals, evidently intent on making up stream,—a mixed lot of fish, the smallest from six to seven inches, the largest about twelve inches in length. A mill-dam a little higher up than where I lived prevented their progress for some days, and gave me an opportunity of capturing a great many.

I noticed that both the large and small fish contained roe, and that they had a peculiar habit of congregating in the deep water, packing themselves close together near the bottom. When disturbed they scattered, but in a few minutes again collected on the exact spot from whence they had moved. In July or August I saw a few straggling fish, apparently making down stream, but I failed to get any at that time.

On two occasions during autumn I saw grayling in the larger rivers of the Waimea, once in the Waiti near its junction with the Waimea, and once in an overflow of the latter about two miles from the sea. On both occasions the fish were in shoals, but swimming apart, not huddled together as in the brook.

Now turning to the Wairau river (Marlborough), which is in every way similar to the Waimea river, except in being larger and draining a much less wooded country, I find the grayling here with precisely the same habits. From the Onomorutu, a small bush tributary, where, during the winter months cart-loads of these fish were formerly taken, I have collected information. The appearing and disappearing at the same time of year, the crowding together at the bottom of deep shady pools, and the bulk of the fish being full of roe, correspond with my own observations in the Waimea. From this I think we may safely conclude that in this portion of the island the grayling during the winter leaves the large open rivers and enters the small sheltered streams for the purpose of spawning. But from whence do they come to reach those streams? From the sea or the upper waters of the large rivers? From the Maitai river (Nelson) I have collected information which I think may answer the question.

Mr. G. Smith, who resides on the banks of that stream five miles out of Nelson informs me that the grayling make their appearance in February, always coming up the river in shoals. They remain till the middle or end of winter and then entirely disappear. During the last three years they have become very scarce, which he attributes to the introduction of the trout. Mr. Norgrove, who formerly resided in Nelson, thus writes,—“I have taken the grayling in the Maitai, just where the tide breaks into the fresh water, in large quantities, and as much as four miles higher up, always

in shoals. About the month of March they go up to spawn. I have fished at the mouth of the same river at all seasons in the salt water and caught lots of so-called herrings, which are, I believe, a kind of mullet, but never caught a single grayling at any time. They remain about a month, and then not one to be seen higher or lower."

Notwithstanding this negative evidence obtained from Mr. Norgrove, I am still inclined to think that the grayling does resort to the sea. When I consider the small size and nature of the Maitai river, I cannot otherwise account for their disappearance during a portion of the year. From its source in Landtrap Gully to its mouth is a straight line for from seven to eight miles, running over a rocky floor the greater portion of that distance. How could immense numbers of fish such as were formerly found conceal themselves, and again, where are the small fish? No one seems ever to have seen grayling less than six inches in length, nor have the large fish been seen except in shoals.

From a still smaller stream, the Waitohi, in Picton, where grayling have been taken, I endeavoured to procure information, but could not get such as I could rely on. It is impossible to observe their habits in the large rivers, such as the Wairau, Pelorus, or Waimea, owing to their rising amongst inaccessible mountains, but wherever they have been seen it has been in shoals always making up stream.

The sea-mullet ascends the Pelorus river during very warm weather, five or six miles above the tide-way. On one occasion in the autumn in a net set for them I caught some grayling which seemed to have been swimming along with the mullet. In this river they do not enter any of the small back streams but confine themselves to the Rai Valley branch and the main stream. This may be owing to the river being surrounded with bush from its mouth to its source. They can therefore find shelter wherever they go.

Such is the information I am able to furnish. It leaves the question, Is the grayling a fresh-water fish? unanswered, but it may assist in throwing some light on their habits.

ART. XXXIII.—*Supplementary Description of Species or Varieties of Chrysophani (Lepidoptera rhopalocera) inhabiting New Zealand.*

By R. W. FEREDAY, C.M.E.S.L.

Plate VIII.

[Read before the Philosophical Institute of Canterbury, 2nd August, 1877.]

IN the last volume of our "Transactions" * will be found some "Brief observations on the genus *Chrysophanus*, as represented in New Zealand,"

* "Trans. N.Z. Inst.," IX, 460.