

II. — ZOOLOGY.

ART. X.—*On the New Zealand Lamprey.*

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[Read before the Philosophical Institute of Canterbury, 6th November, 1901.]

THE lamprey has been found in New Zealand in three well-marked stages of growth—the *Ammocætes*, the larval form, very similar to the corresponding stage in the European lamprey; the adult *Geotria*, with a well-developed gular pouch; and the *Velasia*, a form intermediate between the other two, with no gular pouch. Little is known of its life-history or habits; but in October the *Velasia* come up some of the rivers in shoals, and are caught by the Maoris for food, and the Maoris say that they come down again in December with gular pouches. Very few specimens of any stage have hitherto been preserved, but recently a large number of *Velasia* were sent to us alive from the Mataura River, up which they were making their annual migration, and as regards this stage we were able to work from the fresh material.

Both the *Velasia* stage and the adult *Geotria* were first described by Gray in 1851, and were classified by him as distinct genera (*Geotria* and *Velasia*) of the family *Petromyzonidæ*. Günther, in 1870, ranks the two forms as separate species of the genus *Geotria*; the pouched form he calls *Geotria australis*, and the *Velasia* he calls *Geotria chilensis*, since *Geotria* in the *Velasia* stage was first discovered in Chili. Recently Ogilby, in reclassifying the Australian lampreys, reverts to Gray's system of classification, and places the two forms in different genera.

Before minutely examining the animals themselves it had occurred to us that possibly, since the larval *Ammocætes* was formerly regarded as a separate genus, a similar mistake had been made in the case of the *Velasia*, which might be only an intermediate form (since it was only found in New Zealand, Australia, and Chili, where the *Geotria* was also found), and that, if *Velasia* and *Geotria* actually were distinct species, it

was impossible to account for some forms which have been found intermediate between the *Velasia* stage and the adult. Günther himself, in speaking of one such form, suggests that *Velasia* may possibly develop a gular pouch later in life, in which case the distinction between the two forms would be doubtful. Ogilby, however, as already noted, actually reverts to the idea of a generic difference between the two. The distinctions upon which the old classifications were based are merely external ones—the shape and size of the oral disc, the position of the teeth, the presence or absence of a gular pouch, and the shape and position of the fins.

In the *Velasia* stage the head is small, the oral disc is round and small, and the teeth are closely packed together in rows, whilst in the adult *Geotria* the head region is enormously developed, the oral disc being very large and flattened on the lower margin, owing to the growth of the gular pouch below it; and the teeth, which, as we have ascertained by careful examination, correspond in number and position to the teeth of the *Velasia* form, are some distance apart, owing to the growth of the disc between them. The gular pouch is, of course, only fully developed in the adult *Geotria*, but intermediate forms have been found possessing a slight gular pouch.

There is no very great difference between the fins of the *Velasia* and the adult. They are larger and situated relatively farther forward in the *Velasia*, but they change gradually with the growth of the animal, and we have a series of four specimens which exhibit the different conditions of the fins at different stages in life.

Fourteen specimens of the *Velasia* which were dissected were found to be sexually immature, males and females, whilst the only two pouched forms which we have dissected are sexually mature, or nearly so. None of the former observers appear to have examined the internal anatomy at all, but have drawn their conclusions from the external differences, probably because of the scarcity of material at their disposal.

In other respects the *Velasia* closely resembles the adult, but is longer and thinner. We could not compare the living forms, as we have not yet been able to obtain a fully grown *Geotria* alive, and we find by experiment that spirit-preserved specimens undergo considerable shortening.

As the two generic names *Velasia* and *Geotria* have been applied to the same animal, we have had to decide which to retain, and, following Günther's nomenclature, we propose to call the adult form *Geotria australis*, and to use the term "*Velasia*" to distinguish the intermediate form, just as the term "*Ammocetes*" is still used to distinguish the larva.

Thus it appears that, whereas the northern lampreys of the genus *Petromyzon* undergo only one metamorphosis—namely, from the *Ammocetes* to the adult—the southern form (*Geotria*) undergoes two well-marked changes, from the *Ammocetes* to the *Velasia*, and then from the *Velasia* to the adult, which latter represents a further stage in development never reached by the northern forms.

ART. XI.—*Note on an Entire Egg of a Moa, now in the Museum of the University of Otago.*

By W. B. BENHAM, D.Sc., M.A., F.Z.S., University of Otago.

[Read before the Otago Institute, 11th June, 1901.]

Plate VII.

FRAGMENTS of moa eggshell and more or less complete eggs have long been known, but the acquisition of an absolutely uninjured egg is of some interest, both on its own account and on account of the manner in which it was obtained. As far as I am aware, no entire egg is on exhibition in any museum. The specimen obtained at Kaikoura was injured by the pick in excavation.

The egg which forms the subject of this note was secured by a dredge-hand on the Earnscliffe gold-dredge, working on the River Molyneux, Otago.

The bank of the river is composed of very fine river-silt, and was formerly cultivated as a farm. It is so fine that when dug and dried it soon becomes reduced to fine powder, and is blown away in impalpable dust. The river, especially when in flood, scours the bank considerably, and it was after such a scouring, and when, fortunately, the dredge was not actually at work, that the egg was set free from the silt, and, floating in the river, drifted into the "well" between the two pontoons of the dredge. Luckily it was observed floating here and secured by one of the men, who also noted the hollow in the bank left by its removal, at about 14 ft. below the surface of the ground.

The egg was acquired for the Otago Museum through the kind services of Mr. Alexander Black, of Dunedin, who obtained it from the dredge-hand for £50, towards which Mr. Black himself and the Otago Institute contributed £5 each, while the balance was paid by the University.