

The inside layer is totally different, showing an irregular columnar structure, which very easily breaks up (Fig. 2 b). Sections made parallel to the surface of the egg, or at right angles to the columns, show that each column contains many, more or less complete, triangular prisms of carbonate of lime. Under a low power these prisms appear to have a radiating arrangement from a nucleus, and often there are two, three, or four nuclei in each column (Fig. 4), but under a higher power this disappears. This appearance is owing to the prisms being collected more thickly in the centre of the column, and to many of the imperfectly formed ones having a well formed apex pointing inwards, while the base of the triangle is undefined, and shades off outwards into a brush of very fine spiculæ (Fig. 5).

The prisms appear to be always triangular, and to vary in section from an equilateral to an isosceles triangle, in which the base is about half the length of one of the sides. These, however, might all be produced by variously inclined sections of an equilateral triangular prism. The length of the sides vary from very small up to 0.003 of an inch, which is the longest that I have measured.

The egg of the Kiwi (*Apteryx*) shows none of this prismatic structure, but is in every way similar to that of the common fowl, and we have, therefore, here further evidence that the Moa belongs to the Struthious type, where it has always been placed, while the Kiwi, in the structure of its egg-shell belongs to the Carinate type of birds.

NOTE, AUG. 29TH, 1871.—Since reading this paper I have found the following notice in the "Zoological Record" for 1869, part I., page 103:—"*Dinornis*.—The structure of its egg-shell is essentially similar to that of other *Struthiones*, and agrees most nearly with *Rhea*.—W. von Nathusius, *Zeitschr. wissensch. Zool.* XX., p. 118." Also on p. 104, "*Apteryx*, in the structure of its egg-shell, does not much agree with other *Struthiones*."

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ART. XXI.—*Notes on the Lizards of New Zealand, with Descriptions of Two New Species.* By Captain F. W. HUTTON, F.G.S.

[Read before the Wellington Philosophical Society, 16th September, 1871.]

THE following notes embody the results of an examination of the collection of New Zealand lizards in the Colonial Museum, which contains the types of Mr. Buller's three new species described in the *Transactions* of the New Zealand Institute, Vol. III., p. 4, etc.

Family *Scincidae*.

## HINULIA ORNATA.

*Tiliqua ornata*, Gray, "Dieff. N.Z.," Vol. II., p. 202. *Eulamprus ornatus*, Fitz.

This species varies from pale to golden brown; it is more or less spotted on the back with blackish brown, and generally has an interrupted band of the same colour on the sides; the scales of the back are streaked with black; below it is greenish, or yellowish white with black spots. The tail is thick and short, and is slightly serrated by the projecting tips of the scales. The length of the head and body is about 3 inches; of the tail 2.25 inches. It is found under stones and logs, both in the bush and in the open country.

## MOCOA ZELANDICA.

*Tiliqua Zelandica*, Gray, "Dieff. N.Z.," Vol. II., p. 202. *Lampropholis moco*, Fitz. *Hinulia variegata*, Buller, *Trans. N.Z. Inst.*, Vol. III., p. 5.

The fronto-parietal shield is divided into two, and the ears are denticulated in front in this and all the other New Zealand species of *Mocoo*, except, perhaps, *Smithii*, which I have not seen. The colours in this species are very variable. Generally the back is pale, or dark reddish-brown, sometimes greenish, generally with an irregular whitish stripe, edged below with black, from the nostrils, over the eye, down the side, and often with a darker stripe down the centre of the back. Sometimes it is pale golden brown on the back and darker on the sides, with a narrow black line dividing the colours. Down the middle of the back there is generally a shallow groove, which is deepest over the fore and hind legs.

I have examined both the specimens on which Mr. Buller founded his *H. variegata*; they both have the lower eyelid of *Mocoo*, and cannot be distinguished from *Mocoo Zelandica*. The specimen answering to Mr. Buller's description is a rather remarkable variety as regards its colours, but the other is a very common one, and differs but slightly from the typical *Zelandica*. In neither of them is the ear round, as described by Mr. Buller, but oval. This species is more common than the last, and frequents the same localities. There is a specimen in the Colonial Museum from the island of Rangitoto, near Auckland.

## MOCOA SMITHII.

*Mocoo Smithii*, Gray, "Voy. Erebus and Terror." *Lampropholis Smithii*, Fitz.

I have seen no specimens that I can refer to this species.

## MOCOA GRANDIS.

*Mocoo grandis*, Gray, "Catalogue of Lizards in the British Museum," p. 272.  
*Lampropholis grandis*, Fitz.

This species appears to vary little in colour. The length of the head and body is about 2.5 inches, that of the tail the same. The tail is short, and thick at the root. The specimens in the Colonial Museum were obtained in the neighbourhood of Wellington. It was, I believe, this species that was seen by Mr. Kirk and myself on Flat Island, near the Great Barrier Island, and also on the Little Barrier Island, and referred to by Mr. Buller (*Trans. N.Z. Inst.*, Vol. III., p. 4.)

## MOCOA STRIATA.

*Mocoo striata*, Buller, *Trans. N.Z. Inst.*, Vol. III., p. 6.

This species differs from *Zelandica* in its colours, and in having the ear circular; the palpebral disk is moderate, and the pre-anal scales are rather larger than the others.

No locality is attached to the type specimen.

## MOCOA? LAXA. sp. nov.

General characteristics as in *Mocoo*. Fronto-parietal plates 2, separate; ears ovate, open, denticulated in front with 6 rounded scales; rostral erect, triangular, rounded in front; nasal shields moderate, rather distant, inter-nasal semicircular in front, bi-lobed behind, a semi-oval inter-frontonasal shield separates the inter-nasal from the frontal; fore part of the head, including the frontal shield, depressed; eyebrow shields 5.5 elevated, rounded; palpebral disk rather large. Scales small, rather thick, smooth, loosely imbricating on the back; central pre-anal scales rather larger than the others. Length from muzzle to tail 2.5 inches; of tail 3.75 inches.

*Colours*.—Top of head pale brown, marbled with black; back and limbs pale brown, with irregular undulating transverse bands of black; tail pale brown, with three longitudinal rows of black spots, below greenish white; soles of the feet black.

The specimen from which this description is taken is in the Colonial Museum, but no locality is attached, there can, however, be little doubt but that it comes from New Zealand.

The loose thick imbricating scales on the back, and the extra inter-fronto-nasal shield, perhaps entitle it to rank as a new genus, but I have placed it in *Mocoo* until some naturalist, with greater experience than myself, thinks that it ought to be removed.

## NORBEA ISOLATA. sp. nov.

Head depressed, with a large saucer-shaped hollow on the crown; shields even, minutely granular; rostral squarish; nasal lateral, squarish; inter-nasal large, squarish, slightly emarginate on the posterior edge; fronto-nasal distinct; frontal elongated, tapering behind; eye-brow shields large 4-4, orbits granular, upper eyelid with a row of six scales; temples covered with scales; scales of the body rounded posteriorly, those of the back slightly rugose; those of the throat and belly smooth and polished. Pre-anal shield single, large, four-sided. Tail elongated, tapering, anterior half flattened above and below, with a row of keeled scales on each of the upper edges; posterior half much compressed. Limbs rather short, strong, and compressed. Front feet with the second and third toes equal, first longer than the fourth. Hind feet with the third toe rather longer than the second, first longer than the fourth. Claws 5-5.

Length from muzzle to tail, 1 inch; of tail, 1.35 inch.

*Colours*.—Above blackish brown, below blackish grey; minutely dotted all over with black; scales of the inner surface of the thighs margined with yellowish white.

This specimen is in the Colonial Museum, and is said to have been brought from White Island in the Bay of Plenty, but I have not yet been able to find out who obtained it. It differs from the genus *Norbea*, as described by Dr. Gray in the "Catalogue of Lizards in the British Museum," p. 101, London, 1845, in the remarkable depression on the top of the head, in the upper eyelid being furnished with a row of scales, and in the scales of the back being slightly rugose posteriorly. The only other known species of this genus is *N. Brookei*, from Borneo.

Family *Geckotidae*.

## NAULTINUS ELEGANS.

*Naultinus elegans*, Gray, "Dieff. N.Z.," Vol. II., p. 203. *Hoplodactylus elegans*, Fitz.

In this species the toes are very slender, and the scales on the front of the head are convex in the adult, although flat in the young. In the female the enlarged scales at the root of the tail, on either side of the vent, are much less developed than in *punctatus*. Both sexes have a small transverse patch of pre-anal pores, but no femoral pores. In colour this species varies from bright green to yellow; in spirits they are often purple, but, according to Mr. Buller, this colour is caused by the spirits. They are generally more or less spotted on the back and head, the spots being sometimes surrounded with black and sometimes not. The average length is about 4.5 inches, of which the tail occupies rather more than half.

Sub-species *stellatus*.—Stouter in its proportions, two inter-nasal shields, no pre-anal pores in the female ; (male unknown).

*Colours*.—Above reddish-purple, getting yellowish towards the muzzle. From the base of the upper lip to the ear, and again behind the ear, a white streak ; another on each side of the crown. Down each side of the back a row of six four-rayed star-shaped white spots, and on each side of the upper part of the tail a row of about ten irregular, angular, white spots. On each side a row of four rounded, or stellate white spots, and below them an interrupted band of white. Lower surface yellowish white, tinted with purple on the belly. Limbs yellowish purple, spotted with yellowish white ; feet and toes yellow.

Length, from muzzle to tail, 1.35 inch ; of tail, 1.33 inch.

This specimen is a female. It was obtained by Mr. Brough, under stones among the snow, near the top of Mount Arthur, in the province of Nelson. It is now in the Nelson Museum. This specimen differs very much from the typical *elegans*, not only in its colours, but in its stouter form, and in the absence of pre-anal pores ; but, until more are obtained, I hesitate to call it a distinct species.

The figure of *N. elegans* given in the *Transactions of the New Zealand Institute*, Vol. III., p. 4, is not that species, but *N. punctatus*.

#### NAULTINUS PUNCTATUS.

*N. punctatus*, Gray, "Dieff. N.Z.," Vol. II., p. 203. *N. Grayi*, Bell, "Voy. Beagle," Vol. III., p. 27. *Hoplodactylus punctatus* et *Grayi*, Fitz.

This species is distinguished from the last by its larger size, more robust toes, and the scales on the fore part of the head being flatter. The male, which is the *N. Grayi* of Bell, has the head concave, and a single inter-nasal shield ; a large square patch of pre-anal pores, and a triangular patch extending for some distance up each thigh. The conical scales at the root of the tail are much developed, forming short spines, and there is a large rounded swelling just behind the vent. In the female the inter-nasal shield is divided into two, the head is much more flat, only one or two of the pre-anal scales are punctured, and there are no pores on the thighs. The average length is about 6.5 inches, of which the tail occupies about one half.

In colour this species is variable, being sometimes a uniform green above and yellowish below, but usually the top of the head and the back are marked with oblong yellow or white spots ; it appears occasionally to turn purple in spirits, but generally retains its green colour.

This species is much more common than the last ; both are found in the open fern land.

## NAULTINUS SULPHUREUS.

*N. sulphureus*, Buller, *Trans. N.Z. Inst.*, Vol. III., p. 8.

This species differs from *punctatus* only in its rather larger and flatter scales, and in the slightly more elongated tail, as pointed out by Mr. Buller. The type specimen is a female.

Mr. Buller was mistaken in supposing that this specimen was obtained near Rotorua, for Dr. Hector informs me that he got it at Maketu, on the sea coast, thirty-five miles from the nearest hot spring.

## NAULTINUS PACIFICUS.

*N. pacificus*, Gray, "Dieff. N.Z.," Vol. II., p. 203. *N. granulatus*, Gray, "Catalogue of Lizards in British Museum," p. 273. *Hoplodactylus pacificus* et *granulatus*, Fitz.

The lower labial shields vary very much in this species, so that, although the difference is great between a typical *pacificus* and a typical *granulatus*, all kinds of intermediate grades can be found. The colours are very variable, and are not characteristic, as the white fronted dark bands are just as common in one variety as in the other.

This species is found in both the islands, generally under the bark of trees, but Mr. W. T. L. Travers informs me that at Lake Guyon, in the province of Nelson, it is found under stones. From the same gentleman I also learn that it is occasionally infested with a small red parasite on the inner parts of the thighs. It is exceedingly sluggish in its movements.

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ART. XXII.—*On Some Moa Feathers.* By Captain F. W. HUTTON, F.G.S.

(With Illustrations.)

[Read before the Wellington Philosophical Society, 28th October, 1871].

WHEN at Dunedin last July, I was shown by Mr. Purdie some feathers of the Moa which had been found by Mr. Samuel Thompson with moa bones, buried in sand, about fifty feet from the surface, at the junction of the Manuherikia with the Molyneux River, and quite recently some more moa feathers have been received at the Colonial Museum from Dr. Thomson, of Clyde, which were found between Alexandra and Roxburgh, eighteen feet below the ground.

The feathers from both these places are so much alike that there can be little doubt but that they belong to the same species of bird, their differences being simply due to their coming from different portions of the body. They