"Length, from snout to root of tail. . . . 5·2 inches.
„ of tail . . . . . 3·3 „
„ of head . . . . . 1·38 „

Front feet 4-toed, hind feet 5-toed; thumb with a claw. Teeth yellow. Tail scaly and covered with short stiff white hairs to the end. Nose sharp pointed. Ears long (0·6 inch), rather pointed, yellowish brown, covered with minute hairs. Back and sides light reddish brown, inclining more to yellow on the shoulders and head. Snout, throat, cheeks, belly and feet dirty white. Fur below the hair slate blue.

"This specimen was presented to the Auckland Museum by Mr. J. Thorpe, in January, 1853."

Two skins of the same species of rat as that described by Mr. Buller have since been received from Mr. Moore, who obtained them on the East Coast of the Wellington Province.—Ed.]

Art. II.—*A List of the Lizards inhabiting New Zealand, with Descriptions.*

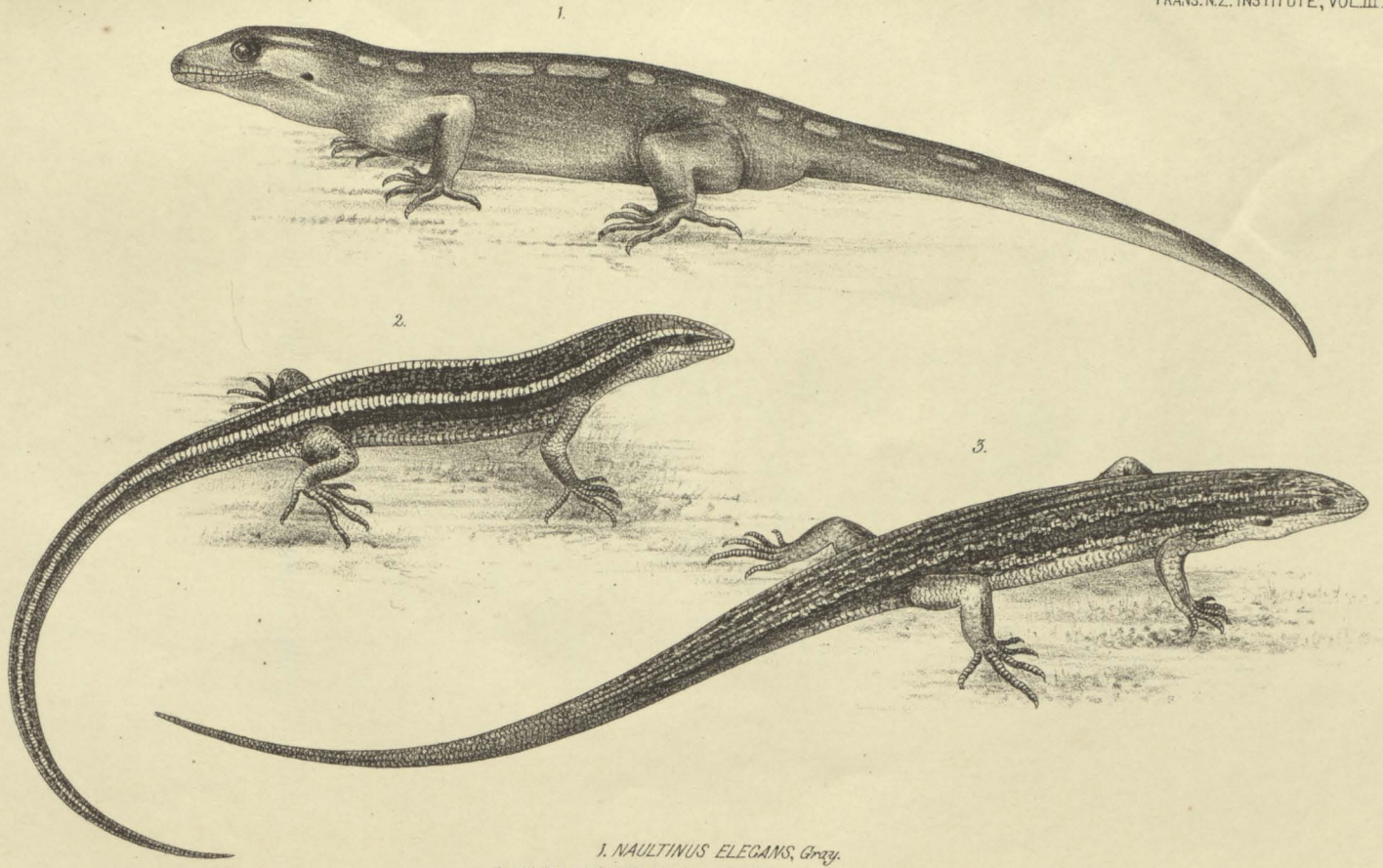
By Walter Buller, F.L.S., F.G.S.

(With Illustrations.)

[*Read before the Wellington Philosophical Society, October* 22, 1870]

As some confusion has hitherto existed in the nomenclature and classification of the New Zealand lizards, I beg to lay before the Society a list of those already known to science, with a short description of each species for the purpose of identification. I am, however, of opinion that in some instances the differences which have been accepted by Dr. Gray and others as sufficient to mark distinct species, are due either to sex or age, and are not of any definite value as specific characters. There is, moreover, among this section, a great tendency to individual variation, and mere differences of colour, unless well marked and constant, are therefore a somewhat unsafe guide in the determination of species.

Further information on this branch of our local zoology is much to be desired. The Kawekaweau, a beautiful striped lizard, sometimes attaining a length of two feet, is still undescribed. It was formerly abundant in the forests north of Auckland, and is still occasionally met with. Mr. F. E. Maning, of Hokianga, recently obtained possession of a pair of live ones, but unfortunately for science, one of them was devoured by a cat and the other made its escape. A black lizard, described by Mr. Thomas Kirk as having been seen by him on the cluster of rocky islets off the west coast of the Great Barrier, known as Grey's Archipelago, will probably prove to be a new form. Descriptions of three new species, which I have ventured to name *Hinulia variegata*, *Mocoa striata*, and *Naultinus sulphureus*, are included in the following paper.



1. NAULTINUS ELEGANS, Gray.
2. MOCOA STRIATA, Buller. 3. HINULIA VARIEGATA, Buller.

J. Buchanan del. et lith.

Printed at the Gov. Gov. Lith. Press, by J. Earle.

Genus HINULIA. Lygosma, part, *Dum. et Bib.* Le Keneux, part, *Cocteau.*

Diagnosis.—Head subquadrangular. Heel surrounded with granules.

Characters.—Frontal plate oblong. Rostral erect, triangular. Palate toothless, with a deep triangular notch in front. Body fusiform. Scales smooth, thin; the two central preanal scales larger than the rest. Tail tapering, roundish. Legs moderate. Toes 5-5, slender, compressed. Heel of the hind feet surrounded with granules.—*Brit. Mus. Cat.*, p. 74.

1. *Hinulia ornata*, Gray.

Bright pale brown, varied with black and white spots, sides with an irregular narrow pale streak above; scales with short black streaks, some black on each edge, white in the centre; ears moderate, rounded, simple edged.

A variety of this species in my possession, differs from Gray's type, in having the sides more variegated with black and white, the marginal streak on the sides distinct but interrupted, and the whole of the under parts irregularly and minutely spotted with brown. There is, moreover, a white spot margined with black between the eye and edge of upper jaw.

2. *Hinulia variegata*, Buller.

Reddish brown, beautifully varied with spots and markings of dark brown and white, disposed in regular series, and forming on the middle of the back and on the sides interrupted bands; tail dark brown, obscurely marked with paler; beneath greenish silvery, shaded with grey under the tail: form slender; tail very long and tapering; ears small, deep and rounded; toes long and slender.

Head ·6 in.; body 2·3; tail 4·4.

In one of my specimens there is a narrow line of yellowish white extending from the nostrils down the sides to the junction of the hind legs, and the dark brown of the sides is margined above with a similar line, although not so distinct.

Genus MOCOA. Lygosma, part, *Dum. et Bib.*

Diagnosis.—Rostral erect, triangular. Palate toothless.

Characters.—Head subquadrangular. Rostral erect, triangular, convex. Nasal lateral, nearly contiguous, supranasal none, frontoparietal separate or united into one. Palate toothless, nicked behind. Ears oblong, slightly denticulated in front, tympanum deep. Lower eyelid with a central transparent disk. Chin with several pairs of large shields. Body fusiform. Scales smooth, with three or four black streaks. Limbs 4, strong. Toes 5-5, compressed, unequal. Tail round, tapering, unarmed. Central preanal scales rather larger than the others.—*Brit. Mus. Cat.*, p. 80.

3. *Mocoa Zelandica,** Gray.

Pale brown, bronzed, with two narrow black edged bright streaks on each side, the lower one continued down the front of the legs; sides blackish; the fronto-nasal nearly contiguous, the fronto-parietal separate, similar to the parietal, nasal nearly contiguous; ears moderate, nearly circular, simple edged; pre-anal scales nearly equal; palpebral disk moderate.

Mokomoko of the natives.

4. *Mocoa Smithii*, Gray.

Pale brown, with three indistinct series of black spots and a pale streak on each side; sides black, varied; beneath whitish; limbs black spotted; nasal and fronto-nasal nearly contiguous, fronto-parietal and parietal nearly equal; ears open, simple-edged; pre-anal plates nearly equal; disk of the lower eyelid very large.

5. *Mocoa grandis*, Gray.

Black, closely yellow spotted, forming interrupted streaks; beneath whitish; soles of the feet black; ears rather large, roundish, with some granular scales in front; fronto-parietals distinct; disk of lower eyelid moderate, sub-central.

6. *Mocoa striata*, Buller.

Dark brown, obscurely marked with black and with two rows of small equidistant spots of white. From each side of the crown a broad stripe of white passes down the back and tail, leaving on the latter only a narrow, intermediate stripe of dark brown. These dorsal bands are narrowly margined above with black, and are succeeded below by an equally broad and distinct stripe of dark brown, which, commencing behind each eye, passes down the sides and widens on the tail. Beneath pale brown, spotted with darker, except on the chin which is almost white; fore feet brown, with an indistinct white stripe down the front; hind legs brown, obscurely spotted with white; tail slender and tapering; ears deep and round.

Head ·5 in.; body 2·2; tail 3·3.

Genus NAULTINUS. *Gray.*

Characters.—Toes free, base rather dilated, thick, rather compressed, end thinner, rather compressed, arched, clawed. Thumb similar, but its base shorter, clawed. Tail cylindrical, tapering, covered with granular scales. Body with a slight fold along each side beneath. Males ? with two or three spines on each side of the base of the tail, and three or more transverse series of preanal pores, forming one and sometimes two patches.—*Brit. Mus. Cat.*, p. 169.

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* *Hinulia ornata* and *Mocoa Zelandica* are the two species commonly described as *Tiliqua ornata* and *T. Zelandica*. Specimens of both are deposited in the Colonial Museum.

7. *Naultinus pacificus*, Gray.

Pale brown with irregular dark brown cross-bands and a dark streak on each side; front lower labial shield very large; the chin granular; scales uniformly granular, rather larger before and behind the vent.

The Common Tree Lizard. Moko-Papa of the natives.

8. *Naultinus elegans*, Gray.

Green, rather paler beneath; back sometimes varied with dark-edged white or yellowish spots; lower lips white; toes moderate; tail with a transverse series of compressed scales at each side of the base.

Green Lizard of the colonists. Kakariki of the natives.

Very beautiful varieties of this lizard are sometimes met with. A specimen, in the collection of the British Museum, has "a streak along the under lip, the ears, two arched stripes on the top of the head, irregular shaped spots on each side of the back and hind legs, an interrupted streak along each side of the body and tail, white, with a narrow black edge."

In some specimens there are only faint indications of these markings, while in others there is merely a lunate spot of pale yellow on each side of the crown. An example which I obtained many years ago, at Kaipara, had a stripe of golden yellow down the centre of the back, and a double series of transverse elliptical spots, on a ground of delicate pea green. A live specimen which I kept for several months, and which presented only a few obsolete yellow marks on the back, gave birth to three young ones, each differently marked but all having the double series of bright dorsal spots.

The purplish tinge noticed by Dr. Gray, in his description of the young, is only discoloration caused by the spirits. In fresh examples the green, although of different shades, is always pure.

This lizard, on being molested, emits a peculiar chattering sound, which the natives term "laughing" (*kata*), and of which they have a widespread superstitious dread. The "laugh" of a green lizard is enough to terrify the bravest warrior, and its occult power for evil is strangely believed in by all the tribes in every part of the country. The reptile itself, whether dead or alive, is an object of universal fear among them. Sir George Grey, in his very interesting *Account of an Expedition through the Interior*, 1849–50, states:— "I have seen twenty or thirty able-bodied men fly in a state of the most abject fright, and even take to the water, when pursued by a child with the dead body of a common green lizard in its hands."

9. *Naultinus Grayii*, Bell.

Green, paler beneath, sometimes varied with white spots; toes elongate; tail with four ovate, convex scales, forming an arched series on each side of the base.

In characterizing this species, as distinct,* Mr. Bell remarks that it greatly resembles *Naultinus elegans*, but adds:—"Upon a comparison of the two however, I find that they differ in the following particulars. In the present species the head is concave between the eyes and forwards nearly to the snout; in the other this part is quite plain; the scales of the head in this species are flat; in the other they are convex. The colour of this species is uniformly green, whereas *N. elegans* has several markings of a yellow colour, each distinctly bordered with black." In the *Cat. Brit. Mus.*, Dr. Gray records an example of this species, from Mr. Egerley's collection, as being "green, with three ovate white spots on each side of the back."

10. *Naultinus punctatus*, Gray.

Dark green, with very small scattered black specks, the size of a granule; beneath yellow-green; pre-anal pores in a triangular patch, with two series of pores under each thigh.

11. *Naultinus sulphureus*, Buller.

Uniform colour bright sulphur yellow, darker on the upper parts; abdomen bounded on each side by obsolete spots of paler yellow, dotted with black on the margins. There is a similar obsolete mark, 3 lines in extent, on each side of the crown. Soles of the feet pale brown. The granular scales are larger and more smoothly set than in *N. punctatus;* abdominal and pre-anal scales also larger. Interior of mouth dark blue.

Total length 6½ inches. From extremity of lower jaw to the vent 2·9 in.; thence to extremity of tail 3·6.

Hab.—Rotorua, North Island.

This fine species was discovered by Dr. Hector, during a visit, in company with His Excellency Sir George Grey, to the hot springs, Rotorua, in 1866. The original specimen is now deposited in the Colonial Museum, but it has unfortunately become partially discoloured. Other examples of this rare lizard have since been obtained.

The discovery is an interesting one, because it affords a fresh example of that mysterious natural law which adapts the colour of certain animals to the character of their habitat, for purposes of concealment and defence. This bright sulphur-coloured lizard lives in a region remarkable for its solfataras, silicious deposits, and sulphur crusts. Dr. Hochstetter, in his graphic account of the Rotorua Lake district, informs us that all around Pohuteo there are extensive sulphur deposits, and that in Arikiroa Bay, the yellow hue of the sulphur crusts which cover the ground, is visible at a great distance. He describes Tikitere as a whole valley of solfataras, bubbling mud pools, sulphur ponds, and hot springs, the ground around being covered with silicious

* *Zool. "Beagle,"* Rept. 27, t. 14, f. 2.

deposits and sulphur crusts, and the atmosphere impregnated with sulphuretted hydrogen.

The law of assimilative colouring, which, by affording protection to otherwise defenceless species, plays an important part in the struggle for life that is ever going on around us, is thus exemplified in the present instance.—The bright green tints of *Naultinus elegans*, enable it almost to defy detection amidst the evergreen foliage of *Leptospermum* and other shrubs; the marbled brown skin of *N. pacificus* is peculiarly adapted for concealment, as it clings motionless to the bark of a tree or hides in the crevices; and, in like manner, the colour of *N. sulphureus* seems specially fitted for a lizard inhabiting a sulphur-crusted and pumicestone region like the one described by Hochstetter.

12. *Naultinus granulatus*, Gray.

Pale brown, with irregular darker cross bands, with white edges in front; scales granular, moderate, those of under side larger; labial shields gradually smaller.

This species was originally noticed by Dr. Gray (*App. Dieff. N.Z.*), as a mere variety of *Naultinus pacificus*, but he has since admitted it to a distinct rank. The form appears to me of very doubtful specific value.

Naultinus brevidactylus and *N. maculatus* (Gray, MSS.) are probably mere varieties of the typical species, which is subject to much variation.

Genus Sphenodon.

13. *Sphenodon punctatum*, Sclater (= *Hatteria punctata*, Gray).

Olivaceous brown; sides and limbs with minute white specks; beneath yellowish grey; the spines of the nuchal and dorsal crests yellow, of the caudal brown; scales of the back, head, tail and limbs small, granular, nearly uniform; the irregular folds of the skin fringed at the top with a series of rather large scales; an oblique ridge of large scales on each side of the base of the tail, and a few shorter longitudinal ridges of rather smaller ones on each side of the upper part of the tail.

The sexes vary both in size and colour. The male is considerably smaller than the female, and the skin is of a brighter olive, yellowish on the under parts.

In the *Philosophical Transactions* for 1867, there is a very elaborate and exhaustive paper by Dr. Albert Günther, on the anatomy of this species; and an interesting paper on the same subject, by Dr. Knox, appears in the *Transactions of the New Zealand Institute*, 1869.

This is the Tuatara or Tuatete of the natives. I had a pair of live ones in my possession for many months, but could never induce them to eat. They were sluggish in their movements, and when molested uttered a low, croaking note. The male measured 13½ inches, and the female 16 inches. They were

obtained on the small island of Karewa, in the Bay of Plenty, where this large lizard is still very plentiful, although it is well-nigh extinct on the mainland. Mr. Gilbert Mair, from whom I received them, furnished the following interesting notes:—"It was just daylight when we reached the island, and the Titis and other birds poured out of their nests underground in thousands. The whole place is completely honeycombed with their burrows, and you cannot move two steps without sinking to the knees in them. The tuataras are very plentiful. They live in holes under the big rocks, and can be only got at by digging. I suspect that, during a part of the year at least, they subsist largely on birds' eggs."

Mr. Sclater, the Secretary of the Zoological Society, in an article contributed to *Nature* (June 23, 1870), notices the acquisition, by purchase, of a living example of this remarkable lizard, and refers to it as the only one that had reached England alive since the publication of Dr. Günther's admirable paper in the *Philosophical Transactions* (Part ii., 1867). This is evidently a mistake; for in the early part of last year, Dr. Hector forwarded, under care of Sir George Grey, a pair of live tuataras (male and female), one of which reached the Zoological Gardens in safety, and was afterwards figured in the *Illustrated London News*. These specimens were obtained by Mr. Gilbert Mair, together with those sent to me, on the Island of Karewa, above referred to, which he describes as distant about nine miles from Tauranga, about two acres in extent, and composed of large masses of scoria loosely jumbled together.

The Bay of Plenty natives assert that those found on the Rurima Rocks are of a different kind; and Mr. Mair adds, of his own knowledge, that those inhabiting East Cape Islet, about fifty miles to the eastward of Opotiki, are of a "bright green colour."

This reptile, which differs in some important structural characters from every other known saurian, and in its osteology is the most *bird-like* of extant lizards, was first described and figured by Dr. Gray under the name of *Hatteria punctata*, and has been generally designated so till lately, when (as Mr. Sclater informs us) "it was most fortunately discovered, that the generic term of *Sphenodon* had been previously applied to a specimen of its skull in the Museum of the College of Surgeons." This term has accordingly been substituted for *Hatteria*, which Mr. Sclater denounces as "vile and barbarous."

All the New Zealand genera of lizards have been re-named by Dr. L. J. Fitzinger, of Vienna, but I have thought it best to adhere to Gray's nomenclature. To prevent further confusion, however, I will give here the generic equivalents, viz.:—*Eulampus*, Fitz. = *Hinulia*, Gray; *Lampropholis*, Fitz. = *Mocoa*, Gray; *Hoplodactylus*, Fitz. = *Naultinus*, Gray. I ought also to mention that I have omitted from my list, a species of "house-gecko," described by

Dr. Fitzinger, as from New Zealand, under the title of *Dactylocnemis Wullerstorfii*—so named in compliment to the Commander-in-chief of the "Novara" Expedition. I have not been able to obtain Dr. Fitzinger's description of this species, but it is very certain that there is no house-gecko indigenous to New Zealand.

Lampropholis moco, Fitz., is identical with *Mocoa Zelandica*, Gray.

[*Errata*, page 5 :—Insert in *Diagnosis* of
HINULIA,—"Lower eyelid covered with scales."
MOCOA,—"Lower eyelid with a transparent disk."]

ART III.—*Critical Notes on the Ornithological portion of "Taylor's New Zealand and its Inhabitants."* By WALTER BULLER, F.L.S., F.G.S.

[*Read before the Wellington Philosophical Society, September* 17, 1870.]

IN offering to the Society some critical notes on the Rev. Mr. Taylor's recently published account of the New Zealand Birds,* I need scarcely say that I am actuated solely by a desire to serve the cause of Truth, which is the foundation of all human science. Mr. Taylor has devoted much labour and research to many of the subjects treated of in his book, and deserves thanks rather than criticism at the hands of his fellow colonists. But, as the reverend author will himself admit, it would be injurious to the interests of science, to allow his mistakes in describing the Ornithology of New Zealand, to go forth to the world uncontradicted. Indeed, to make a practical application of this truth, had some friendly critic reviewed the Natural History portion of Mr. Taylor's first edition of the work, published in 1855, it would have prevented the reproduction of some very flagrant errors in the new edition, fifteen years later. Moreover, I feel sure that my esteemed friend, Mr. Taylor, will, as a true lover of science, receive my critical remarks in the same spirit as that which dictates them.

1. The number of ascertained species belonging to the New Zealand Avifauna, is stated by Mr. Taylor at 136. Our last published lists contain the names of 160, a few of which, however, are of doubtful specific value.

2. The Koekoea (*Eudynamys taïtensis*) does not, "as is said by some," hibernate in New Zealand by "burying itself in the mud at the bottoms of rivers," but migrates to the warm islands of the South Pacific. The form of its wings is sufficient to determine the migratory nature of this bird.

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* *Te Ika a Maui; or, New Zealand and its Inhabitants.* By the Rev. Richard Taylor, M.A., F.G.S. London: 1870.