

II.—ZOOLOGY.

ART. XXX.—*Notes on the Tuatara Lizard (Sphenodon punctatum), with a description of a supposed new species.*

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[Read before the Wellington Philosophical Society, 29th July, 1876.]

THE earliest mention of the Tuatara occurs in "Polack's New Zealand" (1838), where it is stated that a gigantic lizard or guana is found in the isles of the Bay of Plenty, and that "the natives relate ogre-killing stories of this reptile.* It was not, however, till five years later that any authentic account was obtained respecting it. This was furnished by Dr. Dieffenbach, the naturalist sent out by the New Zealand Company, who in his "Travels in New Zealand," Vol II. (1843), p. 205, thus announced its discovery:—"I had been apprized of the existence of a large lizard, which the natives called Tuatara or Ngarara, as a general name, and of which they were much afraid. But although looking for it at the places where it was said to be found, and offering great rewards for a specimen, it was only a few days before my departure from New Zealand that I obtained one, which had been caught at a small rocky islet called Karewa, which is about two miles from the coast in the Bay of Plenty. From all that I could gather about this Tuatara, it appears that it was formerly common in the islands; lived in holes, often in sand-hills near the sea shore, and the natives killed it for food. Owing to this latter cause, and no doubt also to the introduction of pigs, it is now very scarce, and many even of the older residents of the islands have never seen it. The specimen from which the description is taken I had alive, and kept for some time in captivity. It was extremely sluggish, and could be handled without any attempt at resistance or biting." This specimen was presented by the discoverer to the British Museum, where it still is (as Dr. Günther informs us) in the most perfect state of preservation. It was described and figured by Dr. Gray, who recognized it as the type of a distinct genus, referring it to the family of *Agamida* and

* The "monstrous animal of the lizard kind" mentioned in the diary of Mr. Anderson, the companion of Captain Cook, on the authority of the Maori boys who joined the expedition at Queen Charlotte Sound, was no doubt the fabled monster, or Taniwha of the Natives. ("Cook's Third Voyage," 2nd edit., 1785, Vol. I., p. 153.) Native tradition has always ascribed to this mythical dragon the form of a lizard.

naming it *Hatteria punctata*, by which name this lizard has since become generally known. It was lately discovered, however, that a skull of this reptile (whence obtained it is not stated) existed in the museum of the Royal College of Surgeons, to which the generic term *Sphenodon* had previously been applied. The familiar name of *Hatteria punctata* had accordingly to give place to the less barbarous one of *Sphenodon punctatum*.

The anatomy of the Tuatara has been made the subject of a very able and exhaustive memoir by Dr. Günther, published in the "Philosophical Transactions of the Royal Society" (1867). The learned author claims for this New Zealand form, which differs in some important structural characters from every other known Saurian, and in its osteology is the most *bird-like* of existing reptiles, a higher rank than that of a family, and proposes to make it the type of a distinct order of Reptilia, equal in systematic value to the ophidians and crocodilians. He points out that the crocodiles are removed from the lizards into a distinct order or section, on the ground of osteological characters as well as on account of the higher organization of their soft parts; that in *Sphenodon* the modifications of the lacertian skeleton extend to the same parts as in the crocodiles, although they are frequently of a different nature; and that the repetition of lacertian characters in its soft organs is in some measure counterbalanced by the absence of copulatory organs. The presence of a double bar across the temporal region, the intimate and firm connexion of the os quadratum with the skull and pterygoids, the erect ilium, and the uncinatè processes of the ribs, are characters by which a tendency towards the crocodilians is manifested; while the affinities of *Sphenodon* with the true lizards are far more numerous and of greater importance, as shewn by the structure of the heart, of the organs of respiration and digestion, the absence of a diaphragm and of peritoneal canals, the transverse anal cleft, the absence of an external ear, the free tongue, etc. Yet to associate it with the lizards would entirely destroy the unity of this natural group; and Dr. Günther, therefore, proposes a modification of Stannius' division of recent Reptilia, adding the characters which distinguish *Sphenodon* from all other known Saurians, and assigning it the position of a third order in the first division (*Squamata*), under the name of *Rhyncocephalia*.

In his concluding observations, he remarks that the skeleton of the Tuatara—"with its amphicælian vertebræ and abdominal sternum on the one hand, and its highly-developed osseous skull and uncinatè apophyses of the ribs on the other—presents a strange combination of elements of high and low organization; and this is the more significant as this peculiar animal occurs in a part of the globe remarkable for the low and scanty development of reptilian life."

For many years after the discovery of the *Sphenodon*, by Dr. Dieffenbach, it was almost unknown in European Museums, although a few more specimens were forwarded to the National Collection by Dr. Knox and Captain Drury; and even as late as 1867, Dr. Günther writes:—"Evidently restricted in its distribution, exposed to easy capture by its sluggish habits, esteemed as food by the natives, pursued by pigs, it is one of the rarest objects in zoological and anatomical collections, and may one day be enumerated among the forms of animal life which had become extinct within the memory of man."

In December, 1851, Dr. Thomson, of the 58th Regiment, and a party of officers, visited the Island of Karewa, in the Bay of Plenty, and, in the course of an hour, collected nearly forty of these lizards of all sizes, the largest being about two feet in length. The island was swarming with the little scaly lizard called Mokomoko (*Tiliqua zealandica*), and a number of these also were collected. An interesting account of this expedition appeared in the *New Zealander* newspaper at the time, and it was stated therein that, at the end of the return voyage, on opening the box containing the captives, it was found that they had eaten up all the Mokomokos, leaving nothing but the horny tips of their tails!"

Few of these specimens appear to have been preserved, for the *Sphenodon* continued to be an extreme rarity in English collections, and down to 1870 there was not, I believe, a single example in any American or Continental museum.

Since that date, however, attention has been directed to the island home of the Tuatara, and a considerable number of specimens have been from time to time secured and distributed among the local museums or sent to England.

One obtained by Captain Mair on the Rurima Rocks and sent home by Sir George Grey is, I believe, still living in the Zoological Society's Gardens, where I saw it occupying the same cage, in perfect amity, with some Australian guanans in the new reptile house.

A pair which I received from Captain Mair in 1869 were noticed in a communication to this Society on the 22nd October, 1870.* These were in my possession for many months, but I could never induce them to eat. They were sluggish in their movements, and, when molested, uttered a low, croaking note. The male measured thirteen and a half inches, and the female sixteen inches. They were obtained, like the rest, from Karewa Island, and my correspondent sent the following notes with them:—"It was just daylight when we reached the island, and the Titi and other birds

* "Trans. N. Z. Inst.," Vol. III., p. 9.

poured out of their nests underground in thousands. The whole place is completely honey-combed 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 only be got out by digging."

Since that date, however, the Tuataras have become very scarce on the island, and require to be closely hunted for. Captain Mair attributes this scarcity in a great measure to the large Hawk (*Circus gouldi*), which of late years has become naturalized there, and subsists almost entirely on these lizards and their young.

In April last Captain Mair again visited the Island of Karewa, and succeeded in capturing seven fine specimens of the Tuatara, all of which reached me some weeks afterwards, in good order and condition. Two of these I presented to the Canterbury Museum. Two others I exchanged with the Colonial Museum for specimens from The Brothers; and the rest are still in my possession.

The largest of these (a female) measures exactly eighteen inches in length. It is stouter in the body than any other specimen I have seen; and, judging by the heavy nuchal folds, and by the flattened and worn condition of the dorsal spines, I take it to be a very aged Tuatara; how old it is impossible to say. Besides the natural indications of age I have mentioned, the crown of the head is deeply scored and scarred, the marks of old wounds, showing that this Tuatara, at any rate, has done some hard fighting in its day. One of the specimens which I sent to the Canterbury Museum (a medium-sized male) was remarkable for the extreme smallness of the dorsal spines, which were reduced to a line of mere points along the back.

Before proceeding, I may be allowed to quote a passage from Captain Mair's very interesting letter, which accompanied the specimens:—

"I have observed some interesting habits of the Tuatara lately. I think they must live to a great age. You will observe that one of those I am sending you, the largest of them, has some scars on his head and back, I think he must have got them in fighting with the sea-birds in their nests or burrows. Karewa Island is the breeding-place of millions of the small black sea-bird called 'Oi' by the Natives; a sort of petrel. The *Sphenodon* comes out of its burrow to bask in the sun, or to listen to any strange sound. I crept up to some which were listening most intently, with spines erect and head elevated at the sound of my voice. Upon my making too much noise, they at once made for the nearest burrow, and disappeared, the young sea-birds, occupying the burrow, fighting with and expelling the unwelcome intruder by pecking it most unmercifully. The Tuatara generally makes its own burrow by digging out a long hole under some flat rock. During the early

part of the day it may be seen cautiously peering out of its hole, apparently waiting to pounce upon a fly, grasshopper, or perhaps some smaller lizard. I noticed that the excrement contains portions of grass and leaves undigested, legs of grasshoppers, spiders, and a small oval-backed black-beetle, which is found in great numbers in the sand and earth on the sea shore. A few months ago I caught some Tuataras on the Rurima Rocks. At the same time, I put a number of small lizards (*Naultinus pacificus*) into the box with them. There were at first about 20. I observed that these diminished every day, till at last only six were remaining, and these appeared quite paralyzed with fear. For, whenever the *Sphenodon* made a movement, the poor little creatures would crouch down and try and hide themselves under the dry leaves in the box. I watched the box very carefully, and at length found a Tuatara in the act of eating one of the small lizards. He had crushed it quite flat, beginning at the head, and rejecting about an inch of the tail. At the bottom of the box I found about a dozen tails. There were four or five little Tuataras about three inches long, but none of these disappeared. I generally found them perched on the heads of the big ones, asleep!

“Regarding the probable age to which these funny creatures live, I should have mentioned that I have seen an unusually large one which has been kept in an old kumara pit on Flat Island (Motiti) for over three generations. Could the old fellow only speak, what an interesting account he might give us of the fight on ‘bare Motiti,’ when the famous *tohunga*, Te Haramiti, and 170 of his warriors (the Ngatikuri) were killed and eaten by the Ngaiterangi, under the leadership of Tupaea! He may even have been an eye-witness when Tikiwhenua ‘shuffled off this mortal coil’ by blowing himself from the mouth of a gun, fired by his own red hand! You will not easily forget Judge Maning’s graphic description of this original suicide in ‘Old New Zealand.’”

I have only to add that, out of 26 small lizards (*Naultinus*), put into the box with the Tuataras, to supply them with food, only two were surviving when the consignment arrived in Wellington; and that, after this cannibal feast, the Tuataras have fasted for three months without any apparent discomfort, and certainly without becoming emaciated in the body. I have tempted them with earth-worms, insects, and minced meat, but they seldom touch any of this food. They are fond of water, however, drinking freely, and continually bathing their bodies in the open vessel.

In Vol. III. of the “Transactions,” pp. 151-153, will be found some very interesting notes by Major W. G. Mair, on the Rurima Rocks, a group of islets situated about four miles from the mainland, and five or six miles north-east from the entrance to the Awaateatua river, in the Bay of Plenty.

In his description of one of these islets, Moutoki, he says;—"It is on a cone-like hummock rising from its centre that the Tuatara (*Sphenodon punctatum*) is found. The area of this cone is not more than half an acre, and yet the Tuatara exists and has existed for ages in this limited preserve. Tradition says that they were plentiful on Whale Island, but does not account in a satisfactory manner for their extinction. * * In a few minutes we caught four Tuataras (the largest of which I forwarded to Mr. Kirk, the Curator of the Auckland Museum). They were found basking on the rocks and in holes in the loose soil. Whether these holes were the burrows of sea-birds or had been scraped by the lizards I could not tell. In one instance we found a Tuatara and a young Penguin in the same burrow. The Maoris, as a rule, have a perfect horror of lizards, and associate them with death or disaster; but a couple of Uriwera lads, who formed part of my crew, proved superior to superstitious influences, and pulled them out bravely, receiving, however, sundry sharp nips for their temerity. It is believed by some that the Tuatara feeds, for a portion of the year at least, on the eggs of sea-birds, but I could never coax one to eat an egg. From an examination of their excreta, I am of opinion that their food consists of insects, more particularly a shining black beetle about half an inch in length, with a longish neck, small head, and fluted elytra. It is commonly found under stones and old wood."

I think it is pretty evident that the Tuataras excavate their own burrows, or at any rate adapt existing cavities to their wants by that means, for I have observed that my captives are particularly fond of scraping and digging in the earth at the bottom of their cage.

They are very sluggish in their movements, but may be roused to activity by being rubbed or tickled in the ribs, when they wriggle violently, and sometimes utter a low rasping note.

The Tuataras to which the above notes refer have all, as already stated, been obtained on the rocky islets in the Bay of Plenty. Within the last few months, however, a considerable number of these lizards have been obtained on the Brothers Islands in the vicinity of Cook Strait, by the expeditions engaged in the erection of the Government lighthouse there. Over 20 specimens of all sizes (from the young measuring three inches to the full-grown animal measuring twenty-one inches) have been received at the Colonial Museum, the bulk of them being a donation from Mr. Lewis B. Wilson. Another batch obtained by Captain Fairchild of the "*Luna*" has been forwarded to England by Sir Julius Vogel, and other specimens preserved in cages are scattered among lovers of the curious in this city.

An examination of a large series of specimens has satisfied me that the Tuatara inhabiting the Brothers Islands is very different in appearance from

that of the Bay of Plenty ; so much so, in fact, that they must be regarded, if not as absolutely distinct species, at any rate as very strongly marked geographical races. My present opinion inclines to the view of their being distinct species, owing their parentage, of course, to a common ancestor, but sufficiently differentiated in their characters by long insulation as to warrant their specific separation. In form and size they resemble each other, but they are entirely different in colour. The Karewa Island form, with which we have long been familiar, is of a dark olivaceous-brown, appearing sometimes almost black, with minute white spots on the sides and limbs, while the lizards from the Brothers Islands are of a dull yellowish-olive, brighter on the sides and limbs, and irregularly spotted or marked all over the body with pale yellow. This variegated appearance is especially noticeable in the half-grown animal, in which the spotted markings are much lighter, and therefore more conspicuous.

Assuming that this form represents a distinct species, and that I have not been anticipated in the discovery by any of the recipients of those sent to England by Sir Julius Vogel, I propose to give it a distinctive name, and in doing so I am glad to have the opportunity of associating with this branch of our local zoology the name of the foremost among living herpetologists, Dr. Albert Günther, F.R.S. This is the more fitting, as Dr. Günther has so completely investigated the anatomy and systematic affinities of this singular form. I shall first give the description of the dark-coloured species taken from the Karewa specimens in my possession, and then the distinguishing characters of the supposed new species, founded on a large series of living examples of both sexes and of all ages.

1. *Sphenodon punctatum*, Gray.

Dark olivaceous-brown, more or less covered, especially on the sides and limbs, with minute spots or rounded specs of white; under parts yellowish-grey, shading into ashy-grey on the throat. The spines of the nuchal and dorsal crests are white, of the caudal dark 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. Irides rich brown with minute golden reticulations on the upper side, and a narrow elliptical black pupil; claws yellowish horn-colour, with brown tips.

The sexes vary appreciably both in size and colour. In the male there is a brighter tinge of olive, and the spots are clear and distinct, imparting sometimes to the entire surface a speckled appearance. The throat also has a bluer tinge, with numerous interrupted series of white scales from the

chin downwards. In the female the colouring generally is darker and the spots are indistinct.

In the adult state the female is always larger than the male. The following are the measurements of the two finest specimens in my possession.

	Male.	Female.
Total length, measuring along the back...	16.0 in.	17.5 in.
From the chin to the vent	7.75 ,,	9.75 ,,
From the vent to end of tail	8.0 ,,	7.75 ,,

Note.—It should be mentioned that in the female described above the tail has at some period been broken, and has reproduced itself, giving a somewhat stumpy extremity, and a somewhat shorter measurement than it would otherwise yield.

2. SPHENODON GUNTHERI, *sp. nov.*

Adult female: Entire upper surface greenish or olive-yellow, with numerous obscure, rounded spots of pale yellow or white, becoming darker on the tail; the nose, eyelids, sides of the head and outer margins of legs and toes bright yellow; spines for the most part pure white; irides dark brown with black pupil. On the nape, covering a part of the nuchal fold and roots of spines, there is a large spot of jet black, and on each side of the neck, in front of the shoulder a broad crescent-shaped mark of the same; under parts greyish-white, changing to pearl grey on the throat, with interrupted longitudinal series of perfectly white scales.

The female is considerably larger than the male, two of my specimens giving the following measurements:—

	Male.	Female.
Total length, measuring along the back	17.5 in.	19.25 in.
From the chin to the vent	8.0 ,,	9.25 ,,
From the vent to end of tail	9.0 ,,	9.25 ,,

The male, besides being smaller, is much darker in colouring than the female, the upper surface being shaded with brown. In this respect this species appears to differ from *S. punctatum*, in which the male has lighter and brighter colours than his mate.

Having had an opportunity of examining a number of specimens in various stages of growth, I am enabled to add some further notes descriptive of the young:—

1. *Very young state.*—Extreme length, 4 inches. General colour, earthy-brown; fore-part and sides of the head, insertion of the limbs and along the ridge of the tail, paler brown; transverse markings of darker brown on the cheeks, chest, and limbs; irides, mottled grey, having a linear, black pupil margined with white. It is noticeable that in this condition the colour of the lizard is so exactly assimilated to the ground which it

frequents, that, except when in motion, it is almost impossible for the eye to distinguish it.

2. *More advanced state.*—Extreme length, 8.25 inches. General colour, yellowish-brown, tinged with olive; on the sides of the tail, a rufous tinge; eyelids, inner surface of toes, and dorsal spines, bright olive-yellow, especially on the head; and mottled on the body with paler brown; irides, darker than in No. 1, with a narrow black pupil (which, however, is dilatable, and capable of being reduced to a mere line).

3. *Half-grown example.*—Head, dull olive-yellow, spotted with a paler colour; ring encircling the eyes, also the entire surface of the toes, bright yellow; upper parts generally dull yellowish-olive, shading to brown on the tail, and marked all over with irregular spots and blotches of ashy white, which are most conspicuous on the hind-neck and on the limbs; spines, whitish-yellow on the back, darker on the tail; under parts, greyish-white, shading into purer grey on the throat, where there are some broken series of white scales from the chin downwards; irides, rich brown, finely reticulated with golden; the pupil black, with golden edging; claws, horn-coloured. The light markings on the upper surface give a variegated appearance by which this species is very readily distinguished from *Sphenodon punctatum*.

It ought to be mentioned that in both species the colours of the skin come out with much more distinctness when the body is wet; also that, under certain conditions, the animal appears to exercise, to some small extent, the chameleon-power of changing its colours, the tints being apparently brighter at one time than at another.

POSTSCRIPT.—My *Sphenodon guntheri* is probably the "green lizard" referred to in the following paragraph which has recently appeared in one of the Auckland papers:—

"A novel exportation has been lately made to the Sydney Museum from the East Coast, namely, a dozen of large East Cape Island green lizards, which were caught and stuffed by some of the Kawakawa Natives, who received payment at the rate of four shillings each for them. These reptiles are found nowhere else in New Zealand but in East Cape Island, and the Maoris have a tradition amongst them that the lizards were discovered in that island on the arrival of the first of the Native race on the East Coast. There is no other species of lizard on East Cape Island but the green ones, which are the ugliest of all creeping things, with the exception of frogs."

It may be mentioned that East Cape Island, or Whangaokena, is only about half a mile from the mainland, and immediately off the Cape. It has an area of about five acres, and is thickly covered with vegetation.
