THIS BOOK WAS PRESENTED
TO THE LIBRARY OF THE
AUCKLAND INSTITUTE
AND
MUSEUM

by

E. EARLE VAILE

REFERENCE ONLY

This book may not be
taken from the Library

ADONIS 1471 76 110010

NEW ZEALAND COLLECTION
(RESERVE)

Q1696.68

RESERVE

6300

11 FEB 1952

(From Proceedings of the
Zoological Society,
London -

Vol. 214.)
1850

first paper
describing
found in vol.
12, 1848 p. 2-7
+ Trans. iii
p. 366, pl. vi
(Newton
p. 59)

1. NOTICE OF THE DISCOVERY BY MR. WALTER MANTELL IN THE MIDDLE ISLAND OF NEW ZEALAND, OF A LIVING SPECIMEN OF THE NOTORNIS, A BIRD OF THE RAIL FAMILY, ALLIED TO BRACHYPTERYX, AND HITHERTO UNKNOWN TO NATURALISTS EXCEPT IN A FOSSIL STATE. BY GIDEON ALGERNON MANTELL, ESQ., LL.D., F.R.S. ETC.

Amongst the fossil bones of birds collected by my eldest son in the North Island of New Zealand, which I had the honour of placing before the Zoological Society in 1848, in illustration of Professor Owen's description of the crania and mandibles of *Dinornis*, *Palapteryx*, &c., there were the skull, beaks, humerus, sternum, and other parts of the skeleton of a large bird of the Rail family, which from their peculiar characters were referred by that eminent anatomist to a distinct genus of *Rallidæ* allied to the *Brachypteryx*, under the name of *Notornis* *; a prevision, the correctness of which is confirmed by the recent specimen that forms the subject of the present communication.

Towards the close of last year I received from Mr. Walter Mantell another extensive and highly interesting collection of fossils, minerals, and rock specimens, obtained during his journey along the eastern coast of the Middle Island, from Banks' Peninsula to the south of Otago, in the capacity of Government Commissioner for the settlement of native claims. This series comprised also a fine suite of birds' bones from Waingongoro, the locality whence the former collection was chiefly obtained, and among them were relics of the *Notornis*, and crania and mandibles of *Palapteryx*.

The results of my son's observations on the geological phenomena presented by the eastern coast of the Middle Island are embodied in a paper read before the Geological Society in February last, and published in vol. v. of the 'Quarterly Journal.' It will suffice for my present purpose to mention that they confirm in every essential particular the account given of the position and age of the ornithic ossiferous deposits, in my first memoir on this subject †.

The only fact that relates to the present notice is the nature of the bone-bed at Waikonaiti, whence Mr. Percy Earl, Dr. Mackellar, and other naturalists procured the first relics of the gigantic birds, sent by those gentlemen to England, which are figured and described in the 'Zoological Transactions.'

This so-called tertiary deposit is situated in a little bay south of Island Point, near the embouchure of the river Waikonaiti, and is

* Zoological Transactions, vol. iii. p. 366. † Geological Journal, vol. iv.

only visible at low-water, when bones more or less perfect are occasionally observable projecting from the waterworn surface of the bog. This deposit is about 3 feet in depth and not more than 100 yards in length; the extent inland is concealed by vegetation and a covering of superficial detritus, and is supposed to be very inconsiderable. This bed rests upon a blue tertiary clay that emerges here and there along that part of the coast, and which abounds in shells and corals, of species existing in the adjacent sea.

This bone deposit was evidently a morass or swamp, on which the New Zealand flax (*Phormium tenax*) once grew luxuriantly. Bones of the larger species of Moa have from time to time been obtained from this spot by the natives and European visitors; and, as in the menaccanite sand beds at Waingongoro, they are associated with bones of one species of dog and two species of seal: my son also collected crania and other remains of a species of *Apteryx* (probably *Ap. Australis*), Albatros, Penguin, and of some smaller birds whose characters and relations have not yet been ascertained: no bones of the *Notornis* were observed in this locality.

It was from this ancient morass that my son obtained the entire series of bones composing the pair of feet of the same individual *Dinornis robustus*, standing erect, the one about a yard in advance of the other, as if the unfortunate bird had sunk in the slough, and unable to extricate itself had perished on the spot. The upper or proximal ends of the tarso-metatarsals were alone visible above the sod on the retiring of the tide; these were carefully dug round, and the phalanges exposed in their natural order and connection: the bones were numbered as they were extracted from the soil, and thus the normal elements of the locomotive organs of one of the colossal struthious bipeds of New Zealand were for the first time determined*.

It was in the course of last year, on the occasion of my son's second visit to the south of the Middle Island, that he had the good fortune to secure the recent *Notornis* which I have now the pleasure of submitting to this Society, having previously placed it in the hands of the eminent ornithologist Mr. Gould to figure and describe, as a tribute of respect for his indefatigable labours in this department of Natural History.

This bird was taken by some sealers who were pursuing their avocations in Dusky Bay. Perceiving the trail of a large and unknown bird on the snow with which the ground was then covered, they followed the foot-prints till they obtained a sight of the *Notornis*, which their dogs instantly pursued, and after a long chase caught alive in the gully of a sound behind Resolution Island. It ran with great speed, and upon being captured uttered loud screams, and fought and struggled violently; it was kept alive three or four days on board the schooner and then killed, and the body roasted and ate by the crew, each partaking of the dainty, which was declared to be delicious. The beak and legs were of a bright red colour. My son

* The principal dimensions of these bones are given in the Quarterly Journal of the Geological Society, vol. vi. p. 338; and figures with descriptions in 'The Pictorial Atlas of Organic Remains,' just published.

secured the skin, together with very fine specimens of the Kakapo or Ground Parrot (*Strigops*), a pair of Huīas (*Neomorpha*), and two species of Kiwi-kiwi, namely *Apteryx Australis* and *Ap. Oweni*; the latter very rare bird is now added to the collection of the British Museum.

Mr. Walter Mantell states, that, according to the native traditions, a large Rail was contemporary with the Moa, and formed a principal article of food among their ancestors. It was known to the North Islanders by the name of "*Moho*," and to the South Islanders by that of "*Takahé*;" but the bird was considered by both natives and Europeans to have been long since exterminated by the wild cats and dogs, not an individual having been seen or heard of since the arrival of the English colonists. That intelligent observer, the Rev. Richard Taylor, who has so long resided in the islands, had never heard of a bird of this kind having been seen. In his '*Leaf from the Natural History of New Zealand**,' under the head of "*Moho*," is the following note: "RAIL, colour black, said to be a wingless bird as large as a fowl, having a long bill and red beaks and legs; it is nearly exterminated by the cat: its cry was 'keo, keo.'" The inaccuracy and vagueness of this description prove it to be from native report and not from actual observation. To the natives of the pahs or villages on the homeward route, and at Wellington, the bird was a perfect novelty and excited much interest. I may add, that upon comparing the head of the bird with the fossil cranium and mandibles, and the figures and descriptions in the '*Zoological Transactions*' (pl. 56), my son was at once convinced of their identity; and so delighted was he by the discovery of a living example of one of the supposed extinct contemporaries of the Moa, that he immediately wrote to me, and mentioned that the skull and beaks were alike in the recent and fossil specimens, and that the abbreviated and feeble development of the wings, both in their bones and plumage, were in perfect accordance with the indications afforded by the fossil humerus and sternum found by him at Waingongoro, and now in the British Museum, as pointed out by Professor Owen in the memoir above referred to.

It may not be irrelevant to add, that in the course of Mr. Walter Mantell's journey from Banks' Peninsula along the coast to Otago, he learnt from the natives that they believed there still existed in that country the only indigenous terrestrial quadruped, except a species of rat, which there are any reasonable grounds for concluding New Zealand ever possessed. While encamping at Arowenua in the district of Timaru, the Maoris assured him that about ten miles inland there was a quadruped which they called Káurēke, and that it was formerly abundant, and often kept by their ancestors in a domestic state as a pet animal. It was described as about two feet in length, with coarse grisly hair; and must have more nearly resembled the Otter or Badger than the Beaver or the Ornithorhynchus, which the first accounts seemed to suggest as the probable type. The offer of a liberal reward induced some of the Maoris to start for the interior of the country where the Káurēke was supposed to be located, but

* Published at Wellington, 1848.

See Life of
Nasir, 77-8
+ 225
? Wall's in-
vestigation

Kaurēke in Tregear
and see Kaurēke in Williams
with the name Kaurēke

they returned without having obtained the slightest trace of the existence of such an animal; my son, however, expresses his belief in the native accounts, and that if the creature no longer exists, its extermination is of very recent date.

In concluding this brief narrative of the discovery of a living example of a genus of birds once contemporary with the colossal Moa, and hitherto only known by its fossil remains, I beg to remark, that this highly interesting fact tends to confirm the conclusions expressed in my communications to the Geological Society, namely, that the *Dinornis*, *Palapteryx*, and related forms, were coeval with some of the existing species of birds peculiar to New Zealand, and that their final extinction took place at no very distant period, and long after the advent of the aboriginal Maoris. As my son at the date of his last letter was about to depart on another exploration of the bone deposits of the North Island, I indulge the hope that he will ere long have the gratification of transmitting or bringing to England additional materials for the elucidation of the extinct and recent faunas of New Zealand.

With much pleasure I resign to Mr. Gould the description of the ornithological characters and relations of this, in every sense, *rara avis*, from the Isles of the Antipodes.

Chester Square, Pimlico, November 1, 1850.

2. REMARKS ON NOTORNIS MANTELLI. BY J. GOULD, F.R.S.

(Aves, Pl. XXI.)

Dr. Mantell having kindly placed his son's valuable acquisition in my hands for the purpose of characterizing it in the Proceedings of the Society, and of afterwards figuring and describing it in the appendix to my work on the 'Birds of Australia,' I beg leave to commence the pleasing task he has assigned to me.

The amount of interest which attaches to the present remarkable bird is perhaps greater than that which pertains to any other with which I am acquainted, inasmuch as it is one of the few remaining species of those singular forms which inhabited that supposed remnant of a former continent—New Zealand, and which have been so ably and so learnedly described, from their semi-fossilized remains, by Professor Owen; who, as well as the scientific world in general, cannot fail to be highly gratified by the discovery of a recent example of a form previously known to us solely from a few osteological fragments, and which, but for this fortunate discovery, would in all probability, like the Dodo, have shortly become all but traditional. While we congratulate ourselves upon the preservation of the skin, we must all deeply regret the loss of the bones, any one of which would have been in the highest degree valuable for the sake of comparison with the numerous remains which have been sent home from New Zealand.

Upon a cursory view of this bird it might be mistaken for a gigantic kind of *Porphyrio*, but on an examination of its structure it will be

See Newton
p. 591-2

P. = swamp-hen; puteko

found to be generically distinct. It is allied to *Porphyrio* in the form of its bill and in its general colouring, and to *Tribonyx* in the structure of its feet, while in the feebleness of its wings and the structure of its tail it differs from both.

T. - an Aus-
tralian rail;
moor-hen

From personal observation of the habits of *Tribonyx* and *Porphyrio*, I may venture to affirm that the habits and œconomy of the present bird more closely resemble those of the former than those of the latter; that it is doubtless of a recluse and extremely shy disposition; that being deprived, by the feeble structure of its wing, of the power of flight, it is compelled to depend upon its swiftness of foot for the means of evading its natural enemies; and that, as is the case with *Tribonyx*, a person may be in its vicinity for weeks without ever catching a glimpse of it.

From the thickness of its plumage and the great length of its back-feathers, we may infer that it affects low and humid situations, marshes, the banks of rivers, and the coverts of dripping ferns, so abundant in its native country: like *Porphyrio*, it doubtless enjoys the power of swimming, but would seem, from the structure of its legs, to be more terrestrial in its habits than the members of that genus.

I have carefully compared the bill of this example with that figured by Professor Owen under the name of *Notornis Mantelli*, and have little doubt that they are referable to one and the same species; and as we are now in possession of materials whence to obtain complete generic characters, I hasten to give the following details, in addition to those supplied by Professor Owen.

Bill somewhat shorter than the head; greatly compressed on the sides, both mandibles being much deeper than broad; tomia sharp, curving downwards, inclining inwards and slightly serrated; culmen elevated, much arched and rising on the forehead to a line with the posterior angle of the eye; *nostrils* round, and placed in a depression near the base of the bill; wings very short, rounded, and slightly concave; primaries soft and yielding; the first short; third, fourth, fifth, sixth and seventh equal and the longest; tail-feathers soft, yielding, and loose in texture; tarsi powerful, longer than the toes, almost cylindrical; very broad anteriorly; defended in front and on either side posteriorly by broad and distinct scutellæ; the spaces between the scutellæ reticulated; anterior toes large and strong, armed with powerful hooked nails, and strongly scutellated on their upper surface; hind-toe short, strong, placed somewhat high on the tarsus, and armed with a blunt hooked nail.

Head, neck, breast, upper part of the abdomen and flanks purplish blue; back, rump, upper tail-coverts, lesser wing-coverts and tertiaries dark olive-green, tipped with verditer-green; at the nape of the neck a band of rich blue separating the purplish blue of the neck from the green of the body; wings rich deep blue, the greater coverts tipped with verditer-green, forming crescentic bands when the wing is expanded; tail dark green; lower part of the abdomen, vent and thighs dull bluish black; under tail-coverts white; bill and feet red.

Total length of the body, 26 inches; bill, from the gape to the

tip, $2\frac{1}{8}$; from the tip to the posterior edge of the plate on the forehead, 3; wing, $8\frac{1}{2}$; tail, $3\frac{1}{2}$; tarsi, $3\frac{1}{2}$; middle toe, 3; nail, $\frac{7}{8}$; hind-toe, $\frac{7}{8}$; nail, $\frac{3}{4}$.

I cannot conclude these remarks without bearing testimony to the very great importance of the results which have attended the researches of Mr. Walter Mantell in the various departments of science to which he has turned the attention of his cultivated, intelligent and inquiring mind, nor without expressing a hope that he may yet be enabled to obtain some particulars as to the history of this and the other remarkable birds of the country in which he is resident.

See Mackay in Ibis, 1867, p. 144

individual member of these juries will act *sans peur*, and then we are satisfied that, notwithstanding many disappointments, they will feel that they stand before the world *sans reproche*.

ARTS AND SCIENCES.

GEOLOGICAL SOCIETY.

IN our report last week of Sir Roderick Murchison's memoir on the Crystalline Schists of the Forez, a trifling misprint occurs, involving an important error. Instead of "the *other* discovered organic remains," it should have been, "the *author* discovered organic remains." No organic remains had been found hitherto in these schists, and the value of Sir Roderick's discovery consisted in his being enabled by these fossils to refer to the carboniferous age, a deposit which was before assigned, from its physical aspect, to a much older period.

ZOOLOGICAL SOCIETY.

November 12th.—William Yarrell, Esq., Vice-President, in the chair.—The scientific session of this Society was opened with an unusually full attendance of members, considerable interest having been excited by the announcement that Professor Owen and Dr. Mantell would communicate some further discoveries in reference to the wingless birds of New Zealand.

1. "On the Skull of the Great *Dinornis*," by Professor Owen, LL.D., V.P.R.S., &c.—This communication is the fifth of the series of memoirs devoted to the reconstruction and introduction into the annals of zoological science of the great wingless birds which formerly inhabited the islands of New Zealand. The subjects of the memoir had been transmitted to the author by Sir George Grey, Governor-in-Chief of New Zealand, who had discovered them in a cave near the base of the great volcanic mountain Tongariro.

After a minute description of the fossil cranium, which was remarkable for the strength of the broad deflected beak, the author next drew attention to a more mutilated cranium of nearly equal size, which, from the sutures, he inferred to belong to a young individual of the largest species, *Dinornis giganteus*. The more perfect skull belonged, probably, to the species next in point of size, which had been called *D. ingens*. The crania of two smaller species of *Palapteryx* were then described, and the size and shape of the brain were shown by sections of the cranial cavity. An entire cranium of the *Notornis* was exhibited, in which the author pointed out those parts that were defective in the fragmentary specimen, from which the nature and affinities of the *Notornis* as a large species of Coot, or Water-Rail, had been originally deduced. A fragment of a humerus of diminutive size was finally described, that being the first evidence of the rudimentary wings of the *Dinornis* that had yet reached Europe, notwithstanding the number of collections of the remains of the great extinct birds of New Zealand that have from time to time been transmitted from that colony, since the attention of the settlers was first called to them in 1839.

2. "Notice of the discovery, by Mr. Walter

ancestors, but had gradually become scarce, and was finally exterminated by the wild cats and dogs, which are now the great pest of the colony. This bird was called Moho, or Takahé, and was of a black colour, destitute of wings, and had a long bill, which, as well as the legs, was of a bright red colour. No traces of the "*Moho*" had been discovered since the arrival of any of the English colonists. Towards the close of last year, on Mr. Walter Mantell's second visit to the south of Otago, he obtained from some sealers the recent bird now exhibited. It appeared that the men frequenting the south-west extremity of the Middle Island observed foot-tracks of a large and unknown bird on the snow which then thickly covered the ground, and on pursuing the trail they caught sight of the bird, which fled with great rapidity, but was at length driven up a gully behind Resolution Island, and captured alive by their dogs. They kept it on board the schooner two or three days, and then killed it and roasted the body, which was esteemed a great delicacy; the skin, which is in excellent condition, was fortunately obtained by Mr. Walter Mantell, and thus the, perhaps, only remaining individual of this remarkable genus was procured for the examination of the ornithologist. Its identity with the fossil *Notornis Mantelli* is evident: its powerful but short beak, and its abbreviated wings, are in accordance with the indications of the fossil cranium, sternum, and humerus. This bird is about two feet high; the beaks are short and very strong, the wings short and rounded, and their plumage feeble; the legs are very strong. The colour of the plumage is a dark purple over the neck and body, and shaded with green and gold on the wings and back, the tail is very scanty, and is white beneath. The author dwelt on the interest attached to this discovery, from the remains of the *Notornis* having been found associated with those of the *Dinornis*, under circumstances which left no doubt of these genera having been contemporaneous; thus confirming the inferences stated in his memoirs on the ossiferous deposit of New Zealand, read before the Geological Society, that the gigantic wingless birds were coëval with existing species, and that their final extinction took place at no very distant period; there are good reasons for concluding that the native traditions, as to the Moa having lived when their ancestors first took possession of those islands, are well founded. Mr. Walter Mantell, at the date of the last advices from New Zealand, was about to depart on another exploration of the bone deposits, in the hope of obtaining additional materials for the history of the extinct and living birds of those islands.

The finest specimen of *Apteryx Australis* hitherto seen, and a *Strigops*, or Ground Parrot, also an extremely rare bird, peculiar to New Zealand, sent over by Mr. Walter Mantell, were likewise exhibited: also *Apteryx Owenii*, which is now, for the first time, added to the British Museum. Panoramic sketches of the Middle Island of New Zealand, drawn by Mr. W. Mantell, were suspended in the room.

Mr. Gould, to whom Dr. Mantell had lent this unique specimen of *Notornis* for description and ill-

And inasmuch as a very extensive series of meteorological observations have been made at the Toronto Observatory it highly desirable that the Toronto Observatory should be continued in activity for a somewhat longer period.

* As it must be some time before these resolutions can reach this country in a formal manner through the American Ambassador, we have great pleasure in making them generally known to the public, and especially to the scientific, who feel so much interest in the subject.—Ed. T. G.

By Walter Mantell Esq. 1848. Received Oct. 1850.

individual member of these juries will act *sans peur*, and then we are satisfied that, notwithstanding many disappointments, they will feel that they stand before the world *sans reproche*.

ARTS AND SCIENCES.

GEOLOGICAL SOCIETY.

In our report last week of Sir Roderick Murchison's memoir on the Crystalline Schists of the Forez, a trifling misprint occurs, involving an important error. Instead of "the *other* discovered organic remains," it should have been, "the *author* discovered organic remains." No organic remains had been found hitherto in these schists, and the value of Sir Roderick's discovery consisted in his being enabled by these fossils to refer to the carboniferous age, a deposit which was before assigned, from its physical aspect, to a much older period.

ZOOLOGICAL SOCIETY.

November 12th.—William Yarrell, Esq., Vice-President, in the chair.—The scientific session of this Society was opened with an unusually full attendance of members, considerable interest having been excited by the announcement that Professor Owen and Dr. Mantell would communicate some further discoveries in reference to the wingless birds of New Zealand.

1. "On the Skull of the Great *Dinornis*," by Professor Owen, LL.D., V.P.R.S., &c.—This communication is the fifth of the series of memoirs devoted to the reconstruction and introduction into the annals of zoological science of the great wingless birds which formerly inhabited the islands of New Zealand. The subjects of the memoir had been transmitted to the author by Sir George Grey, Governor-in-Chief of New Zealand, who had discovered them in a cave near the base of the great volcanic mountain Tongariro.

After a minute description of the fossil cranium, which was remarkable for the strength of the broad deflected beak, the author next drew attention to a more mutilated cranium of nearly equal size, which, from the sutures, he inferred to belong to a young individual of the largest species, *Dinornis giganteus*. The more perfect skull belonged, probably, to the species next in point of size, which had been called *D. ingens*. The crania of two smaller species of *Palapteryx* were then described, and the size and shape of the brain were shown by sections of the cranial cavity. An entire cranium of the *Notornis* was exhibited, in which the author pointed out those parts that were defective in the fragmentary specimen, from which the nature and affinities of the *Notornis* as a large species of Coot, or Water-Rail, had been originally deduced. A fragment of a humerus of diminutive size was finally described, that being the first evidence of the rudimentary wings of the *Dinornis* that had yet reached Europe, notwithstanding the number of collections of the remains of the great extinct birds of New Zealand that have from time to time been transmitted from that colony, since the attention of the settlers was first called to them in 1839.

2. "Notice of the discovery, by Mr. Walter Mantell, in the Middle Island of New Zealand, of a living specimen of *Notornis*, a bird of the Rail family, allied to *Brachypteryx*, and hitherto unknown to naturalists, except in a fossil state;" by Gideon Algernon Mantell, Esq., LL.D., F.R.S. The author describes the circumstances under which the fossil remains of the then supposed extinct Rail, named *Notornis* by Professor Owen, consisting of the skull and beak, humerus, sternum, &c., were discovered by his son in the deposit containing bones of several genera and species of the *Dinornis*, *Palapteryx*, &c., at Waingongoro, on the west coast of the north island of New Zealand, in 1847. These relics are now in the British Museum. The Maoris, or natives, informed Mr. Walter Mantell that there formerly existed a large bird, resembling the Swamp-Hen, which was a favourite article of food with their

ancestors, but had gradually become scarce, and was finally exterminated by the wild cats and dogs, which are now the great pest of the colony. This bird was called Moho, or Takahé, and was of a black colour, destitute of wings, and had a long bill, which, as well as the legs, was of a bright red colour. No traces of the "*Moho*" had been discovered since the arrival of any of the English colonists. Towards the close of last year, on Mr. Walter Mantell's second visit to the south of Otago, he obtained from some sealers the recent bird now exhibited. It appeared that the men frequenting the south-west extremity of the Middle Island observed foot-tracks of a large and unknown bird on the snow which then thickly covered the ground, and on pursuing the trail they caught sight of the bird, which fled with great rapidity, but was at length driven up a gully behind Resolution Island, and captured alive by their dogs. They kept it on board the schooner two or three days, and then killed it and roasted the body, which was esteemed a great delicacy; the skin, which is in excellent condition, was fortunately obtained by Mr. Walter Mantell, and thus the, perhaps, only remaining individual of this remarkable genus was procured for the examination of the ornithologist. Its identity with the fossil *Notornis Mantelli* is evident: its powerful but short beak, and its abbreviated wings, are in accordance with the indications of the fossil cranium, sternum, and humerus. This bird is about two feet high; the beaks are short and very strong, the wings short and rounded, and their plumage feeble; the legs are very strong. The colour of the plumage is a dark purple over the neck and body, and shaded with green and gold on the wings and back, the tail is very scanty, and is white beneath. The author dwelt on the interest attached to this discovery, from the remains of the *Notornis* having been found associated with those of the *Dinornis*, under circumstances which left no doubt of these genera having been contemporaneous; thus confirming the inferences stated in his memoirs on the ossiferous deposit of New Zealand, read before the Geological Society, that the gigantic wingless birds were coëval with existing species, and that their final extinction took place at no very distant period; there are good reasons for concluding that the native traditions, as to the Moa having lived when their ancestors first took possession of those islands, are well founded. Mr. Walter Mantell, at the date of the last advices from New Zealand, was about to depart on another exploration of the bone deposits, in the hope of obtaining additional materials for the history of the extinct and living birds of those islands.

The finest specimen of *Apteryx Australis* hitherto seen, and a *Strigops*, or Ground Parrot, also an extremely rare bird, peculiar to New Zealand, sent over by Mr. Walter Mantell, were likewise exhibited: also *Apteryx Owenii*, which is now, for the first time, added to the British Museum. Panoramic sketches of the Middle Island of New Zealand, drawn by Mr. W. Mantell, were suspended in the room.

Mr. Gould, to whom Dr. Mantell had lent this unique specimen of *Notornis* for description and illustration in his 'Birds of Australia,' then pointed out its ornithological characters, which he considered to be allied to those of *Porphyrio* and *Tribonyx*, though generically distinct from either. He dwelt on the high interest of this living example of a type of *Rallidae*, only known hitherto by a few osteological fragments in a semi-fossilized state, and remarked that, but for this discovery, the bird would soon probably have become, like the Dodo, all but traditional.

In the discussion which followed the reading of these memoirs, Professor Owen availed himself of the opportunity of replying to a question which was frequently put to him, as to whether the comparatively small *Apteryx*, *Notornis*, and similar existing birds, might not be the degenerate descendants of the gigantic extinct species; and when the general results of the restoration of extinct species, and their

relations to existing species of the different continents and islands of the globe, are first received, they commonly suggest the idea that the races of animals have deteriorated in respect of size. The more striking phenomena first and most strongly impress the mind, which contrasts, for example, the great Cave-Bears of Europe with the actual Brown Bear, the *Megatherioids* of South America with the small existing Sloths, and the gigantic *Glyptodons* with the Armadillos. The huge *Diprotodon* and *Nototherium* suggest a similar contrast with the Kangaroos of Australia; and the towering *Dinornis* and *Palapteryx* with the humble *Apteryx* of New Zealand. But the comparatively diminutive animals of South America, Australia, and New Zealand, that form the nearest allies of the gigantic extinct species respectively characteristic of such tracts of dry land, are specifically if not generically distinct from them, nor have such small species been more recently introduced. In England, for example, our Moles, Water-voles, Hares, Weasels, Stoats, Badgers and Foxes, are of the same species as those that existed when the Hippopotamus swam the rivers, the Hyæna, Bear and Lion lurked in the caves, and the Rhinoceros and Elephant trod the land. So likewise the remains of small Sloths and Armadillos are found associated with the *Megatherium* and *Glyptodon* in South America; and the fossil remains of species as diminutive as the present Kangaroos and Dasyures occur abundantly in Australia with those of herbivorous *Marsupials* as large as Tapirs and Rhinoceroses, and of carnivorous *Marsupials* as large as the Lion or Tiger. So likewise in New Zealand we find that the small *Apteryx* has co-existed with the great *Dinornis* and *Palapteryx*.

There was not a particle of evidence that any species of bird or beast that lived during the pliocene period had had its characters modified in any respect by the influence of time or of change of external influences. In proportion to its bulk is the difficulty of the contest which, as a living organised whole, the individual of such species has to maintain against the surrounding agencies that are ever tending to dissolve the vital bond, and subjugate the living matter to the ordinary chemical and physical forces. Any changes, therefore, in such external agencies as a species may have been originally adapted to exist in, will militate against that existence in a degree proportionate, perhaps, in a geometrical ratio, to the bulk of the species. If a dry season be gradually prolonged, the large *Mammal* will suffer from the drought sooner than the small one: if such alteration of climate affect the quantity of vegetable food, the bulky *Herbivore* will first feel the effects of stinted nourishment: if new enemies are introduced, the large and conspicuous quadruped or bird will fall a prey, whilst the smaller species conceal themselves and escape. Smaller animals are usually, also, more prolific than larger ones.

The actual presence, therefore, of small species of animals in countries where larger species of the same natural families formerly existed, is not the consequence of any gradual diminution of the size of such species, but is the result of circumstances which may be illustrated by the fable of "the oak and the reed:" the smaller and feebler animals have bent and accommodated themselves to changes which have destroyed the larger species. We find, nevertheless, that the same peculiar forms or families of animals exist, and characterize particular portions of dry land, such, e. g., as South America, Australia, and New Zealand, at the present day, as at a period long antecedent to human history or existence; and although many species have perished, there has been no general sweeping away of the peculiar aboriginal land animals of those continents or islands. But just as the smaller Sloths and Armadillos still linger in South America, so the smaller Kangaroos, Wombats, Dasyures, and other *Marsupials* have continued to exist in Australia, and a few species of the comparatively diminutive wingless birds of the genera *Apteryx* and *Brachypteryx* still exist in the island, where their peculiar families

were once much more richly represented, and by species on a far larger scale.

3. On three new species of Birds from the North Coast of Australia, by John Gould, Esq., F.R.S. One is allied to *Eurylaimus* and *Todus*; the second is a species of *Malurus*, and the third is a *Ptilotis*, discovered by the late Captain Owen Stanley, of Her Majesty's ship *Rattlesnake*, at the above-named locality, and presented to the Society.

ENTOMOLOGICAL SOCIETY.

Nov. 4th.—Mr. G. R. Waterhouse, President, in the Chair.—New members were elected. Mr. Westwood mentioned that M. Guérin had observed that the structure of the blood in diseased silkworms was found, when viewed under microscopes of high powers, to be considerably altered. The small granules, which in the healthy blood were found to be oval or round, in the diseased blood became elongated, and then branched, thus apparently turning from an animal into the vegetable substance known as muscardine.

Mr. Shepherd exhibited an hermaphrodite *Nongria Caninae*, of which, however, both the antennæ were male. Mr. S. Stevens exhibited some cocoons of a *Bombyx* from Columbia, in each of three of which he had found two pupæ; he also exhibited the four new species of Australian Coleoptera—*Clytus bicinctus*, *Saperda bilabilis*, *Cerambyx subserratus*, and *Agasma semicrudum*, described by Mr. Newman in the *Zoologist*. Mr. Stephens also exhibited some specimens of insect economy brought from South Australia by Mr. Mossman. Mr. J. F. Stephens exhibited specimens from Scotland of *Dictyopterus Aurora*, a beetle new to Britain, and *Tinea ochracea*, of Tengström—the latter species had been found by Mr. Weaver in ants' nests. Mr. Bond exhibited some rare Lepidoptera he had taken at Ventnor in August, including *Agrolis lunigera*, *Catoptria pupillana*, *Depressaria caprella*, *rotundella*, *Douglasella nanatella*, and *pallorrella*. The President exhibited, on behalf of Mr. G. Ransome, a very fine *Deilephila Celerio*, recently taken at Ipswich. Mr. W. F. Evans exhibited four specimens of a *Culex* which had accidentally been enclosed in a letter received from Commander Pullen, dated Great Slave Lake, June 28th, 1850, in latitude 61°. The great abundance and intolerable annoyance of these little pests in high latitudes had been mentioned by Sir G. Back in his account of the Arctic Land Expedition in 1833, and by Sir John Franklin in his account of his journey to the Polar Sea in 1819-22.

Several other interesting botanical papers were read.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

At a meeting held at Newhaven, in the United States, in August 1850, the following resolutions were unanimously adopted:—

Resolved—That in the foundation and maintenance of numerous Magnetical and Meteorological Observations, the British Government have evinced an appreciation of the claims of science, and a readiness to contribute liberally to its support, which challenge the admiration and demand the hearty acknowledgment of the scientific world.

Resolved—That the experiments which are now in progress at the Toronto Observatory, to test the practicability of self-registering photographic methods, the system of concerted auroral observations recently organized by Captain Lefroy, and the peculiar interest attached to magnetic observations made near the focus of maximum intensity, render it highly desirable that the Toronto Observatory should be continued in activity for a somewhat longer period.

And inasmuch as a very extensive series of meteor-

* As it must be some time before these resolutions can reach this country in a formal manner through the American Ambassador, we have great pleasure in making them generally known to the public, and especially to the scientific, who feel so much interest in the subject.—Ed. L. G.

ological observations, embroiled the United States, is now tion by the Smithsonian I add exceedingly to the valuations if simultaneous ones the region north of the I even to the shores of Hudson of Labrador; therefore,

Resolved—That the British Directors of the Hudson's Bay to co-operate with the States in united and systematic inquiries.

NEW YORK HISTORICAL SOCIETY.

At the request of one of the the Rev. W. Walker, of the was present, gave a description variety of the Simia tribe, hood of the mission, of specimens, a young male, a female, nearly full grown arms of the latter extended not owing to any extraordinary which measure about the s but to the enormous breadth should judge that a full g least six feet in height; and that they have on the top an inch and a half high, round the skull from the front to furnished with hairs about are erected when the creature not so closely resemble the as the Chimpanzee, and it on all fours; but from its immense and ferocious disposition, formidable assailant to a man firearms. Mr. Walker has female to America.

Notornis Mantelli.

(so named by Prof. Owen from fossil remains discovered at Rangatapu associated with those of the Moa, by Mr. Walter Mantell in 1848.) This unique bird was captured alive on the snow in a gully in Resolution Island, in Dusky Bay, which is situated at the South-western extremity of the Middle Island of New Zealand. It belongs to the *Rallidae* or *Rails*, and according to the Natives the species formerly existed in great numbers, but not an individual had been seen within the memory of man, and it was supposed to be extinct. It was called *Moho* by the natives of the North, & *Takake* by those of the South Island.

By Walter Mantell Esq. 1848. Received Oct. 1850.

relations to existing species of the different continents and islands of the globe, are first that they commonly suggest the idea that the animals have deteriorated in respect of size. More striking phenomena first and most to impress the mind, which contrasts, for example, the great Cave-Bears of Europe with the Brown Bear, the *Megatherioids* of South America with the small existing Sloths, and the *Glyptodons* with the Armadillos. The huge *Glyptodon* and *Nototherium* suggest a similarity with the Kangaroos of Australia; and the *Dinornis* and *Palapteryx* with the humble *Apapteryx* of New Zealand. But the comparatively diminutive animals of South America, Australia, and New Zealand, that form the nearest allies of the extinct species respectively characteristic of tracts of dry land, are specifically if not geographically distinct from them, nor have such species been more recently introduced. In Europe, for example, our Moles, Water-voles, Weasels, Stoats, Badgers and Foxes, are the same species as those that existed when the Nile swam the rivers, the Hyæna, the Lion lurked in the caves, and the Rhinoceros and Elephant trod the land. So likewise the small Sloths and Armadillos are found associated with the *Megatherium* and *Glyptodon* in America; and the fossil remains of species as minute as the present Kangaroos and Emus occur abundantly in Australia with those of voracious *Marsupials* as large as Tapirs and Crocodiles, and of carnivorous *Marsupials* as large as the Lion or Tiger. So likewise in New Zealand we find that the small *Apapteryx* has co-existed with the great *Dinornis* and *Palapteryx*.

There was not a particle of evidence that any species of bird or beast that lived during the Tertiary period had had its characters modified in respect by the influence of time or of changing external influences. In proportion to its bulk and the difficulty of the contest which, as a living organism, the individual of such species has to maintain against the surrounding agencies that are ever tending to dissolve the vital bond, and subjugate the matter to the ordinary chemical and physical laws. Any changes, therefore, in such external agencies, a species may have been originally adapted to, will militate against that existence in a proportionate manner, perhaps in a geometrical ratio.

bull
prol
dro
tion
food
of s
duc
will
the
also
T
of
san
con
of
wh
and
ber
wh
ne
far
po
Au
at
ex

From "Illustr. London News" (no date noted)

THE MOHO; OR, NOTORNIS MANTELLI.

UNIQUE BIRD FROM NEW ZEALAND.

IN the ILLUSTRATED LONDON NEWS of the 18th May last, in our report of a lecture on the "Extinct Birds of New Zealand," delivered by Dr. Mantell, before the Royal Institution, allusion was made to the discovery, by Mr. Walter Mantell, of the bones of other supposed extinct species and genera of birds associated with those of the *Moa*, or *Dinornis*. Of these, the most remarkable were the skulls and other parts of the skeleton of a very large and peculiar form of the *Rail* family (*Rallidæ*), which are described by Professor Owen in the "Zoological Transactions," under the name of NOTORNIS (*Southern bird*) MANTELLI. According to the traditions of the Maoris, or natives of New Zealand, this bird formerly existed contemporaneously with the *Moa*, a large bird resembling the Swamp-Hen, or Water-Rail, which was a favourite article of food with their remote ancestors, but had gradually disappeared, and was believed to have been long since exterminated by the wild dogs and cats, which are now so formidable a pest to the colonists. This bird was called the Moho, or *Takahé*, and described as of a black colour, with red beak and legs, and destitute of wings. No traces of the traditionary *Moho* had, however, been seen either by the natives or Europeans since the arrival of the English colonists; and the occurrence of the fossil bones of a bird apparently answering the general description of the gigantic Rail, with those of the *Dinornis*, in deposits of great antiquity, rendered it highly probable that the *Moho*, like the *Dodo* of the Mauritius, had become extinct within the last few centuries. Fortunately, this proves not to be the case, for a living specimen has been captured; and we have now the pleasure of placing before our readers the first representation of this *rara avis* of our antipodean colony.

This bird was obtained by Mr. Walter Mantell, a few months since, of some men engaged in the pursuit of seals among the coves of Dusky Bay, which lies on the south-western extremity of the Middle Island. It appears that these sealers had observed the foot-prints of a large and strange bird on the snow, with which the ground was thickly covered; pursuing the trail, they at length caught sight of the object of their search, which fled with great rapidity, for a long while distressing their dogs, but at length was driven up a gully behind Resolution Island, and captured alive. They kept it on board the schooner a few days, and then killed and skinned it, roasting and eating the body, which was declared to be very delicious. The skin was procured by Mr. Walter Mantell, while in good condition; and thus has been preserved for science—the, perhaps, only remaining individual of this remarkable type of the *Rallidæ*. The identity of this recent specimen with the fossil *Notornis* was immediately recognised by Mr. Walter Mantell, and has been confirmed by Mr. Gould and Professor Owen. Its powerful and short mandibles, abbreviated wings, and strong metatarsals and feet perfectly agree with the indications afforded by the fossil skull, sternum, and other bones that are now preserved in the British Museum.

The *Notornis* is about two feet high, the beaks are relatively very short and strong; the wings are short and rounded, and their plumage is feeble, constituting but very imperfect organs of flight; the legs and feet are more adapted for the land than those of the ordinary rails. The plumage is of a rich purple colour on the neck, breast, and abdomen; on the back and wings it is dashed with green and gold; the tail is scanty and white beneath; the beak and legs were of a bright scarlet when the bird was alive. The discrepancy between the traditional account of the *Moho* and the recent bird shows that a considerable time must have elapsed since a living example was seen by the natives.

This discovery is of the highest interest both to the ornithologist and palæontologist; for this remarkable form of *Rallidæ* was previously only known by its fossil remains, and would, probably, like the *Dodo*, have soon become all but traditional. It seems probable that living examples of some of the other supposed extinct birds may yet be met with in the imperfectly explored districts of New Zealand; but we fear there is no reason to hope that we shall ever see a recent representative of the noble ostrich-like *Moas*, some twelve or fourteen feet high, whose fossil remains have excited so much astonishment even in the scientific world. Should, however, Mr. Walter Mantell's arduous researches be rewarded by the capture of a live *Moa*, in time for the World's Exhibition of 1851, we trust the Royal Commissioners will allow him space for its display, though not previously applied for. We may add that the *Notornis* has been most successfully stuffed and mounted by Mr. Bartlett, and may now be seen at Dr. Mantell's residence.

THE MOHO; OR, NOTORNIS MANTELLI FROM NEW ZEALAND.

THE THIRD NOTORNIS.

WENT TO GERMAN MUSEUM.

By J. DRUMMOND, F.L.S., F.Z.S.

Dr A. B. Meyer, who was director of the Dresden Museum when it received the skin and skeleton of the third Notornis 44 years ago, states that the New Zealand Government made no effort to buy the specimen while it was in Dunedin, before it was sent to London, but, after a patron had presented it to the Dresden Museum, the New Zealand Government wrote to Dr Meyer asking him to surrender the specimen. The Government offered the sum paid in London (£110), and, in addition, a collection of skins of native New Zealand birds. "Of course, I refused the offer," Dr Meyer states; "in any case, the rules of the museum would not allow me to accept it."

In scientific journals Dr Meyer described the specimen in scientific terms. Up to that time the rare bird was known as Notornis mantelli, a name Sir Richard Owen had given to an extinct North Island bird represented by a fossil skull. It was believed that this and the three living individuals then known belonged to the same species. Finding that the specimen in his hands was different in important points from the fossil, Dr Meyer gave his specimen, and the other two specimens of the living bird, the title Notornis hochstetteri. By doing this he dedicated this large, handsome, massive rail to Dr Ferdinand von Hochstetter, who, 74 years ago, came to New Zealand in the Austrian exploring frigate Novara, and who helped to straighten out the early classification of New Zealand's birds.

Mr W. Mantell, who missed having his name associated with a species that almost ranks in interest with the dodo and the great auk, was an enthusiastic naturalist in the pioneering days of this Dominion. He was particularly interested in moa bones. Eighty-five years ago he gathered moa bones in a bed of volcanic ashes at Waingongoro, North Island, and sent them to Sir Richard Owen. Amongst them Sir Richard Owen found parts of the skull of a bird about the same size as a turkey. The back of the head was broad and sloping, somewhat like a moa's head, but there were differences that led him to make extensive comparisons with moa bones. These brought him to the family of the coots and water-hens. There he found the largest number of similarities with the fossil skull. Although the evidence on which he worked was incomplete and scanty, his anatomical training and his remarkably accurate observations convinced him that there had lived in New Zealand a bird that might be called the giant of the coots, but resembling the pukeko, which is a rail. He named the genus Notornis. The species he named Mantelli, in honour of the discoverer of the fossil skull.

Mr Mantell's name remains in association with an extinct bird; Dr Hochstetter's name is linked with the living Notornis. The word "living" is applied here to the four live individuals of Notornis that have been caught. It may have a wider application, as it is reasonable to believe that, in the wild, unfrequented country of the Southern Sounds, from which all living individuals have come, there are more members of the species. For the fourth and latest individual, caught by Messrs D. and J. Ross at Lake Te Anau 34 years ago, and placed in the Otago Museum, the Government paid the discoverer £250. Since then the law has altered the conditions. If there are any living individuals of the Notornis they belong to the Government, not to any persons who find them. Anybody who handles one, or interferes with it, is liable to be fined.

The egg of the Notornis is unknown. The eggs also belong to the Government. When, or if, an egg is found it, as a curio, will be in the same class as the egg of the great auk. A Notornis egg probably will prove to be about two inches and a-half long, richly coloured in greys and browns, dotted and blotched with grey and brownish violet. The great auk's egg is about four inches long, dirty white, scrawled or blotched with pale grey, drab, or brown. Although a comparatively few years ago the great auk existed in large numbers, it is absolutely extinct. Its last stronghold was rocky islands and skerries in Iceland. The last authentic record of it was on June 3, 1844. Flightless, it spent much time in the water, and nested on remote islands in the North Atlantic.

Slaughter of the great auk was conducted mainly for food. Later, fishermen used it for bait. Its fat and its feathers became an attraction. Collectors put in the finishing blow. While there are only four skins and no eggs of the Notornis, there are about 81 skins of the great auk, 10 skeletons, about 130 birds represented by detached bones, and 70 eggs. Values of the great auk's skin and eggs have increased many fold, reaching fabulous sums. An authenticated egg of the Notornis would be priceless. It could not serve anybody's cupidity. To dispose of it to a purchaser would be difficult, as any person in possession of it, even if possession was secured by purchase, would be outside of the law.

Mr Mantell, who discovered the fossil skull of an extinct Notornis, obtained the first Notornis skin. Eighty-three years ago sealers in Duck Cove, Resolution Sound, Southern Sounds, saw in the snow the trail of a large, unknown bird. Following the trail, they caught the bird alive in a gully. As it ran with great speed, the chase was a long one. When caught it screamed loudly and fought and struggled violently. It was kept alive on a schooner for several days, and then killed. The body was roasted and eaten, members of the crew declaring that the flesh was delicious. That, probably, was the most valuable meal in New Zealand. The sealers refrained from eating the feathers. The whole skin was secured by Mr Mantell. He also obtained the second Notornis skin, belonging to a bird

March 29, 1932.

caught by Maoris on Secretary Island, Thompson Sound. Both these skins, that is, the first and the second are in the British Museum.

Mr Donald Ross gave me an account of the discovery of the fourth Notornis by him and his brother John. They were camping on the shore of Lake Te Anau, south of Shag Burn, 34 years ago. The Notornis was in their minds. They knew that £110 had been paid for one, and the form and plumage of the species were fixed in their mind by coloured drawings. Lying in their bunks one Sunday morning, they heard a strange bird note. As they were tired they did not get up and look for the bird, but they discussed it and made up their minds that it was a Notornis.

Soon before dark on the same day Mr Donald Ross went for a walk along the beach, accompanied by his dog, Rough. About 150 yards behind the camp Rough made a determined rush and caught a bird under the overhanging branches of a beech tree. Believing that Rough had found a weka, Mr Ross called it to bring its captive to him. Rough obeyed, and Mr Ross knew that another Notornis had been added to the short list. The bird was alive. When the brothers were considering how they could make a cage out of a box, the head of the Notornis dropped to one side, and it died. It had lived for about half an hour after it was captured. Its eyes had been bright and intelligent, it had held its head proudly, and death seemed to come very suddenly.

The brothers knew that even in death the Notornis was valuable. After tea, they struck camp, put everything into the boat, began to run down the lake, and soon left behind the scene of their discovery, now known as Notornis Bay. They took the body to the post office, and sent it to Dr Young in Invercargill. Returning to their work in Notornis Bay, they stayed there for three weeks. When they went to the lake post office again, they found that the scientific world was excited by their discovery. Mr Jennings, taxidermist in Otago Museum, skinned and mounted the specimen. The only injury disclosed was a broken breast bone. Shock resulting from the injury probably caused death. Mr Ross told me that while his brother and he wished their Notornis to remain in New Zealand, they believed that they could have got £1000 for it elsewhere, and that they felt that they, two working men, had made a present of £750 to Otago Museum.

rela
tine
the
ani
mo
imp
the
Bro
wit
Gly
tod
wit
Di
of
ani
Ze
ex
tra
cal
sp
lan
W
sal
po
Li
El
of
wi
A
m
oc
ve
ce
th
fi
g
sp
co
re
to
d
w
a
in
n
f
a
i
l
l
c
t
f
c
.

AUCKLAND

10. FEB 1949

AND MUSEUM