

ART. XCIII.—A new fossil bird, *Anas finschi*, from the Earnsclough Caves, Otago, New Zealand. By P. J. VAN BENEDEN.

(Abridged from "Annales de la Soc. Geol. de Belg.," Vol. II., p. 123.)

[Read before the Wellington Philosophical Society, 9th December, 1876.]

Communicated by Dr. Hector.

Plate XXVIII.

EXCAVATIONS recently made in the above caves have revealed the existence of several new kinds of birds, amongst which there is one that deserves special notice.

It was submitted by Dr. Finsch, of Bremen, one of the most distinguished ornithologists of the present day, and one who has specially interested himself in the birds of New Zealand. He has compared these remains with the existing species of that country, and has easily been able to convince himself that these bones do not come from any bird known there at the present day.

Among the nine species of ducks described, there are only two to which these bones bear any resemblance. These are *Dendrocygna eytoni*, Gould, and *Querquedula gibberifrons*, S. Mull., two birds accidentally observed as stragglers in New Zealand, being quite peculiar to the Australian continent.

Dr. Finsch adds to these accounts the table of measurements which he has taken from these two species, after some stuffed specimens in the Bremen Museum. These measurements are herewith appended :—

—	—	<i>Anas chlorotis</i> (Gray).	<i>Anas gibbosifrons</i> (Mull).	<i>Dendrocygna eytoni</i> (Gould).
	Mill.	Mill.	Mill.	Mill.
Length of head	69	95	87	97
„ of beak from the frontal ..	..	40	55	41
„ of beak from edge behind nasal holes	27	39	33	40
„ from anterior edge .. ..	..	29	24	29
Width of beak in front .. ..	..	11	15	16
Length of fore-arm .. ..	..	63	60	..
„ of tarsi	53	40	37	58

Dr. Finsch remarks :—“ If the bones of the head and of the beak resemble the *Querquedula*, the length of the legs removes them considerably from it. On the other hand the legs are not so long as in *Dendrocygna eytoni*, also he thinks that these remains proceed from a duck which has affinities rather with the *Dendrocygna* than with the other division.

Among the true ducks of this country (New Zealand) there is only the *Anas chlorotis*, Gray, which can be compared to it, says Dr. Finsch, and he adds the measurement of this species as given above.

The following is a list of the bones forwarded by Dr. Finsch, from which the bird has been described :—

- 2 heads almost complete, with a large portion of the inferior maxillary.
- 2 pelves.
- 2 clavicles.
- 4 shoulder blades.
- 4 coracoids.
- 2 humerus.
- 4 radius and as many ulna.
- 4 metacarpus.
- 1 phalange.
- 12 ribs.
- 4 femurs.
- 4 tibiae and fibulae.
- 4 tarso-metatarsus.
- Several joints of the toes.

These bones came chiefly from two specimens, and probably from male and female. There are some pieces which indicate a third species.

The head most resembles our *Anas clangula* in shape as well as in proportions. In comparing it with a skeleton that we have received from Greenland we only find the beak a little wider, the nostrils more elongated, the sockets of the eyes not quite so large, and the whole of the skull more regularly rounded off. The part about the back of the head is still more alike in these two species than in the part round the face. Above the hole at the back of the head one sees in both the bone pierced to the right and to the left, and the boundary well established by ridges between the back of the head and the temples, but these parts are even better distinguished in the *Anas clangula* than in the *Anas* from New Zealand.

The two fossil heads show a certain difference, which does not exceed the difference that is found between the two sexes.

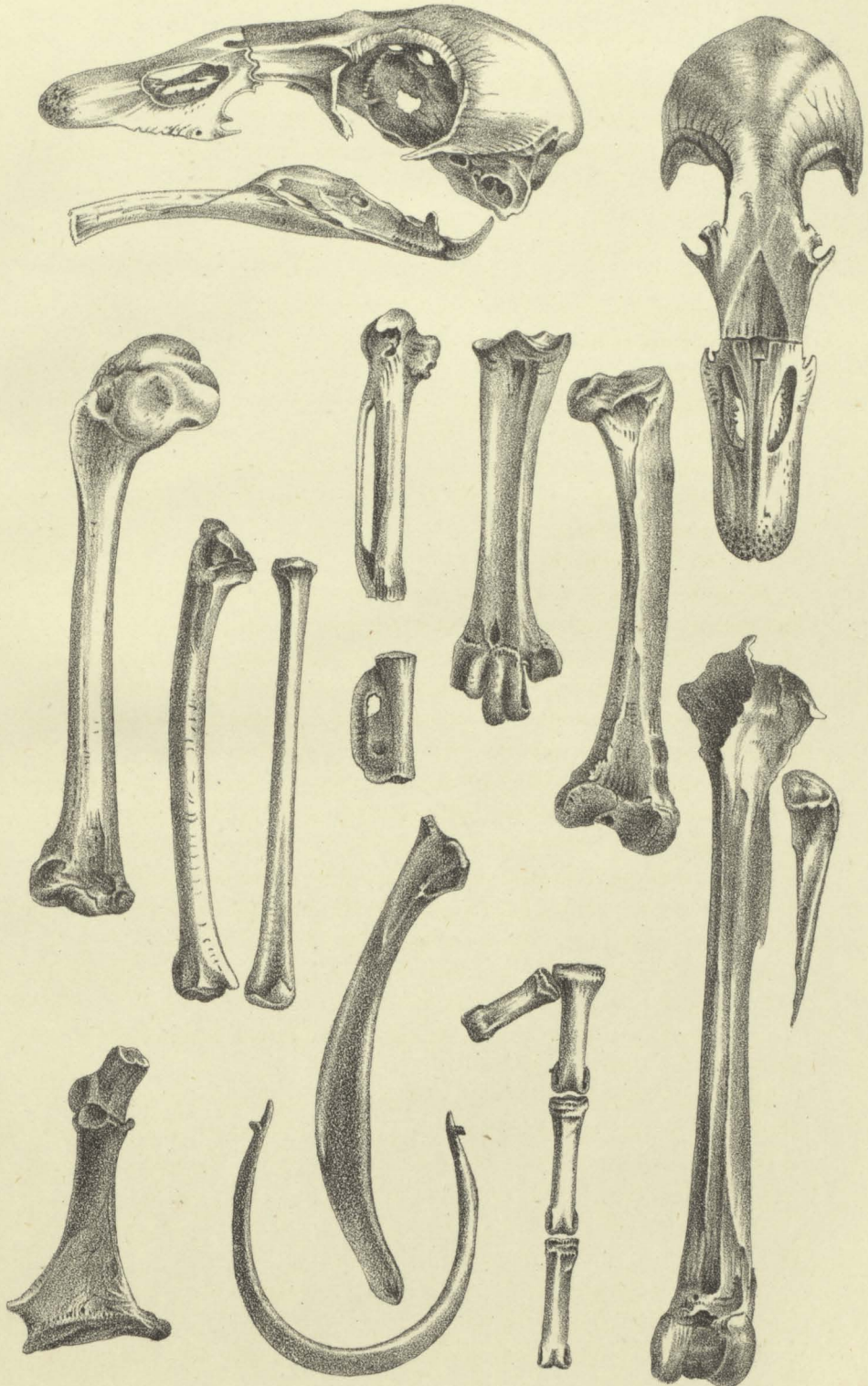
The inferior maxillary is more delicately terminated behind than in the living species of our hemisphere.

The sternum very much resembles that of *Anas clangula*; it has the same dimensions and the same outline, only the notch is not so high, more faint at the back, and shorter in front, so that everything in this bird shows less power of flight than in our *Anas clangula*.

The differences which are observed in the two New Zealand sternums are, no doubt, as in the head, sexual differences.

The clavicle is considerably larger, stronger, and with the two parts more separate than in the Marila Duck.

The pelvis is in proportion much larger and stronger than in the living



species of the North, and what especially distinguishes it is the width of the sacrum and the height of the cotyloid cavities. The shoulder blade is also stronger, wider, and longer.

We have two entire coracoids, and their resemblance to the coracoid of the Marila is so great that we had some difficulty at first to distinguish them.

The humerus is larger and stronger than that of *Anas clangula* and *Anas marila*.

The radius and ulna are alike in size as in diameter. The metacarpals are stronger as well as the following segments. If the humerus is stronger than in the two living species, *A. clangula* and *A. fuligula*, more especially is a similar difference seen in the bones of the feet.

The femur is almost double in length and thickness. We can say as much, at least, of the tibia and tarsus, and the joints of the fingers are alike incomparably stronger in the new species from New Zealand.

The tarso-metatarsus bones show in addition differences we believe to be sexual. We have also a dozen ribs, and if we find any differences it is that the central apophyses, instead of being recurved from the lower part upwards, are on the contrary extended from the upper part downwards, uniting with the bone in the whole width.

From all this we may conclude with Dr. Finsch, that the bones of the duck from the Earnsclough caves belong to a new bird, which has probably disappeared at the same time as the *Dinornis*, and to which we propose to give the name of the learned naturalist of Bremen—*Anas finschi*.

In comparing these bones with the two species known in Europe, we have been quite struck with their resemblance to the fossil species, which inhabited in great numbers the shores of lakes, the bottoms of which at the present day constitute a considerable portion of the department of Allier, and to which M. Alphonse Milne-Edwards has given the name of *Anas blanchardi*.

The principal difference between these and *Anas finschi* is that the head is not so long in the New Zealand species; and if there is but a slight difference in the size of the head, there is on the other hand a remarkable difference in the size of the bones of the limbs. The wings as well as the feet are stronger in the New Zealand species; the clavicle is wider, but it is with difficulty one discovers differences between the sternums or plastron.

That which is especially surprising in comparing these bones of a New Zealand form with the European species is, that one finds so faithfully reproduced all the characters peculiar to the birds of the family.

EXPLANATION OF PLATE XXVIII.

ALL FIGURES ARE OF NATURAL SIZE.

- Fig. 1.—Head seen in profile with inferior maxillary.
 - Fig. 2.—Same, seen from above.
 - Fig. 3.—Clavicle.
 - Fig. 4.—Shoulder blade.
 - Fig. 5.—Coracoid.
 - Fig. 6.—Humerus.
 - Fig. 7.—Radius and ulna.
 - Fig. 8.—Metacarpus and phalange.
 - Fig. 9.—Femur.
 - Fig. 10.—Tibia and fibula.
 - Fig. 11.—Tarso-metatarsus.
 - Fig. 12.—Phalanges.
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ART. XCV.—*On a new Trilobite (Homalonotus expansus).*

By JAMES HECTOR.

Plate XXVII., fig. 2, p. 474.

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Homalonotus expansus, sp. nov.

Distinguished from *H. delphinocephalus*, Green (Hall, "Palæontology of New York," p. 309), and from *H. harrisoni*, McCoy, ("Pal. of Victoria," Pt. III.), by its great proportionate width, and particularly by the middle lobe being only half the width of the lateral anas of the caudal portion of the buckler.

From the Spirifer slates associated with Madripore limestone and quartzites on which the auriferous slates of Reefton rest unconformably. Probable age, upper silurian, being the upper part of the group of strata mapped as the "Mount Arthur Series."

Tail segments only; width of largest specimen, 3 inches.
