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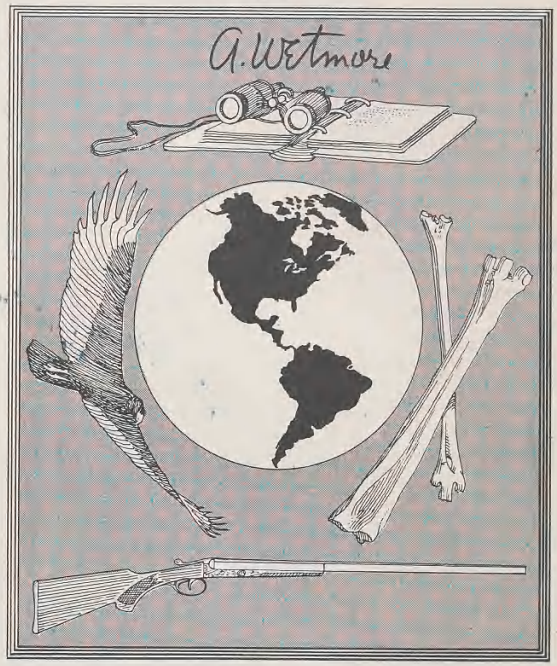
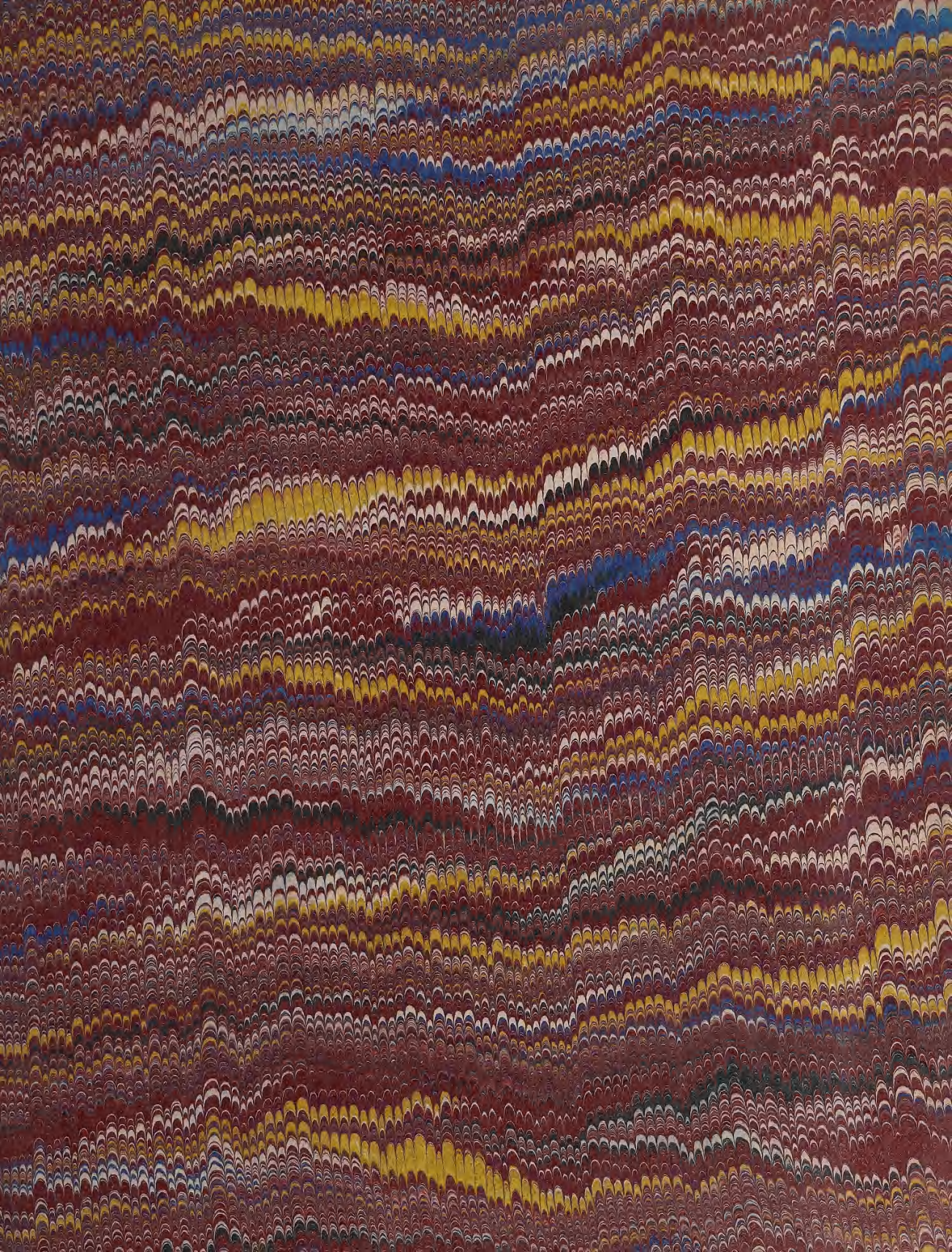


Alexander Wetmore

1946 *Sixth Secretary* 1953



SUPPLEMENT TO

OSTEOLOGIA AVIUM;

OR,

A SKETCH OF THE OSTEOLOGY OF BIRDS.

BY

T. C. EYTON, ESQ., F.G.S., F.Z.S.,

And Corresponding Member of Institute of Philadelphia.

TO BE HAD OF MR. PRINCE, AT MR. GOULD'S, CHARLOTTE STREET, BEDFORD SQUARE, LONDON.

PUBLISHED BY R. HOBSON, WELLINGTON, SALOP.

1869.

PREFACE.

It having been represented to me that Illustrations of the Osteology of the Anatidæ are required, and having a few copies of those executed for my work on the Anatidæ in hand, and also five others executed on stone by the same artist, viz., Mr. G. Scharf, I have published them in the form of an Appendix to "Osteologia Avium." There are eighteen Plates in all, five of which have not previously been published.

EYTON, THOS C. EYTON.

Feb. 1, 1869.

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Containing 18 Plates of Skeletons, and Trachea of the Anatidæ. 30s. Cloth.

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T. Eyton del.

1. Posterior margin of the Sternum of Alca Torda.
2. ——— Phalacrocorax cristatus.
3. ——— Podiceps cristatus.
4. ——— Clangula vulgaris.
5. ——— Fuligula cristata.
6. ——— Mergus albellus.
7. ——— Rhynchaspis clypeata.
8. ——— Carina Moschata.
9. ——— Tadorna bellonii.
10. ——— Anser ferus.
11. ——— Cygnus olor.

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9/8 of an Inch to an Inch.

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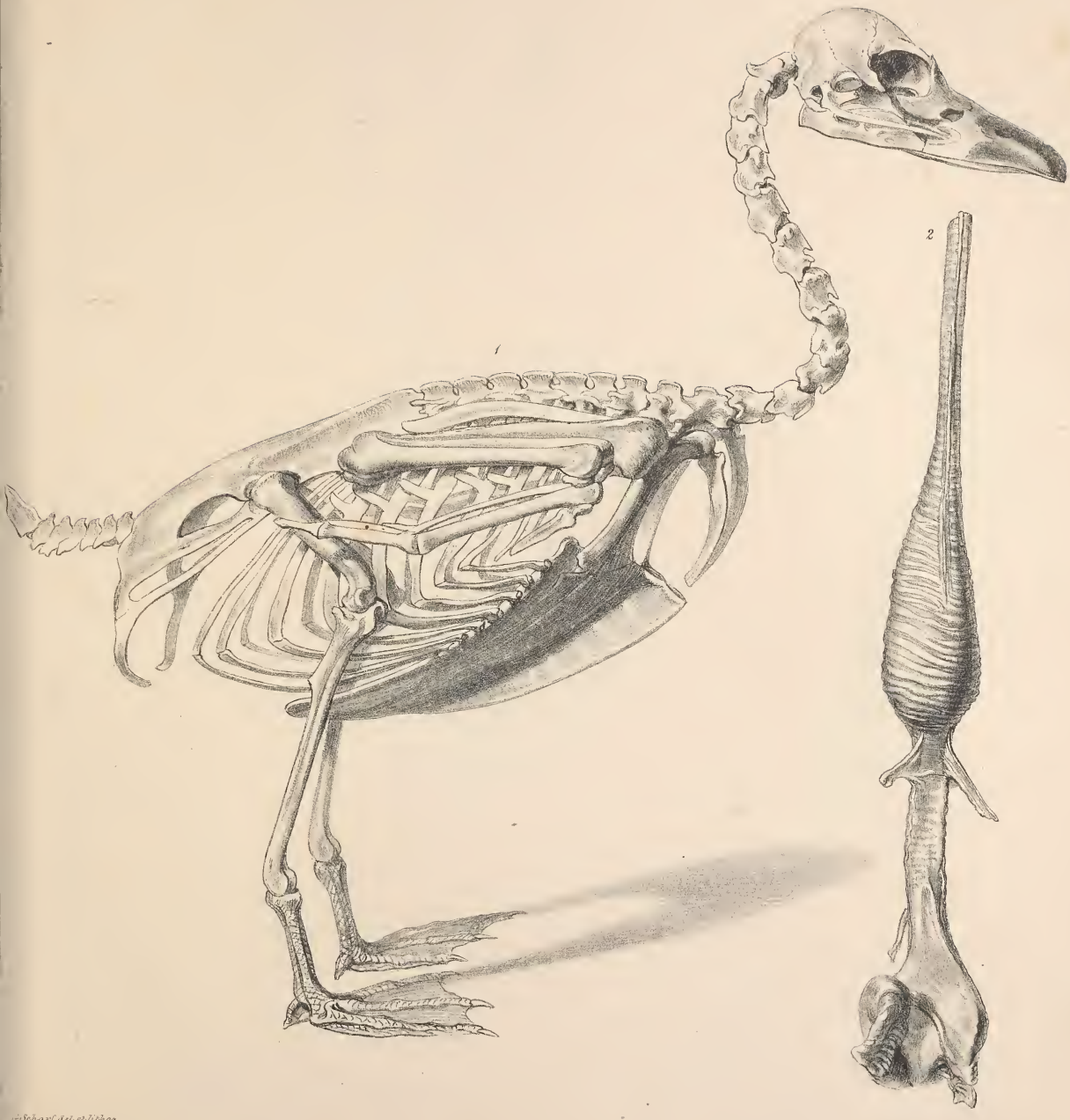

G. Scharf del et lithog

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1. SKELETON OF CLANGULA HISTRIONICA.
2. TRACHEA OF ..... VULGARIS.

Two thirds the Nat. Size.

G. Scharf del et lithog.

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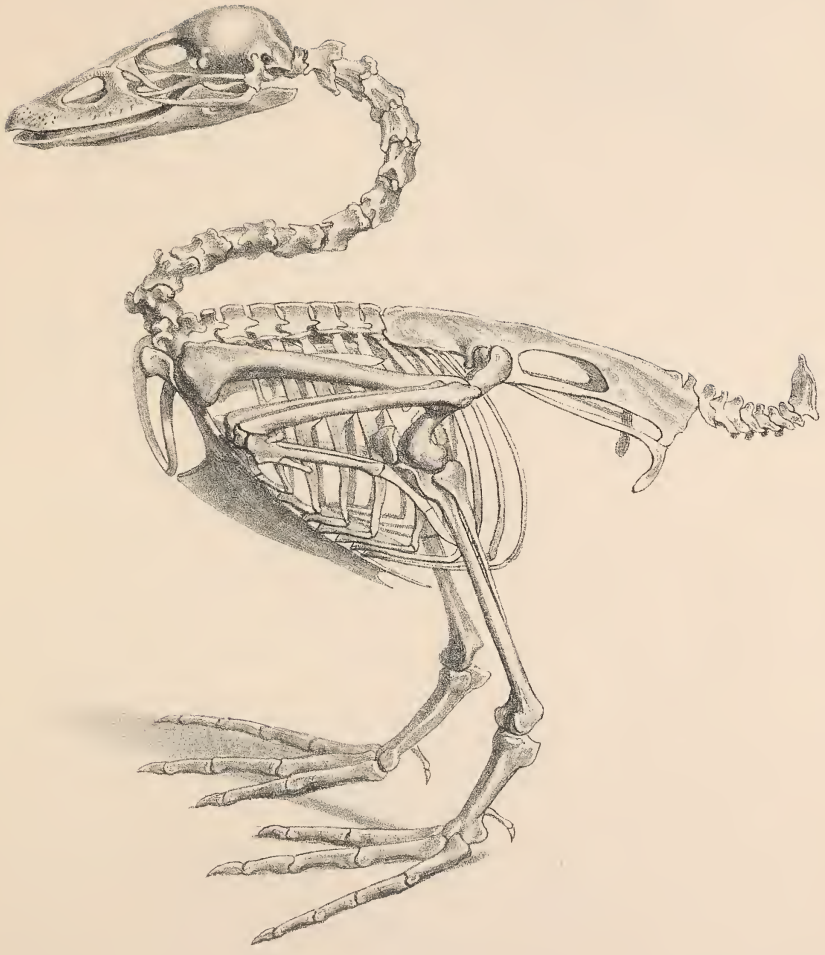
Biziura (Hydrobates) lobatus. Temm. Mas.

Scale Half.



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Hydrobates lobatus. Fem. Temm.

Scale One Half.

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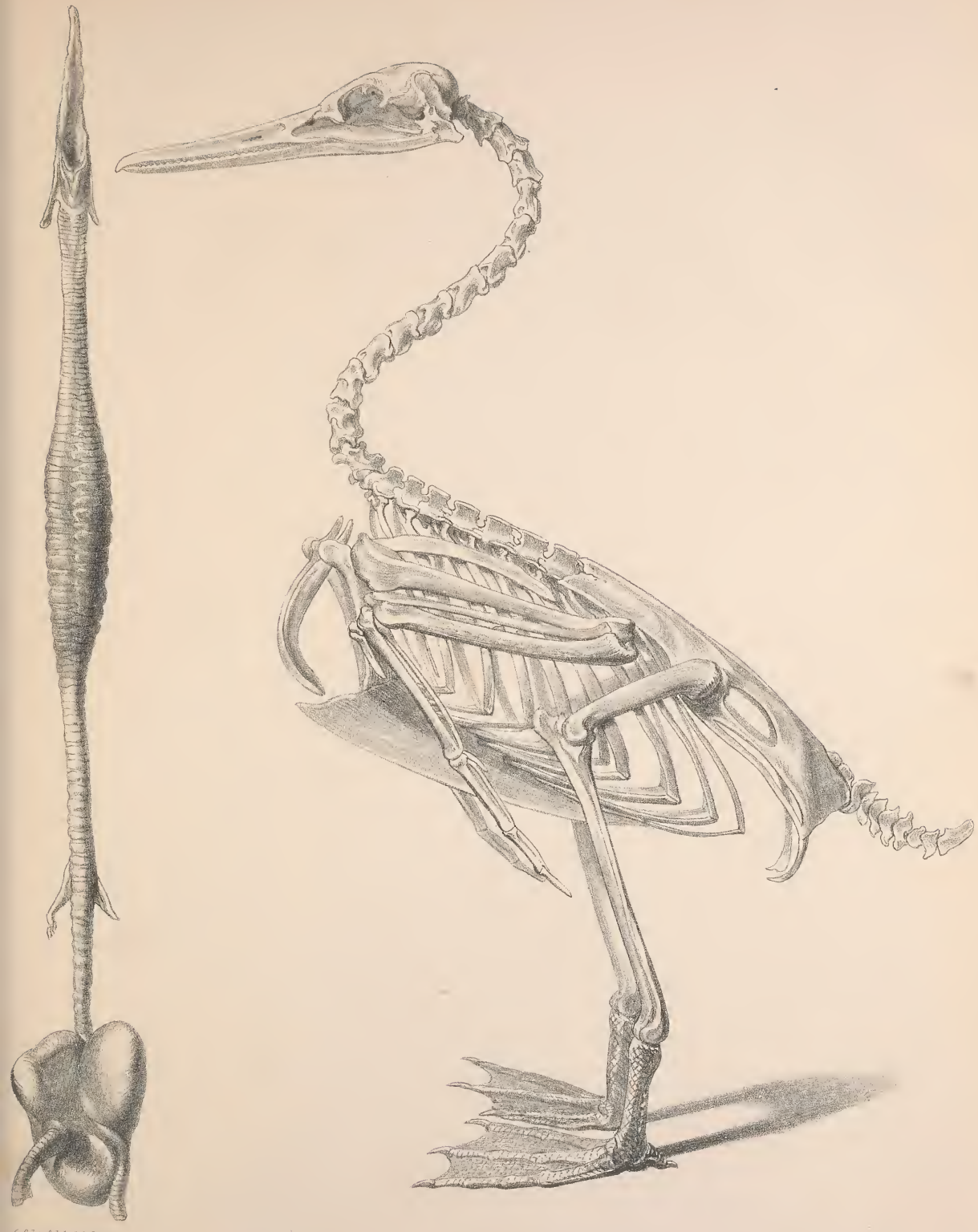
Oxyura (Erismatura) Australis Fam.

Scale 3/4 Inch to an Inch.



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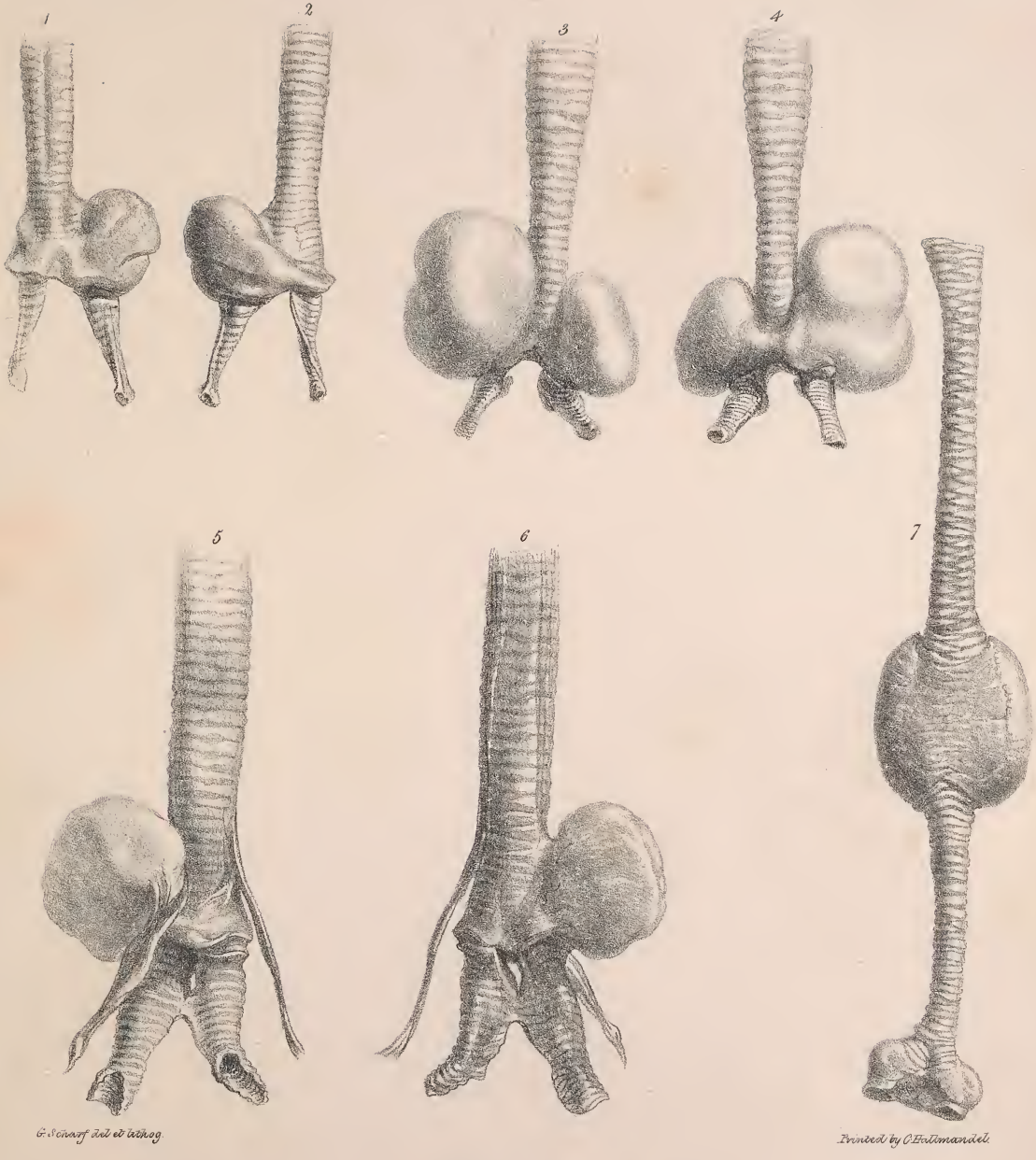
MERGUS SERRATOR & TRACHEA.

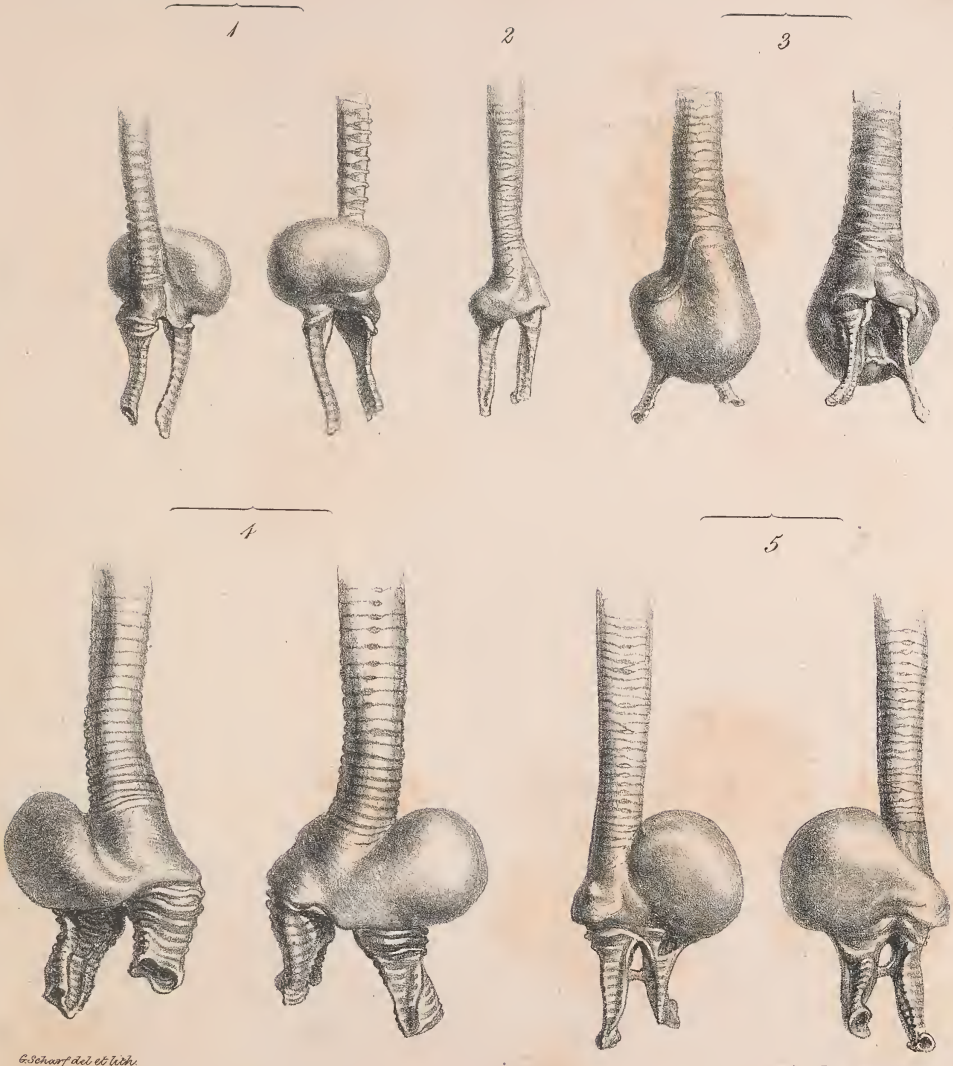
Two thirds the Nat. Size.



Trachea of

1. 2. Chlorphaga Magellanica. 3 4. Tadorna Bellonii.

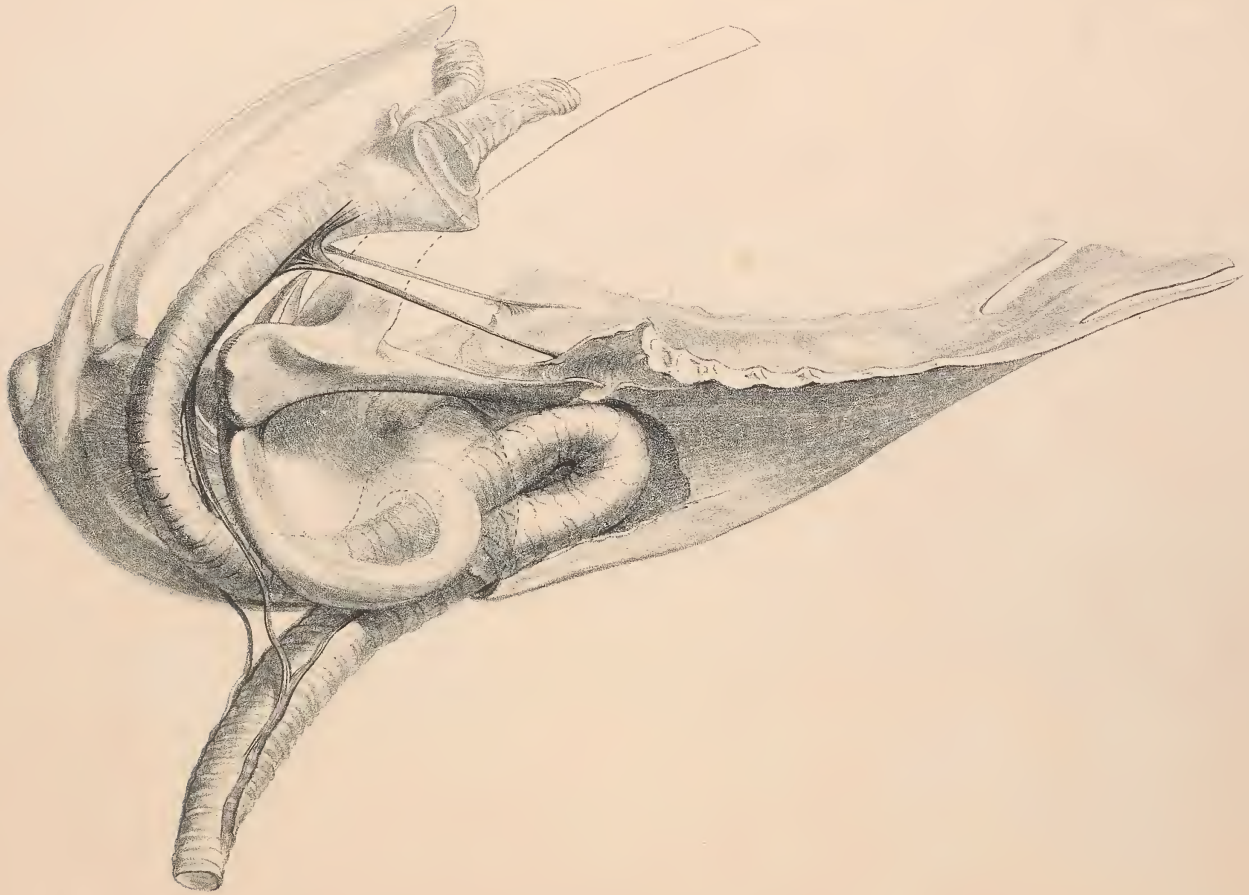
5. 6. Carina Moschata. 7. Melanitta fusca.



Trachea of

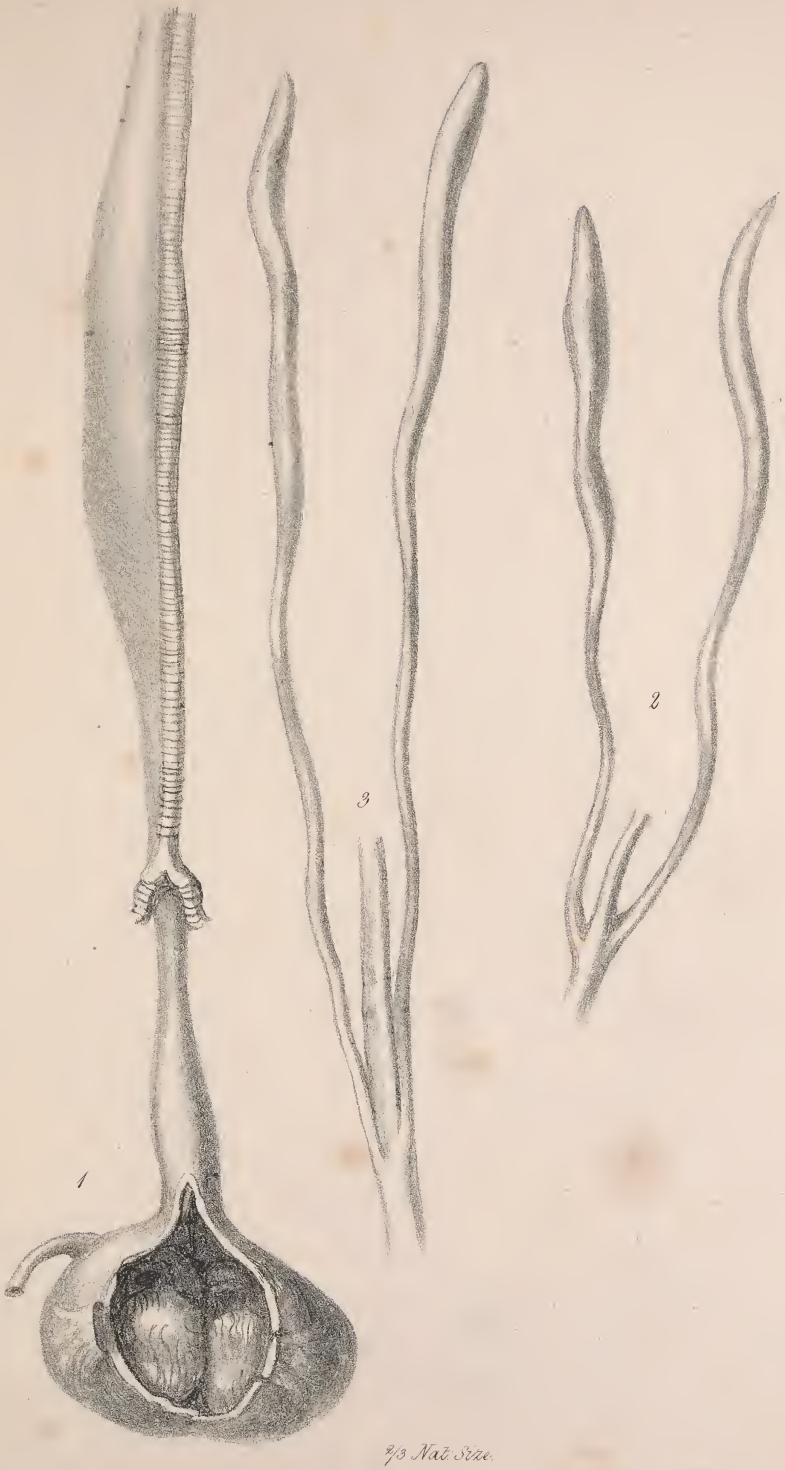
Fig. 1. Aix Sponsa.
2. Querquedula Formosa
3. Cyanopterus Circia.
4. Micropterus Patachonichus
5. Bernicla Antarctica.

All males.



MUSCLES OF VOICE OF CYGNUS BERWICKII.

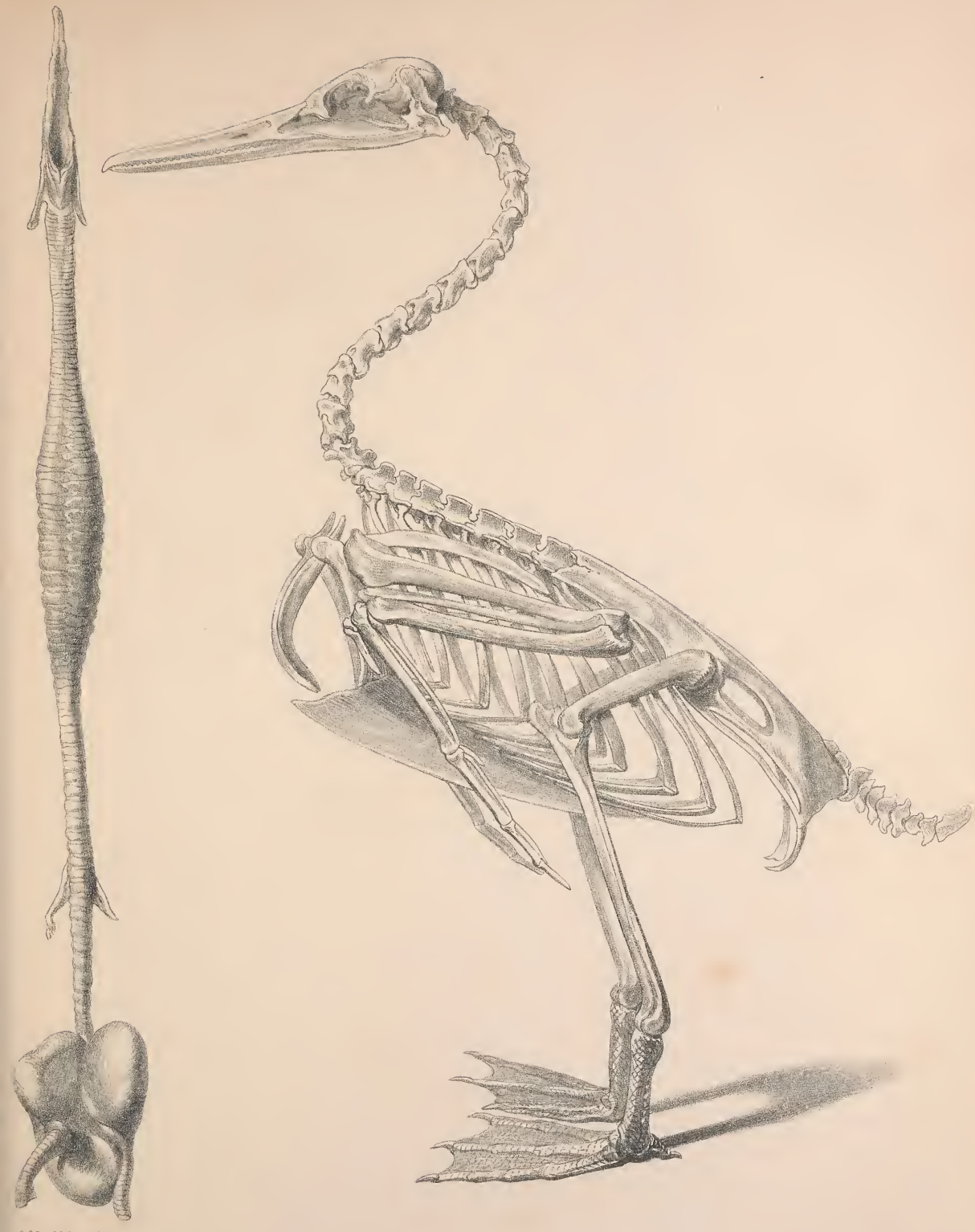
Two thirds the Nat. Size.



T. C. E. del.

2/3 Nat. Size.

1 Æsophagus provantriculus and Stomach of Querquedula crecca. Fem.
2. Cæca of Dº 3. Cæca of Tadorna Bellonii. Male.



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MERGUS SERRATOR & TRACHEA.

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CHENALOPEX ÆGYPTIACA &. TRACHEA.

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C. Scharf del. et lith.

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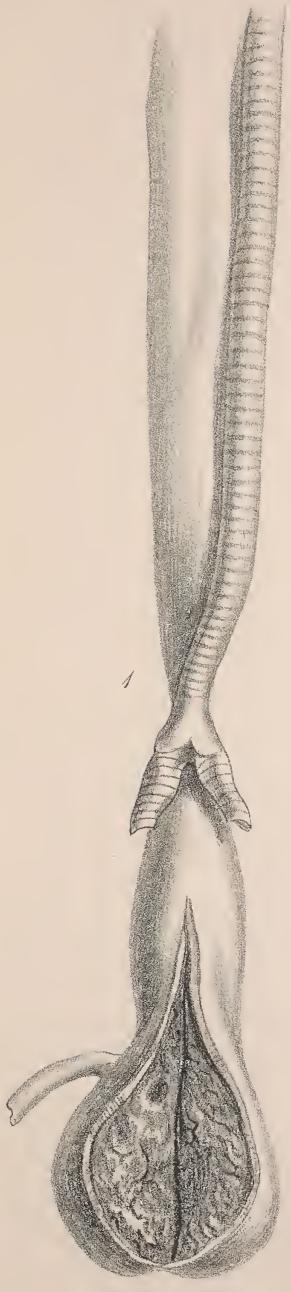
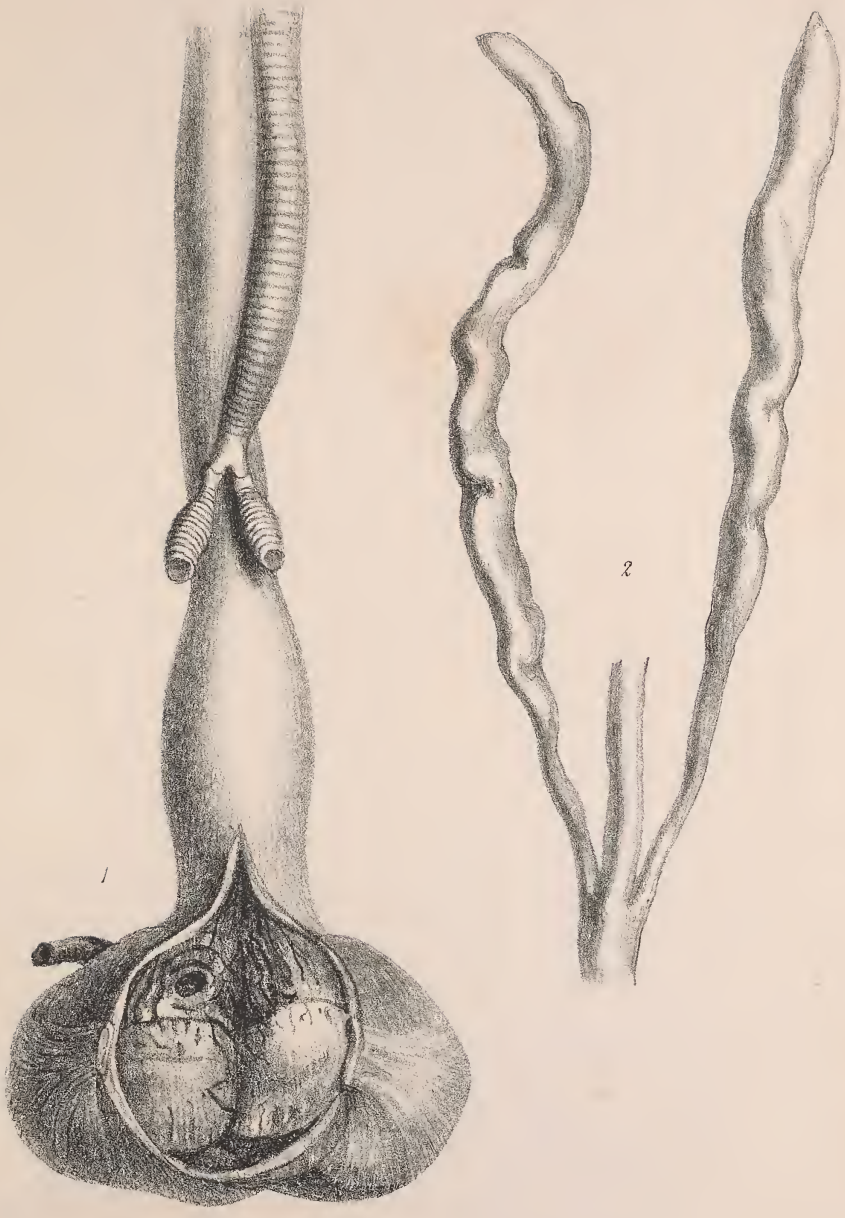


T.C.E. del.

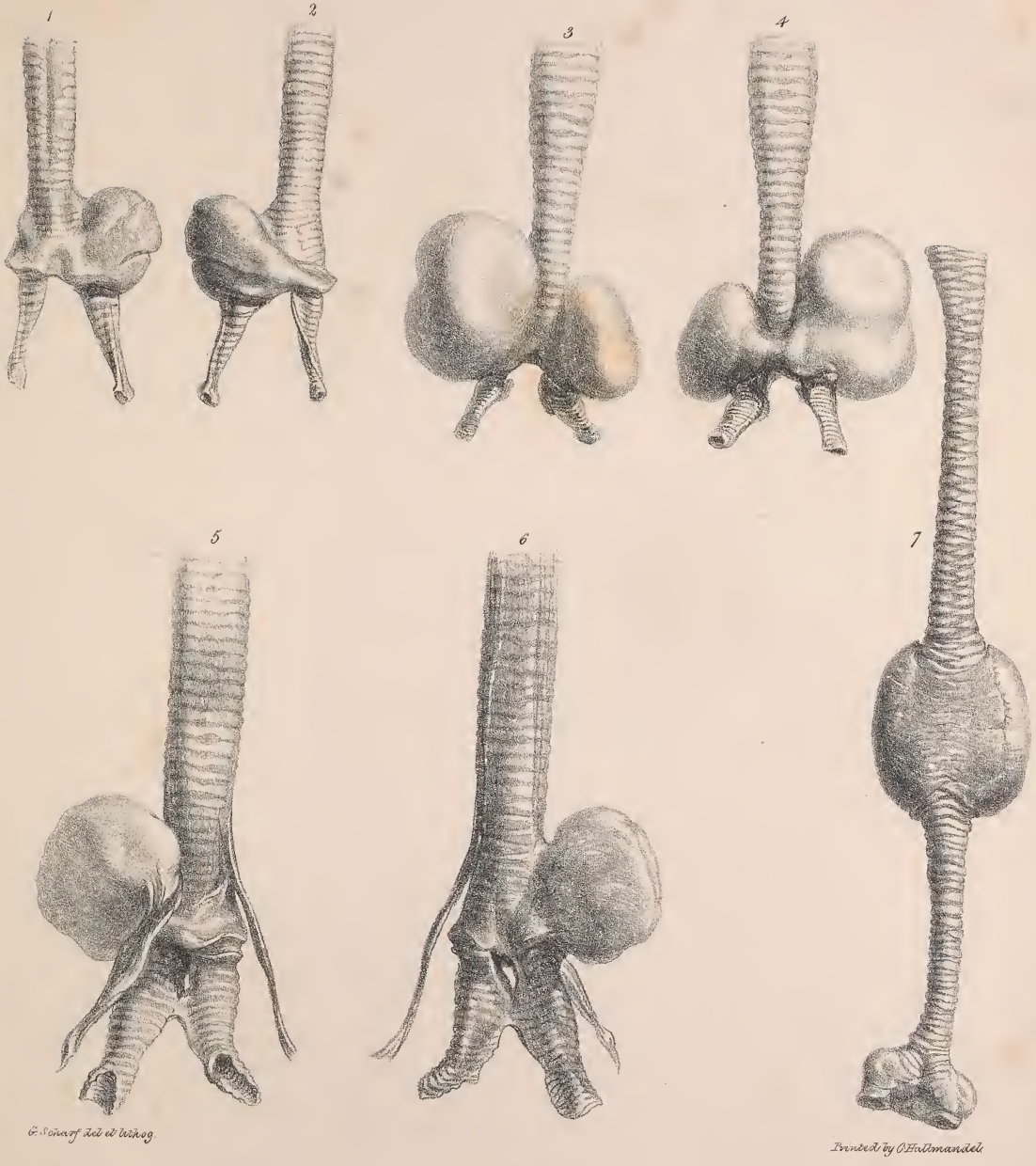
⅔ Nat. Size.

1. Æsophagus proventriculus and Stomach of Mergus Serrator. Fem.
2. Cæca of D.°



T.C. Eäel

1. Æsophagus Proventriculus & Stomach of Anser segetum Fem.
2. Cœca of Ditto



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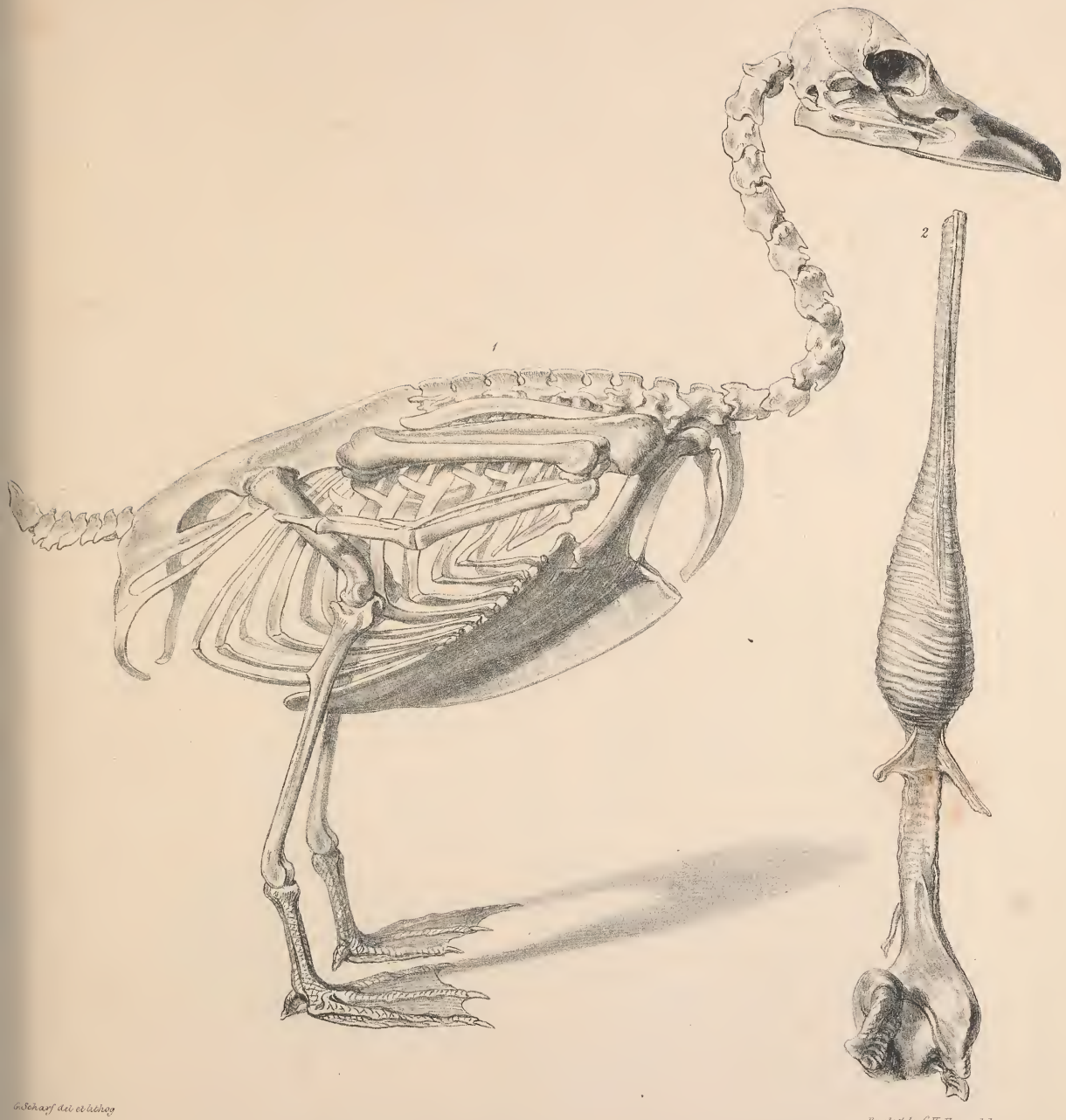

G.Schaff del et lithog

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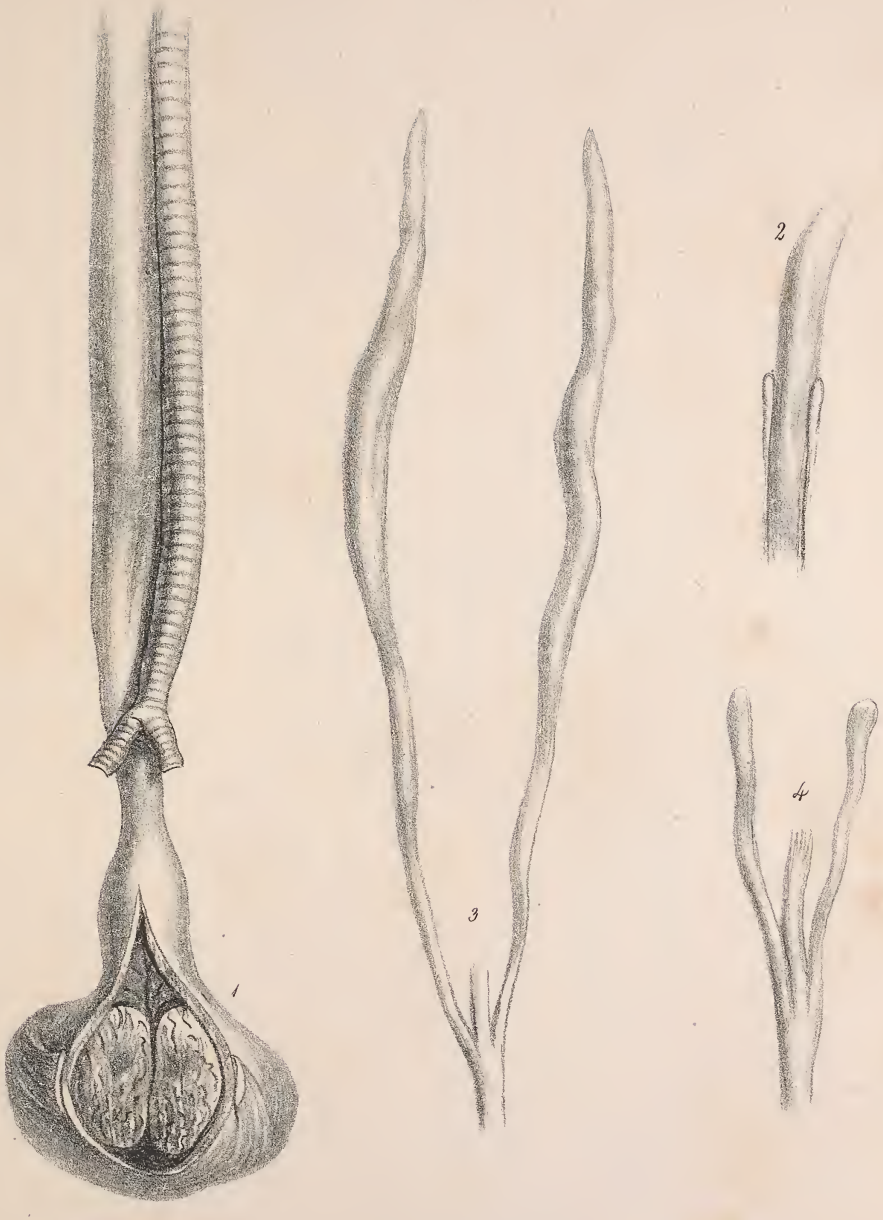
Two thirds the Nat Size.



T. C. E. del.

2/3 Nat. Size.

1. Œsophagus Proventriculus and Stomach of Melanitta nigra. Fem.
2. Cæca of D.° 3. Cæca of Fuligula ferina. Male. 4. Cæca of Clangula vulgaris. Fem.

G. Scharf del. et lithog.

Printed by C. Hullmandel.

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Half the Nat. Size.

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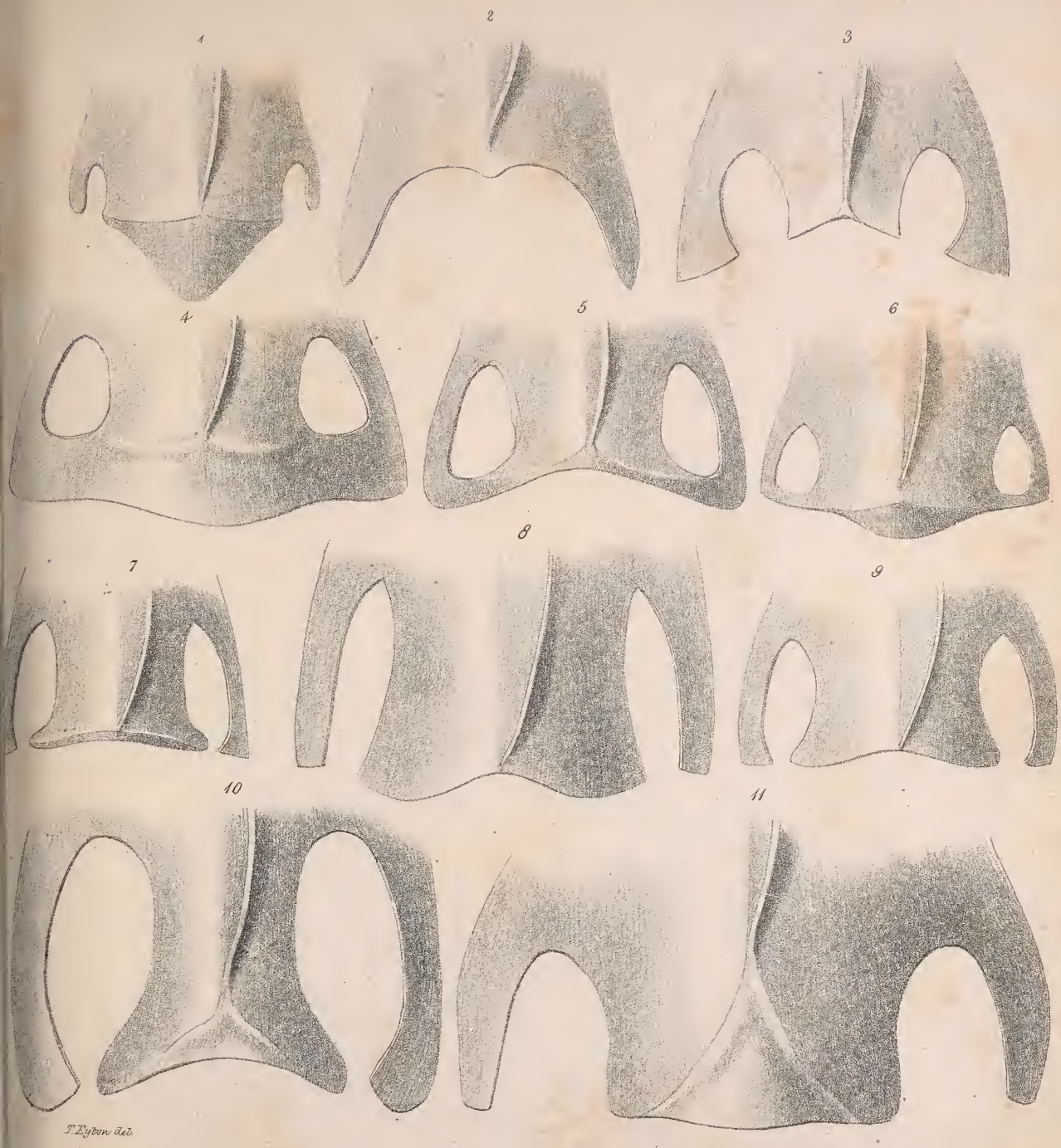

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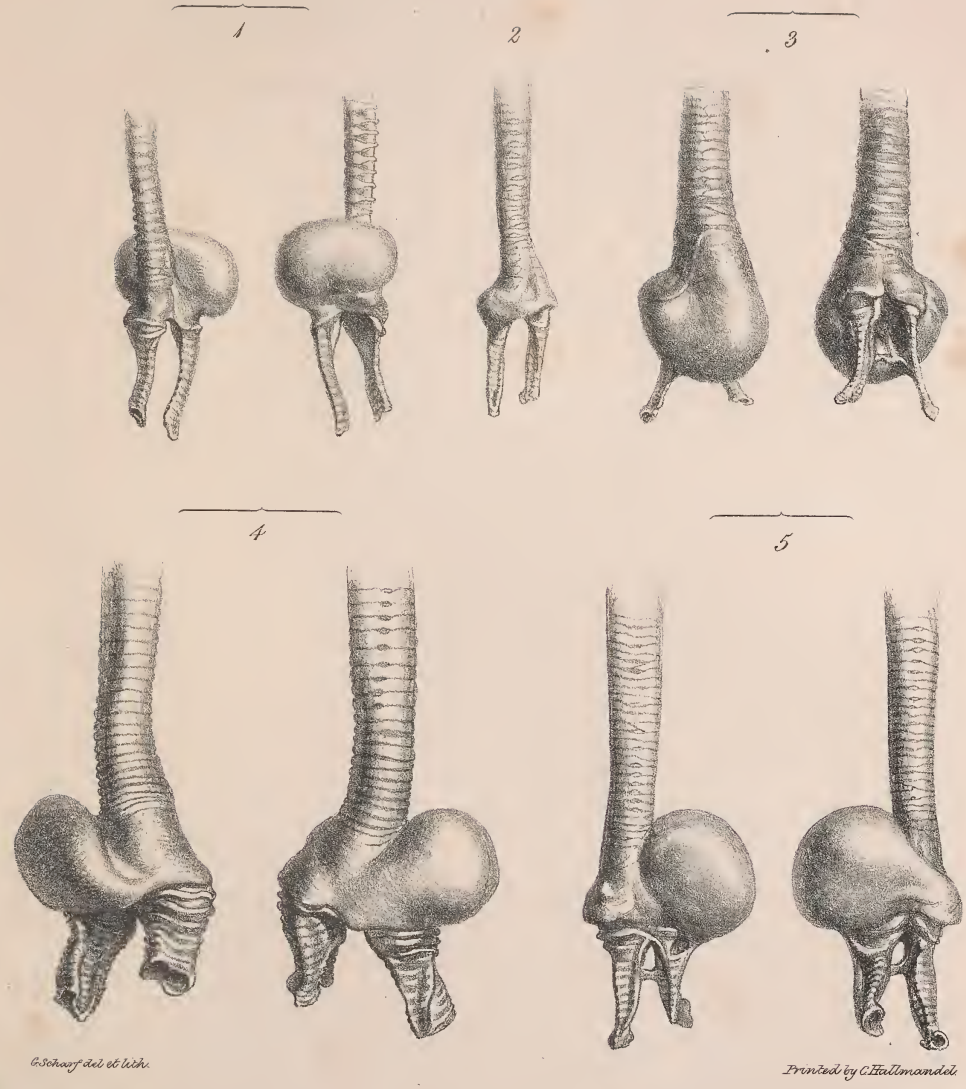

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All males.

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OSTEOLOGIA AVIUM;

OR,

A SKETCH OF THE OSTEOLOGY OF BIRDS.

Supplement II.

BY

T. C. EYTON, ESQ., F.G.S., F.L.S.,

And Corresponding Member of the Institute of Philadelphia.

PUBLISHED BY WILLIAMS AND NORGATE, HENRIETTA STREET, COVENT GARDEN, LONDON,

AND

R. HOBSON, WELLINGTON, SALOP.

1875.

PREFACE.

I have now figured, I believe, all the principal forms of the Skeletons of Birds, and in conclusion beg to thank those who have assisted me. I am much obliged to Mr. Gerrard, senior, of the British Museum, and Mr. Flowers, of the College of Surgeons, who have always assisted me in finding anything I wanted in the respective collections in their care ; to Mr. Bartlett, senior, also, I am much obliged for information regarding the habits of some birds, among which I may mention Chauna Chavaria, and Rhynochetus Jubatus ; and to Professor Owen I am much obliged by his always giving me access to him, although so much employed, when I wished to ask him a question ; to Dr. Gray also I am obliged for allowing me access to the collection under his care.

I have added to this Supplement a list of plates of Skeletons of Birds for reference.

T. C. EYTON,

Eyton-on-the-Wealdmoors,

Wellington, Shropshire.

LIST OF PLATES AND INDEX.

ERRATA.

Page 22.—For *Spisc* read *Spix ;* for *Kettl.* read *Kittl.* Page 26.—*For* Rhynochotus *read* Rhynochetus.

OSTEOLOGIA AVIUM.

SECOND SUPPLEMENT.

Euryceros prevostii, *Less.*

This bird was described by Lesson in his "Centurie Zoologique" in 1830. The following is a part of his description:—

"L'oiseau type, du genre nouveau que nous représentons dans la planche 74 est une des singularités les plus neuves et les plus remarquables de l'ornithologie.

"C'est un passage transitoire entre les toucans, les calaos et les enrylaimes; c'est un type caractérisé a placer comme lieu intermédiaire entre l'erotta.—(Traite d'Ornithologie, p. 260) et les buceros.

"Les enrycères appartiennent à nos passereaux hétérodactyles et à notre famille des enrylaimes, le genre sera ainsi caractérisé."

Bonaparte, in his "Conspectus Genera Avium," classes it near the *Rhamphastidæ* after *Buceridæ*, which immediately precedes it. G. R. Gray classes it among the *Sternidæ*, to which it has no affinity whatever.

Cranium rounded, without any channel over the vertex to the bill. Occiput very round, with a slight depression on each side above the foramen magnum; orbital septum, perforated with two foramina, orbits large; the superior margin slightly reflexed. Bill, with the upper mandible, large; very much raised above, composed of cellular bone, deep; lower mandible deep, with a foramen near its hinder extremity; both mandibles pointed.

Sternum of moderate length, with a deep and wide fissure on each hinder margin.

Pelvis broad, short.

Palatine bones prolonged on the exterior and hinder margin into an elongated spine, from the base of which they slope gradually, until they unite in the centre, where they are slightly deflected, broad.

Furculum much arched anteriorly; the process at the junction of the rami, which are rounded, arched, flattened, and the rami long.

Coracoids long, broad at their junction with the sternum, rounded in the middle.
Scapulæ long, much deflected.
Ribs weak, expanded at their dorsal extremities.
Wing bones long.
Tarsi long.
Toes long, the too outer anterior ones united; vertebræ short.

Measurements.

	Tenths.		Tenths.
Length of humerus	11	Breadth of posterior margin	10
Length of ulna	16	Breadth of anterior margin of ditto	6
Length of radius	12½	Depth of keel	3
Length of metacarpus	9	Length of head	24
Length of femur	11	Breadth of head	9
Length of tibia	15	Length of pelvis	14
Length of metatarsus	11	Breadth of pelvis	9
Length of sternum	13		

From the above description it will be perceived that this bird presents no affinity whatever to *Rhamphastidæ* or *Sternidæ*. From the first family it differs in the shape of the sternum, and from the last in almost every part, particularly in the structure of the sternum and the palatine bones. In all these particulars it agrees with *Buceros*, and also in the form of the pelvis and furculum.

Illustration.

Sup. 2, pl. A. Details, pl. 1.

OPISTHOCOMUS.

Cristatus.

Cranium, a channel of moderate depth, has its origin at the base of the bill, and proceeds backwards on the top of the head to the occiput. Occipital ridge slight, and with a small occipital protuberance; orbits of moderate size; the septum with one foramen on its hinder and lower edge; a transverse indentation at the base of the bill; nostrils situated at about half its length, nearly round. Palatine bones much bent downwards; broad for their posterior two-thirds, and united for that distance down their centres, then divaricating, and both edges turned downwards, forming a channel on their lower edges; hinder end pointed backwards, and gradually narrowed to their junction with the interarticular bones, which are broad for their anterior half and narrowed backwards, the outer edges slightly deflected. Vomer thin. Foramen lacerum posterius very small. Lower maxillary bone curved downwards; broad, with a foramen near the hinder extremity of each branch.

Sternum of moderate length; posterior margin rounded, with one fissure on each side of the keel, and with a large triangular foramen on each side externally to it; hinder margin considerably broader than the anterior edge. Keel very short, extending from the hinder margin to little more than one-half of the length of the sternum; hinder edge sloped off from the point to the hinder margin. The anterior edge sloped very much backwards to the point from the junction of the furculum; the anterior portion being a mere rudimentary ridge.

Furculum having the rami very short and straight, and uniting at an acute angle, flattened at their junction with the coracoids, and becoming more rounded towards the terminal process, which is very long and narrow; triangular anchylosed to the rudimentary portion of the keel.

Coracoids short and strong, broad at their junction with the sternum, and having a slightly raised rib down the front.

Pelvis with the divisions of the vertebræ on the hinder half apparent when held up to the light; ischiadic foramen of moderate size, oval; obturator also of medium size, without any notch in front of the acetabulum; ilium projecting much over the bones of the ischium; a ridge proceeds from the junction of the caudal vertebræ up the centre of the pelvis, becoming more rounded and obscure on the anterior portion.

Ribs broad and strong; the styliform process attached for a considerable length to the hinder edge of the ribs, and not projecting so far as next rib.

Scapula strong, slightly deflected, slightly expanded upwards at about half its length, rounded at its distal extremity.

Wing bones strong, short; ulna and radius as long as the humerus, anterior metacarpal bone straight, posterior one much bent, having a large space between it and the inner edge of the anterior one.

Leg Bones rather slender; tibia long in proportion to the femur. Metatarsus

triangular at its upper extremity, with a channel down the front, flattened towards its lower extremity; os calcis projecting considerably, with a very slight ridge proceeding downwards from it. A supplemental metatarsal bone projecting much backwards, not twisted on its axis, tapering and flattened upwards; tubercles for the articulation of the feet broad; toes long.

This curious bird appears to be nearly allied to the guans, but differs from in the form of the palatine bones, the hinder margin of the sternum, and furculum. There is no Gallinaceous bird that I am acquainted with that has the hinder margin of the sternum of a similar form, the nearest approach that I am aware of to the form of the furculum is among the cracidæ in C. Globocera, the process at the junction of the rami is very much elongated, but is not nearly so much so as in the opisthocomus. The rami also are curved, while in the latter bird they are straight, and the furculum, instead of being anchylosed, or united by a ligament to the point of the keel of the sternum, is anychylosed to its medial portion.

Measurements.

	Tenths.		Tenths
Length of humerus	17$\frac{3}{4}$	Breadth of anterior margin of ditto	11$\frac{1}{2}$
Length of ulna	19	Depth of keel	6
Length of metacarpus	12	Length of head	14
Length of femur	16	Breadth of head	9$\frac{1}{2}$
Length of tibia	15	Length of pelvis	16
Length of metatarsus	11	Breadth of pelvis	12
Length of sternum	16		
Breadth of posterior margin	15$\frac{1}{2}$		

Illustration.

Snp. 2, pl. 2, B. Details, pl. 2.

Rhynochetus.

Jubatus, *Verr.*

Cranium much arched above, with an indentation from the base of the bill to vertex, a large and prominent occipital ridge, with two deep channels anterior to it. Orbital septum with very large foramen. Palatine bones truncated behind, gradually tapering to point anteriorly; posterior margin entire.

Sternum narrow, long; keel very narrow, with the edge nearly straight.

Pelvis anteriorly much arched and gradually sloping backwards, with two deep hollows, one on each side of the sacral vertebræ. Ischiadic foramen long. Obturator foramen large and rounded anteriorly, short posteriorly. Pelvis very short.

Ribs narrow and thin, styliform process turned much upwards.

Furculum weak, without any process at the junction of the rami.

Coracoids broad, at their sternal extremities light.

Scapulæ very much arched, short.

Wing bones short, ulna much bent.

Measurements.

	Tenths.		Tenths.
Length of humerus	26	Breadth of anterior margin of ditto	10
Length of ulna	28	Depth of keel	3
Length of metacarpus	14	Length of head	17
Length of femur	26	Breadth of head	13
Length of tibia	50	Length of pelvis	30
Length of metatarsus	45	Breadth of pelvis	13
Length of sternum	19		
Breadth of posterior margin	7		

Mr. G. Gray, in his Hand-list, places this bird next Eurypyga, from which it differs in the shape of the sternum. In Eurypya the keel is very deep, and continued to the posterior margin. In Rhynochetus it is obliterated, the former bird has a deep foramen on each side, the latter none at all; the pelvis in the former bird is quite straight on its dorsal aspect, the latter has it much arched; in all of which respects it agrees with Psophia.

Illustration.

Sup. 2, pl. 3. Details, pl. 3, C.

Centropus, *Ill.*

Rufipennis, *Horsf.*

Cranium with a slight channel between the orbits. Occipital ridge large and prominent, the channel for the masseter muscle large. Orbital septum with a large central foramen and a smaller one above.

Palatine bones similar to those of centropus phasianus, (pl. 13, fig. 1).

Sternum with one foramen on each side of the keel placed near the margin, the plate of bone bordering it not being so wide as in centropus phasianus; lateral margin more curved outwards. Keel with its edge more curved than in centropus phasianus; remainder as in the foregoing, but not so strong.

Measurements.

	Tenths.		Tenths.
Length of humerus	12	Breadth of posterior margin	13
Length of ulna	18	Breadth of anterior margin of ditto	10
Length of radius	17	Depth of keel	4
Length of metacarpus	9	Length of head	28
Length of femur	22	Breadth of head	11
Length of tibia	34	Length of pelvis	21
Length of metatarsus	23	Breadth of pelvis	11
Length of sternum	15		

Illustration.

Sup. 2, pl. 4. Details, pl. 4, D.

Scythrops, *Lath.*

Novæ Hollandiæ, *Lath.*

I have only been able to obtain a small portion of the skeleton of this curious bird, although it appears to be by no means rare in its native country; namely, the sternum, furculum, coracoids, and scapulæ.

Sternum broad, short; hinder margin with an indentation on each side of the keel; anteriorly slightly convex. Keel deep, much arched on its inferior edge, and continued to the posterior margin; anteriorly much hollowed out. Lateral margin curved, the hinder margin broader than the anterior one.

Furculum arched; process at the junction of the rami small, slightly flattened.

Coracoids very broad at their articulation with the sternum

Scapulæ very broad near their extremities; arched, pointed.

Measurements.

	Tenths.		Tenths.
Length of sternum	23	Breadth of anterior margin of ditto	14
Breadth of posterior margin of ditto	20	Depth of keel	6

Illustration.

Sup. 2, pl. 5, E.

ZANCLOSTOMUS.

Javanicus, *Horsf.*

Cranium rounded, a slight channel over the vertex to the bill. Orbits large. Septum with one large foramen, a depression at the base of the bill, channel for the masseter muscles large, depression extending to the occiput.

Sternum with two fissures on the hinder margin, the inner one largest; hinder margin much broader than the anterior one; anterior edge receding.

Pelvis very broad, the sacral vertebræ forming a ridge for its whole length; ischiadic foramen large. Obturator foramen narrow, a large projection in front of the acctabulum pointing forwards.

Furculum very long, branches not much arched, process at their junction small.

Scapulæ broad.

Wing bones strong, the ulna nearly as long as the humerus.

Measurements.

	Tenths.		Tenths.
Length of humerus	10½	Breadth of posterior margin	8
Length of ulna	10	Breadth of anterior margin of ditto	6
Length of radius	9½	Depth of keel	2½
Length of metacarpus	5	Length of head	22
Length of femur	14	Breadth of head	8
Length of tibia	20	Length of pelvis	10
Length of metatarsus	10	Breadth of pelvis	8
Length of sternum	8		

Illustration.

Sup. 2, pl. 6, F.

ZANCLOSTOMUS.

Sumatranus.

Very similiar to the preceding.

Measurements.

	Tenths.		Tenths.
Length of humerus	8	Breadth of anterior margin of ditto	6
Length of ulna	11½	Depth of keel	3
Length of metacarpus	6	Length of head	21
Length of femur	15	Breadth of head.	9
Length of tibia	20	Length of pelvis	12
Length of metatarsus	8½	Breadth of pelvis	7
Length of sternum	8		
Breadth of posterior margin	8		

Illustration.

Sup. 2, pl. 6.

Struthidea, *Gould.*

Cinerea, *Gould.*

Cranium very round over the vertex. Occipital crest very small, with a slight depression between the orbits, which are large, and with a large foramen through the septum. Nostrils large. Palatine bones very broad, posteriorly with a blunt spine on each side, the central edge deflected slightly for the posterior half, united at their articulation, with the interarticular bones gradually narrowed towards their anterior extremities.

Sternum long, indented, with two fissures on the posterior margin, much retiring from the manubrial process, which is large and prominent; bifcurcate at the end. Keel of moderate depth, straight on its inferior edge.

Pelvis broad, divisions of the vertebræ apparent. Ischiadic foramen large; obturator foramen rounded, open, not a mere slit as in most birds.

Ribs of moderate size; styliform process turned much upwards.

Furculum much expanded; process at their junction of the rami small.

Coracoids long, of moderate size.

Scapulæ long, broad.

Wing bones of moderate size; ulna longer than than the humerus.

Leg bones metatarsus, very long.

Measurements.

	Tenths.		Tenths.
Length of humerus	14	Breadth of anterior margin of ditto	$7\frac{1}{2}$
Length of ulna	16	Depth of keel	4
Length of metacarpus	8	Length of head	19
Length of femur	8	Breadth of head	9
Length of tibia	23	Length of pelvis	16
Length of metatarsus	17	Breadth of pelvis	$9\frac{1}{2}$
Length of sternum	16		
Breadth of posterior margin	9		

Illustration.

Sup. 2, pl. 7. Details, pl. 7, F.

Struthidea presents a strong resemblance to kitta in the shape of the palatine bones and sternum, but pelvis is narrower.

PTILORHYNCHUS, *Cuv.*

Smithii, *Vig & Horsf.*

Differs very slightly in form from Cassicus.

Measurements.

	Tenths.		Tenths.
Length of humerus	12	Breadth of anterior margin of ditto	9
Length of ulna	21	Depth of keel	5
Length of metacarpus	10½	Length of head	25
Length of femur	16	Breadth of head	10
Length of tibia	20	Length of pelvis	22
Length of metatarsus	21	Breadth of pelvis	12
Length of sternum	17		
Breadth of posterior margin	11		

Illustrations.

Pl. 1. Details, pl. 8, H.

Dendrocitta, *Gould.*

Vagabunda, *Lath.*

Cranium round on the vertex. Occipital ridge well defined, but not prominent. Orbits large. Septum with the foramina partly filled up. Palatine bones broad on their hinder margins, their lateral edges terminating with a blunt spine. Interanticular bones broad at their junction with the palatine bones, which, anteriorly, merely form a narrow strip on each side to their junction, with the superior maxilliary bones.

Sternum rather long, with a deep fissure on each side inferior edge of the keel, arched; the front edge much scolloped out.

Pelvis broad. Obturator foramen long; ischiadic large.

Ribs with the styliform process very long.

Furculum narrow.

Coracoids small.

Scapulum slightly arched, expanded near the extremity, and finally pointed.

Wing bones of moderate size; the ulna much longer than the humerus.

Leg bones with the tibia and metatarsal bones nearly equal.

Measurements.

	Tenths.		Tenths.
Length of humerus	9	Breadth of anterior margin of ditto	6½
Length of ulna	15	Depth of keel	3½
Length of metacarpus	8	Length of head	22
Length of femur	13½	Breadth of head	10
Length of tibia	18	Length of pelvis	16
Length of metatarsus	15	Breadth of pelvis	7
Length of sternum	13		
Breadth of posterior margin	8		

Illustrations.

Sup. 2, pl. 9. Details, pl. 9, I.

Stercorarius, *Briss.*

Pomarinus, *Temm.*

Cranium rather flattened. Orbits large; a moderate-sized foramen in the centre, and a smaller one above it; a deep depression over each orbit. Palatine bones narrow, bending downward at the lateral edges; wider than in Chroicocephalus ridibundus. Interanticular bones bending inwards at their hinder ends, flattened.

Sternum with a large and deep fissure on each side of the keel, which is very deep and much curved on its inferior edge; much scolloped out on its anterior edge. Manubrial process small, laterally compressed, pointed.

Pelvis long; the pubis and ischium very much prolonged backwards. Obturator foramen long, narrow. Ischiadic foramen small; the division of the sacral vertebræ apparent.

Ribs moderate; styliform processes long, pointing upwards.

Furculum flattened, no projection at the junction of the rami.

Coracoids very strong, flattened on the upper side.

Scapulæ thick, of nearly the same width throughout, pointed at their extremities.

Wing bones very long, especially the metacarpal.

Leg bones light.

Measurements.

	Tenths.		Tenths.
Length of humerus	46	Breadth of anterior margin of ditto	15
Length of ulna	47	Depth of keel	8
Length of metacarpus	42	Length of head	36
Length of femur	18	Breadth of head	8
Length of tibia	26	Length of pelvis	33
Length of metatarsus	22	Breadth of pelvis	19
Length of sternum	30		
Breadth of posterior margin	13		

Illustrations.

Sup. 2, pl. 10. Details, pl. 10, I.

The genus stercorarius differ from the genus larus, in having only one fissure on the posterior margin of the sternum, in the more depressed form of the cranium.

ARDEA, *Linn.*

Herodias. *Linn.*

Cranium much the same as in A. cinerea, but with the muscular impressions more distinct. The occipital crest more prominent, and orbital septum with a large foramen. Palatine bones narrow.

Sternum longer and narrower, and more convex. Keel not so deep.

Pelvis also longer and narrower, and with the central channel more marked.

Ribs narrow.

Furculum, *Coracoids*, and *Scapulæ* smaller and longer.

Wing and *Leg bones* similar, but longer.

Measurements.

	Tenths.		Tenths.
Length of humerus	80	Breadth of anterior margin of ditto	24
Length of ulna	96	Depth of keel	10
Length of metacarpus	40	Length of head	96
Length of femur	46	Breadth of head	16
Length of tibia	105	Length of pelvis	50
Length of metatarsus	75	Breadth of pelvis	20
Length of sternum	44		
Breadth of posterior margin	15		

Illustrations.

Sup. 2, pl. 11. Details, pl. 11, J.

	Cervical.	Dorsal.	Sacral.	Caudal.
Euryceros prevostii	10	7	8	7
Opisthomus cristatus	10	0	10	5
Rhynochetus jubatus	14	7	10	7
Centropus rufipennis	12	6	10	5
Scythrops, Novæ hollandiæ non ridi	—	—	—	—
Zanclostomus javanicus	10	6	12	5
Zanclostomus sumatranus	10	7	9	6
Struthidea cinerea	12	8	10	7
Ptilorhynchus smithii	12	8	10	7
Dendrocitta vagabunda	12	8	9	6
Stercorarius pomarinus	11	8	10	8
Ardea herodias	16	8	12	7

NOTE.

RHYNOCHETUS.

Jubatus.

Provisionally I have classed this bird with the Psophiadæ, but there is another family with which it agrees in many respects, but without knowing anything of the habits of the Kagu, not much can be finally determined. The family alluded to is that of the Rallidæ, in which Aramus scolopoæceus is placed by Mr. Gray; it has long feet, like Rhynochetus, and the same form of sternum. The eggs of the Kagu, of which I have two, are white, spotted with brown; while those of Posphia, Mr. Bartlett informs me are white. Nuttall says the eggs of Aramus are two in number; Audubon that they rarely exceed five or six, but neither of these Naturalists say of what colour they are, or shape; they are not like any heron that I know of, or those of Eurypyga, but more like those of a coot, or large rail.

Nat. size.

From Nature on Zinc by J. Erxleben

Vincent Brooks Day & Son, Imp.

EURYCEROS PREVOSTII.

From Nature on Zinc by J.Braxleben

3/4 Nat. size.

Vincent Brooks Day & Son, Imp.

OPISTHOCOMUS CRISTATUS.

2/3 Nat. size.

From Nature on Zinc by J. Erxleben

Vincent Brooks Day & Son Imp.

RHYNOCHETUS JUBATUS.

From Nature on Zinc by J. Erxleben.

Vincent Brooks Day & Son, Imp.

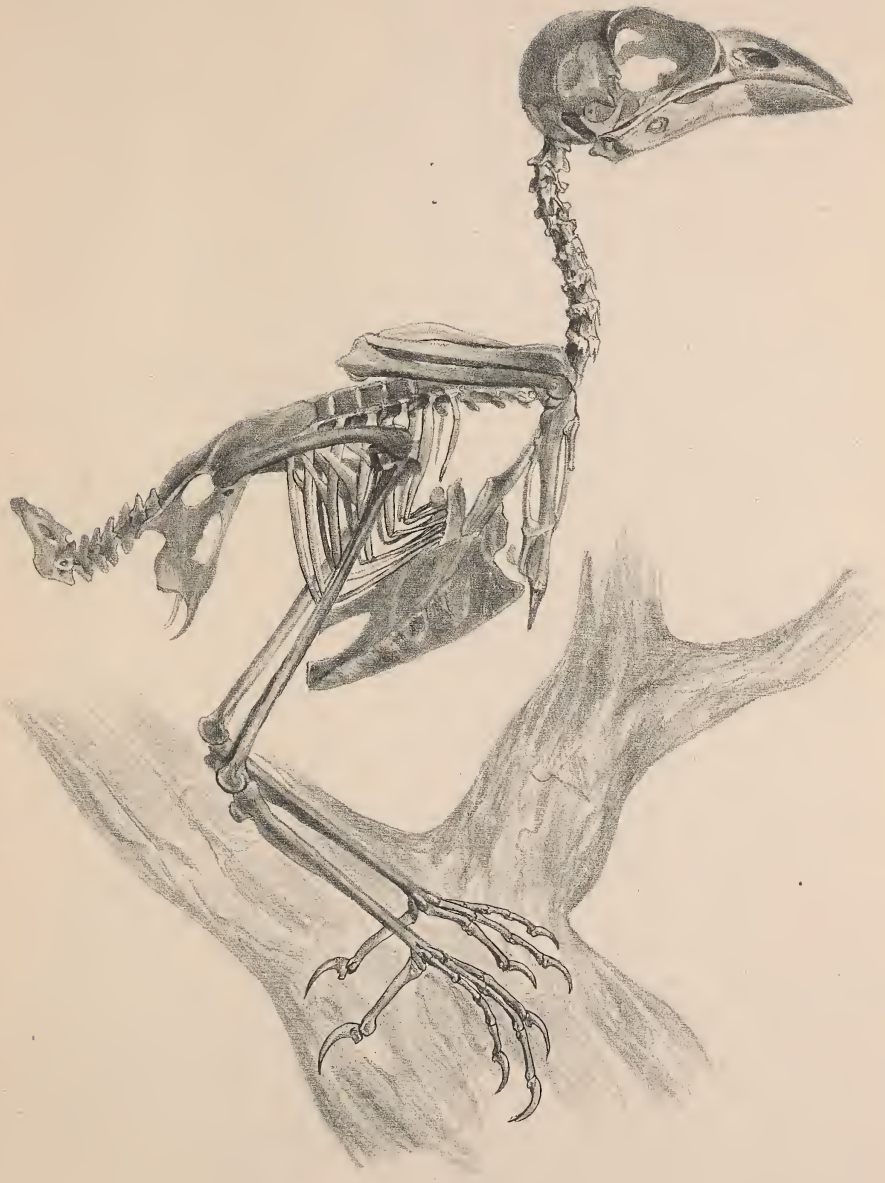
CENTROPUS RUFIPENIS.

Nat. size.

From Nature on Zinc by J. Erxleben.

Vincent Brooks Day & Son, Imp.

ZANCLOSTOMUS SUMATRANUS.



Nat. size

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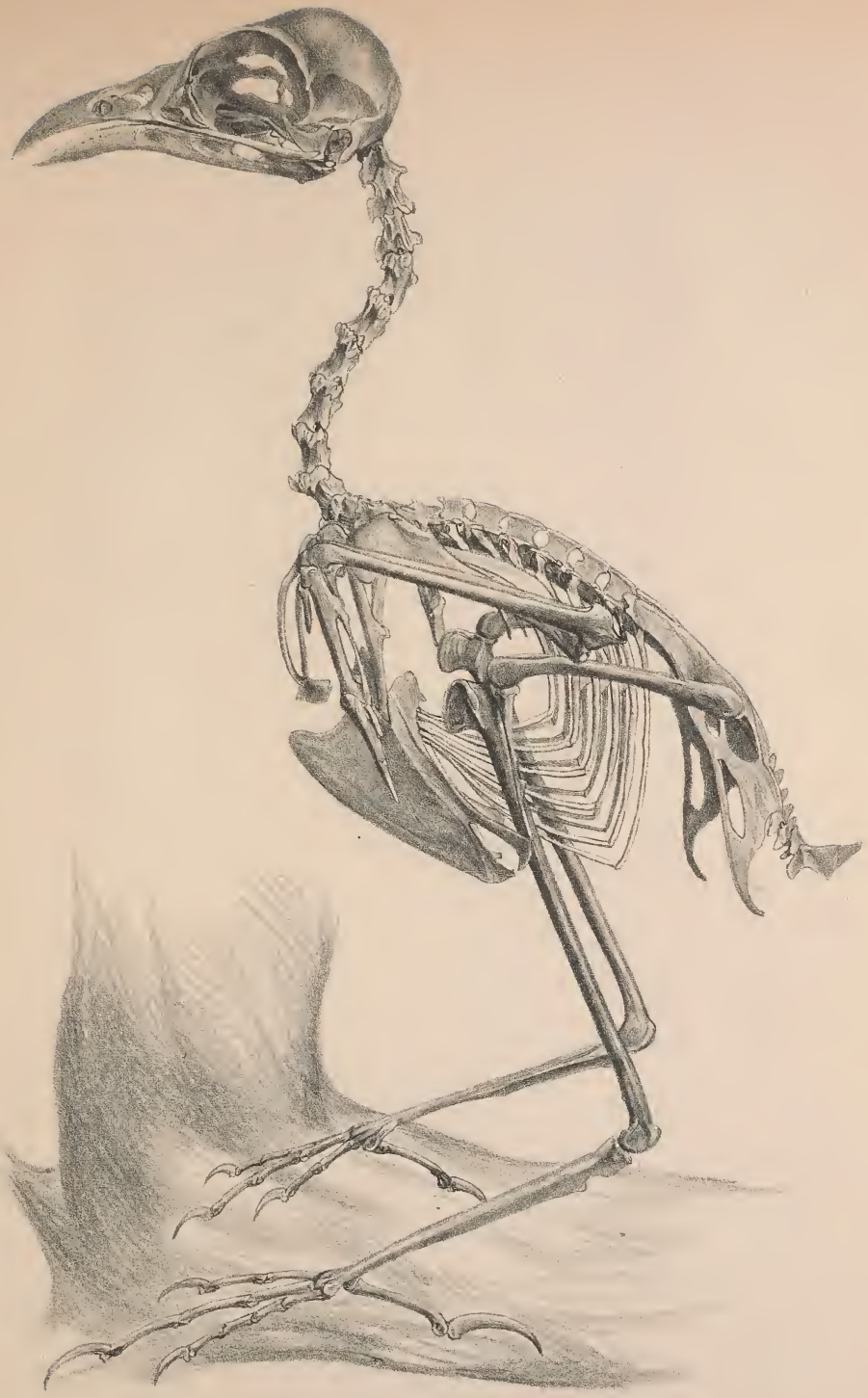
STRUTHIDEA CINEREA.



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PTILONORHYNCHUS SMITHII.

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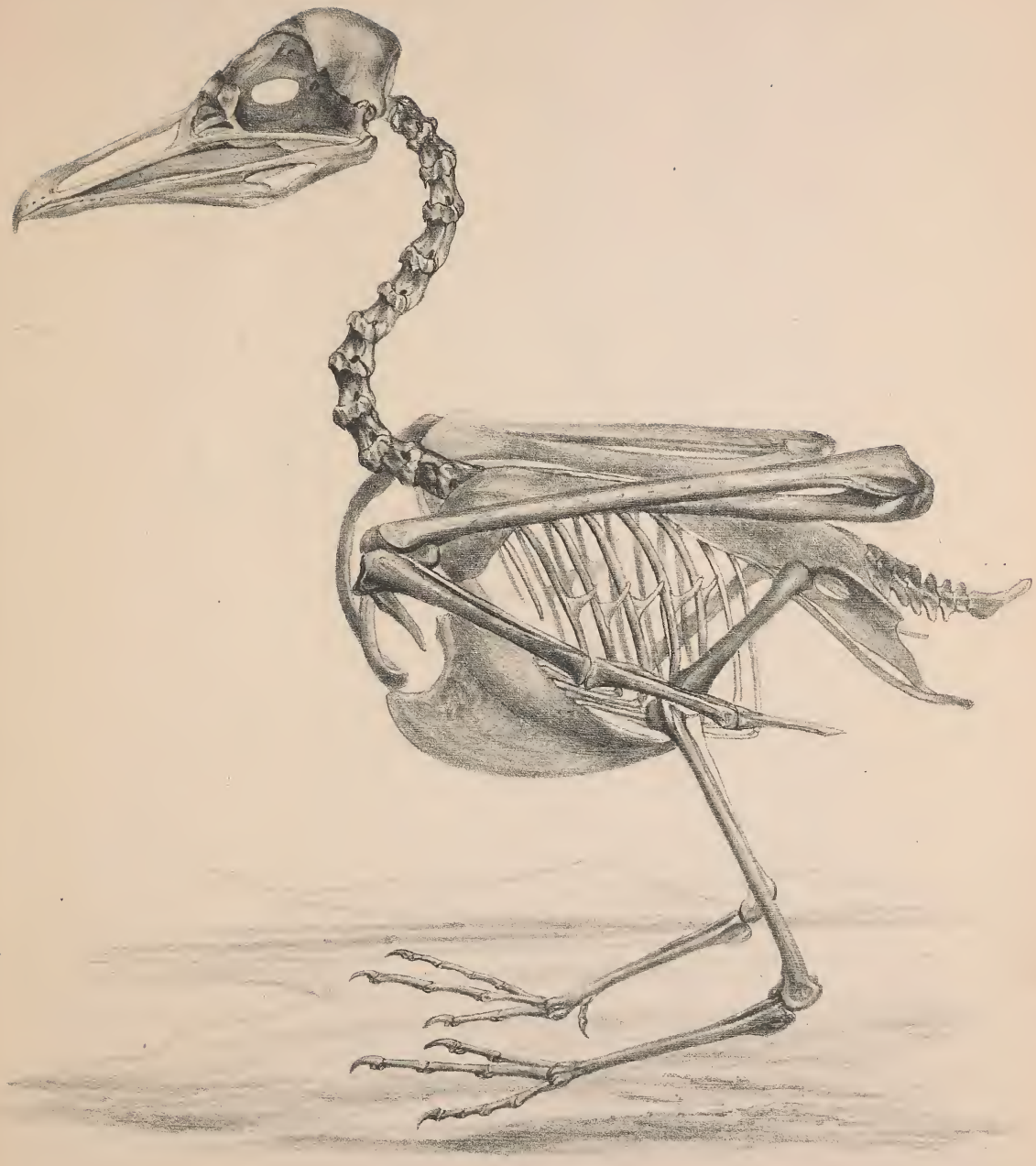
DENDROCITTA VAGABUNDA



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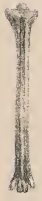
STERCORARIUS POMARINUS.

From Nature on Zinc by J. Erxleben.

Vincent Brooks Day & Son, Imp.

ARDEA HERODIAS.



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EURYCEROS PREVOSTII.

Nat size.

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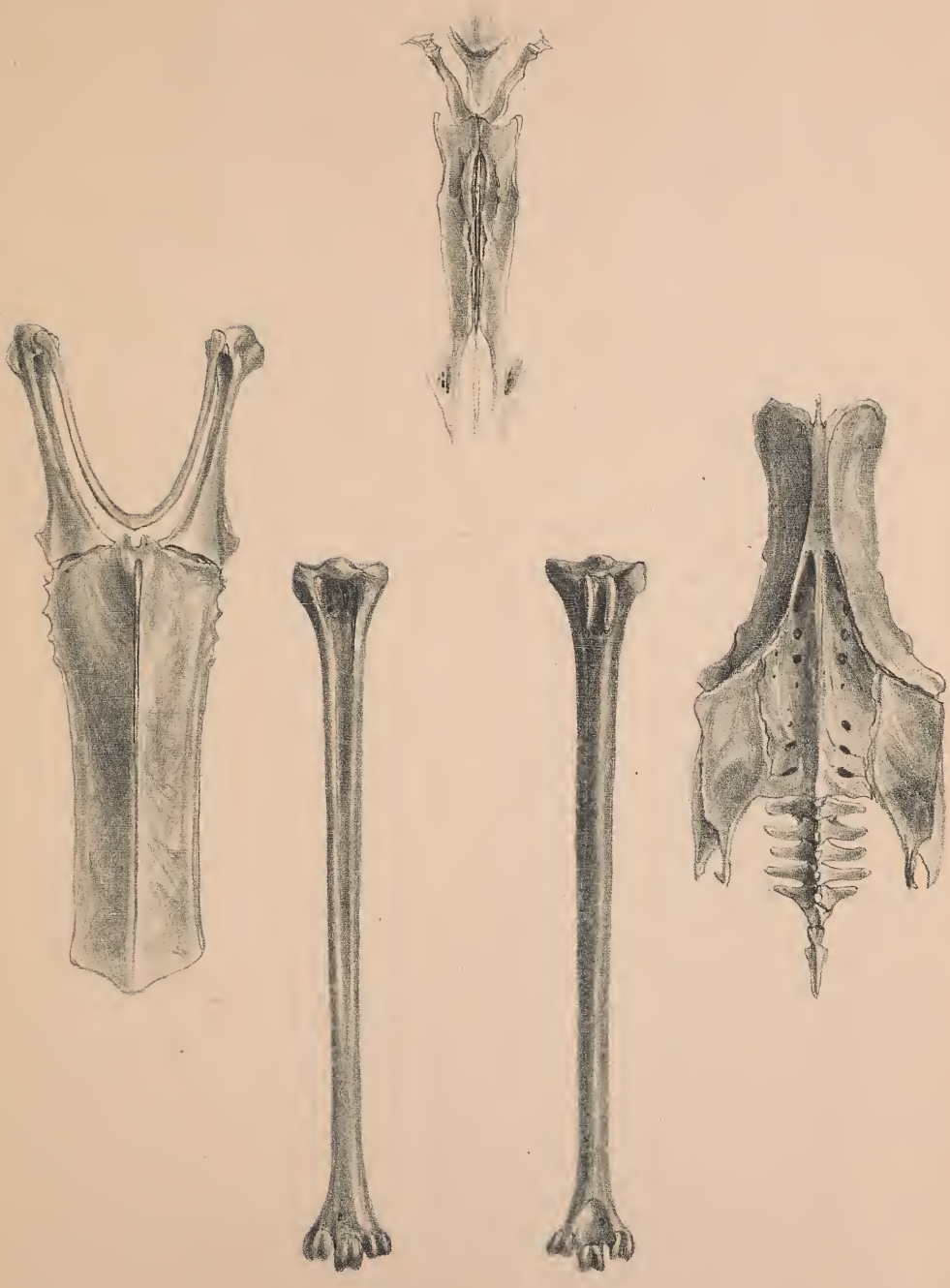
OPISTHOCOMUS CRISTATUS.



Nat. size.

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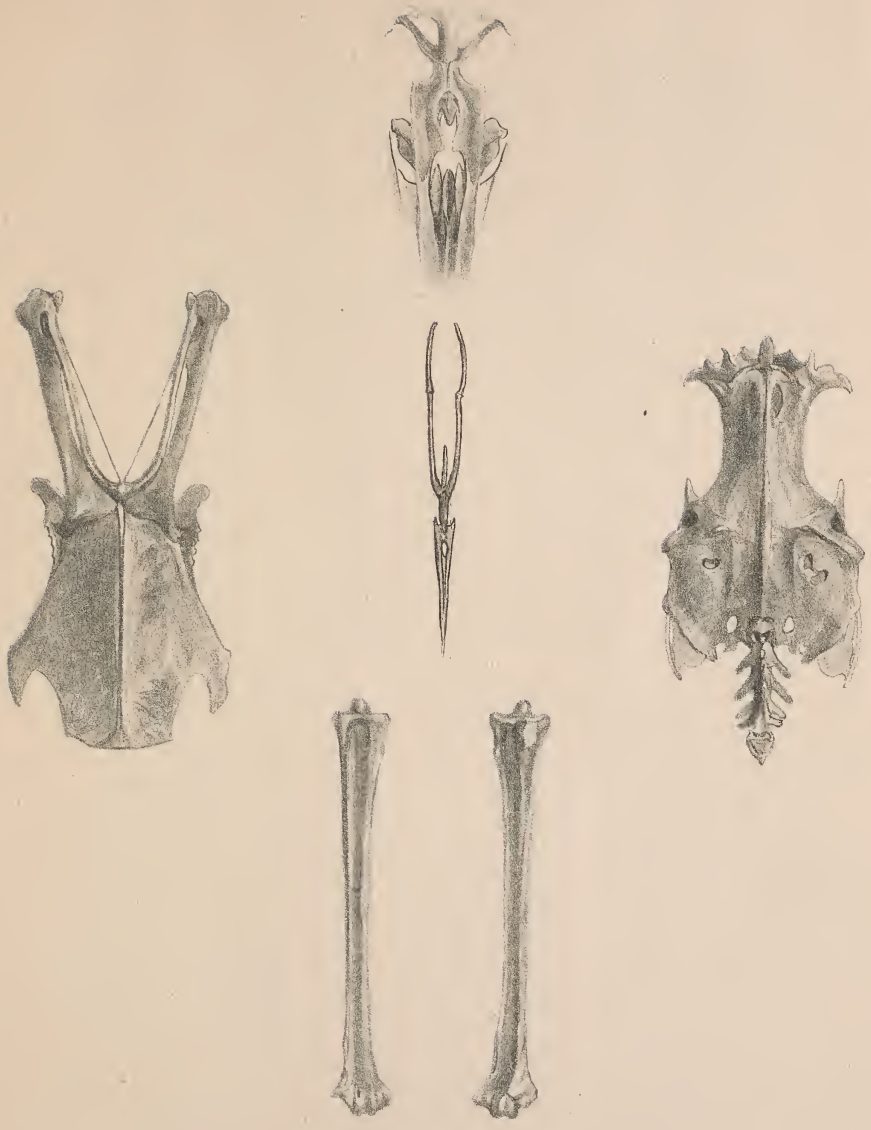
RHYNOCHETUS JUBATUS.



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CENTROPUS RUFIPENIS.

Nat size.

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Vincent Brooks Day & Son, Imp.

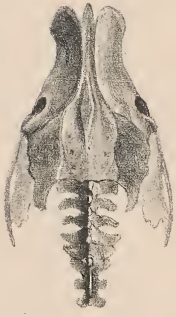
SCYTHROPS NOVÆ HOLLANDIÆ.

Nat size.

From Nature on Zinc by J. Erxleben

Vincent Brooks Day & Son, Imp.

ZANCLOSTOMUS JAVANICUS.



Nat. size

From Nature on Zinc by J.Erxleben

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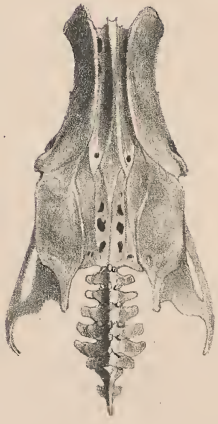
STRUTHIDEA CINEREA.



Nat. size.

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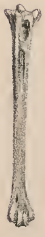
PTILONORHYNCHUS SMITHII.



Nat size

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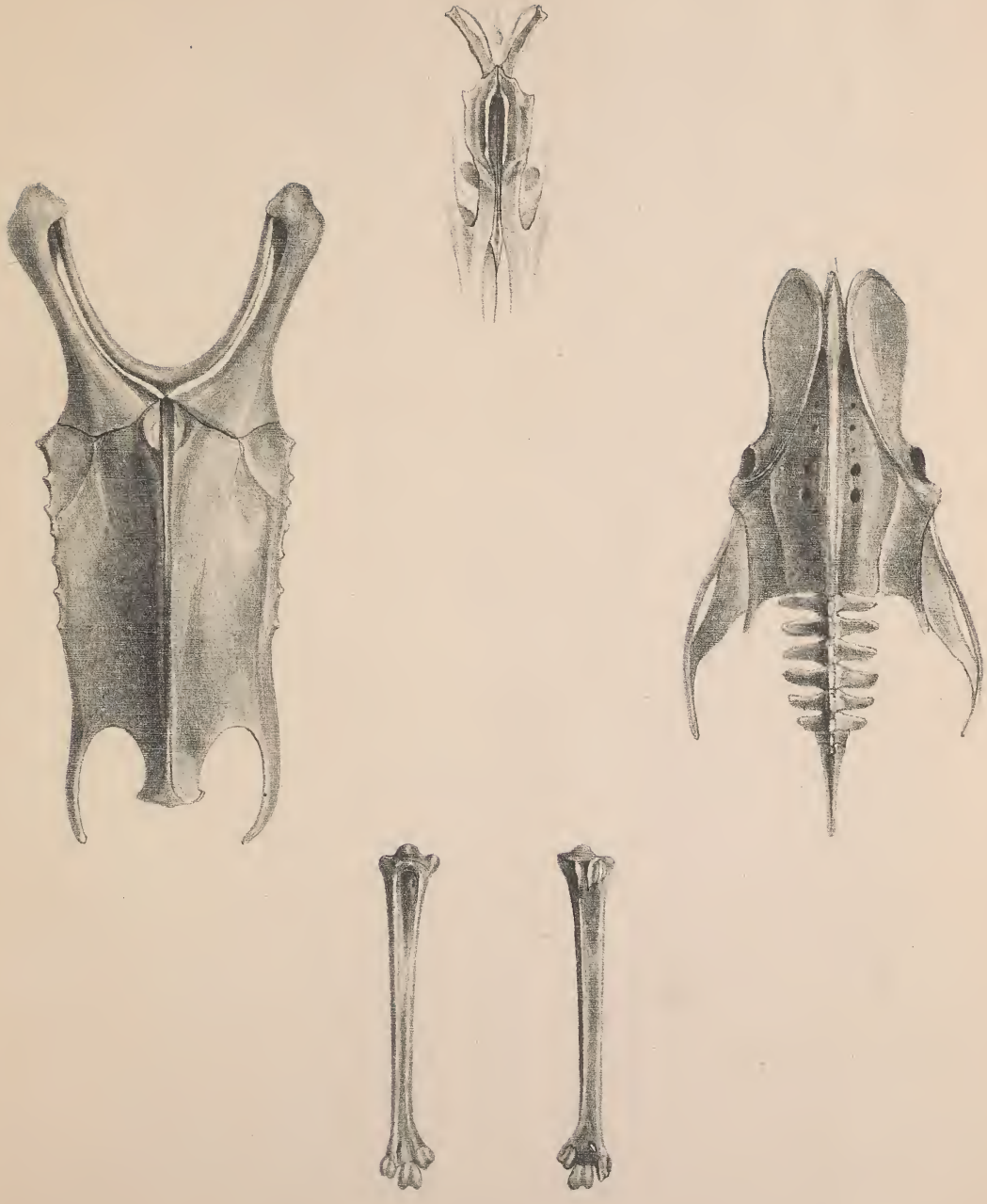
DENDROCITTA VAGABUNDA.



Nat. size.

From Nature on Zinc by J. Erxleben

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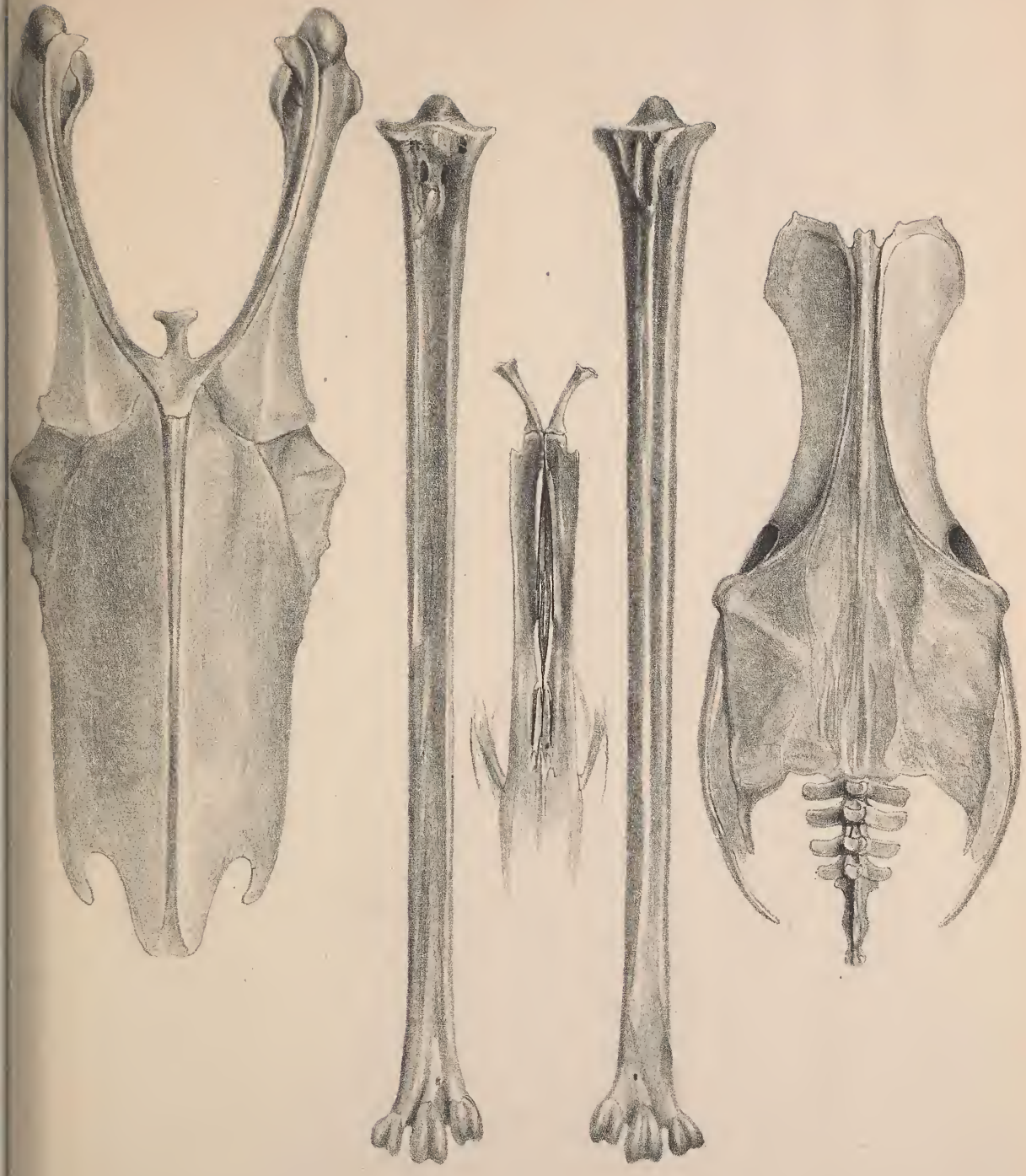
STERCORARIUS POMARINUS.



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ARDEA HERODIAS.

OSTEOLOGIA AVIUM.

SECOND SUPPLEMENT.

PART II.

Momotus, by *R. Gray.*

Œquinoctialis, *Gould.*

When the first part of this work was published I had some fragments of the skeleton of Momotus (pl. 12, fig. 13) taken from a skin. I have since obtained a perfect skeleton of Momotus Œquinoctialis, which I now figure.

Cranium rounded, with a rounded projection on side of the vertex. Orbital septum entire. Occipital ridge distinctly marked; impression of the masseter muscles distinct; nostrils large, oval. Palatine bones broad, united posteriorly, the central edge turned downwards, the exterior edge slightly so. The two plates united for about one-third of their length, then narrowed and divaricating and carried forward as two strips of bone.

Sternum broad, with two large fissures on each side of the posterior margin, the inner one smallest. Keel deep, arched on its inferior edge. Manubrial process broad at the base, of moderate length.

Pelvis very broad in proportion to its length. The ischiadic foramen large, oval. The obturator of moderate size.

Ribs broadest near their dorsal extremities, and gradually diminishing to their junction with the sternal ribs, which are flattened.

Furculum arched in front, the rami flattened, without any process at their junction.

Coracoids long.

Scapulæ very slightly bent, pointed at the extremities.

Wing bones long; the ulna longer than the humerus.

Leg bones of moderate length.

Measurements.

	Tenths.		Tenths.
Length of humerus	18	Breadth of anterior margin of ditto	8
Length of ulna	21	Depth of keel	4
Length of metacarpus	5	Length of head	29
Length of femur	11	Breadth of head	12
Length of tibia	20	Length of pelvis	15
Length of metatarsus	13	Breadth of pelvis	12
Length of sternum	13		
Breadth of posterior margin	11		

Illustrations.

Suppt. 2, pl. 12. Details, pl. 12, A.

RHYNCHOTUS, *Spisc.*

Perdicarius, *Kettl.*

Very similar to Crypturus, but the tarsi are shorter, and without back toe. The palatine bones also differ, and the wings are longer in proportion. A process projects from the end of the ilium anterior to acetabulum.

Measurements.

	Tenths.		Tenths.
Length of humerus	24	Breadth of anterior margin of ditto	12
Length of ulna	24½	Depth of keel	7
Length of metacarpus	13	Length of head	25
Length of femur	20	Breadth of head	9
Length of tibia	30	Length of pelvis	25
Length of metatarsus	19	Breadth of pelvis	16
Length of sternum	38		
Breadth of posterior margin	9		

Illustrations.

Suppt. 2, pl. 13. Details, pl. 13, A.

CRYPTURUS, *Ill.*

Megapodius, *Bp.*

Does not differ much from Tinamus, except in size. My specimen of Tinamus was much damaged, therefore would not do to figure in the first part of this work.

Cranium small, rounded. Occipital ridge small. The foramen in the orbital septum large. Palatine bones broad, narrowed behind to a point. Interarticular bones very long.

Sternum very long; the central and horizontal portion very narrrow; a strip of bone forming each lateral edge makes between it and the central portion a large fissure on each side. Keel deep; the lower edge arched.

Pelvis broad; the vertebræ apparent from the upper surface; the os pubis curved. Obturator foramen large; ischiadic large; in fact both the above-named foramina are converted into fissures, not being closed at their hinder ends; a process at the end of the ilium before the acetabulum.

Ribs strong.

Furculum small, weak; without any process at the junction of the rami.

Coracoids strong.

Scapulæ strong, very slightly arched, blunt at the distal extremity.

Wing bones short.

Leg bones of moderate size.

Measurements.

	Tenths.		Tenths.
Length of humerus	29	Breadth of anterior margin of ditto	12
Length of ulna	32	Depth of keel	9
Length of metacarpus	16	Length of head	23
Length of femur.	27	Breadth of head	9
Length of tibia	40	Length of pelvis	37
Length of metatarsus	27	Breadth of pelvis	18
Length of sternum	44		
Breadth of posterior margin	13		

Illustrations.

Suppt. 2, pl. 14. Details, pl. 14, A.

CERIORNIS,

Temminckii, *Gray*.

Does not differ very much in shape from the skeleton of the common pheasant, but considerably in measurements, particularly in that of the sternum.

Measurements.

	Tenths.		Tenths.
Length of humerus	33	Breadth of anterior margin of ditto	15
Length of radius	33	Depth of keel	13½
Length of metacarpus	16	Length of head	29
Length of femur	40	Breadth of head	11
Length of tibia	59	Length of pelvis	49
Length of metatarsus	34	Breadth of pelvis	20
Length of sternum	40		
Breadth of posterior margin	20		

Illustrations.

Suppt. 2, pl. 15. Details, pl. 15, A.

ARAMIDES, *Puch.*

Cayanea, *Mull.*

Cranium similar in form to the other rallinæ; lacrymals long.

Pelvis also similar.

Leg bones of moderate length. Metatarsi not so short as in Ocydromus.

Wings short.

Sternum long, narrow; keel with deep fissures at the hinder margin converted into foramina; a very narrow strip of bone across the hind margin. Sternum much constricted in the middle; inferior edge of the keel arched.

Measurements.

	Tenths.		Tenths.
Length of humerus	19	Breadth of anterior margin of ditto	8
Length of ulna	17	Depth of keel	5
Length of metacarpus	12½	Length of head	28
Length of femur	22	Breadth of head	8
Length of tibia	31	Length of pelvis	22
Length of metatarsus	21	Breadth of pelvis	10
Length of sternum	2½		
Breadth of posterior margin	5½		

Illustrations.

Suppt. 2, pl. 16. Details, pl. 16, A.

OCYDROMUS, *Wag.*

Sylvestris, *Sclat.*

Cranium of moderate length; a transverse indention at the base of the bill. Nostrils long, oval. Lacrymal bone elongated over the orbits. Orbital septum with a large foramen. Occipital ridge prominent. Palatine bones rounded behind; edges curved downward, narrowed suddenly anteriorly to a mere strip of bone.

Sternum broadest anteriorly, narrowed in the middle again; slightly expanded at posterior margin, with a deep fissure on each side.

Pelvis anteriorly; deep and arched; posterior half, with a deep and broad channel down the centre; deep curved on each side of the caudal vertebræ; divisions of the sacral vertebræ apparent.

Ribs long, thin. Stylyform process very long, extending over two ribs.

Furculum without any process as the junction of the rami.

Coracoids of moderate size.

Scapulæ long, slightly arched, pointed at their ends.

Wing bones short.

Leg bones moderate; metatarsus short.

Measurements.

	Tenths.		Tenths.
Length of humerus	20	Breadth of anterior margin of ditto	19
Length of ulna	16	Depth of keel	3
Length of metacarpus	12	Length of head	34
Length of femur	24½	Breadth of head	9
Length of tibia	34	Length of pelvis	22
Length of metatarsus	18½	Breadth of pelvis	9
Length of sternum	19		
Breadth of posterior margin	5½		

Illustrations.

Suppt. 2, pl. 17. Details, pl. 17, A.

When I described the skeleton of Rhynchotus I had not the skeleton of any large rail; since that I have obtained one, Ocydromus sylvestris, which I now figure. The sternum is similar, except that of Ocydromus has two foramina on the posterior margin, which Rhynchotus has not. The metatarsi of Ocydromus are much shorter than those of Rhynchotus. The cranium and pelvis are similar. The palatine bones are more truncate at hinder extremities in the latter than in the former.

ANTIGONE, *Reich, Bp.*

Torquata, *Viell.*

Cranium with a very slight depression across the base of the bill; no depression over the upper surface, except a very slight one near the occiput, much rounded above. Orbital septum strong, with two foramina, the central one large, the upper one small, elongated. Occipital ridge not very prominent; a large ridge from the centre of it to the foramen magnum. Lacrymal bones large, projecting far backwards. Inter-articular bone very massive and strong. Palatine bones long, the lateral edges curved downwards, pointed posteriorly, flat and narrowed anteriorly; bones formiug the bill strong; the lower edge of the inferior maxillary projecting backwards.

Sternum elongated. Narrow keel, very thick on its inferior edge and curved anteriorly; hollow and perforated by the trachea, which makes a convolution in its interior extended to the posterior margin of the sternum, which projects much forward beyond the junction of the furculum. Posterior margin widened laterally, and rounded on the outer angles; edge nearly entire.

Pelvis similar to Ardea in shape; foramina long.

Ribs with the styliform process long.

Furculum of moderate length. Rami flattened; strongly anchylosed to the sternum, and much flattened transversely.

Coracoids very broad at their junction with the sternum.

Scapulæ flattened, very long, pointed, slightly bending downward.

Leg bones the callineal process slight, continued nearly to the hind toe.

Measurements.

	Tenths.		Tenths.
Length of humerus	106	Breadth of anterior margin of ditto	23
Length of ulna	130	Depth of keel	25
Length of metacarpus	50	Length of head	101
Length of femur	80	Breadth of head	19½
Length of tibia	155	Length of pelvis	90
Length of metatarsus	135	Breadth of pelvis	35
Length of sternum	90		
Breadth of posterior margin	24		

Illustrations.

Suppt. 2, pl. 18. Details, pl. 18, A.

EPHIPPIORHYNCHS, *Bp.*

Senegalensis, *Shaw.*

Very similar, except in size, to Antigone torquata; the tracheæ penetrates the keel of the sternum in the same manner, namely, in one perpendicular loop.

Measurements.

	Tenths.		Tenths.
Length of humerus	95	Breadth of anterior margin of ditto	25
Length of radius	125	Depth of keel	22
Length of metacarpus	45	Length of head	88
Length of femur	53	Breadth of head	18
Length of tibia	150	Length of pelvis	68
Length of metatarsus	120	Breadth of pelvis	34
Length of sternum	75		
Breadth of posterior margin	16		

Illustrations.

Suppt. 2, pl. 19. Details, pl. 19, A.

ATRICHIA, *Gould.*

Clamosa, *Gould.*

I have only the sternum, coracoids, and scapulæ of this bird.

Sternum long, with a deep fissure on each side at the posterior, and much elongated on each side anteriorly. Keel shallow.

Coracoids long, very broad at their junction with the sternum.

Scapulæ long, slightly expanding near the tip, pointed at the extremity.

Measurements.

	Tenths.		Tenths.
Length of sternum	7	Depth of keel	1
Breadth of posterior margin . . .	4	Length of coracoids	7
Breadth of anterior margin . . .	4½	Length of scapulæ	6

Illustration.

Suppt. 2, pl. 20., fig. 1.

TANTALUS, *Linn.*

Ibis, *Linn.*

I have only the sternum and head of this bird, the latter is figured in pl. 33, fig. 1.

Sternum short, of moderate breadth, with a broad fissure on each side of the keel on the posterior margin. Keel very deep, much arched on its inferior edge.

Coracoids rather long.

Furculum, with an appendage at the junction of the rami, broadest at their junction with the coracoids and arched.

Scapulæ slightly bent, blunt at the end; of nearly the same width throughout.

Measurements.

	Tenths.		Tenths.
Length of sternum	43	Depth of keel	20
Breadth of posterior margin . .	20	Length of coracoids	26
Breadth of anterior margin . . .	22	Length of scapulæ	30

Illustrations.

Suppt. 2, pl. 20, fig. 2.

APTENODYTES, *Fosst.*

Penantii, *G. R. Gray.*

I have only the sternum of this bird, with the coracoid, scapulæ, and furculum attached.

Sternum short, scolloped out from the lateral margin to the end of the keel, which is shallow and much produced in front towards the furculum, to which it is united by a ligament.

Coracoids long, very strong.

Furculum much arched, broadest next the coracoids, gradually narrowed towards the sternum ; a small process at the junction of the rami.

Scapulæ very broad posteriorly, narrowed at their junction with the coracoids.

Measurements.

	Tenths.		Tenths.
Length of sternum	47	Depth of keel	8
Breadth of posterior margin . . .	33	Length of coracoids	50
Breadth of anterior margin . . .	36	Length of scapulæ.	47

Illustrations.

Suppt. 2, pl. 21.

TALLEGALLA, *Less.*

Lathami, *Jard.*

Cranium slightly flattened between the orbits, strong. Nostrils large, oval. Orbital septum nearly entire, with only a small foramen on its posterior edge. Palatine bones expanded on their posterior third, pointed behind, slightly bent upwards at their junction; fore part consisting of a narrow strip of bone expanded slightly forward, nearly resembling Crax Globiura (pl. 22, fig. 2).

Sternum very like that of Crax, but rather shorter, with a short, but perpendicular broad keel.

Pelvis broader than in Crax, but with the ischiadic and obturator foramina larger.

Ribs broad, flattened as in Crax.

Furculum with the rami long, a small process at their junction turning inwards slight.

Coracoids of moderate size.

Scapulæ broad, blunt at their tips.

Wing bones short; metacarpus long.

Leg bones tibiæ, short; not very strong.

Measurements.

	Tenths.		Tenths
Length of humerus	34	Breadth of anterior margin of ditto	12
Length of ulna	35½	Depth of keel	13
Length of metacarpus	18	Length of head	29
Length of femur	35	Breadth of head	21
Length of tibia	49	Length of pelvis	47
Length of metatarsus	32	Breadth of pelvis	24
Length of sternum	36		
Breadth of posterior margin	17		

Illustrations.

Suppt. 2, pl. 22. Details, pl, 22, A.

NUMBERING OF VERTEBRÆ.

	Cervical.	Dorsal.	Sacral.	Caudal.
Antigone torquata	18	6	18	7
Ephippiorhynchus Senegalensis	17	6	14	8
Aramides cayanea	13	10	13	7
Ocydromus sylvestris	12	10	14	8
Satyra Temminckii	13	8	15	6
Crypturus megapodius	15	8	19	7
Rhynchotus perdicarius	15	8	14	5
Momotus Œquinoctialis	12	8	13	8
Tallegalla Lathami	14	7	13	6

Since the former part of this work was published, I have obtained from America the skeletons of fuligula valisneria and querquedula discors, both agree with their representatives in this country; the former with the fuligula ferina, and the latter with querquedula cruca, so as not to be distinguishable from them by the skeleton.

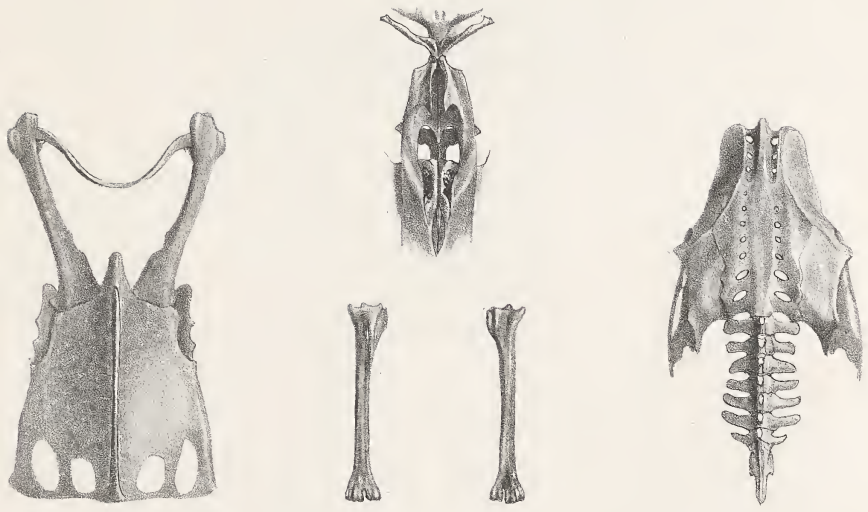
END OF SUPPLEMENT II., PART 2.

Nat. size.

From nat. on stone by J. Erxleben.

M & N. Hanhart imp.

MOMOTUS ÆQUINOCTIALIS.

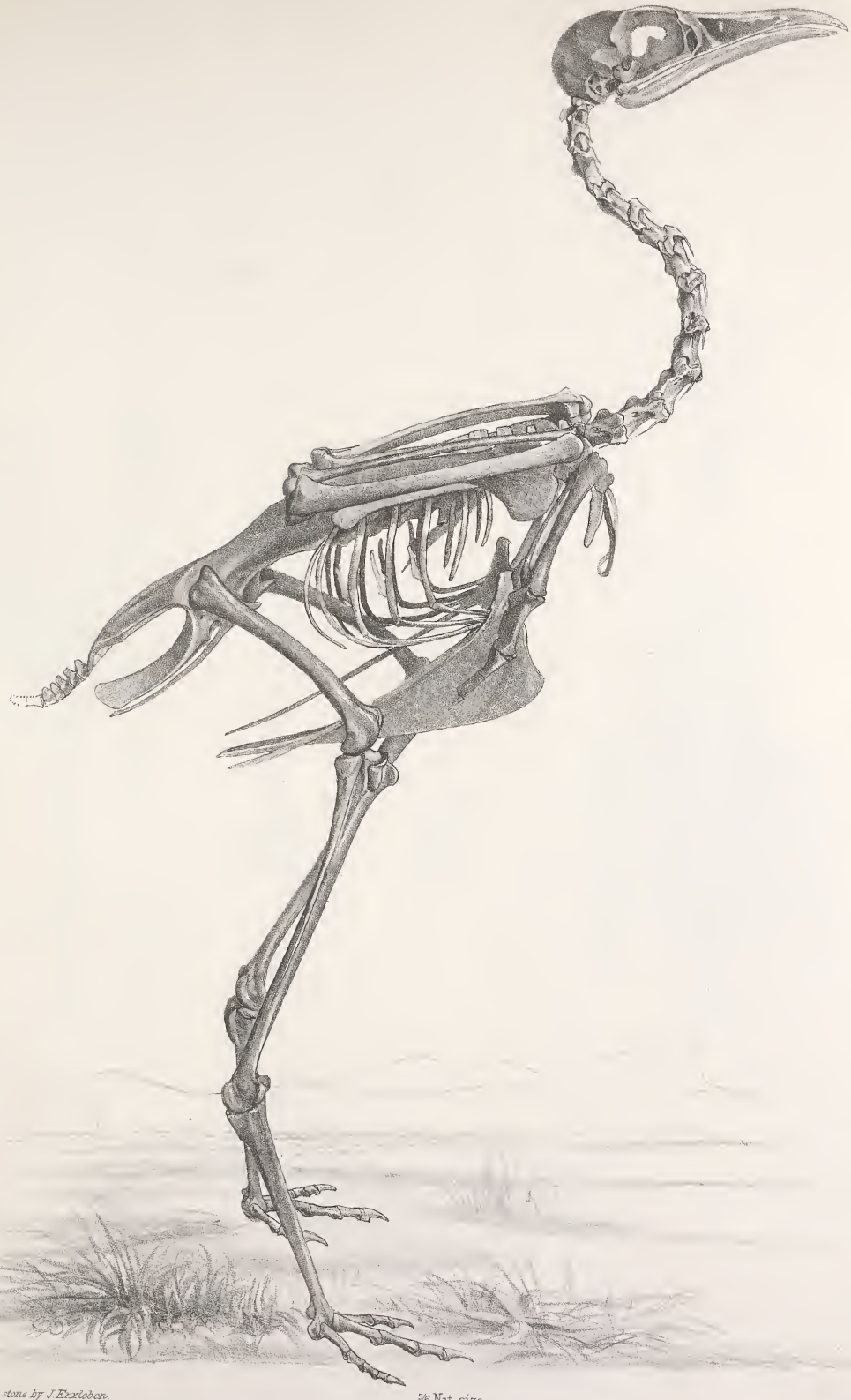


Nat. size.

From nat. on stone by J. Erxleben.

Mck. N. Hanhart imp.

MOMOTUS OEQUINOCTIALIS.

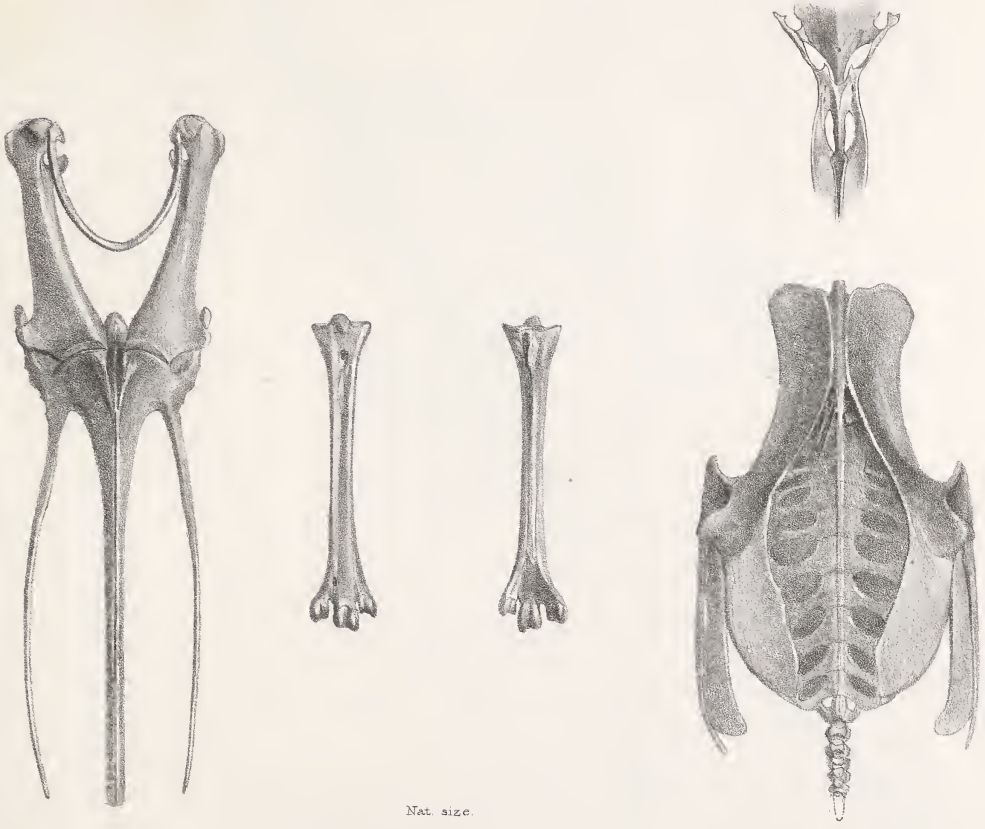


From nat. on stone by J. Erxleben.

5/6 Nat. size

M & N. Hanhart imp.

RHYNCHOTUS PERDICARIUS.



Nat. size.

From nat. on stone by J. Wrixleben.

M&N. Hanhart imp.

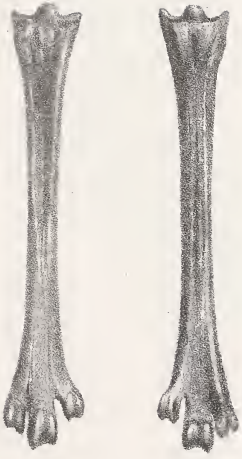
RHYNCHOTUS PERDICARIUS.

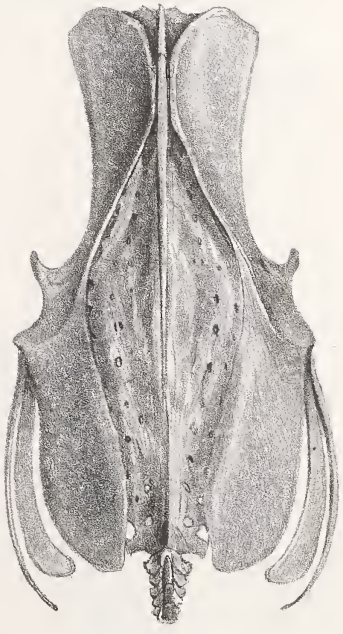
⅓ Nat size.

From nat. on stone by J. Erxleben

M & N. Hanhart imp.

CRYPTURUS MEGAPODIUS.





Nat. size.

From nat. on stone by J. Erxleben.

M & N. Hanhart imp.

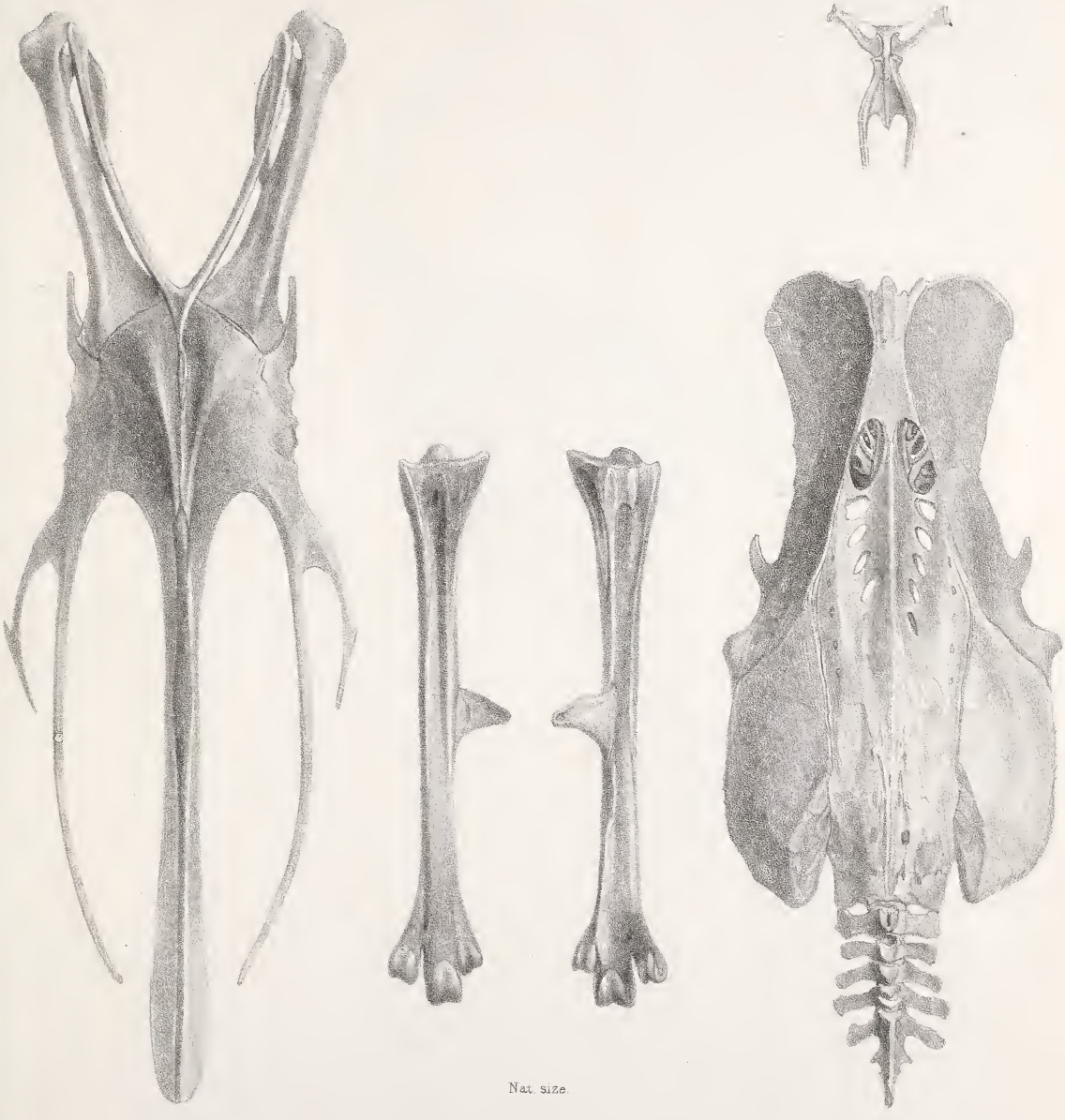
CRYPTURUS MEGAPODIUS.

½ Nat. size.

From nat. on stone by J. Erxleben.

M. & N. Hanhart imp.

CERIORNIS TEMMINCKII.



Nat. size.

From nat. on stone by J. Erxleben.

M & N. Hanhart imp.

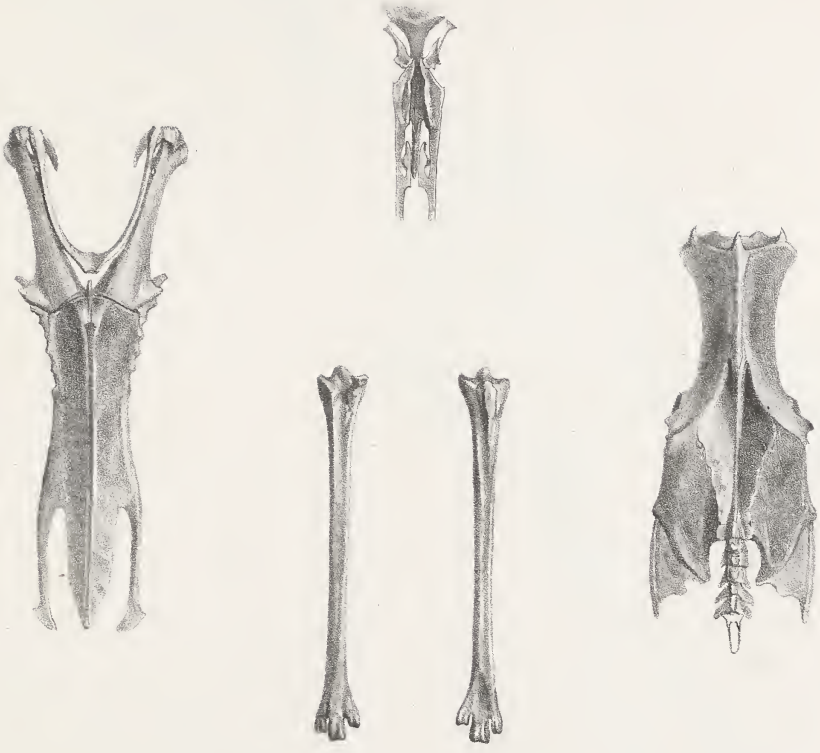
CERIORNIS TEMMINCKII.

¾ Nat. size.

From nat. on stone by J. Erxleben.

M & N. Hanhart imp.

ARAMIDES CAYANEA.



Nat. size.

From nat. on stone by J. Erxleben.

M & N. Hanhart imp.

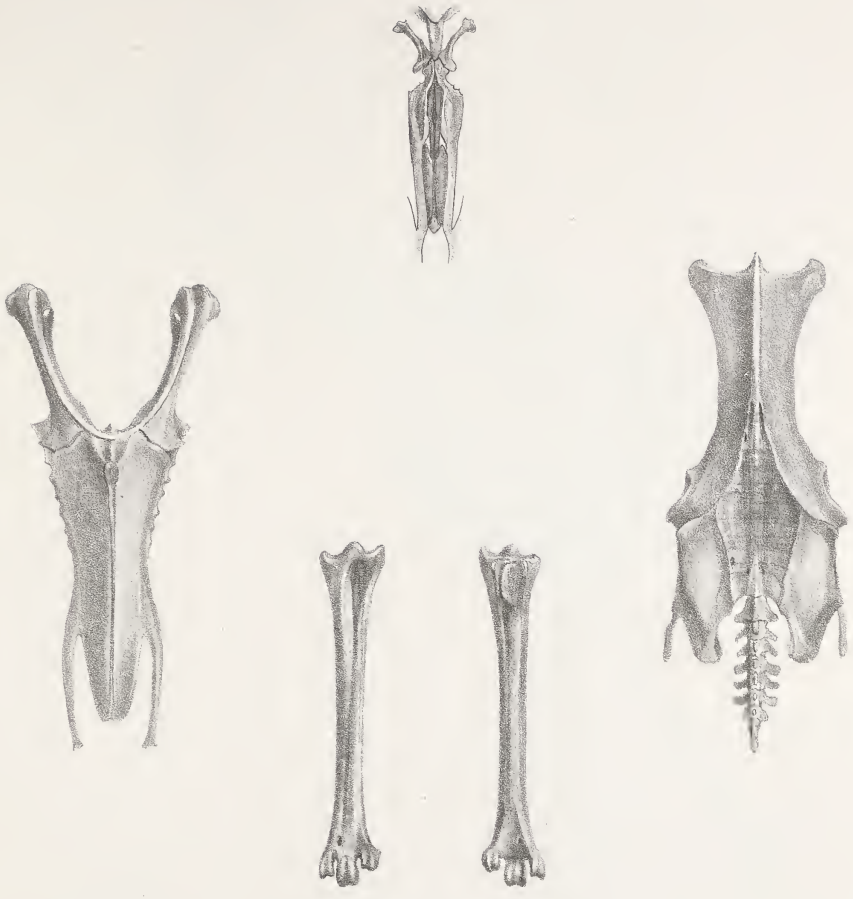
ARAMIDES CAYANEA.

¾ Nat size.

From nat on stone by J Erxleben.

M & N Hanhart. imp.

OCYDROMUS SYLVESTRIS.



Nat. size.

From nat. on stone by J. Erxleben.

M & N. Hanhart imp.

OCYDROMUS SYLVESTRIS.

⅓ Nat size

From nat. on stone by J. Erxleben.

M & N Hanhart imp.

ANTIGONE TORQUATA.

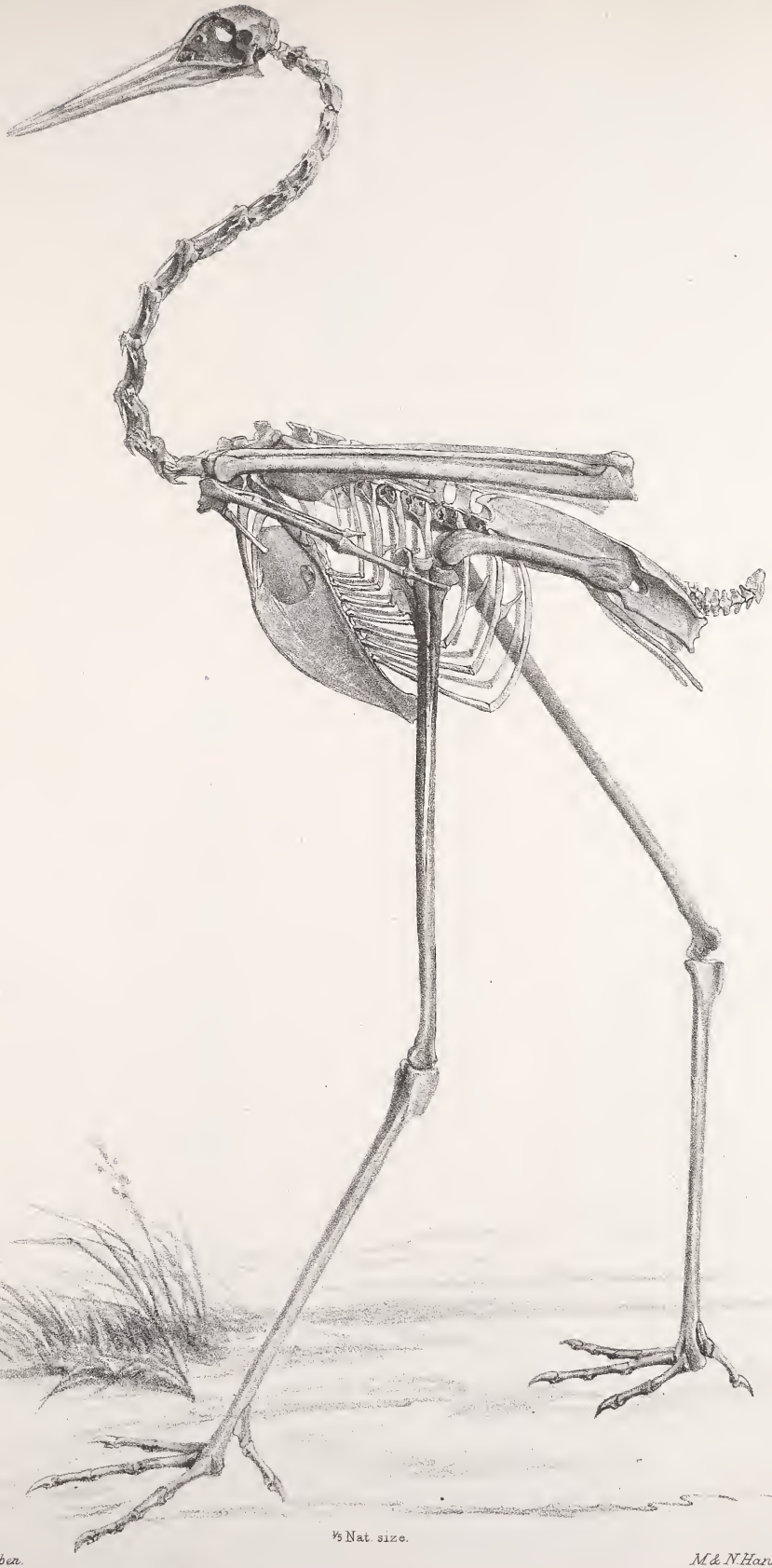
Nat. size.

⅓ Nat. size.

From nat. on stone by J. Erxleben.

M & N Hanhart imp.

ANTIGONE TORQUATA.



1/5 Nat. size.

From nat. on stone by J. Erxleben. *M & N. Hanhart imp.*

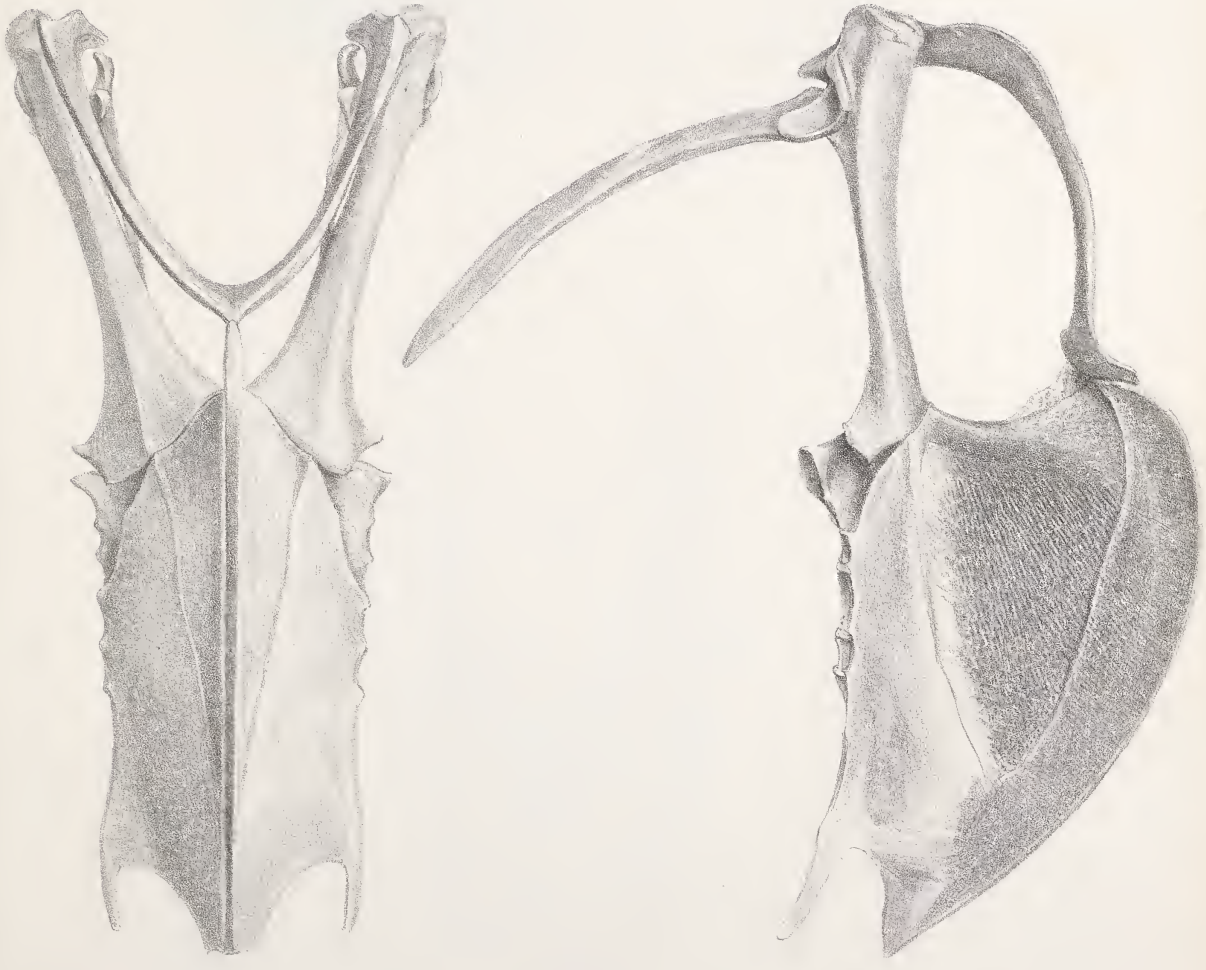
EPHIPPIORHYNCHUS SENEGALENSIS.

Nat. size.

1/5 Nat. size.

From nat. on stone by J. Erxleben. *M & N. Hanhart imp.*

EPHIPPIORHYNCHUS SENEGALENSIS.

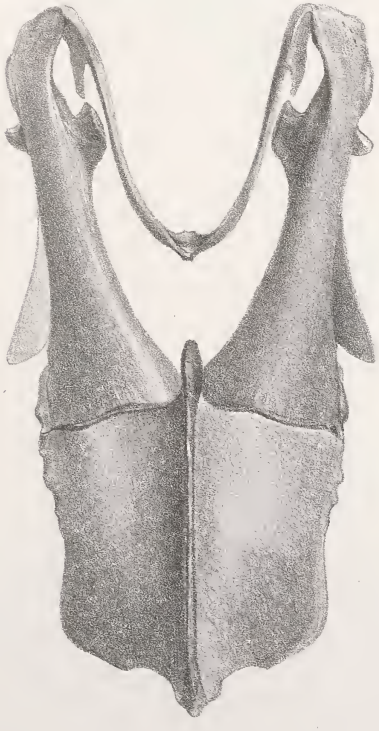


Nat. size.

From nat. on stone by J. Erxleben.

M & N. Hanhart imp.

1. ATRICHIA CLAMOSA STERNUM. 2. TANTALUS IBIS STERNUM.



½ Nat size.

From nat. on stone by J. Erxleben.

M & N Hanhart imp.

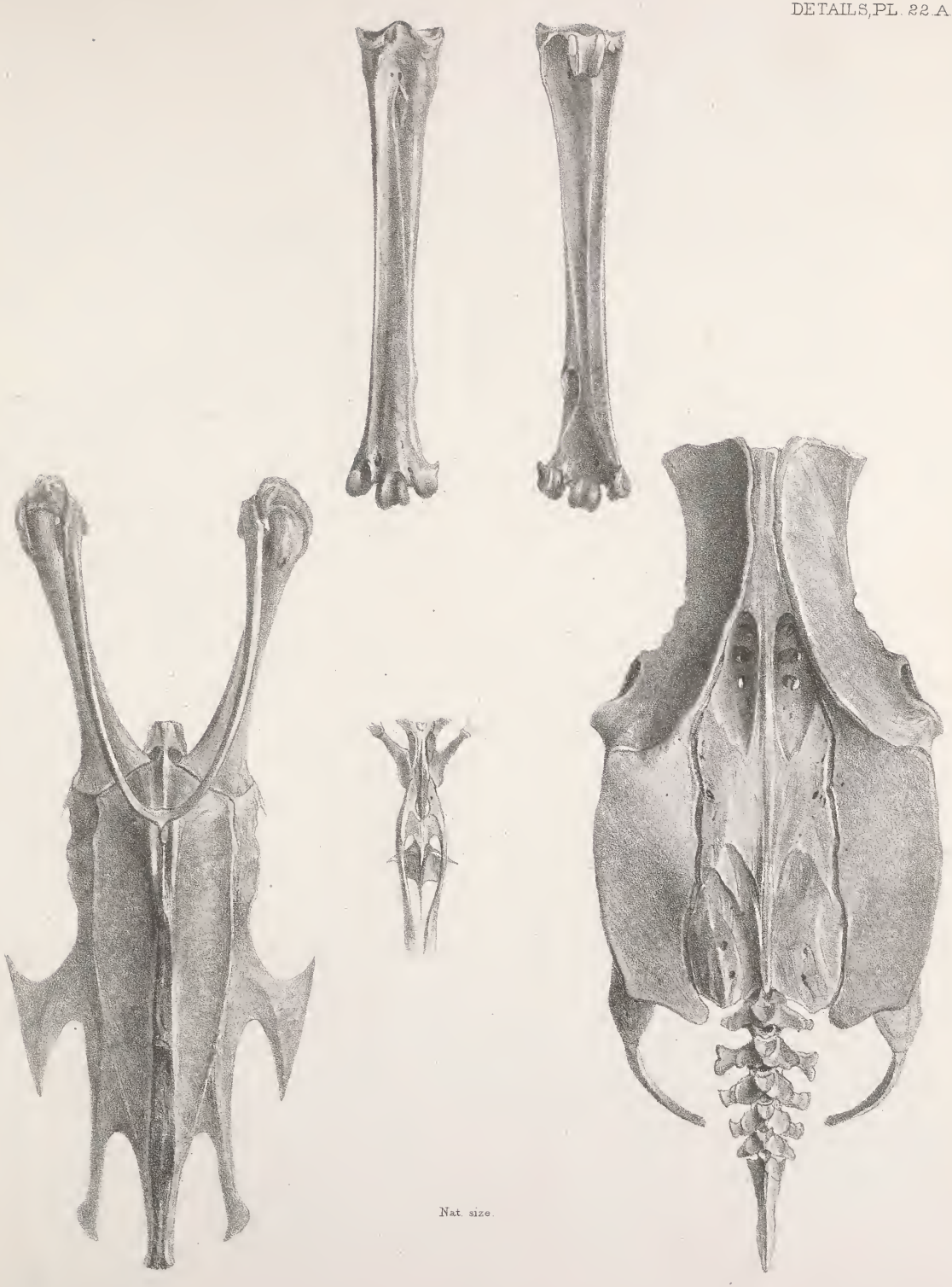
APTENODYTES PENANTII STERNUM.

½ Nat. size.

From nat. on stone by J. Erxleben.

M & N. Hanhart imp

TALLEGALLA LATHAMI.



Nat. size.

From nat. on stone by J. Erxleben.

M & N. Hanhart. imp.

TALLEGALLA LATHAMI.

OSTEOLOGIA AVIUM.

SECOND SUPPLEMENT.

PART III.

Didunculus, *Peale.*

Strigirostris, *Jardine.*

Cranium much indented at the base of the bill. Nostrils lengthened. Ovate cranium, flattened on the vertex; rounded behind; foramen-magnum large. Bill much arched. Inferior maxillary bone much elongated backwards beyond its articulation with the os quadratum. Inter obital foramen large.

Sternum indented with a very large fissure, which extends more than half the length of the sternum, and is bounded by a narrow strip of bone, expanded at its extremity, and terminating at about half the length of the fissure; the posterior margin rounded, and narrower than the anterior. In the young bird I suspect it is penetrated with a smaller foramen on each side, as my specimen has traces of them.

Keel very deep anteriorly; the lower edge rounded, the front edges curved.

Pelvis very broad, much like the ground pigeon's.

Ribs broad, flattened styliform process, much turned upwards.

Furculum rounded, but slightly flattened at its articulation with the coracoids.

Coracoids strong.

Scapula arched, expanded near the extremities and pointed at the extremities.

Wingbones of moderate length; the ulna much longer than the humerus.

Legbones with the metatarsi very short

Vertebral column strong

Remarks.—This curious bird strongly resembles the ground pigeons in the form of the head, sternum, and pelvis. It is figured in Owen's Memoir on the Dodo.

Measurements.

	Tenths		Tenths.
Length of humerus	17	Margin of posterior	7
Length of ulna	22	Breath of anterior	
Length of metacarpus	$12\frac{1}{2}$	margin of ditto	8
Length of femur	$12\frac{1}{2}$	Depth of keel	9
Length of tibia	24	Length of head	19
Length of metatarsas	15	Breadth of head	8
Length of sternum	22	Length of pelvis	26
Breadth of posterior		Breadth of pelvis	15

NUMBER OF VERTEBRÆ.

Cer.	Dor.	Sac.	Cand.
4	7	13	7

The birds belonging to the genera that constitute this family are very curious, so much so that it is difficult to say where they ought to be classed. In many respects they resemble the vultures, as in the structure of the furculum, cranium, and palatine bones and pelvis, more particularly Neophron, while in the feet they resemble the Rallidæ, and in the form of the posterior margin of sternum are not like either, but the keel resembles the Vulturidæ. It is no wonder therefore that they have been classed differently by authors, a few of whose opinions I shall proceed to quote.

Mr. G. GRAY classes the genera Palamedea and Chauna, forming his family Palamedeidæ, next to the Parridæ. He says they inhabit marshy places and inundated grounds, in the northern parts of America, especially those that are situated near the sea. It is generally found in pairs, and is very shy and timorous, but soon betrays itself by its loud calls. The seeds and leaves of aquatic plants constitute its principal food.

These birds are peculiar to the northern parts of South and Central America. They are observed in the marshes and occasionally on the borders of lakes and rivers, in pairs, or in troops of many individuals. Their manners are shy, but when not scared their gait is slow and stately. Their flight is easy and swift, and they are unable to run, except with the assistance of their wings. They resort to rest on the tops of high trees. The Brazilian species is kept by the natives amongst their poultry. It goes with them to feed during the day, and during this time proves very useful in defending the poultry against the attacks of the numerous birds of prey, by means of the spurs on the bend of its wings. If the wing of the bird is handled a crackling is felt, which is caused by the quantity of air which is lodged between the skin and muscles. Marshy and inundated places are preferred by these birds, as their food consists solely of the leaves of aquatic plants, grapes, and seeds. Their nest is spacious, and made of small branches of trees, and usually placed in a bush surrounded with water, but sometimes it is formed among reeds and rushes. The female lays two eggs.

Castelnau, in his "Animaux ou Rares de l' Amerique du sud," gives a plate (15) of Palamedæ Cornuta and the sternum of Palamedæ Derbyana, and (page 73) a description and account of the two birds, in which he says they are very different from the moor-hen, rails, or coots; and Illiger unites the genera Glarieola, Cereopsis, Chauna, Palamedea, and Psophia, under the name of Alectorides, from which they are very different. He also says, in speaking of the sternum, that it presents an analogy to the Vulturidæ.

"Beiträge zur Naturgeschichte von Brasilien von Maximilian Prinzen zu Weid"; from which the following is a translation:—

"The Aniuma, from its great size and beauty, forms an ornament to the Brazilian forests. It is dispersed over a large portion of South America, for it has been seen in Guiana, where Somnini

found it; it does not however appear to be found at Paraguay, as Azara makes no mention of it. I myself never met with the bird in Brazil, until travelling from South to North I had reached the island Caxoeirinka (Kaschoerinnia) in the river Belmonte, that is to say the sixteenth degree of south latitude. I was told there that it had never been seen higher up the stream towards Minas. In the neighbourhood of the above-named island in the Belmonte it is very numerous. It only frequents lonely spots far removed from the habitations of man. I never met with it, as Sonnini describes, in open places, only in the depths of the primeval forest on the borders of the river, after I had made some days' journey up the stream of the Belmonte. There we frequently heard the loud, uncommon cry of this bird, which in its modulation has some resemblance to our own wood-pigeon, but it is much louder and more shrill and the throat note is pitched in another key.

"Sometimes we saw the Aniumas as they strutted on the sandbanks and in and out of the river. If we approached them, they took fright, and then, both in the size and broad expanse of their wings, and in their colour and manner of flapping them, they resembled the Urubus (Cathartes Aura et Urubu). They always perched in the summit of some thickly-leaved forest tree, where we constantly heard their voices, though we could seldom see the birds themselves. In the breeding season the Aniuma pairs, at other times four, five or six are seen together; they go to feed on the sandbanks or in the thickly wooded marshes, which are so frequent in these forests. The food of these birds appears to be entirely vegetable, at least in the five or six, whose stomachs I have examined. I found nothing but leaves of a kind of grass plant and of another broad-leaved grass plant.

"The nest of this bird is found on the ground in the wooded marshes near the river. The Botocudians state that it contains two large white eggs, and consists of only one layer. The young birds run at once on leaving the shell.

"The flesh of the Aniuma is not good eating; the Botocundians devour it all the more greedily, as the Portuguese do not eat it at all. The fine long pinion feathers are used for writing, the tail feathers are much valued by the savages for their arrows. There is a popular superstition that this bird always dips his frontal horn into the water when he wishes to drink."

Marcgravè calls the Aniuma a bird of prey, in other respects he describes him very correctly, and represents his voice tolerably correct by the word "Vihu, Vihu." He mentions the great attachment subsisting between the male and female when paired, but of this the Brazilian sportsmen made no mention to me. That the two sexes differ greatly in size, as Marcgrave represents, is incorrect. That the nest has the shape of an oven, must, if the statements of the Botocundians is to be believed, be a fable.

The following note was sent to me in reply to one of mine, by Mr. Bartlett, of the Zoological Gardens of London:—

"In reply to your note, I find the Chauna and Palamideidæ feed upon green food principally; they will also eat boiled rice, bread, and boiled Indian corn, but no flesh of any kind."—

"Yours faithfully, A. BARTLETT."

PALAMEDEA, *Lin.*

Cornuta, *Lin.*

Cranium with a deep hollow at the base of the bill, anterior to the orbits; upper edge of the orbits projecting much over the orbit. Palatine bones broad at their posterior ends, laterally projecting downwards, tapering forwards to a thin strip of bone.

Sternum with the posterior and anterior edges nearly equal in breadth.

Keel with the inferior edges arched and continued nearly to the posterior margin, which is indented with a broad fissure extending nearly the whole breadth of the sternum, and bounded on each side with a broad strip of bone, in which there is a smaller rounded fissure in the direction of the lateral margin.

Pelvis very broad posteriorly; ischiadic and obturator foramina large, splints bounding the former long. End of the metacarpi furnished with long, sharp spines, pointing forwards.

Furculum very strong at the coracoid extremity; much flattened laterally; at the opposite one more rounded.

Coracoids very strong.

Scapula slightly arched, flattened and pointed at the extremities.

Measurements.

	Tenths.		Tenths.
Length of humerus		Margin of posterior	
Length of ulna		Breadth of anterior	
Length of metacarpus		margin of ditto	
Length of femur		Depth of keel	
Length of tibia		Length of head	
Length of metatarsus.		Breadth of head	
Length of sternum		Length of pelvis	
Breadth of posterior		Breadth of pelvis	

VERTEBRÆ.

Cer.	Dor.	Sac.	Cand.
15	9	11	7

CHAUNA,

Chavaria, *Lin.*

Cranium similar to Palamidea.

Sternum also similar, but not so much scolloped out behind, but without the small lateral fissures.

Pelvis similar to Palamidea; terminal joint of the caudal vertebræ very long and pointed.

Ribs of moderate strength, without any styliform process.

Furculum very strong and broad, shorter than in Palamidea.

Coracoids shorter and stronger than in Palamidea.

Scapula similar.

Wingbones long; the ulna much longer than the humerus; the metacarpus armed with a strong spine, pointing forwards at each extremity.

Legbones of moderate length and strength; toes very long.

Vertebræ of moderate strength; short.

Measurements.

	Tenths		Tenths.
Length of humerus	68	Margin of posterior	26
Length of ulna	76	Breadth of anterior margin of ditto	30
Length of metacarpus	38	Depth of keel	14
Length of femur	37	Length of head	32
Length of tibia	69	Breadth of head	15
Length of metatarsus	48	Length of pelvis	50
Length of sternum	59	Breadth of pelvis	25
Breadth of posterior			

NUMBER OF VERTEBRÆ.

Cer.	Dor.	Sac.	Cand.
16	8	12	9

PHAETON, *Lin.*
Æthereus, *Lin.*

Cranium long and hollow between the edges of the orbits; orbital septum perforated with a large foramen; a deep tranverse indentation at base of the bill. Occiput perpendicular; occipital ridge well marked.

Sternum rather short in its horizontal position, with a moderate-sized fissure on each side of the keel, which is much elongated anteriorly, and deep.

Pelvis broad; the os pubis much elongated; ischiatic foramen large.

Ribs thin and light, styliform processes short.

Furculum flattened; broader at its junction with the keel, which is a little below the point.

Coracoids light; much expanded at their junction with the sternum.

Scapula very light; very slightly expanded near its hinder extremity; blunt at the end.

Wingbones long.

Legbones short, very weak; metatarsi with a deep groove down the front.

Vertebræ strong, broad.

The birds of this genus very much resemble the Sternidæ in the form of the sternum and pelvis.

Measurements.

	Tenths.		Tenths.
Length of humerus	30	Margin of ditto	11
Length of ulna	33	Breadth of anterior	
Length of metacarpus	15	Margin of ditto	14
Length of femur	10	Depth of keel	8
Length of tibia	15	Length of head	33
Length of metatarsus	8	Breadth of head	14
Length of sternum	22	Length of pelvis	19
Breadth of posterior		Breadth of pelvis	12

NUMBERING OF VERTEBRÆ.

Cer.	Dor.	Sac.	Cand.
13	8	9	8

ALCA, *Lin.*

Impennis, *Lin.*

I have received a skeleton of this bird, which differs so much from the figure in the "Zoological Transactions," that I should almost think there must be two species of Great Auk. Mr. Ed. Gerrard, from whom I received my skeleton, gives this account of it:

"You may perhaps like to know how I got these bones. They were got from a guano island off the North of Newfoundland. A vessel was sent there to see if the guano was worth anything for manure. It was found to be useless, owing to the island being so washed by the sea that all the nature was washed out of the guano. While digging about, one of the gentlemen came across a quantity of bones, which he took to Mr. Woodward, of the British Museum, and they turned out to be the bones of the Great Auk. I bought the whole, and after spending a great deal of time in sorting them over, I have been able to make out three tolerably perfect skeletons, the best of which I have given you the refusal of."

Pl. 27; details 27A.

LIST OF PLATES OF SKELETONS OF BIRDS,

THAT HAVE BEEN PUBLISHED.

Castelnau: Animaux, noveaux ou rares L'Amerique, du sud, Anatomie Oiseaux.

Pl. 14: Opisthocomus Cristatus.
Pl. 15, fig. 1-5: Palamedea Cornuta.
Pl. 15, fig. 6: Palamedea Derbyana.
Pl. 16, fig. 1-5: Dicholophus Cristatus.
Pl. 17, fig. (1-5): Psophia Crepitans.
Do. (6-7): Cymbops Cancrophaga.

Ibis, 1873, pl. 5—Murie.
Fragments of Upupa Epops.
Ditto " " Minor.
Ditto Irrisor ,, Erythrorhyncha.
,, ,, Senegalensis.

1862, pl. 10:
Do. ,, Colius Leucotis.

Contributions to Ornithology, by Sir. W. Jardine, Bart., 1850.

Pl. 53; Ramphastos Erythrorhynchus.
Pl. 54: Psilopogon Pyrolophus.

Reserches sur L'apparel sternal des Oiseaux, par Docteur F. J. Herminier, second Edit., 1828, with 3 plates of the sterna of 37 genera.

Transactions of the Zoological Society, Vol 6.
Pl. 91 Skeleton and details of Rhinochetus jubatus.

Do. Vol. 5: Osteology of Gallinaceous birds and Tinamous, Pl. 34, 35, 36, 37, 38, 39, 40, 41, 42.
Description of the Skeleton of the great Auk, Alca impennis, Pl. 51, 52.

Do. Vol. 4: on the Osteology of a Balæniceps Rex Gould, by W. K. Parker.
Pl. 65, 66, 67.

Vol. 2: the Anatomy of the southern Apteryx, by R. Owen, Esq., pl. 47—55.

Reserches Anatomiques et Palæontolgiques pour servir a l'Histoire des Oiseaux Fossiles de la France, par Mons. Alphonse Milne Edwards, 1867, 1868.
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Proceedings of the Zoological Society, 1872.

Pl. 4, 5, Murie on the Skeleton of Todus.

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DIDUNCULUS STRIGIROSTRIS.

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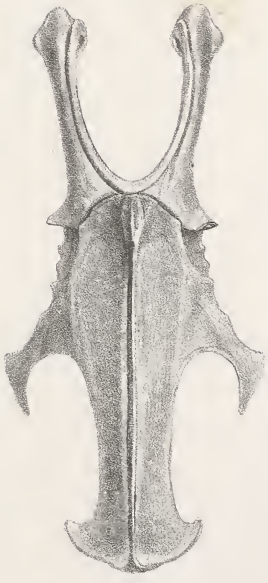

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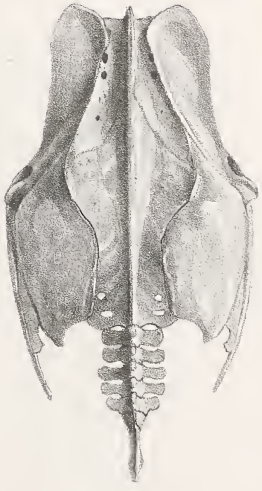

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PALAMEDEA CORNUTA.

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Nat. size.

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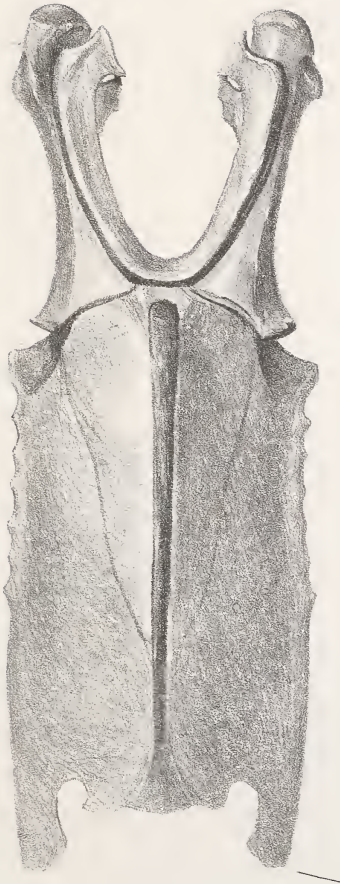

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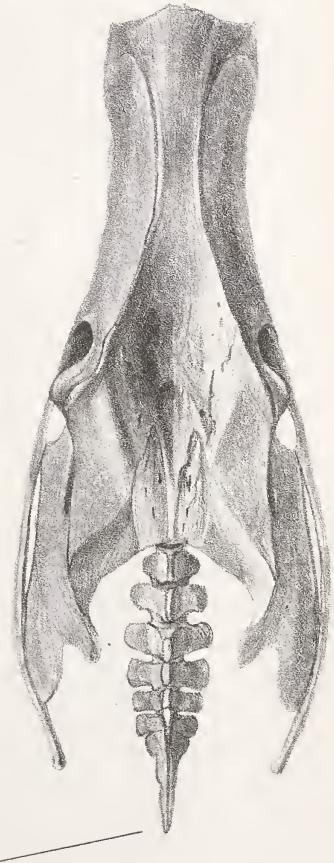

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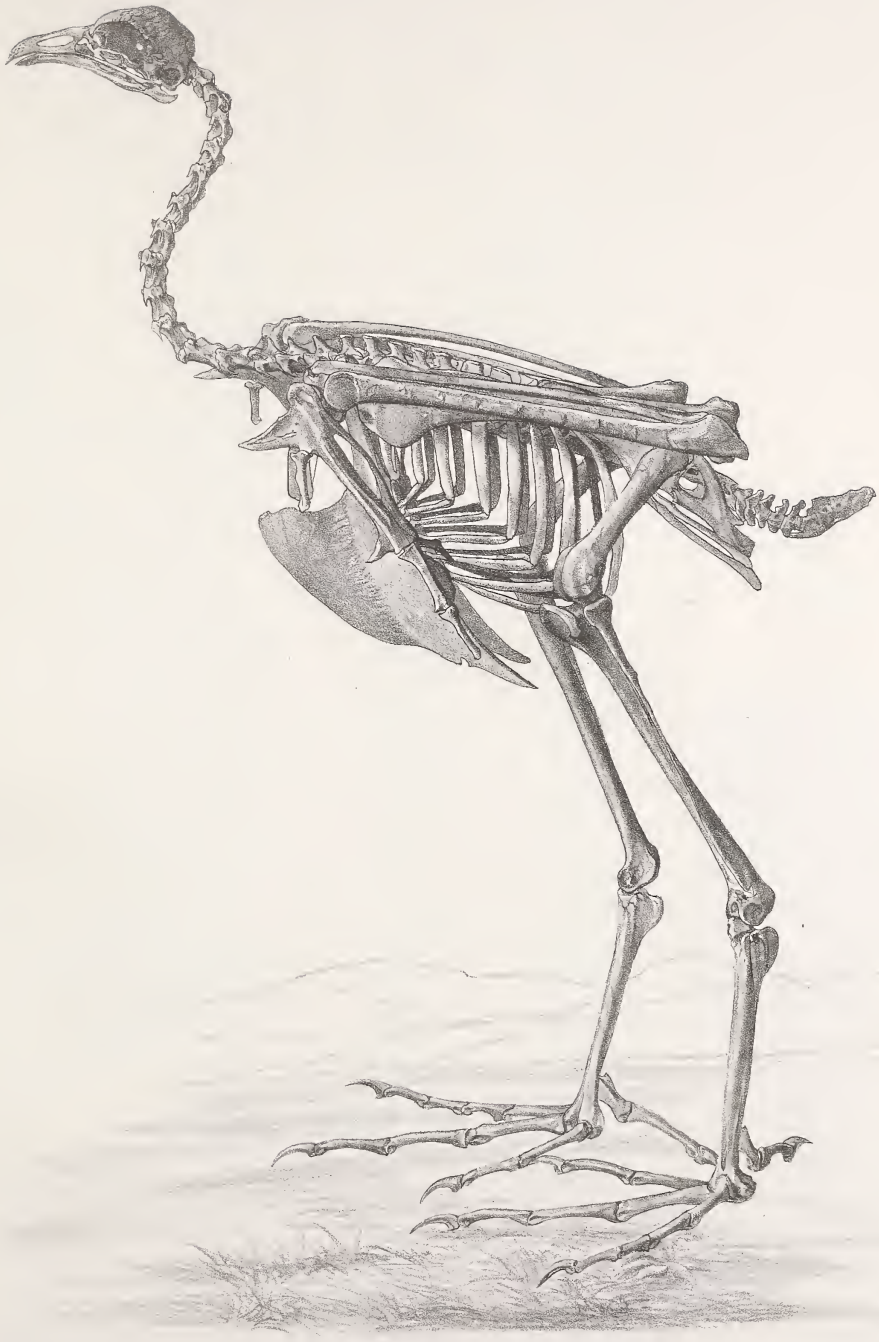
PALAMEDEA CORNUTA.



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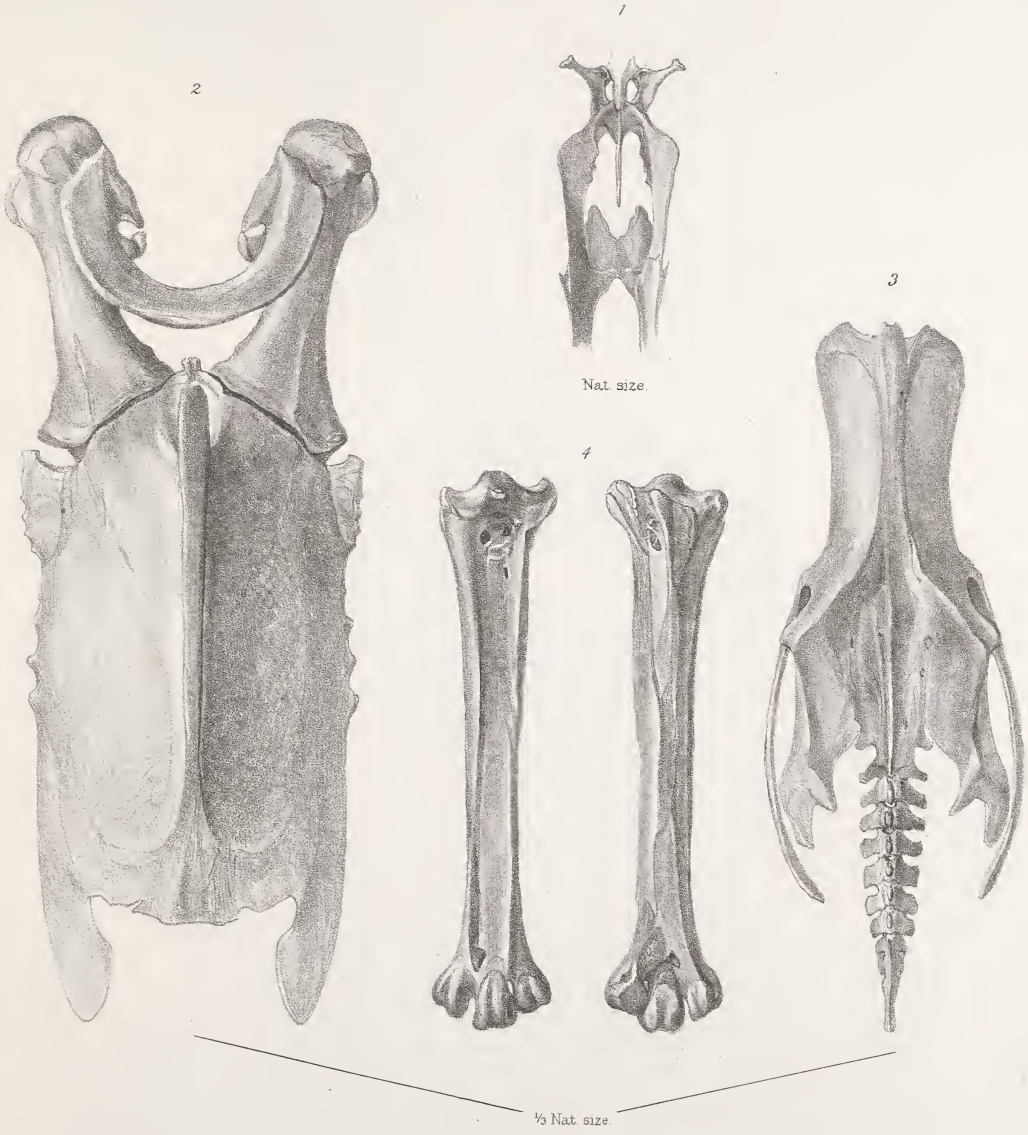
CHAUNA CHAVARIA.



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CHAUNA CHAVARIA.

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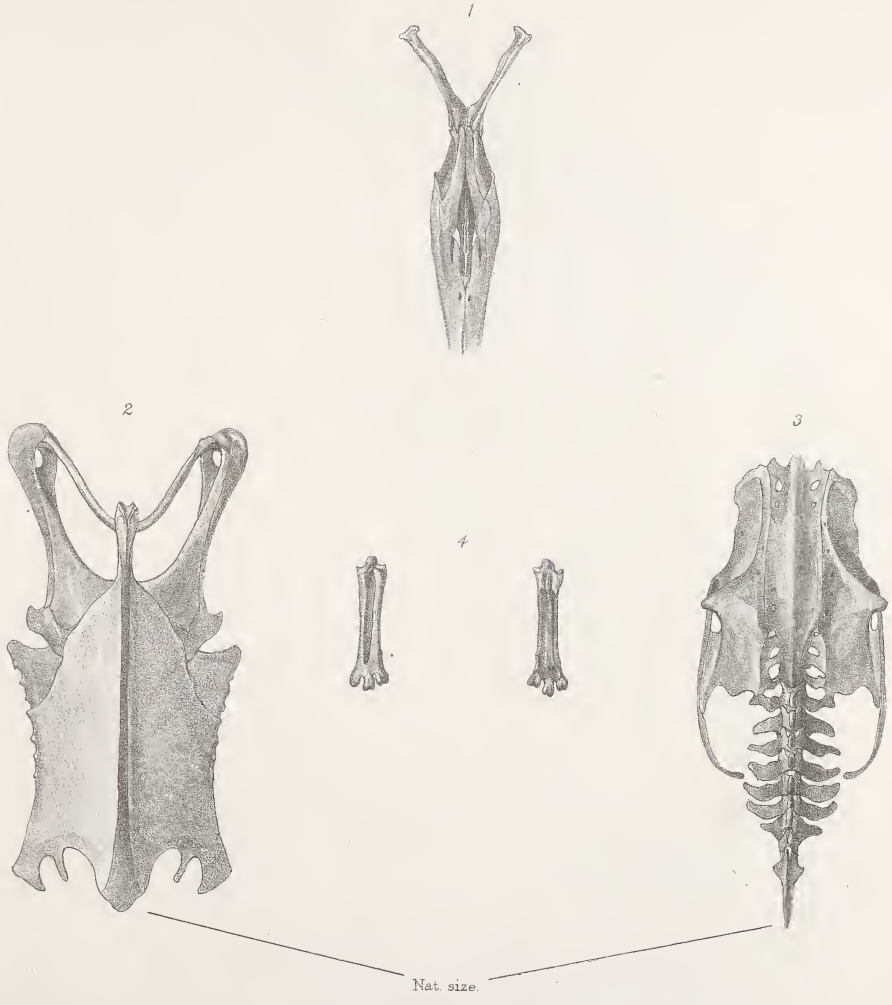
PHAETON ÆTHERENS.



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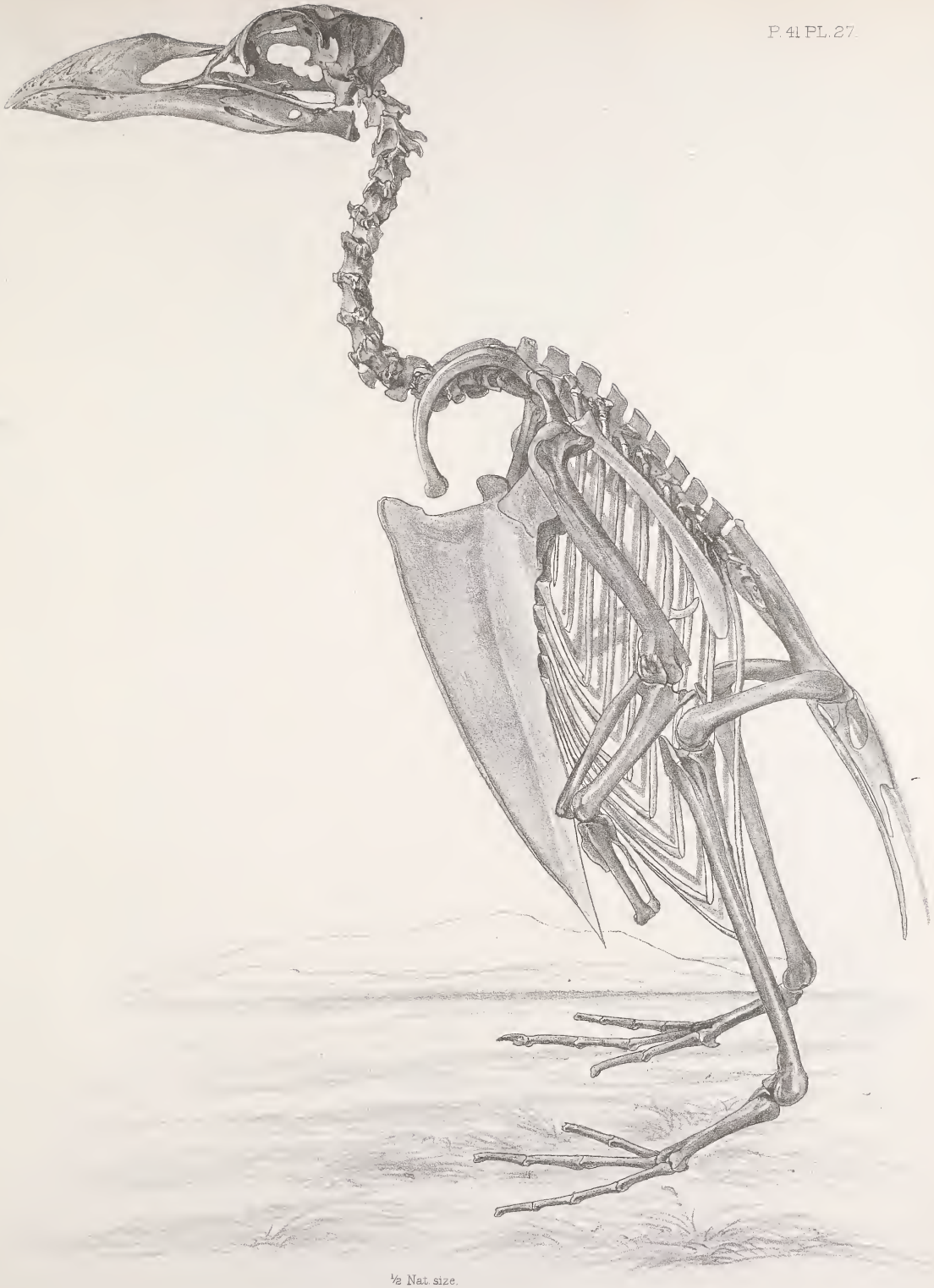
PHAETON ÆTHEREUS.



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ALCA IMPENNIS.

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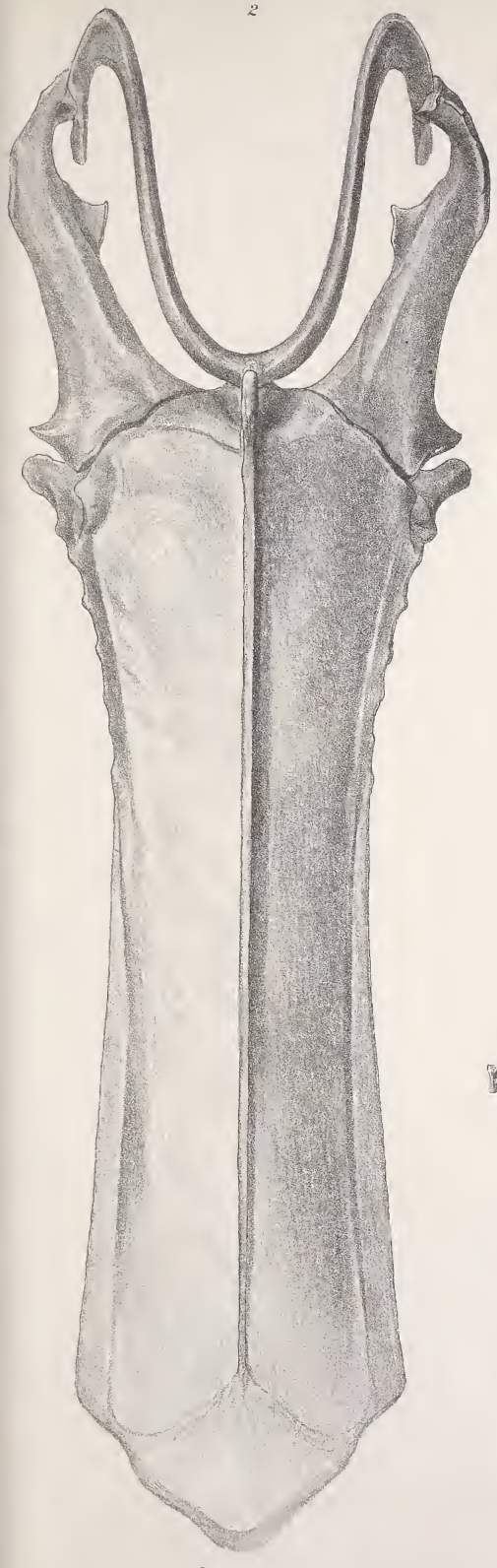

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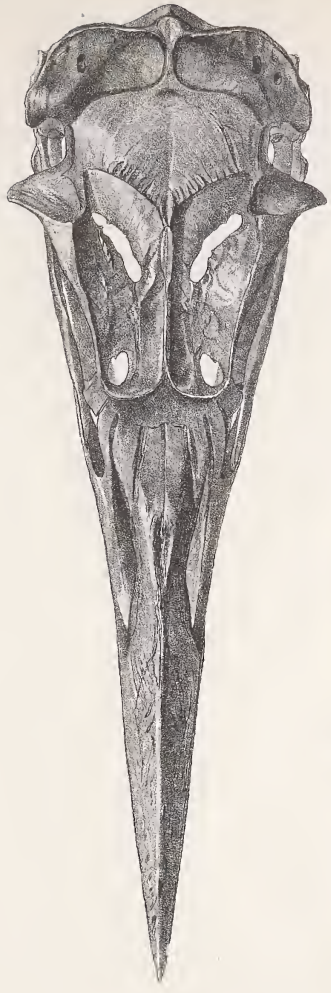

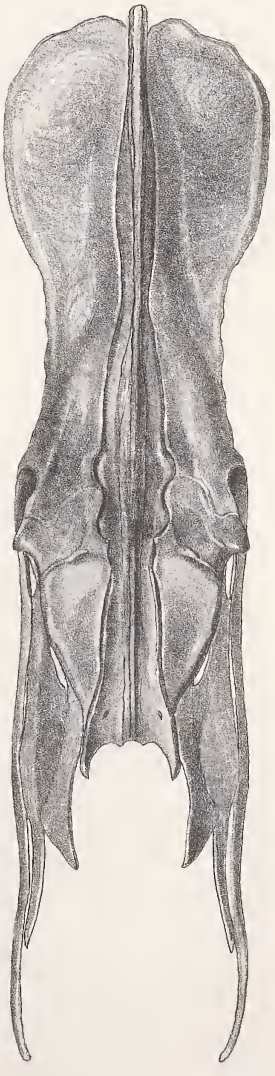

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inside.

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ALCA IMPENNIS.