

THE CHIONIDIDÆ.

(A Review of the Opinions on the Systematic Position of the Family.)

BY R. W. SHUFELDT.

EVER since the time that I first examined a skeleton of *Chionis minor* I have held that that species is related, in so far as its osteology is concerned, to the Plovers, and in July, 1891, I published in the 'Journal of Anatomy and Physiology' (London) an illustrated memoir upon this remarkable type, wherein I said that "*Chionis minor* probably constitutes one of the links among the Plovers and the Gulls, standing close up to the former and having its nearest living allies in *Hæmatopus* and such forms as *Glareola*. Recognizing this as we do, we cannot ignore, on the other hand, the impress it has at least received upon its skeleton from the columbo-gallinaceous group, and the Bustards, through the Plovers, seem to offer us a partial clue here, or missing links in the line through *Hemipodius*, or perhaps, too, in some yet unknown way, through *Syrrhaptes*, the other connecting forms having passed away, and left us only such conjectures as these to offer upon the position of *Chionis* in the system" (p. 524). Since the above was printed I have again re-examined my material and re-read the literature on the subject. My views remain practically unaltered.

The morphologist need not especially take into consideration the writings of naturalists upon the genus *Chionis* prior to 1836. In that year, however, M. De Blainville¹ anatomically examined the best part of a skeleton of a specimen of *C. alba*, and decided that *Chionis* was most nearly related to *Hæmatopus*. My figures and descriptions of the skeleton of *C. minor* in the 'Journal of Anatomy' seemed to me to lend substantial support to the opinion of that learned researcher, and there is no question but that he was pre-eminently correct about his views of the sternum.

¹ Blainville, M. H. D. De—Mémoire sur la place que doit occuper dans le système ornithologique le genre *Chionis* ou Bec-en-fourreau. Ann. Sci. Nat. VI, 1836, p. 97.

Nothing worthy of special note upon the structure of the bird appeared after De Blainville's contribution until Mr. Eyton published some observations twenty-two years afterwards,¹ and he was inclined to place the form near *Glareola*. Eleven years later Dr. Cunningham examined the larynx and parts of the digestive apparatus of a specimen of *Chionis alba*, and he remarked that "the legs present a decided resemblance to *Hæmatopus*, and the sternal characteristics are similar."² Professor Newton who has both described and figured the egg of *Chionis minor* has said that it "confirms by its appearance the systematic position of the form [*C. minor*] shown by osteology, its affinity, namely, to the Plovers."³ The literature of the subject is next materially enhanced by the appearance of the memoir by Doctors Kidder and Coues,⁴ and those distinguished writers distinctly dissent from the views of De Blainville and all foregoing authors on the subject, and are lead to believe that "*Chionis* stands between grallatorial and natatorial birds, retaining slight but perfectly distinct traces of several other types of structure" (p. 109); and further: "We thus find in *Chionis* a connecting link, closing the narrow gap between the Plovers and Gulls of the present day. In our opinion, this group represents the survivors of an ancestral type from which both Gulls and Plovers have descended. And this opinion is strongly supported by the geographical isolation of its habitat, affording but few conditions favorable to variation" (p. 114). They propose the group Chionomorphæ to contain the two known species *C. minor* and *C. alba*, the "Chionomorphs" then "constituting exactly the heretofore unrecognized link between the Charadrimorphs and Cecomorphs, nearer the latter than the former, and still nearer the common ancestral stock of both." They were further of the opinion that *C. minor* is "undoubtedly nearest to the ancestral type" and therefore called it *Chionarchus minor*. Messrs. Sclater and Salvin in their 'Nomenclator' include the Chionididæ in their

¹ Eyton, T. C.—Note on the skeleton of the Sheathbill (*Chionis alba*). Proc. Zool. Soc. XXVI, 1858, pp. 99, 100.

² Cunningham, R. O.—On *Chionis alba*. Jour. Anat. and Phys., Nov., 1869, pp. 87-89.

³ Newton, Alfred—Proc. Zool. Soc., Jan. 17, 1871, p. 57, pl. iv, fig. 7.

⁴ Kidder, J. H., and Coues, E.—Bull. U. S. Nat. Mus., No. 3, 1876, pp. 85-116.

group 'Limicolæ,' which leads us to infer that they believed it to be most nearly related to the Plovers.¹ In 1880 Mr. Sclater still retained the 'Chionididæ' in the Limicolæ, placing the family between the Charadriidæ and the Thinocoridæ.² Garrod, who was always prone to lay too great stress upon single characters, sustained Kidder and Coues in their opinion upon the affinities of *Chionis*, and believed them to be chiefly larine. He adds, nevertheless, "that the genus deserves to be located in a separate division, however, as Dr. Coues suggests, I cannot agree," and further "that Dr. Coues's account of the myology of *Chionis minor* is incomplete as far as the varying muscles are concerned." Strange to say, Garrod found, in studying the muscles, the following, directly militating against his expressed opinion—namely, the Laridæ all lack the accessory femoro-caudal, while certain of the Charadriidæ as well as both *Chionis minor* and *C. alba* possess it. Every one of these families possesses the ambiens.³ Now the principal fault to be found in the work of Doctors Kidder and Coues, is that the major part of their dissections were *not made comparative*. As Garrod noticed, their dissections of the muscles is extremely deficient. Their studies of the 'viscera' of *Chionis* are even more so, and, finally, there is barely any evidence whatever in their study of the skeleton of *C. minor* that it was critically compared with the skeletons of such genera as *Larus*, *Hamatopus*, *Alca*, or a species of the *Gallinæ*. Professor Parker who was always great in his comparisons of the details in the skeletons of many kinds of birds from every conceivable group, and who possessed clear taxonomical ideas in his generalizations, as a rule, believed, when he gave his 'scheme' of the relationships of *Pluvialis*, that the Plovers through *Hamatopus* and *Chionis* were connected with the Tubinares on the one hand, and through *Glareola* and *Sterna* were connected with the Laridæ upon the other. That Parker spoke of *Chionis* as a "thoroughly *marine* Plover," and not as a thoroughly *terrestrial* Gull, is good evidence upon what he thought about the

¹ Sclater, P. L., and Salvin, O.—Nomenclator Avium Neotropicalum, p. 142. 1873.

² Sclater, P. L.—Remarks on the Present State of the Systema Avium. Ibis (4 ser.), IV, 1880, p. 340.

³ Garrod, A. H.—Coll. Sci. Mem. pp. 221, 222, 419. 1881.

affinities of the Sheathbill.¹ It is worthy of mention, too, that in 1882 Dr. Reichenow² placed *Chionis* near *Hæmatopus*, and Burmeister was of the same opinion.

Other authors, both early and recent, have held diverse opinions as to the affinities of the Chionididæ, and we still stand in need of a complete study of the entire structure of *Chionis*. Thus, for example, Forbes placed the Sheathbill between *Dromas* and *Thinocorus*,³ and Gray between the Thinocoridæ and the Hæmatopodidæ,⁴ while some even, as we are aware, referred the family to the Fowls and others to the Pigeons, Hartlaub being a representative of the former and Swainson of the latter class of writers, but as their views are not supported by a knowledge of the structure of the Sheathbills, we only mention their names here in order to show what different opinions naturalists will entertain when those opinions are based upon the external appearance of things.

Forbes has not been the only classifier to place *Chionis* near the Thinocorythidæ, for such a view is quite generally held; Eyton had that idea, and Sclater, already cited above, and Carus, and Sundevall,⁵ and Wallace,⁶ Lilljeborg,⁷ and Fitzinger,⁸ and of such an opinion Newton has said that "The little group of very curious birds, having no English name, of the genera *Thinocorys* and *Attagis*, which are peculiâr to certain localities in South America and its islands, are by some systematists placed in the family Chionididæ and by others in a distinct family Thinocoridæ (more correctly Thinocorythidæ. They are undoubtedly limi-

¹ Parker, W. K.—On the Osteology of Gallinaceous Birds and Tinamous. Trans. Zoöl. Soc. Lond. 1866, V, 5, pp. 206 and 236.

² Reichenow, A.—Die Vögel der Zoologischen Gärten. I, II. Leipzig, 1882–1884.

³ Forbes, W. A.—Collected Scientific Papers. 1885. p. 226.

⁴ Gray, G. R.—Handlist of Genera and Species of Birds, I, II. 1869–1871.

⁵ Sundevall, C. J.—Methodi Naturalis Avium Disponendarum Tentamen. Stockholm, 1872.

⁶ Wallace, A. R.—Attempts at a Natural Arrangement of Birds. Ann. Nat. Hist. (2d ser.), XVIII, 1856, p. 193.

⁷ Lilljeborg, W.—Outlines of a Systematic Review of the Class Birds. Proc. Zool. Soc., 1866, p. 5.

⁸ Fitzinger, L. J.—Ueber des System und die Charakteristik der natürlichen Familien der Vögel. Sitz. K. Akad. d. Wiss. Math.-Nat. Cl. XXI, p. 277 et seq. Vienna, 1856–65.

coline, though having much the aspect of Sand Grouse, but their precise position and rank remain at present uncertain."¹ (Cf. Garrod (*ut supra*) and Professor Parker (Trans. Zool. Soc. Lond. X, pp. 301 et seq.) To the number of those who correctly saw that the hæmatopine characters in *Chionis* predominated over its larine ones, we must not forget to add the worthy name of De Blainville's pupil L'Herminier,² who also saw something of the anatomy of the Sheathbill, and enough to convince him that the bird was more Oystercatcher than it was Gull; and no less distinguished a naturalist than M. Alph. Milne-Edwards³ is of the same opinion. Support again came to this view in 1885 when Dr. Leonhard Stejneger published his scheme of classification of birds in the 'Standard Natural History' (Boston: Cassino & Co.). This writer divides his 'Order VII, the Grallæ' into five superfamilies, of which the first is the Chionoideæ, containing the two families (1) Chionidæ, and (2) Thinocoridæ. This superfamily is followed by the Scolopacoidæ, containing such families as the Glareolidæ, Dromadidæ, Charadriidæ and others. The Laridæ and their allies are in another and different order, viz., the Cecomorphæ, which practically agrees with Huxley's group of the same name. A few years after the appearance of this work there appeared the two sumptuous volumes on the structure and classification of the class Aves by Fürbringer,⁴ and the following from his scheme gives his views upon the position of the Chionididæ:—

¹ Newton, A.—Art. 'Sheathbill.' *Encycl. Brit.* 9th Ed. Vol. XXI, p. 782. Newton in this article again invites attention to the unfortunate inaccuracies in the memoir of Doctors Kidder and Coues, and adds "The opinions of De Blainville and Dr. Reichenow are borne out by the observations of Mr. Eaton (*Philos. Trans.* CLXVIII, pp. 103-105), and no one knowing the habits of an Oystercatcher can read his remarks without seeing how nearly related the two forms are."

² L'Herminier, F. J.—*Recherches sur l'appareil sternal des oiseaux, considéré sous le double rapport de l'ostéologie et de la myologie, etc.* *Mem. Soc. Linnéenne* VI, p. 1. Paris, 1827—2d ed. Paris, 1828.

³ *Ann. Sc. Naturelles*, ser. 6, XIII, art. 4, p. 247.

⁴ Fürbringer, Max.—*Untersuchungen zur Morphologie und Systematik der Vögel.* Amsterdam and Jena, 1888, 30 plates.

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|--|---|----------------------------------|---|--------------------|---|---|
| O. CHARADRIORNITHES. Ægialornithes. S. O. Charadriiformes. | { | G. s. lat. Laro-Li- micolæ | { | G. s. Charadrii | { | F. Charadriidæ. F. s. str. Glareolidæ. F. s. str. Dromadidæ. F. Chionididæ. F. Laridæ. F. Alcidæ. F. Thinocoridæ. |
| | | | | G. Parræ | | F. Parridæ. |
| | | | | G. Otides | | { F. CEdicnemidæ. F. Otididæ. |

It would seem that Professor Fürbringer saw more Gull than Plover in the Sheathbills, and had underestimated the significance of the characters presented on their part, inasmuch as he has only awarded them family rank.

The following year Cope¹ published his 'Synopsis of the Families of Vertebrata,' and in his arrangement of Aves sets forth the position of the Sheathbills as follows:—

| | | | | | | | |
|----------------------------|---|-------|---|------------|---|----------|---|
| SUPERORDER EURHIPIDURÆ. | { | ORDER | { | SUBORDER | { | FAMILIES | |
| | | | | Euornithes | | Grallæ | Chionidæ. Thinocoridæ. Glareolidæ. Dromadidæ. Charadriidæ. Otididæ. Eurypygidæ. Rhinochetidæ. Cariamidæ. Psophiidæ. Gruidæ. Rallidæ. |
| | | | | | | | |

The Laridæ and their supposed allies he places in another suborder of the Euornithes, viz., the Cecomorpha.

It will be seen that Cope's suborder Grallæ with its twelve families nearly corresponds to Stejneger's order Grallæ with its five superfamilies divided into its seventeen families. Cope here revived the opinions of those who believed that *Chionis* stood most nearly related to the 'Thinocoridæ,' and yet showing too that it was more Plover than Gull.

¹ Cope, E. D.—Amer. Nat. Vol. XXIII, No. 274. Oct. 1889, pp. 849-877.

In 1891 the present writer's memoir¹ on *Chionis minor* appeared, which has been referred to at the beginning of this article, and in the same year there was published the very admirable contribution to the classification of birds by Dr. Sharpe of the British Museum, one of the most useful papers now in the hands of systematic ornithologists.² With the exception of the present writer's article from the 'Journal of Anatomy,' Doctor Sharpe had before him at the time of his writing his 'Review,' all the schemes of classification of Aves mentioned in this paper, and no doubt many others not herein noticed; and in it he sets forth his own most able views upon the taxonomy of the class. The Sheathbills are thus placed:—

| ORDER XVIII | SUBORDERS | FAMILIES |
|-----------------|------------------|-----------------|
| CHARADRIIFORMES | XXII. Dromades | Dromadidæ. |
| | XXIII. Chionides | Chionididæ. |
| | XXIV. Attagides | { Attagidæ. |
| | | { Thinocoridæ. |
| | | { Hæmatopodidæ. |
| | XXV. Charadrii | { Charadriidæ. |
| | | { Scolopacidæ. |
| | XXVI. Glareolæ | |
| | XXVII. Cursorii | |
| | XXVIII. Parræ | |
| XXIX. Œdicnemi | | |
| XXX. Otides | | |

Further Dr. Sharpe places the Gulls in his Order XVII,—the Lariformes, containing the suborder Lari, and the two families Stercorariidæ and Laridæ, the latter containing the three sub-families Larinæ, Sterninæ and Rhynchopinæ.

Previous to having seen Dr. Sharpe's classification the present writer had the following in manuscript to be used in his forthcoming work upon the osteology of birds.

¹ Shufeldt, R. W.—Contributions to the Comparative Osteology of Arctic and Sub-arctic Water-Birds, Part IX. Jour. Anat. and Phys. Vol. XXV, n. s. Vol. V, pt. IV, Art. V, Plates XI, XII, London, July, 1891, pp. 509-525. The entire part is devoted to the osteology of *C. minor*, and several figures are given of its skull, other figures of the bones of the skeleton having appeared in earlier parts of this series of memoirs.

² Sharpe, R. Bowdler.—A Review of Recent Attempts to Classify Birds; An Address delivered before the 2nd Intern. Ornith. Cong. at Budapest, May, 1891. Budapest, 1891.

| SUBORDER | FAMILY | GENERA | SPECIES |
|-----------|--------------|--------------------------|-------------------------|
| CHIONIDES | { Chionididæ | { Chionarchus Chionis | { C. minor. C. alba. |

Such a suborder would probably stand between my suborder Longipennes and the suborder Limicolæ, and there probably would be added to the Chionididæ, the three other families Dromadidæ, Attagidæ, and Thinocorythidæ. But with what I know of the osteology of *Chionis minor* and of *Hæmatopus*, and not having examined the entire structure of any of the three families first named, such a proposal must be considered wholly provisional. A knowledge of the entire morphology of all these forms is something very much to be desired.

OUR SCOTERS.

BY G. TRUMBULL.

IN an article under the above title printed in 'The Auk' of April, 1892, I called attention to numerous errors which had appeared concerning our representatives of the genus *Oidemia*. It was my intention at the time to continue the list of such errors in this second (and in a third) article, but I abandon the idea. Such a continuance would occupy altogether too much space. I give the facts which I have ascertained, with only occasional reference to the failures of former accounts.

Though difficult to conceive how some of the mistakes ever crept into print, it is easy to imagine how others occurred, viz., by the absence of fresh specimens; by compiling, with phraseologic variation, from earlier accounts of more or less credibility; by studying faulty pictures; by mistaking immaturity for maturity; by unhappy inferences; and by a desire, latent or active in us all, to appear at least a little wiser, a little more experienced than we really are.