

1. On the Petrel called *Thalassidroma nereis* by Gould, and its Affinities. By W. A. FORBES, B.A., F.L.S., F.G.S., Prosector to the Zoological Society.

[Received May 17, 1881.]

In this Society's Proceedings for the year 1840, the late Mr. Gould described a "beautiful fairy-like" new species of Stormy Petrel from Bass's Straits, which he called *Thalassidroma nereis* (tom. cit. p. 178), under which name it is figured in the last volume of the 'Birds of Australia.'

Dr. Elliott Coues, in his revision of the family Procellariidæ<sup>1</sup>, treating of the species under the name *Procellaria nereis*, says:—"I have had the pleasure of examining Mr. Gould's types of this species from Bass's Straits, Australia, now in the collection of the Philadelphia Academy. It is a beautiful little species, quite unlike any other known Stormy Petrel. In form it comes nearer to *Procellaria pelagica* than to any other species; and it is *probably congeneric with it, though it differs somewhat*<sup>2</sup> in the proportion of the tarsus and toes, and very widely in its pattern of coloration.\* \* \* The proportions of the tibia and tarsus differ from those of *pelagica* in the greater comparative length of the former."

Amongst the Petrels mentioned at various times by the late Prof. Garrod as having been examined by him, a species several times occurs which is doubtfully named "*Procellaria* (or *Thalassidroma*) *fregata*?"<sup>3</sup> The specimens dissected by him are now before me, and have been identified by Mr. Salvin as being really referable to the *Procellaria nereis* of Gould, an example of which, from the Falkland Islands, is now in the museum of Messrs. Salvin and Godman. A careful examination of the three spirit-specimens of this bird, as well as of the skin mentioned, have convinced me that this species is not referable to the true genus *Procellaria* as represented by *Procellaria pelagica*, and is in fact in no way related to that group of Petrels, but has its nearest allies in the flat-clawed genera *Oceanites*, *Fregetta*, and *Pelagodroma*.

In his paper on the muscles of the thigh in Birds<sup>4</sup> the late Prof. Garrod divided the Nasutæ, or Petrels, into two groups, the "Storm-Petrels" and the Fulmaridæ, the former group differing from the latter in that they possess the accessory semitendinosus muscle (Y), but lack intestinal cæca. In the Fulmaridæ, on the other hand, the accessory semitendinosus muscle is absent, but cæca are present. The species of Storm-Petrels on which this generalization was based are called, with doubt<sup>5</sup>, "*Procellaria pelagica* and *P. fregata*," the latter being the species now identified by Mr. Salvin

<sup>1</sup> Proceedings of the Academy of Natural Sciences of Philadelphia, 1864, p. 81.

<sup>2</sup> The italics are mine.—W. A. F.

<sup>3</sup> Cf. P. Z. S. 1873, pp. 470 and 641.

<sup>4</sup> P. Z. S. 1874, p. 122.

<sup>5</sup> P. Z. S. 1873, p. 641.



as *P. nereis*. As regards the first-named species, there can be little or no doubt that the bird really dissected by Prof. Garrod, and called by him "*Procellaria pelagica*," was Wilson's Petrel (*Oceanites oceanicus*), as in this bird there are no cæca<sup>1</sup>, at the same time that the accessory semitendinosus muscle is present. The true *Procellaria pelagica* (of which I have lately dissected two perfectly fresh examples) agrees with the Fulmaridæ, as defined by Prof. Garrod, in having cæca<sup>2</sup>, but no accessory head to the semitendinosus; and *Cymochorea leucorrhoa* agrees in both these points with *Procellaria pelagica*.

The so-called "*Procellaria nereis*" of Gould is therefore obviously not a true *Procellaria* at all; and this view is confirmed by other characters, such as the shape of its nostrils, the elongated tarsi, which are much longer than the mid toe<sup>3</sup> and covered anteriorly with transversely arranged scutellæ<sup>4</sup>, the very minute hallux, and the lamellar, concave form of the claws. It belongs, in fact, to the group of *Oceanites*, *Fregetta*, and *Pelagodroma*, but is not exactly congeneric with any of them. I propose therefore to make it the type of a new genus, to be called *Garrodia*, in memory of my lamented friend A. H. Garrod, not only as a token of my personal esteem for, and indebtedness to him, but also as some slight recognition of the thanks ornithologists generally owe him for the additions he made to our knowledge of the anatomy of birds.

The genus *Garrodia* may be shortly defined as follows:—

GARRODIA. Genus ex ordine Tubinarium OCEANITÆ maxime affine, tarsis pro digitis longioribus et antice scutellatis, necnon margine sterni posteriore integro distinguendum.

Type *Procellaria nereis*, Gould.

*Garrodia* is perhaps most closely allied to *Oceanites*, as already stated, but differs from that genus in having the tarso-metatarsi covered anteriorly with a series of transverse scutellæ instead of being "entire," in their slightly greater proportional length as compared with the third toe<sup>5</sup>, in the even more minute hallux, and in the more flattened and lamellar form of the claws. The sternum too is posteriorly entire, whereas in *Oceanites oceanicus* it is slightly notched. The coloration of the two genera is also quite different. From *Fregetta* *Garrodia* may be easily distinguished by the very different proportions and forms of the nails and feet in that genus, and from *Pelagodroma* by its much shorter feet and entire tail.

These four genera—*Oceanites*, *Garrodia*, *Pelagodroma*, and

<sup>1</sup> Cf. also Macgillivray, in Audubon's 'Ornithological Biography,' v. p. 646.

<sup>2</sup> Cf. Macgillivray, l. c. p. 313; also Wagner in Naumann's 'Vögel Deutschlands,' x. p. 556.

<sup>3</sup> In *Procellaria pelagica* and *Cymochorea leucorrhoa* the tarso-metatarsus is not longer, and may be shorter, than the 3rd toe. As against 21.5 and 21.5, and 23 and 26 millim. in the two first-mentioned genera, in the so-called *Procellaria nereis* the lengths of the two are respectively 34 and 26 millims.

<sup>4</sup> In *Procellaria pelagica* the tarsi are pretty uniformly covered with somewhat irregular hexagonal scutes.

<sup>5</sup> In a specimen of *Oceanites oceanicus* (in spirit) the middle toe measures 29 millim.; in one of *Garrodia* the length is 26 millim. The length of the metatarsus in both is 34 millim.



*Fregetta*—form a very well-marked family of the Tubinares, which may be called Oceanitidæ, as distinguished from the remainder of the group, or Fulmaridæ of Prof. Garrod. Anatomically, these four genera agree together, and differ from the Fulmaridæ (on nearly all the genera of which, including *Diomedea* and *Puffinuria*, I have notes), in the two important characters already mentioned—the absence of cæca and the presence of the accessory semitendinosus muscle. Externally they may be at once recognized by their peculiar elongated tarsi, lamellar nails, and by never having more than 10 secondaries, *Procellaria* and *Puffinuria* having 13, and the remaining Fulmaridæ more (in *Diomedea*, according to Nitzsch, as many as 40). My family Oceanitidæ, in fact, corresponds to Bonaparte's section “\*\* *Unguibus depressis*” of his Procellariæ<sup>1</sup>, and to Coues's “second group” of the similarly-named section in his ‘Review’<sup>2</sup> with the addition, in each case, of *Garrodia*, included by both authors in the restricted genus *Procellaria*.

Being now engaged in a report, for the Voyage of H.M.S. ‘Challenger,’ on the anatomy of the Petrels collected during that expedition, I propose to reserve further details of the differences and characters of these two groups, and of the genera composing them, till that occasion.

## 2. Observations on the Habits of the *Echidna hystrix* of Australia. By GEORGE J. BENNETT, C.M.Z.S.

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Having been now engaged for nearly three years in endeavouring to get an Echidna with the young *in utero*, that it might assist me in ascertaining whether they are oviparous or ovoviparous, I have had the opportunity of observing the habits of this interesting little animal in its native haunts. I hope therefore that a few notes collected during that time may be of interest.

Most of my observations have been made at Rosewood, a station below the Range, and the property of Messrs. Kent and Wienholt, from whose manager, Mr. Edmund Lord, I have received much valuable assistance. Their “black boy” Johnny has always been at my disposal. Without him I could have got very few specimens, as he is most sagacious in tracking these animals.

My first trip with Johnny showed many of the difficulties in my way. We saw a great many tracks, but no animals. The ground was rooted up as if so many pigs had been there tearing up the ground, which the Echidnæ do with their noses, to uncover the insects lying under the dead leaves. They then go to the fallen rotten trees, quite denuding them of bark, and tearing out the rotten wood and feasting on the insects, which, on examination, I found to be small

<sup>1</sup> Consp. Av. ii. p. 197 (1857).

<sup>2</sup> *Op. cit.* p. 74, where characters for it are given.



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